
APPENDIX F:

Cultural Impact Assessment for the Proposed
Lease for the Nāhiku, Ke‘anae, Honomanū,
and Huelo License Areas

Cultural Surveys Hawai‘i, Inc.

Final
Cultural Impact Assessment for the Proposed Lease (Water Lease) for the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua‘a, Makawao and Hāna District, Maui Island, TMKs: [2] 1-1-001:044, 50, 1-1-002:002, 1-2-004:005, 007 (por.), 2-9-014:001, 005, 011, 012, 017

**Prepared for
Wilson Okamoto Corporation**

**Prepared by
Hallett H. Hammatt, Ph.D.**

**Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: MAUI 27)**

June 2019

**O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950**

www.culturalsurveys.com

**Maui Office
1860 Main St.
Wailuku, Hawai‘i 96793
Ph.: (808) 242-9882
Fax: (808) 244-1994**

Management Summary

Reference	Cultural Impact Assessment for the Proposed Lease (Water Lease) for the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua‘a, Makawao and Hāna District, Maui Island, TMKs: [2] 1-1-001:044, 50, 1-1-002:002, 1-2-004:005, 007 (por.), 2-9-014:001, 005, 011, 012, 017 (Hammatt 2019)
Date	June 2019
Project Number	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: MAUI 27
Agencies	Department of Health – Office of Environmental Quality Control (DOH-OEQC)
Land Jurisdiction	State of Hawai‘i
Project Proponent	Alexander & Baldwin Inc. (A&B) / East Maui Irrigation Company, Limited (EMI), collectively referred to as “A&B”
Project Location	The proposed Water Lease includes the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas (herein referred to as “License Area”) within the State of Hawai‘i Forest Reserve on the northern slope of Haleakalā. The License Area includes portions of the modern judicial districts of Makawao and Hāna, the traditional <i>moku</i> of Hāmākua Loa and Ko‘olau, and numerous <i>ahupua‘a</i> . The License Area is depicted on portions of the 1992a Haiku, 1992c Keanae, 1991 Kilohana, 1992d Nahiku, and 1992b Hana U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.
Project Description	The Proposed Action constitutes the issuance of one long-term (30 years) Water Lease from the Board of Land and Natural Resources (BLNR) for the continued “ <i>right, privilege, and authority to enter and go upon</i> ” the License Area for the “ <i>purpose of developing, diverting, transporting, and using government owned waters</i> ” through the existing EMI Aqueduct System which supplies water to domestic and agricultural water users. The Water Lease will enable the lessee to continue to go on lands owned by the State in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System. It will allow continued operation of the EMI Aqueduct System to deliver water to the Maui County Department of Water Supply (MDWS) for domestic and agricultural water needs in Upcountry Maui, including agricultural users at the Kula Agricultural Park (KAP) and the future 262-acre KAP expansion, as well as the Nāhiku community. It also will allow for the continued provision of water to approximately 30,000 acres of agricultural lands in Central Maui.
Project Acreage	The License Area encompasses a total of approximately 33,000 acres (13,355 hectares).
Document	This Cultural Impact Assessment (CIA) provides information pertinent to

Purpose	the proposed project’s potential impacts to cultural beliefs, practices, and resources pursuant to the State of Hawai‘i environmental review process under Hawai‘i Revised Statutes (HRS) Chapter 343. The CIA follows the Environmental Council’s <i>Guidelines for Assessing Cultural Impacts</i> . The document will likely also support the project’s historic preservation review under HRS §6E and HAR §13-275 and §13-284.
Results of Background Research	<p>Background research for this project yielded the following results (presented in approximately chronological order):</p> <ol style="list-style-type: none"> 1. The License Area covers four license areas: Huelo, Honomanū, Ke‘anae, and Nāhiku (collectively referred to as the License Area). The License Area encompasses the following <i>ahupua‘a</i> (land division usually extending from the uplands to the sea): Honopou, Mokupapa, Waipi‘oiki, Waipi‘onui, Hanehoi, West Hanawana, East Hanawana, Pu‘uomālie, Pāpa‘a‘ea, West Makaīwa, East Makaīwa, Honomanū, Ke‘anae, Wailuanui, Wailuaiki, Ko‘olau, and Pa‘akea. 2. The following streams can be found within the License Area: Makapipi, Hanawī, and Kapā‘ula in the Nāhiku License Area; Waia‘aka, Pa‘akea, Puakea, Waiohue, Kopili‘ula, Pua‘aka‘a Tributary, East Wailuāiku, West Wailuāiki, Wailuānui (Waikani Waterfall), Kualani (or Hāmau), Waiokamilo, ‘Ōhi‘a (or Waianu), Palauhulu (Hauoli Wahine and Kano Tributaries), Pi‘ina‘au in the Ke‘anae License Area; Nua‘ailua, Honomanū, Punala‘u (Kōlea and Ulunui Tributaries), Ha‘ipua‘ena in the Honomanū License Area; and Puohokamoa, Wahinepe‘e, Waikamoi (Alo Tributary), Kōlea, Punalu‘u, Ka‘aiea, ‘O‘opuola (Makanali Tributary), Puehu, Nā‘ili‘ilihaele, Kailua, Hanahana (Ohanui Tributary or Hanawana or Hanauna), Hoalua, Hanehoi, Huelo (Puolua Tributary), Waipi‘o, Mokupapa, Ho‘olawa (Ho‘olawa ili and Ho‘olawa nui Tributaries), and Honopou (Puniawa Tributary) in the Huelo License Area 3. According to <i>mo‘olelo</i> (story), in “The Epic Tale of Hi‘iakaikapoliopole,” retold by Ho‘oulumāhiehie, Hi‘iaka and her friend Wahine‘ōma‘o sail to Maui and travel to the windward side of the island. They stop in Wailua Iki Ahupua‘a where they encounter a group of people celebrating the hula. The <i>hālau</i> (meeting hall) was filled with men, women, and children (Ho‘oulumāhiehie 2008:199). Hi‘iaka spies her cousin, Kapokūlani (Kapo), in hopes that an invitation to dine and rest will be extended to both her and her traveling companion. In order to capture Kapo’s attention, Hi‘iaka offers a chant. It should be noted that Kapo is a goddess of sorcery on Maui where she acts as an <i>akua noho</i> (spirit that takes possession of people and speaks through them as a medium).

	<ol style="list-style-type: none"> 4. Kihapi'ilani is the son of the <i>ali 'i nui</i> (high chief) Pi'ilani. Kihapi'ilani is known for his <i>lelekawa</i> (cliff diving) skills and for building a stone paved road around the island of Maui (Beckwith 1970). According to legend, Kihapi'ilani fled from his brother and took up residence in Makawao but kept his identity a secret. He left Makawao after he was accused of being lazy and stayed in Kalaua'ama in Ha'ikū to obtain sweet potato growing skills. He later took his skill set to Kalaniwai and Wailuku. 5. In the legend of Kāne and Kanaloa, the two demi-gods are in search for water to accompany their appetite for 'awa (kava; <i>Piper methysticum</i>). One of the first places the pair travel to is in the mountains of Ke'anae where Kāne thrusts his <i>kauila</i> (<i>Alphitonia ponderosa</i>) wood staff into the ground and a spring appears. According to author, Martha Beckwith, two holes can be seen across from 'Ōhia Gulch (1970:65). 6. 'Ai'ai, son of Ku'ula the Fish God, instructed his friends to venture into the deep waters off of Wailua Nui Ahupua'a and kill the giant <i>he'e</i> (general term for octopus) that lived there. Canoes were drawn and people came down ready. 'Ai'ai brought the <i>hokeo</i> (fishing gourd) and <i>leho</i> (general name for cowrie shell) that his father gave him. The canoes and people sailed out. It was here that Ku'ula and Hina were called upon for their assistance and the <i>hokeo</i> and <i>leho</i> were taken out and lowered into the ocean. The <i>he'e</i> was attracted by the radiance the <i>leho</i> brought out but due to its overwhelming size, scared the people. 'Ai'ai's friend brought a stone with him and at the right time, shoved the stone into the head of the squid. The weight of the stone sunk the <i>he'e</i> and one of the men cut off one of the tentacles of the squid. When the <i>he'e</i> died it turned into stone and a formation resembling a squid can be seen just outside of Wailua Nui (Thrum 1907:234-235). 7. Of the 230 structures that Walker (1931) surveyed on Maui, 39 of the recorded <i>heiau</i> (pre-Christian place of worship) (Walker Sites 64 through 102) were documented in this portion of East Maui. Of the 39 documented <i>heiau</i> sites, only one lies within the License Area. This <i>heiau</i> is named Pu'u o Koholā and was presumed to be located within the current Honomanū License Area. Pu'u o Koholā was listed as "destroyed/not found" by Walker (1931). 8. The Alaloa (Long Road) of Kihapi'ilani or the Kihapi'ilani Highway, was constructed during the sixteenth century during the reign of Kihapi'ilani. The chief is credited with completed the paved road from Hāna to Wailuku, which was initiated by his father, Pi'ilani (Fleming 1933). The road provided a means of trade,
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	<p>commerce, and war time protection.</p> <ol style="list-style-type: none"> 9. Honomanū Valley was once the site of a large Hawaiian community. The residents of this area utilized the bay for canoe fishing and the uplands for agricultural terracing and house sites (Handy and Handy 1978). Another account states that many burials can be found in the upper reaches of the valley (Sterling 1998:109). 10. Ke‘anae Peninsula is a lava plain that extends a mile into the ocean from Ke‘anae Valley. This area is known for <i>lo‘i</i> (irrigated terrace) cultivation and still continues to celebrate a traditional Native Hawaiian lifestyle today (Handy 1940). 11. The earliest estimation of occupation along the coastal region of East Maui is approximately AD 1200 (Haun et al. 2004). The abundance of traditional land divisions and place names between Hāmākua Loa and Hāna suggest habitation was extensive after initial establishment. 12. Documentation regarding Native Hawaiian tenancy reveal that ocean resources were just as important as products of the land for sustenance. The preferred method of fishing was open ocean fishing for the people who lived along the coast of East Maui. In waters of ten or more fathoms deep, the favored technique was <i>kākā</i> (hook and line with no pole) or <i>kūkaula</i> (deep water fishing with hook and line). 13. It has been noted that there was some rivalry between the <i>ahupua‘a</i> of Ke‘anae and neighboring Wailua Nui. This rivalry gave way to larger political battles concerning rule of Maui Island between the sons of Pi‘ilani (Kamakau 1992:22-29) and later the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International Inc. et al. 1995). 14. In 1778, after Captain James Cook’s ships returned from their North American explorations, the crew stopped in Hāna and encountered Hawaiians for the first time on board their ships (Cordy 2000:294). 15. Prior to the establishment of the Hāna Protestant mission in 1837, missionaries would visit East Maui once or twice a year. Hāna was considered to be “one of the most isolated places in these islands, remote and difficult to access” (Bishop 1861). The journey was made by horseback to Ke‘anae then traveled by canoe for the remainder of the trip. 16. It may be inferred from Māhele documentation that there was dense and widespread occupation of East Maui, especially in the Honopou, Mokupapa, and Ke‘anae regions. According to records, the landscape was modified for the cultivation of traditional crops. The
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	<p>region was characterized by the presence of agricultural fields such as <i>lo 'i kalo</i> and <i>kula</i> (plain or open country) for potato growing and <i>olonā</i> (<i>Touchardia latifolia</i>), <i>'ie</i> (<i>Freyceinetia arborea</i>), <i>wauke</i> (paper mulberry; <i>Broussonetia papyrifera</i>), <i>koa</i> (<i>Acacia</i>; <i>Acacia koa</i>), <i>'ulu</i> (breadfruit; <i>Artocarpus altilis</i>), and <i>'ōhi 'a</i> (<i>Metrosideros macropus</i>) plantings. In addition, many streams, <i>'auwai</i> (irrigation ditch), and <i>loko i 'a</i> (fishpond) were identified within land claims as well. A unique trait to this area was that specific areas including the sea shore, <i>pali</i> (cliff), government roads, and streams that contained <i>'ōpae</i> (general name for shrimp) and <i>'o 'opu</i> (general name for fishes in the families <i>Eleotridae</i>, <i>Gobiidae</i>, and <i>Blennidae</i>) were also claimed.</p> <p>17. The Māhele of 1848 set the precedence of private land ownership across the entire Hawaiian Island chain and Maui was no exception to the age of Western development. The Māhele enabled foreigners and foreign nationals to acquire land for the establishment of ranching and plantation operations, including any infrastructure projects that were to support these land intensive industries.</p> <p>18. With the decline of the whaling industry in the mid- to late 1800s, the Hawaiian Islands attracted a new generation of entrepreneurs. Samuel T. Alexander and Henry P. Baldwin were prominent in this movement. Alexander was credited with using irrigation for improving sugar cane and banana yields (Dean 1950), while Baldwin's father had been granted 2,675-acres of land in northwest Maui.</p> <p>19. In 1867, S.T. Alexander proposed a massive construction project to bring mountain water from the streams of East Maui to the Central Maui isthmus, where many sugar crops were experiencing drought (Kuykendall 1967:64). This would later be known as the East Maui Irrigation Company (EMI) Aqueduct System.</p> <p>20. The digging of the EMI Aqueduct System from East Maui to Central Maui was a great feat. Hundreds of men were employed at a time with food, shelter, and tools supplied to them. The work required brute strength as heavy timber for flumes would need to be transported from the main road to the upper reaches of the forest (Thrum 1877:39-42). The crew dealt with torrential rains and landslides. Sometimes workers hacked their way through the thick forests and were required to descend sheer cliffs by way of rope.</p> <p>21. In July 1877, the first water began to flow through the EMI Aqueduct System and reached Haiku Plantation 24 hours later. Approximately 60 million gallons of water per day ran through the EMI Aqueduct System. The system cost \$80,000, which was paid</p>
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	<p>for by Castle & Cooke.</p> <p>22. The EMI Aqueduct System has been in use for over 134 years and continues to collect water today for private and municipal entities. The ditch system in its current state contains 50 miles of tunnels, 24 miles of open ditches, 13 inverted siphons and flumes, 388 intakes, eight reservoirs, and a solar powered radio telemetry system to monitor ditch flow. The catchment begins at roughly 1,300 ft elevation and delivers water to Central Maui at an elevation of 1,150 ft, covering 18 miles from its western to eastern extent.</p>
<p>Results of Community Consultation</p>	<p>CSH contacted a total of 136 parties including the Office of Hawaiian Affairs (OHA), the State Historic Preservation Division (SHPD), the County of Maui, other agencies, Department of Hawaiian Homelands (DHHL) beneficiaries, Native Hawaiian Organizations (NHOs) and knowledgeable community members. NHOs consulted included: Aha Moku o Maui, Inc. (Ke‘eumoku Kapu and Kyle Nakanelua); Kuloloi‘a Lineage – I Ke Kai o Kuloloi‘a (Les Kuloloi‘a); Waiehu Kou Phase 3 Association (Roy Oliveira); Moku o Kaupō (Jade Alohalani Smith); and Aha Moku o Kahikinui (Donna Sterling).</p> <p>Of the 136 parties consulted, a total of 15 people/agencies responded to the consultation letter. Three people participated in formal interviews. CSH initiated its outreach effort in November 2017 which included letters, phone calls, emails, and in-person interviews. Below is a list of individuals and agencies who shared their <i>mana‘o</i> (thoughts, opinions) and <i>‘ike</i> (knowledge) about the License Area:</p> <ol style="list-style-type: none"> 1. Dr. Kamana‘opono Crabbe, Ka Pouhana – OHA 2. Pomaika‘i Crozier. Conservation Manager – Pu‘u Kukui Watershed Preserve 3. Skippy Hau, <i>Kama‘āina</i> (native born) and Aquatic Biologist – Division of Aquatic Resources – State of Hawai‘i 4. Garrett Hew, <i>Kama‘āina</i>, Upcountry Maui farmer, and former East Maui Irrigation (EMI) employee 5. Robert Hobdy, Retired naturalist and forester 6. Roslyn Lightfoot, Director – Alexander & Baldwin Sugar Museum 7. Kyle Nakanelua, <i>Kama‘āina</i>, Aha Moku o Maui, and <i>kalo</i> (taro; <i>Colocasia esculenta</i>) farmer 8. Jerry Sakugawa, Upcountry Maui farmer 9. Sandy Takeshita, Upcountry Maui farmer 10. Mahealani Wendt, Member of Nā Moku Aupuni o Ko‘olau Hui 11. Mavis Oliveira-Medeiros, <i>Kama‘āina</i> of Hāna 12. Dawn Lono, Long-time resident of Hāna 13. Shane Sinenci, holds the County Council seat for the East Maui residency area 14. Dorothy “Aunty Dottie/Kumu Kamalu” Kaho‘okele and ‘Ohana,

	<p style="text-align: center;"><i>Kama'āina</i> of Nāhiku 15. Moses “Moke Boy” Bergau, <i>Kama'āina</i> of Nāhiku</p> <p>In addition, CSH asked permission to use declarations made by members of the community and [members of] Nā Moku Aupuni o Ko‘olau that were given to CWRM in late 2014 prior to the CWRM D&O on the IIFS. CWRM's final decision on the IIFS was issued on June 20, 2018. Although the declarations are part of the public domain, CSH nevertheless attempted to contact each individual to obtain approval to include these declarations in the CIA. Below is a list of individuals who approved use of their declaration:</p> <ol style="list-style-type: none"> 1. Dan Clark 2. Jonah Jacintho 3. Lezley Jacintho 4. Kauai L. Kanaka‘ole 5. Pualani Kimokeo 6. Davianna McGregor, Ph.D 7. Lurlyn Scott 8. Earl Smith, Sr. 9. Ty Kāwika Tengan 10. Edward Wendt 11. Emily Wendt <p>Tabulated results of approved declarations that relay traditional cultural practices, which includes fishing, gathering, hunting, sites, traditional knowledge, and values can be found in Table 13. Tabulated results of declarations that declarants requested not be used are arranged anonymously in Table 14.</p>
<p>Non-Cultural Community Concerns and Recommendations</p>	<p>Community consultation was conducted from December 2017 through March 2019. Based on information gathered from the community consultation, participants voiced the following concerns not related to the cultural context. These concerns were expressed prior to the CWRM D&O.</p> <ol style="list-style-type: none"> 1. Community participant Skippy Hau noted that “not all lands belong to the State” and recommends that private lands should and need to be identified by signs and safe parking areas. In addition, many visitors and tour groups assume that most lands belong to the State resulting in illegal trespassing. Also noted that rental cars regularly block Hana Highway creating and blocking traffic. 2. Mr. Hau states that the EMI Aqueduct System requires mapping that shows the 388 intakes, ditches, dams, pipes, and flumes. Each diversion should be located and identified accurately with GPS coordinates. Elevations should also be recorded. The amount of water moving through the system should be measured at specific locations within the EMI Aqueduct System as well.

	<p>3. Other questions and clarifications from Mr. Hau included the following (please note that these questions were asked prior to the June 2018 decision on the East Maui Interim Instream Flow Standards):</p> <ul style="list-style-type: none"> a. Is the 20,000 gallons per day for Nahiku and Kula Agricultural Park a minimum? b. Isn't the interim instream flow supposed to maintain a minimum flow for each stream? c. Will EMI property be clearly identified along the boundaries of State land? d. Please identify "settlements" along Hana Highway. e. Please clarify "diversified agricultural uses as [is] economically feasible." The term is used but not clearly identified or the need for water. f. The three Department of Water Supply treatment facilities water use should be clearly identified. Please identify actual use, not maximum capacity. The reservoir capacities does not clarify actual water use. g. Please clarify abandoned diversion. Is the diversion and other structures to collect water removed and natural stream restored? Mr. Hau noted that historically, structures and associated materials have been abandoned throughout East Maui. He recommends that debris and abandoned structures should be completely removed and/or buried. h. Mr. Hau recommends that concrete walls and control structures that are planned for full and permanent restoration should be completely removed and streams restored to their natural conditions. <p>4. In addition, Mr. Hau relayed via email that he recommends a five-year lease with constant updates due to the fact that the project description lacks information on the amount of water flowing through the EMI Aqueduct System and the actual amount of water collected at each diversion and/or ditch without the factor of climate change accounted for.</p> <p>5. Participant Kyle Nakanelua's recommendations for this project was simply, "Follow the law! Support the law! File for your permit. There's a policy and there's procedures. Adhere to the policy and follow the procedures. And stop trying to circumvent it [the law] because you smart. You know, just be honest, be transparent."</p>
<p>Cultural Community Concerns and Recommendations</p>	<p>Community consultation was conducted from December 2017 through March 2019. Based on information gathered from the community consultation and declarations, participants voiced and framed the following concerns in a cultural context. These concerns were expressed prior to the</p>

	<p>CWRM D&O.</p> <ol style="list-style-type: none"> 1. Mr. Hau states that native gathering rights should be addressed. The gathering of <i>'ōpae</i>, <i>'o'opu</i>, and <i>hīhīwai</i> continue throughout East Maui streams that are being diverted. 2. Mr. Hau adds that State lands should be open to the public for hunting and gathering. The general public should have access for recreational activities such as hiking, scenic viewing, and swimming at waterfalls. 3. Mr. Robert Hobdy voiced his concerns, which include that the study should: <ol style="list-style-type: none"> a. Provide adequate stream flow to support diversified agriculture in the Hāmākualoa and Ko'olau region. b. Provide adequate stream flow to support indigenous fish, shrimp, and mollusk species in the Hāmākualoa and Ko'olau region. 4. Participant Kyle Nakanelua is concerned with the act of diverting water. He explicitly states that “when those places dry up that adversely impacts the way of life, the cultural practice if you will” and it “adversely impacts the people’s way of life that live there.” <ol style="list-style-type: none"> a. To support this claim, Mr. Nakanelua states that <i>'ōpae</i> was once prevalent in the streams that flowed through their family property named Lakini. He relates that when he began to regularly clean the property his grandmother would still catch <i>'ōpae</i>. He adds that today there is no <i>'ōpae</i> but there are prawns. When CSH asked if <i>'ōpae</i> was being overpicked, he replied “no” because “we were the only one there.” He also does not think the introduction of prawns are to blame but believes “that the flow of water is impactful” and has seen the water decline since 1989. 5. A declaration provided by Mr. Dan Clark from Ke'anae stated he needs cool, fast running water for optimal <i>kalo</i> production. Due to low stream flow results, there has been an increase in disease to his <i>kalo</i>, which decreases production. 6. Jonah Jacintho states in his declaration that due to a lack of stream flow, fish populations have decreased therefore he cannot fish as much. To increase the population of ocean fish, fresh water is integral for spawning and nutrients. He also added that more water in stream beds would also increase <i>'o'opu</i>, prawn, and <i>hīhīwai</i> populations. 7. In Lezley Jacintho’s declaration, she states that due to lack of stream flows, her <i>kalo</i> production has declined due to root rot and other diseases. She adds that stream flow output is also important in the spawning of different species of fish. The lack of stream flow affects her gathering rights as a Native Hawaiian and her <i>'ohana</i> (family).
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	<p>Native species such as ‘o‘opu needs fresh water to travel back upstream, which compromises their reproduction. Fish, <i>hīhīwai</i>, ‘ōpae, and ‘o‘opu populations are also scarce and many families cannot gather these resources causing them to move away. Another concern Ms. Jacintho voiced is stagnate water, which causes leptospirosis and other bacteria.</p> <p>8. Kau‘i Kanaka‘ole voices in her declaration the Papaku Makawalu framework, which incorporates traditional Hawaiian knowledge and <i>mo‘olelo</i> (stories) and connects it with <i>wahi</i> (place). Papaku Makawalu consists of three Papa or houses of knowledge (earth, atmospheric, and the living). In this case, Ms. Kanaka‘ole points out that without water, all three Papa could not exist. She shares <i>mo‘olelo</i> on ‘O‘opuola Stream, Makapīpī Stream, Ka‘aiea Stream, and ‘Ōhia Stream. She points out that ‘Ōhia Stream was known for its healing powers and that the people of this area understood that this water was “special, sacred, kapu (taboo) and only to be used in unique circumstances.”</p> <p>9. Pualani Kimokeo states in her declaration that due to a lack of stream flow there is an increase in pocket rot and “guava seed,” which she describes as a growth on the taro. There are also apple snails in her <i>lo‘i kalo</i>, which she states like the warm water. She points out that farmers in Ke‘anae have to compete for water.</p> <p>10. In Mr. Earl Smith, Sr.’s declaration, he states that he recalls gathering ‘ōpae, <i>hīhīwai</i>, and ‘o‘opu from Hanawī, Makapīpī, and One‘o Streams. He can only find these species in Hanawī Stream. Near the coast, he would fish for <i>moi</i> (threadfish; <i>Polydactylus sexfilis</i>), <i>aholehole</i> (Hawaiian flagtail; <i>Kuhlia sandvicensis</i>), <i>manini</i> (reef surgeonfish; <i>Acanthurus triostegus</i>), and <i>enenuē</i> (chub; <i>Kyphosus bigibbus</i>) but has noticed a depletion of fish. He attributes this to a lack of stream flow that empties in the ocean.</p> <p>11. In Edward Wendt’s declaration, he states that he gathers and fishes in the streams to provide a protein source for his family, neighbors, and <i>kūpuna</i> (elders) who may be unable to gather for themselves. He also enjoys teaching traditional fishing practices and values to students. However, due to the lack of adequate stream flow, Mr. Wendt is unable to teach students how to <i>mālama</i> (to take care of) streams, fish, and gather. The diminished stream flow has negatively impacted the <i>muliwai</i>, fisheries, and his <i>lo‘i kalo</i>. Invasive species such as the apple snail and African tulip tree have infringed his <i>lo‘i kalo</i>.</p>
<p>Ka Pa‘akai Analysis</p>	<p>In <i>Ka Pa‘akai O Ka ‘Āina v. Land Use Commission</i>, 94 Hawai‘i 31, 74, 7 P.3d 1068, 1084 (2000), the Hawai‘i Supreme Court held that State and County agencies, when making decisions that may impact cultural, historical, or natural resources or native Hawaiian traditional and customary</p>

	<p>practices, must, at a minimum, make specific findings and conclusions on:</p> <ol style="list-style-type: none"> 1. The identity and scope of valued cultural, historical, or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area; 2. The extent to which those resources—including traditional and customary native Hawaiian rights—will be affected or impaired by the proposed action; and 3. The feasible action, if any, to be taken by the [agency] to reasonably protect native Hawaiian rights if they are found to exist. <p>The following analysis is a summarization of Section 7.5 of this report. Please refer to Section 7.5 to view the analysis in its entirety. Based on information gathered from the cultural and historical background, in conjunction with archaeological evidence, oral histories, declarations, and interviews throughout East Maui, significant cultural, historical, and natural resources were identified within the License Area as well as outside the License Area. It should be acknowledged that although some of the valued cultural resources exist outside of the License Area boundaries, actions within the License Area are directly affecting these cultural practices and resources (cultural, historical, and natural resources in addition to customary and traditional Native Hawaiian rights). In general, East Maui, where the License Area is located, should be understood as a locality that maintains a rich subsistence and cultural history. Traditional and customary cultural practices and beliefs were also identified as currently existing within the License Area. At present, there is documentation and testimony indicating traditional and customary Native Hawaiian rights are currently being exercised within the License Area.</p> <p>The following traditional and customary cultural practices associated with natural and cultural resources have been identified:</p> <ol style="list-style-type: none"> 1. Foraging, traditional, and generational gathering of freshwater species for personal consumption. These species include but are not limited to <i>‘ōpae</i>, <i>‘o‘opu</i>, <i>pūpūlo‘i</i> (also known as <i>pūpū Pākē</i>, or Chinese snail), crayfish, prawns, and <i>hīhīwai</i> (endemic grainy snail; <i>Neritina graposa</i>). 2. Foraging, traditional, and generational gathering of plants that may be in or adjacent to tributaries for personal consumption. These species include but are not limited to <i>pohole</i> (native fiddlehead fern) and watercress. 3. Traditional and generational gathering of introduced plants that can be cultivated or foraged. These species include but are not limited to <i>‘ulu</i>, bananas, wild <i>kalo</i>, wild <i>lū‘au</i> (young taro tops), guava, <i>‘uala</i> (sweet potato), <i>‘awapuhi</i> (wild ginger), <i>tī</i>, oranges, <i>hāhā</i>, avocado,
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	<p><i>puakenikeni</i> (ornamental, flowers used for <i>lei</i>), and medicinal plants for <i>lā'au lapa'au</i> (curing medicine).</p> <ol style="list-style-type: none"> 4. Traditional and generational gathering of plants that can only be foraged. This includes but is not limited to <i>pepeiao</i>, various types of ferns (ornamental), and <i>hau</i> (beach hibiscus; <i>Hibiscus tiliaceus</i>). 5. Traditional and generational gathering of rocks that are used for traditional food preparation. These activities include but are not limited to <i>imu</i> (underground oven) and the production of stone tools for traditional food preparation (i.e., <i>pōhaku ku'i'ai</i>). 6. Traditional and generational fishing and gathering methods utilized for the shoreline and offshore. Species gathered include but are not limited to <i>limu</i> (seaweed), <i>'opihi</i> (limpets), lobster, <i>enenue</i>, <i>kole</i>, <i>ulua</i>, <i>moi</i>, <i>aholehole</i>, <i>'anae</i>, <i>kumu</i>, <i>tako</i>, <i>moanakali</i>, <i>'ōmilu</i>, <i>'ū'ū/menpachi</i> (soldierfish; Holocentridae), <i>'āweoweo</i> (Bulleye; <i>Priacanthus meeki</i>), <i>pāpio</i>, <i>pa'ananu</i>, <i>'ō'io</i>, <i>uhu</i>, <i>lae</i>, <i>kala</i>, black crab, <i>hā'uke'uke</i>, and <i>kūpipi</i>.
<p>Impacts and Recommendations</p>	<p>Once the valued cultural, archaeological, and historical resources within the License Area are identified, the second and third prongs of the <i>Ka Pa'akai</i> analysis require the agency to determine how any of the resources may be impacted by the proposed action, and what, if any, feasible measures can be taken to protect the resources.</p> <p><u>Proposed Action</u></p> <p>The Proposed Action constitutes the issuance of a long term (30 years) Water Lease from the BLNR for the continued “right, privilege, and authority to enter and go upon” the License Area for the “purpose of developing, diverting, transporting, and using government owned waters” via the existing EMI Aqueduct System which supplies water to domestic and agricultural water users. The Water Lease will enable the lessee to continue to go on lands owned by the State in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System, and will allow continued operation of the EMI Aqueduct System to deliver water to the County of Maui DWS for domestic and agricultural water needs in Upcountry Maui, including the agricultural users at the Kula Agricultural Park (KAP), as well as for the Nāhiku community. It will also allow the continued provision of water to approximately 30,000 acres of agricultural lands in Central Maui. The proposed action is subject to the terms of the Interim Instream Flow Standard (IIFS) established by the CWRM.</p> <p>Based on information gathered from the cultural and historical background, and the community consultation, CSH identified potential impacts and made the following recommendations:</p> <ol style="list-style-type: none"> 1. <u>Impact:</u> Participants expressed interest in getting clarification on stream flow, water diversion, and climate statistics with the

	<p>following questions:</p> <ul style="list-style-type: none"> ○ How much water is being diverted at each location of intakes, ditches, dams, pipes, and flumes? ○ How much water is being diverted from East Maui to Central Maui? ○ Is climate change accounted for? <p><u>Recommendation:</u> It is recommended that these questions be addressed by qualified professionals who possess an understanding of stream flow mechanics, water diversion, and climate statistics within the License Area.</p> <p>2. <u>Impact:</u> Several community participants voiced their concern regarding indigenous freshwater species that may be impacted by the act of diverting water. These species include but are not limited to <i>'ōpae</i>, <i>'o'opu</i>, <i>pūpūlo'i</i> (also known as <i>pūpū Pākē</i>, or Chinese snail), crayfish, prawns, and <i>hīhīwai</i> (endemic grainy snail; <i>Neritina graposa</i>), which are still gathered regularly by residents for personal consumption. Furthermore, community participants shared their concern of water not exiting stream beds and flowing into the ocean. This estuary environment creates an ecosystem where freshwater and saltwater species spawn and travel back upstream (such as <i>'o'opu</i>) or continue to grow in the ocean. Specific streams mentioned by community participants where this impact is identified include: Wahinepe'e, Puohokamoā, Ha'ipua'ena, Honopou (Puniawa Tributary), Punala'u (Kōlea and Ulunui Tributaries), Honomanū, Nua'ailua, Pi'ina'au, Waiokamilo, Wailuānui (Waikani Waterfall), Kopili'ula, Pa'akea, Kapā'ula, Hanawī, Makapīpī, Waiohue, Waikamoi (Alo Tributary), Hanehoi, Palauhulu (Hauoli Wahine and Kano Tributaries), 'Ōhi'a (or Waianu), Kualani (or Hāmau), East Wailuāiki, West Wailuāiki, Pua'aka'a Tributary, and Waia'aka. It is understood that these streams were subject to the Interim Instream Flow Standards (IIFS) decision.</p> <p><u>Recommendation:</u> It is recommended that a biologist or similar qualified professional provide an assessment of the impacts of water diversion to indigenous freshwater species (<i>'ōpae</i>, <i>'o'opu</i>, and <i>hīhīwai</i>) within the License Area. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact. Nine of the streams mentioned by community participants where this impact is identified have been fully restored in accordance with the IIFS. These include Honopou (Puniawa Tributary), Pi'ina'au, Waiokamilo, Wailuānui (Waikani Waterfall), Makapīpī, Waiohue, Hanehoi, Palauhulu (Hauoli Wahine and Kano Tributaries), and West Wailuāiki Streams.</p>
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	<p>3. <u>Impact</u>: A majority of participants who are taro farmers voiced their concern of the lack of water needed to maintain a healthy and productive <i>lo 'i kalo</i> or taro patch. A cold, vigorous flow of water is needed for the production of <i>kalo</i>. Without an ample amount of water continuously flowing, many taro crops have been subject to invasive species such as the apple snail, root rot, and growths. Many taro farmers are unable to continue their traditional and generational cultural practice. Specific streams mentioned by community participants where this impact is identified include: Honopou (Puniawa Tributary), Waikamoi (Alo Tributary), Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u (Kōlea and Ulunui Tributaries), Honomanū, Nua'ailua, Pi'ina'au, Palauhulu (Hauoli Wahine and Kano Tributaries), 'Ōhi'a (or Waianu), Waiokamilo, Kualani (or Hāmau), Wailuānui (Waikani Waterfall), West Wailuāiki, East Wailuāiki, Kopili'ula, Pua'aka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue. It is understood that these streams were subject to the IIFS decision.</p> <p><u>Recommendation</u>: It is recommended that a botanist, ethnobotanist, or similar qualified professional provide an assessment of the ideal conditions of water flow and water temperature needed for <i>kalo</i> growth in comparison to the current water flow and water temperature of impacted areas in order to understand and address the stated impact. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact. Eight of the streams mentioned by community participants where this impact is identified have been fully restored in accordance with the IIFS. Honopou (Puniawa Tributary), Pi'ina'au, Palauhulu (Hauoli Wahine and Kano Tributaries), Waiokamilo, Wailuānui (Waikani Waterfall), West Wailuāiki, Makapīpī, and Waiohue.</p> <p>4. <u>Impact</u>: While no human burials have been identified by previous archaeological studies within or immediately adjacent to the License Area, historical research indicates that Honomanū Valley and other areas throughout East Maui once held a sizable population. LCA documentation indicates that there were settlements along the coast, however, a pedestrian survey was also conducted where there was evidence of habitation in the higher reaches of the valley (E. M. Fredericksen and Fredericksen 1998b).</p> <p><u>Recommendation</u>: It is recommended that any personnel involved in access, maintenance, or any other related activities within the License Area be informed of the possibility of inadvertent cultural finds, including human remains. In the event that any potential</p>
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	<p>historic properties are inadvertently discovered within the License Area, these discoveries should be reported immediately to the State Historic Preservation Division (SHPD). In the event that <i>iwi kūpuna</i> and/or cultural finds are encountered, consultation with lineal and cultural descendants of the area is also recommended.</p> <p><u>No Action Alternative</u></p> <p>The No Action alternative is understood as the termination or non-issuance of the subject Water Lease. Under this alternative, A&B would be permitted to 30% of the water from the larger 50,000-acre Collection Area based on previous agreements.</p> <p>The No Action alternative includes permission to divert 30% of the water from the larger 50,000-acre Collection Area and therefore, impacts related to the diversion of water may apply, but to a lesser extent than the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include: interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive <i>lo 'i kalo</i> or taro patch in areas where water may continue to be diverted.</p> <p>Recommended mitigation for the No Action alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate cultural impacts of the No Action alternative as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.</p> <p><u>Water Sources Alternative</u></p> <p>The Water Sources alternative is understood as the decision to obtain water from new sources other than from the diversion of East Maui streams into the existing EMI Aqueduct System. These sources could include new wells, desalinization facilities, and reservoirs located on Maui Island.</p> <p>The Water Sources alternative has the potential for cultural impacts to the areas where new sources of water are obtained. Potential cultural impacts could be wide-ranging as these new facilities would likely require ground disturbance, land clearing, and/or changes to coastal environments on Maui Island. Impacts related to the diversion of water, as discussed in relation to the Proposed Action would not apply to the Water Sources Alternative, however with the potential of project-related ground disturbance, there is</p>
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	<p>the possibility of impacts to <i>iwi kūpuna</i>.</p> <p>Recommended mitigation for the Water Sources alternative would include a cultural impact study for the specific location or region of Maui Island in which this new infrastructure is installed. Additionally, in the event that any potential historic properties are inadvertently discovered within the Water Sources alternative locations, these discoveries should be reported immediately to the State Historic Preservation Division (SHPD). In the event that <i>iwi kūpuna</i> and/or cultural finds are encountered, consultation with lineal and cultural descendants of the area is also recommended</p> <p><u>Water Lease Volume Alternative</u></p> <p>The Water Lease Volume alternative is understood as a modification (reduction) to the volume of water that is diverted from East Maui streams.</p> <p>The Water Lease Volume alternative has the potential for cultural impacts related to the diversion of water that may apply to a lesser extent than the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include: interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive <i>lo 'i kalo</i> or taro patch in areas where water may continue to be diverted.</p> <p>Recommended mitigation for the Water Lease Volume alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.</p> <p><u>Lease Terms Alternative</u></p> <p>The Lease Terms alternative is understood as a modification to the length of the proposed lease term for the “<i>right, privilege, and authority to enter and go upon</i>” the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas for the “<i>purpose of developing, diverting, transporting, and using government owned waters</i> through the existing EMI Aqueduct System. The Proposed Action constitutes the issuance of one long term (30 years) Water Lease, and this alternative considers either a shorter or longer lease term.</p> <p>The Lease Terms alternative has the potential for cultural impacts related to the diversion of water that may apply to an equal extent as the Proposed Action. These impacts, as discussed in detail in relation to the Proposed</p>
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	<p>Action, include: interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive <i>lo 'i kalo</i> or taro patch in areas where water may continue to be diverted.</p> <p>Recommended mitigation for the Lease Terms alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.</p> <p><u>Management Alternative</u></p> <p>The Management alternative is understood as a change of the entity that manages the diversion of water from East Maui streams.</p> <p>The Management alternative has the potential for cultural impacts related to the diversion of water that may apply to an equal extent as the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive <i>lo 'i kalo</i> or taro patch in areas where water may continue to be diverted.</p> <p>Recommended mitigation for the Management alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.</p>
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Section 1 Introduction

1.1 Project Background

At the request of Wilson Okamoto Corporation (WOC), Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Water Lease for the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas, TMKs: [2] 1-1-001:044, 50, 1-1-002:002, 1-2-004:005, 007 (por.), 2-9-014:001, 005, 011, 012, 017. The project includes the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas (License Area) that are located within State of Hawai‘i Forest Reserve on the northern slope of Haleakalā. The License Area includes portions of the modern judicial districts of Makawao and Hāna, the traditional *moku* of Hāmākua Loa and Ko‘olau, and the following *ahupua‘a* (traditional land division spanning from the mountain to the sea): Honopou, Huelo, Mokupapa, Waipioiki, Waipionui, Hanehoi, West Hanawana, East Hanawana, Pu‘uomaile, Pāpa‘a‘ea, West Makaīwa, East Makaīwa, Honomanū, Ke‘anae, Wailua Nui, Wailua Iki, Pa‘akea, Nāhiku, and Ko‘olau. The License Area encompasses approximately 33,000 acres (13,355 hectares) of land owned by the State of Hawai‘i, and approximately 13,000 acres of privately owned land. The License Area is depicted on portions of the 1992a Haiku, 1992c Keanae, 1991 Kilohana, 1992d Nahiku, and 1992b Hana U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles (Figure 1), tax map plats (Figure 2 through Figure 5), and aerial photographs (Figure 6).

The Proposed Action constitutes the issuance of one long-term (30 years) Water Lease from the Board of Land and Natural Resources (BLNR) for the continued “*right, privilege, and authority to enter and go upon*” the License Area for the “*purpose of developing, diverting, transporting, and using government owned waters*” through the existing EMI Aqueduct System which supplies water to domestic and agricultural water users. The Water Lease will enable the lessee to continue to go on lands owned by the State in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System. It will allow continued operation of the EMI Aqueduct System to deliver water to the County of Maui Department of Water Supply (DWS) for domestic and agricultural water needs in Upcountry Maui, including agricultural users at the Kula Agricultural Park (KAP) and the 262-acre expansion of KAP, as well as the Nāhiku community. It also will allow for the continued provision of water to approximately 30,000 acres of agricultural lands (formerly in sugarcane) in Central Maui proposed for diversified agriculture.

1.2 Document Purpose

The purpose of this CIA is to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) Chapter 343, which requires consideration of the project’s potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts on cultural beliefs, practices, and resources (pursuant to the Environmental Council’s *Guidelines for Assessing Cultural Impacts*), which may include Traditional Cultural Properties (TCPs).

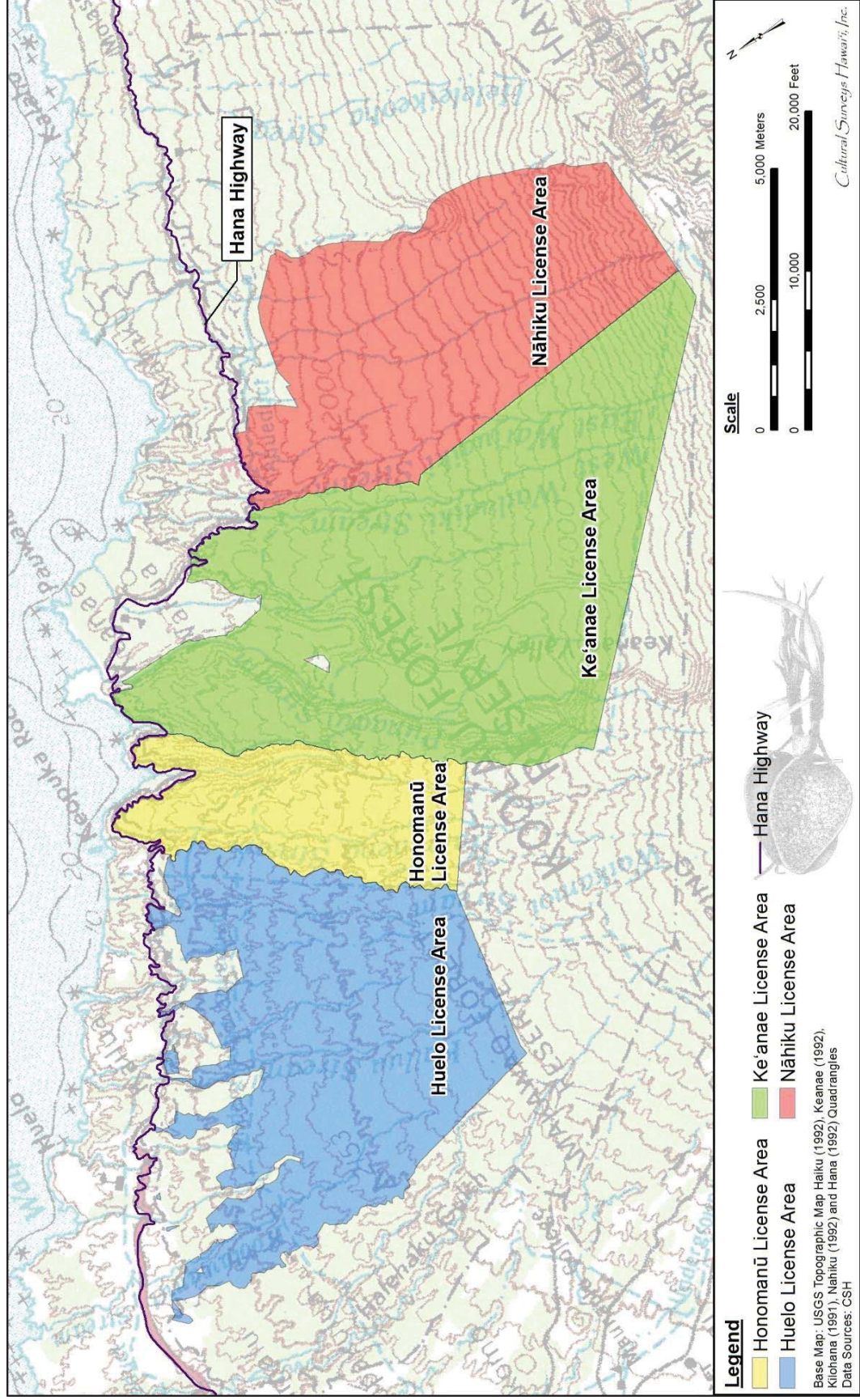


Figure 1. Portions of the 1992a Haiku, 1992c Keanae, 1991 Kilohana, 1992d Nahiku, and 1992b Hana USGS 7.5-minute topographic quadrangles showing the location of the License Area (Nahiku, Ke'anae, Honomanu, and Huelo License Areas)

CIA for the Proposed Water Lease for the Nahiku, Ke'anae, Honomanu, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hana, Maui

TMKs: Various

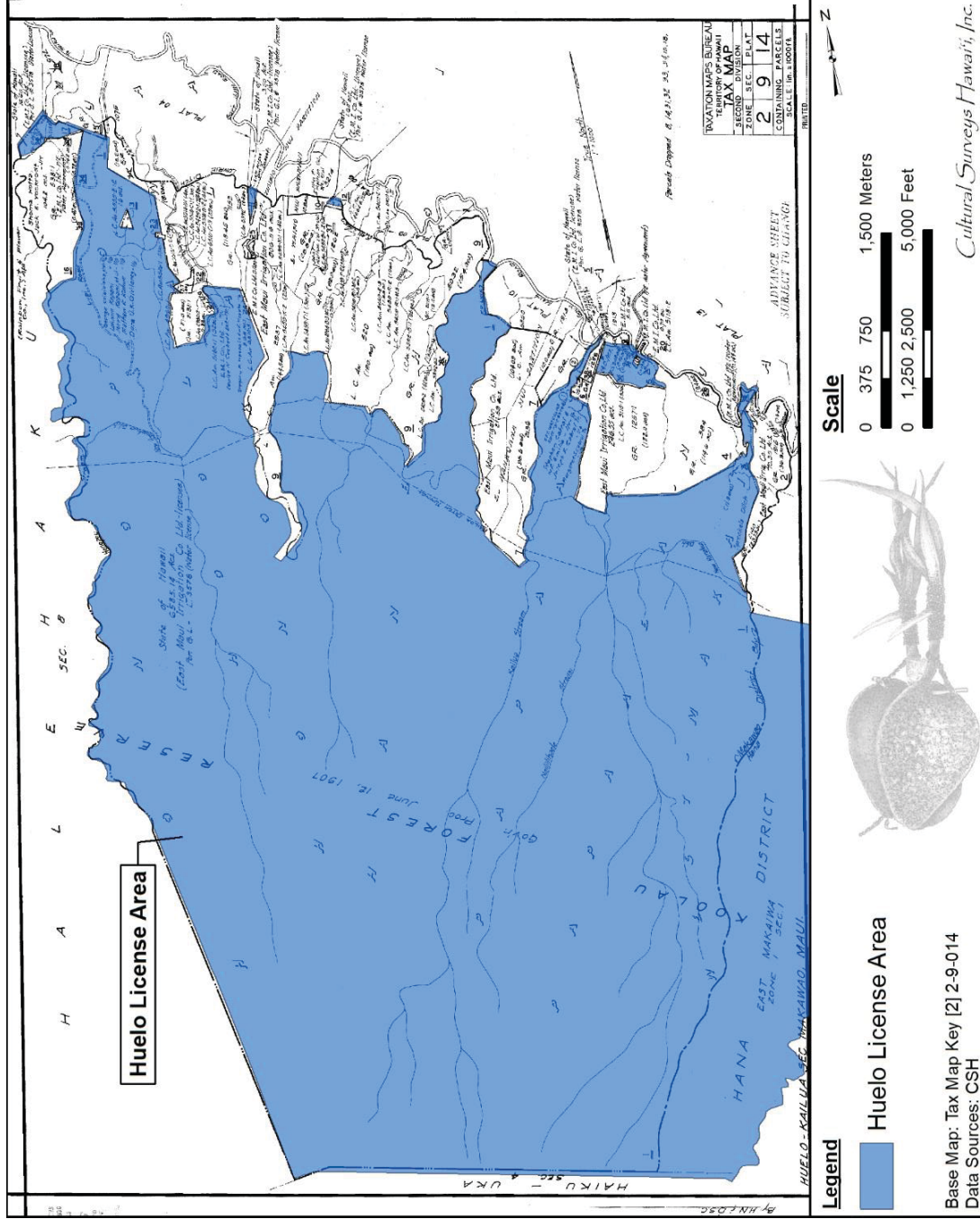


Figure 2. Tax Map Key (TMK): [2] 2-9-014 showing a portion of the Huelo License Area (Hawai'i TMK Service 2014)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

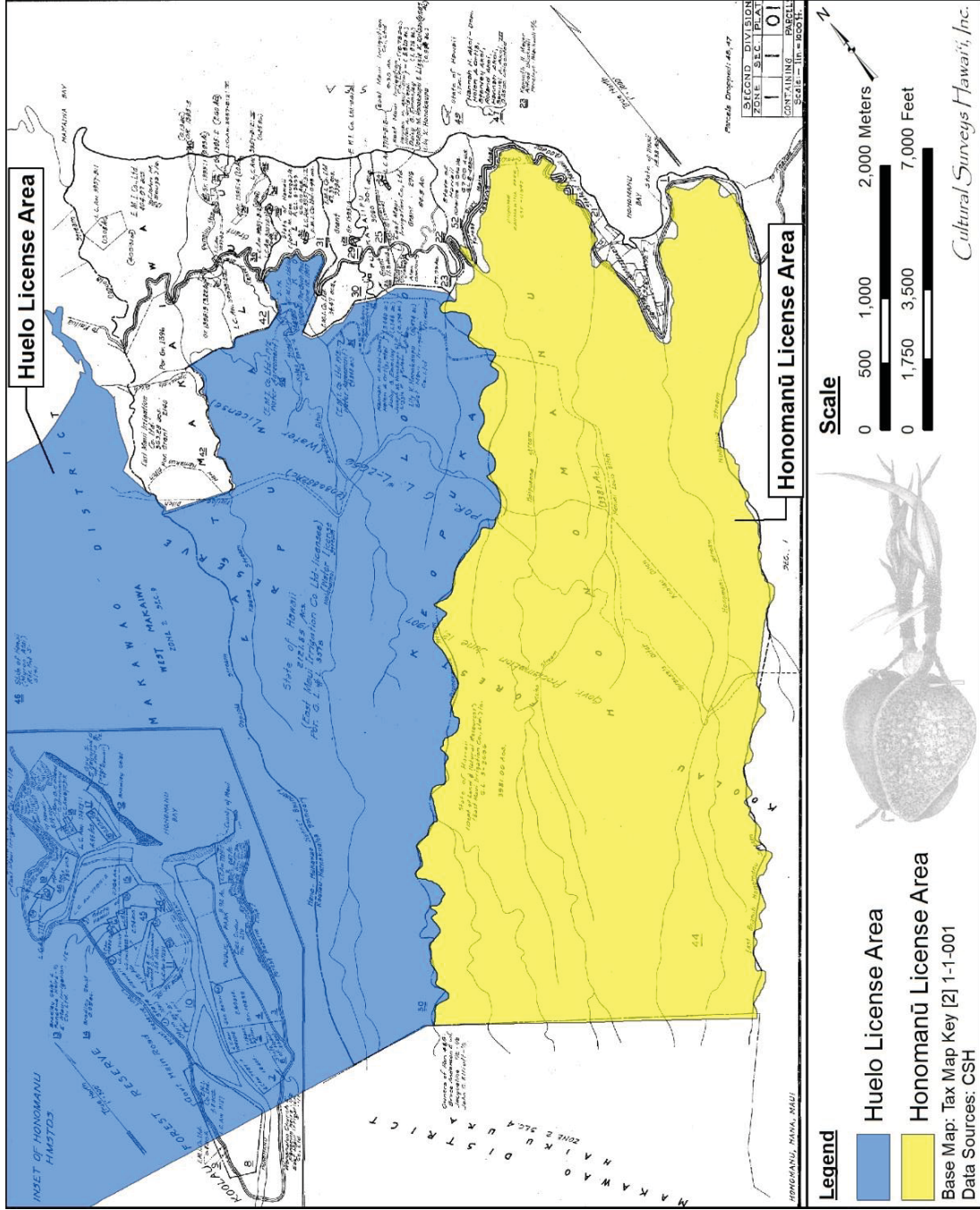


Figure 3. TMK: [2] 1-1-001 showing a portion of the Huelo and Honomanu License Areas (Hawai'i TMK Services 2014)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

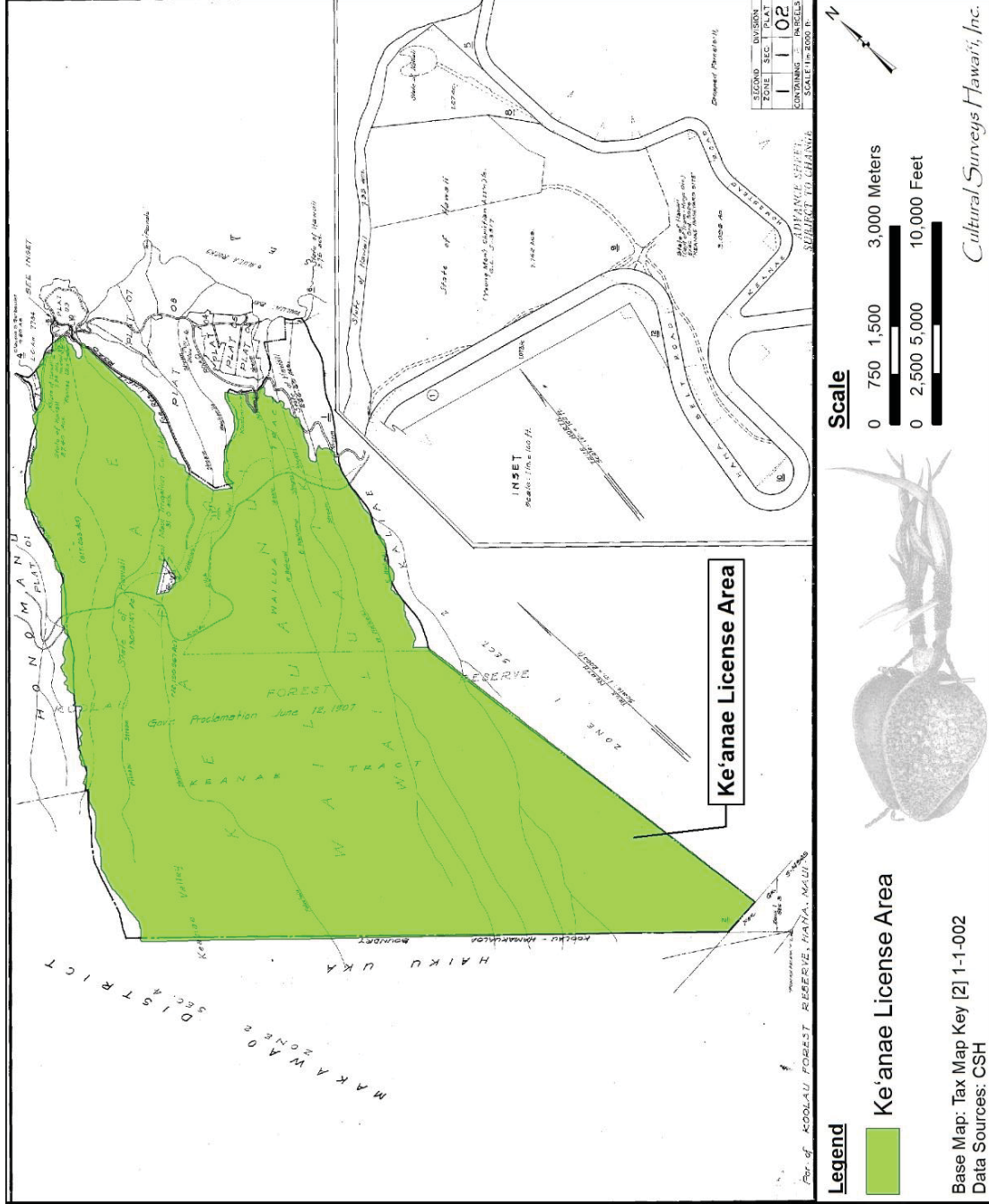


Figure 4. TMK: [2] 1-1-002 showing the Ke'anae License Area (Hawai'i TMK Service 2014)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

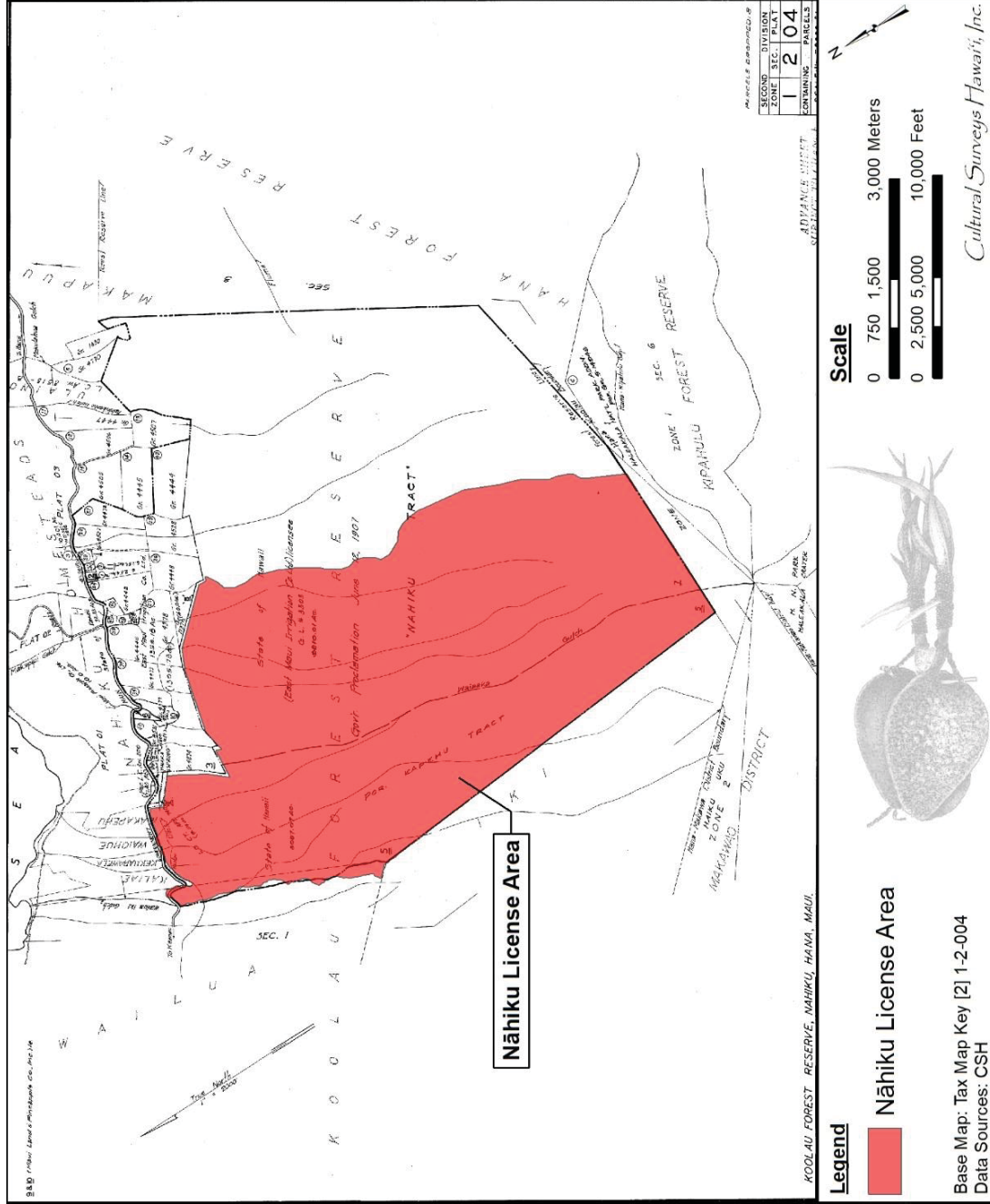


Figure 5. TMK: [2] 1-2-004 showing the Nāhiku License Area (Hawai'i TMK Service 2014)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

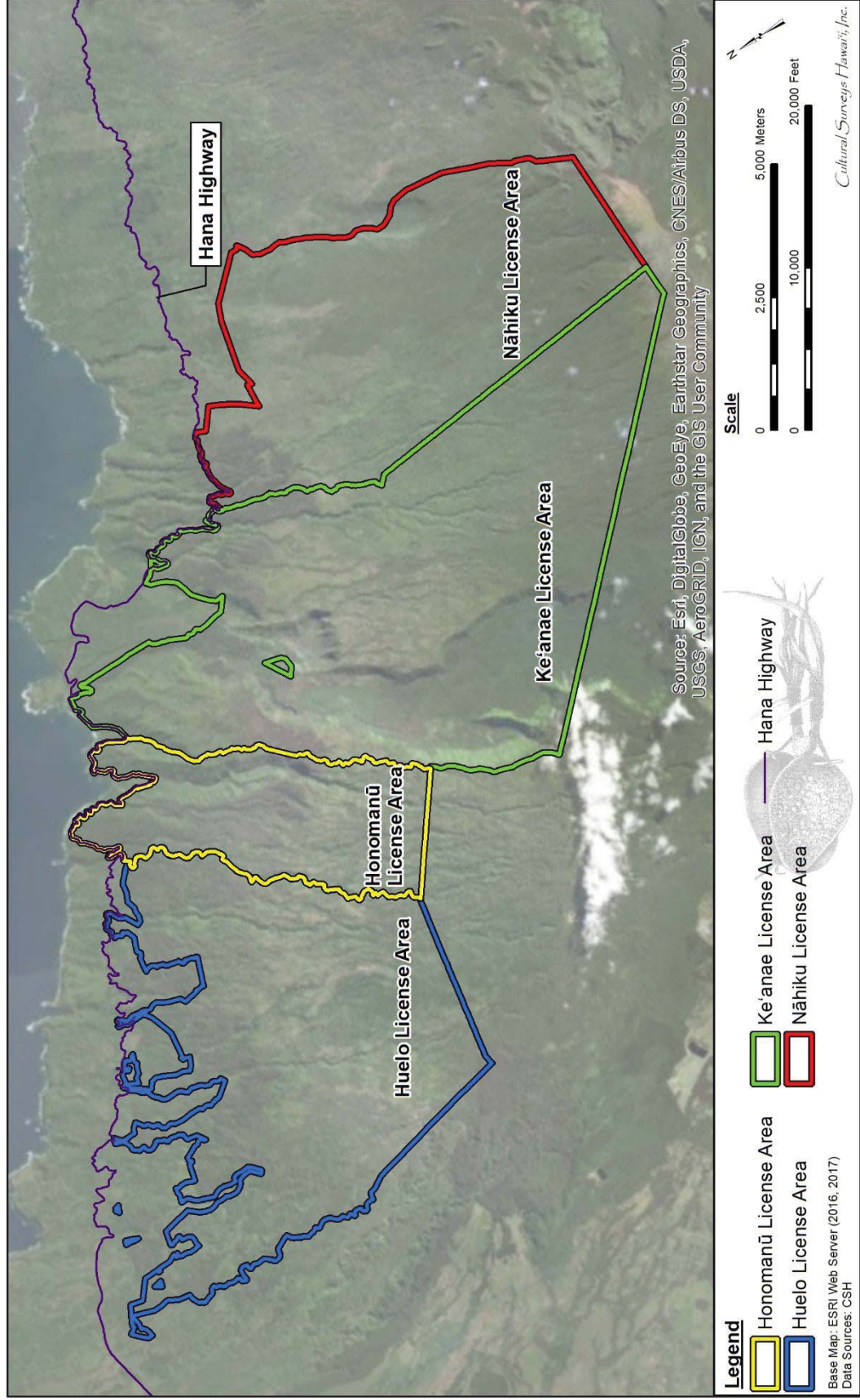


Figure 6. 2009 aerial image showing License Areas (ESRI Web Server 2009)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

It should be noted, however, that TCP is a term used for federal designation of historic properties and that while SHPD may consider federally designated TCPs, there is no formal application to designate them under the state process.

TCPs may be significant historic properties under State of Hawai'i significance Criterion e, pursuant to Hawai'i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that “have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity” (HAR §13-275-6 and §13-284-6). The document will likely also support the project’s historic preservation review under HRS Chapter 6E and HAR Title 13, Chapters 275 and 284.

1.3 Scope of Work

The scope of work for this CIA includes the following:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports with specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources, accessing religious sites, or agricultural pursuits as may be indicated in the historic record.
2. Review of previous archaeological work at and near the License Area that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the License Area; present and past uses of the License Area; and/or other practices, uses, or traditions associated with the License Area and environs.

Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 *Lepo* (Soils)

Huelo License Area

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the License Area’s soils in the Huelo License Area consist of Kailua silty clay (3 to 25 percent slopes) (KBID), Pauwela clay (15 to 25 percent slopes) (PFD), Rough broken land (rRR), Honomanu-Amalu association (rHR), Rough mountainous land (rRT), Amalu peaty silty clay (3 to 20 percent slopes) (rAMD), and water > 40 acres (W) (Figure 7).

Kailua silty clay (3 to 25 percent slopes) (KBID) soils are described as follows:

This soil is on low uplands. Included in mapping were areas of Honomanu and Makawao soils. Also included were small, steep areas near cinder cones.

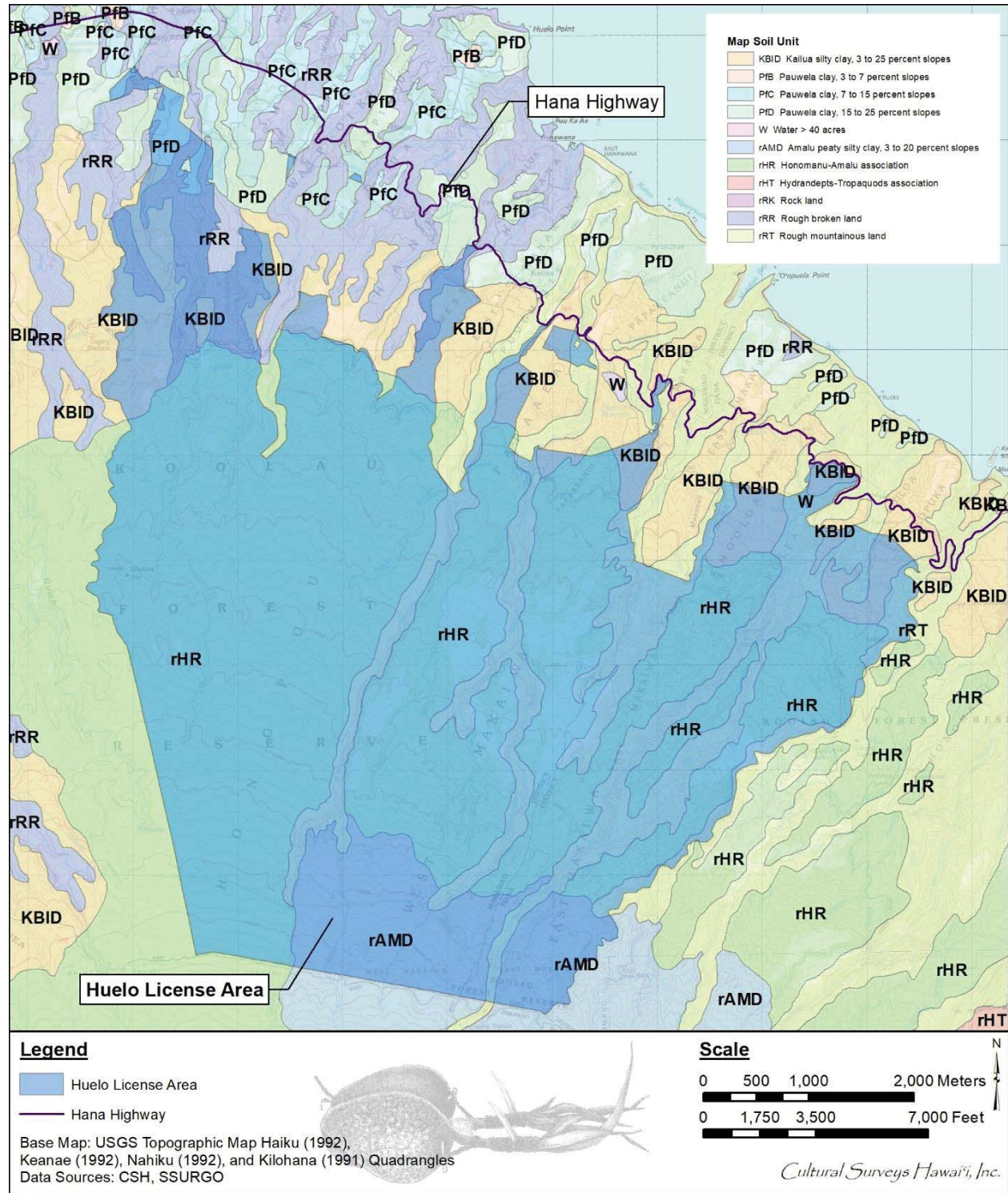


Figure 7. Overlay of Soil Survey of the State of Hawaii (Foote et al. 1972) indicating soil types within and surrounding the Huelo License Area (U.S. Department of Agriculture 2001)

In a representative profile the surface layer is dark brown silty clay about 9 inches thick. The upper part of the subsoil, about 18 inches thick, is dark-brown and dark reddish-brown silty clay that has subangular blocky structure. The lower part of the subsoil is very dark gray silty clay loam. The substratum is soft, weathered basic igneous rock. The soil is very strongly acid in the surface layer and strongly acid or medium acid in the subsoil.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 4 feet or more. . . .

This soil is used for pasture, woodland, and wildlife habitat. (Capability classification IVe, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:53]

Pauwela clay (15 to 25 percent slopes) (Pfd) soils are described as follows:

On this soil runoff is medium and the erosion hazard is moderate. Included in mapping were areas that are steep and moderately eroded. This soil is used for pasture and woodland. (Capability classification IVe, nonirrigated; pineapple group 8; pasture group 8; woodland group 7). [Foote et al. 1972:112]

Rough broken land (rRR) is described as follows:

Rough broken land (rRR) consists of very steep land broken by numerous intermittent drainage channels. In most places, it is not stony. It occurs in gulches and on mountainsides on all the Islands except Oahu. The slope is 40 to 70 percent. Elevations range from nearly sea level to about 8,000 feet. The local relief is generally between 25 and 500 feet. Runoff is rapid, and geologic erosion is active. The annual rainfall amounts to 25 to more than 200 inches. These soils are variable. They are 20 to more than 60 inches deep over soft, weathered rock. In most places some weathered rock fragments are mixed with the soil material. Small areas of rock outcrop, stones, and soil slips are common. Included in mapping were areas of colluvium and alluvium along gulch bottoms.

This land type is used primarily for watershed and wildlife habitat. In places, it is used also for pasture and woodland. The dominant natural vegetation in the drier areas consists of guava, lantana, Natal redbud, bermudagrass, koa haole, and molasses grass. Ohia, kukui, koa, and ferns are dominant in the wetter areas. Puakeawe, aalii, and sweet vernal grass are common at the higher elevations. (Capability classification VIe, nonirrigated). [Foote et al. 1972:119]

Honomanu-Amalu association (rHR) soils are described as follows:

The soils in this association have the profiles described as typical of their respective series. The areas are almost inaccessible by vehicle or on foot. They are on gently sloping to moderately steep, intermediate uplands on East Maui. The Honomanu soils occupy the more sloping, better drained side slopes. The Amalu soils occur on the less sloping tops of ridges and interfluvies. The Honomanu soils are well drained; the Amalu soils are poorly drained. Runoff is slow to very slow, and the erosion hazard is slight.

Honomanu soils make up about 60 percent of the association, and Amalu soils about 40 percent. Included in mapping were small areas of Kailua soils and many small, very steep gulches. This association is used for water supply and wildlife habitat. It is covered with dense min forest vegetation. (Honomanu part is in capability classification IVe, nonirrigated; woodland group 8. Amalu part is in capability classification VIIw, nonirrigated). [Foote et al. 1972:43]

Rough mountainous land (rRT) is described as follows:

Rough mountainous land (rRT) occurs in mountainous areas on all islands in the survey area. It consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. Elevations range from nearly sea level to more than 6,000 feet. The annual rainfall amounts to 70 to more than 400 inches. Over much of the area, the soil mantle is very thin. It ranges from 1 inch to 10 inches in thickness over saprolite. In most places the saprolite is relatively soft and permeable to roots and water.

The land surface is dominated by deep, V-shaped valleys that have extremely steep side slopes and narrow ridges between the valleys. In most places, the local relief exceeds 500 feet. The soil material on the narrow ridgetops is similar to that of the Amalu and Olokui series. Rock land, rock outcrop, soil slips, and eroded spots make up 20 to 40 percent of the acreage.

This land type is used for water supply, wildlife habitat, and recreation. The natural vegetation consists of ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui, and puakeawe. (Capability classification VIIIe, nonirrigated) [Foote et al. 1972:119]

Amalu peaty silty clay (3 to 20 percent slopes) (rAMD) soils are described as follows:

This soil is on high ridges and mountaintops. Included in mapping were small areas of Honomanu and Olokui soils and of steep gulches. In a representative profile an organic layer of black peat, about 8 inches thick, overlies a layer of gray massive clay about 8 inches thick. The substratum is soft, weathered basic igneous rock capped by a horizontal ironstone sheet 1/8 to 1 inch thick. The soil is extremely acid above the ironstone layer.

Permeability is restricted by the ironstone sheet, which is impermeable except for cracks. Runoff is very slow, and the erosion hazard is no more than slight. Roots penetrate to a depth of 8 to 15 inches in places. ...

This soil is used for water supply and wildlife habitat. (Capability classification VIIw, nonirrigated; woodland group 16). [Foote et al. 1972:28]

Honomanū License Area

According to the USDA SSURGO (2001) and soil survey data gathered by Foote et al. (1972), the License Area's soils in the Honomanū License Area consist of Kailua silty clay (3 to 25 percent slopes) (KBID), Stony alluvial land (rSM), Honomanu-Amalu association (rHR),

Rough mountainous land (rRT), and Amalu peaty silty clay (3 to 20 percent slopes) (rAMD) (Figure 8).

Kailua silty clay (3 to 25 percent slopes) (KBID) soils are described as follows:

This soil is on low uplands. Included in mapping were areas of Honomanu and Makawao soils. Also included were small, steep areas near cinder cones.

In a representative profile the surface layer is dark brown silty clay about 9 inches thick. The upper part of the subsoil, about 18 inches thick, is dark-brown and dark reddish-brown silty clay that has subangular blocky structure. The lower part of the subsoil is very dark gray silty clay loam. The substratum is soft, weathered basic igneous rock. The soil is very strongly acid in the surface layer and strongly acid or medium acid in the subsoil.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 4 feet or more. ...

This soil is used for pasture, woodland, and wildlife habitat. (Capability classification IVe, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:53]

Stony alluvial land (rSM) is described as follows:

Stony alluvial land (rSM) consists of stones, boulders, and soil deposited by streams along the bottoms of gulches and on alluvial fans. In most places, the slope is 3 to 15 percent. Elevations range from nearly sea level to 1,000 feet. The annual rainfall amounts to 15 to 200 inches.

This land type is suited to pasture in the dry areas and to pasture and woodland in the wet areas. The natural vegetation consists of kiawe, klu, ilima, pilgrass, and lantana in the dry areas and guava, kukui, hilograss, and Christmas berry in the wet areas. Improvement of this land is difficult because of the stones and boulders. (Capability classification VII, nonirrigated). [Foote et al. 1972:120]

Honomanu-Amalu association (rHR) soils are described as follows:

The soils in this association have the profiles described as typical of their respective series. The areas are almost inaccessible by vehicle or on foot. They are on gently sloping to moderately steep, intermediate uplands on East Maui. The Honomanu soils occupy the more sloping, better drained side slopes. The Amalu soils occur on the less sloping tops of ridges and interfluves. The Honomanu soils are well drained; the Amalu soils are poorly drained. Runoff is slow to very slow, and the erosion hazard is slight.

Honomanu soils make up about 60 percent of the association, and Amalu soils about 40 percent. Included in mapping were small areas of Kailua soils and many small, very steep gulches. This association is used for water supply and wildlife habitat. It is covered with dense min forest vegetation. (Honomanu part is in

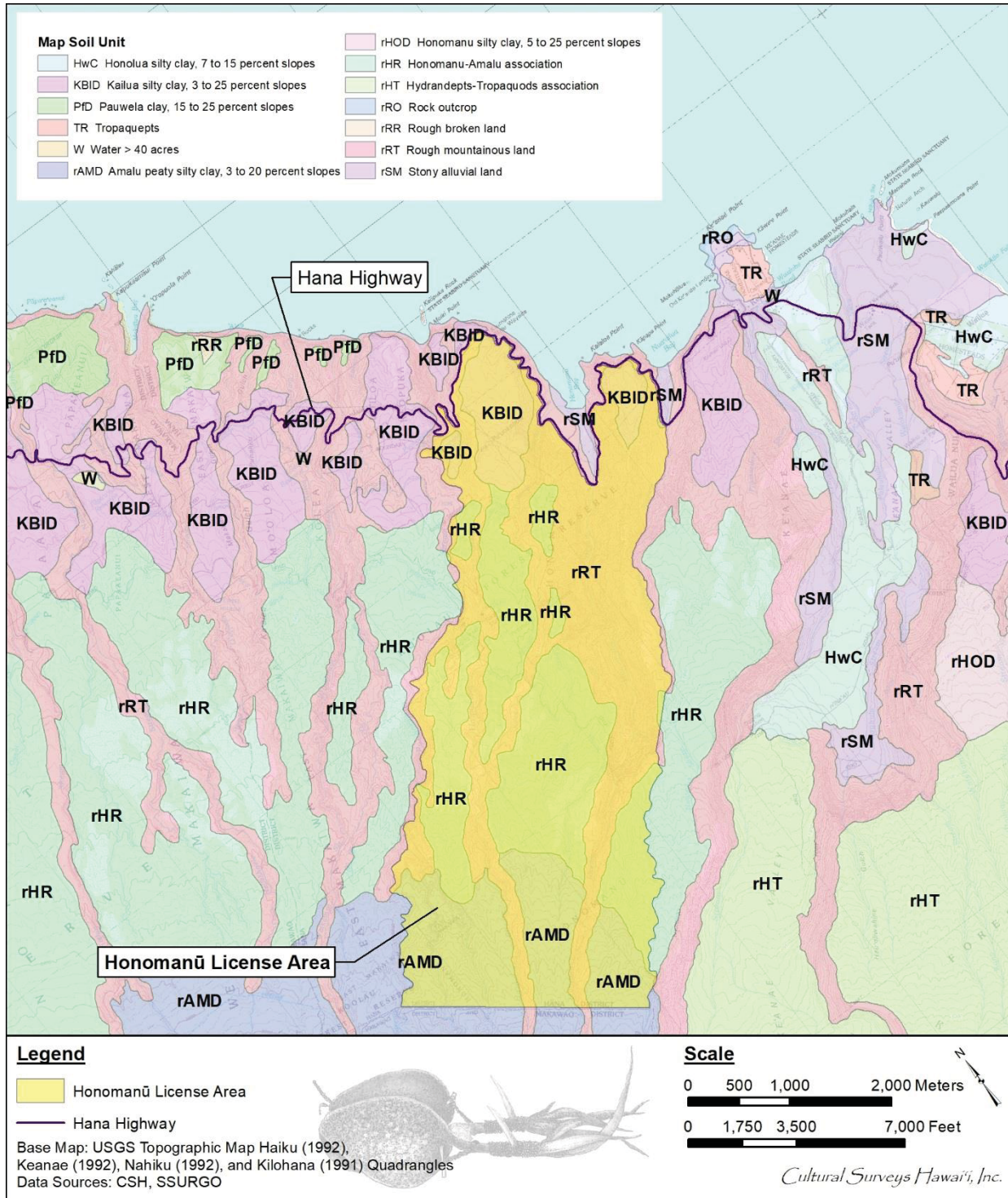


Figure 8. Overlay of Soil Survey of the State of Hawaii (Foote et al. 1972) indicating soil types within and surrounding the Honomanu License Area (U.S. Department of Agriculture 2001)

capability classification IVe, nonirrigated; woodland group 8. Amalu part is in capability classification VIIw, nonirrigated). [Foote et al. 1972:43]

Rough mountainous land (rRT) is described as follows:

Rough mountainous land (rRT) occurs in mountainous areas on all islands in the survey area. It consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. Elevations range from nearly sea level to more than 6,000 feet. The annual rainfall amounts to 70 to more than 400 inches. Over much of the area, the soil mantle is very thin. It ranges from 1 inch to 10 inches in thickness over saprolite. In most places the saprolite is relatively soft and permeable to roots and water.

The land surface is dominated by deep, V-shaped valleys that have extremely steep side slopes and narrow ridges between the valleys. In most places, the local relief exceeds 500 feet. The soil material on the narrow ridgetops is similar to that of the Amalu and Olokui series. Rock land, rock outcrop, soil slips, and eroded spots make up 20 to 40 percent of the acreage.

This land type is used for water supply, wildlife habitat, and recreation. The natural vegetation consists of ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui, and puakeawe. (Capability classification VIIIe, nonirrigated). [Foote et al. 1972:119]

Amalu peaty silty clay (3 to 20 percent slopes) (rAMD) soils are described as follows:

This soil is on high ridges and mountaintops. Included in mapping were small areas of Honomanu and Olokui soils and of steep gulches. In a representative profile an organic layer of black peat, about 8 inches thick, overlies a layer of gray massive clay about 8 inches thick. The substratum is soft, weathered basic igneous rock capped by a horizontal ironstone sheet 1/8 to 1 inch thick. The soil is extremely acid above the ironstone layer.

Permeability is restricted by the ironstone sheet, which is impermeable except for cracks. Runoff is very slow, and the erosion hazard is no more than slight. Roots penetrate to a depth of 8 to 15 inches in places. ...

This soil is used for water supply and wildlife habitat. (Capability classification VIIw, nonirrigated; woodland group 16). [Foote et al. 1972:28]

Ke'anae License Area

According to the USDA SSURGO database (2001) and soil survey data gathered by Foote et al. (1972), the License Area's soils in the Ke'anae License Area consist of Kailua silty clay (3 to 25 percent slopes) (KBID), Stony alluvial land (rSM), Honolua silty clay (7 to 15 percent slopes) (HwC), Honomanu-Amalu association (rHR), Rough mountainous land (rRT), Honomanu silty clay (5 to 25 percent slopes) (rHOD), and Hydrandepts-Tropaquods association (rHT) (Figure 9).

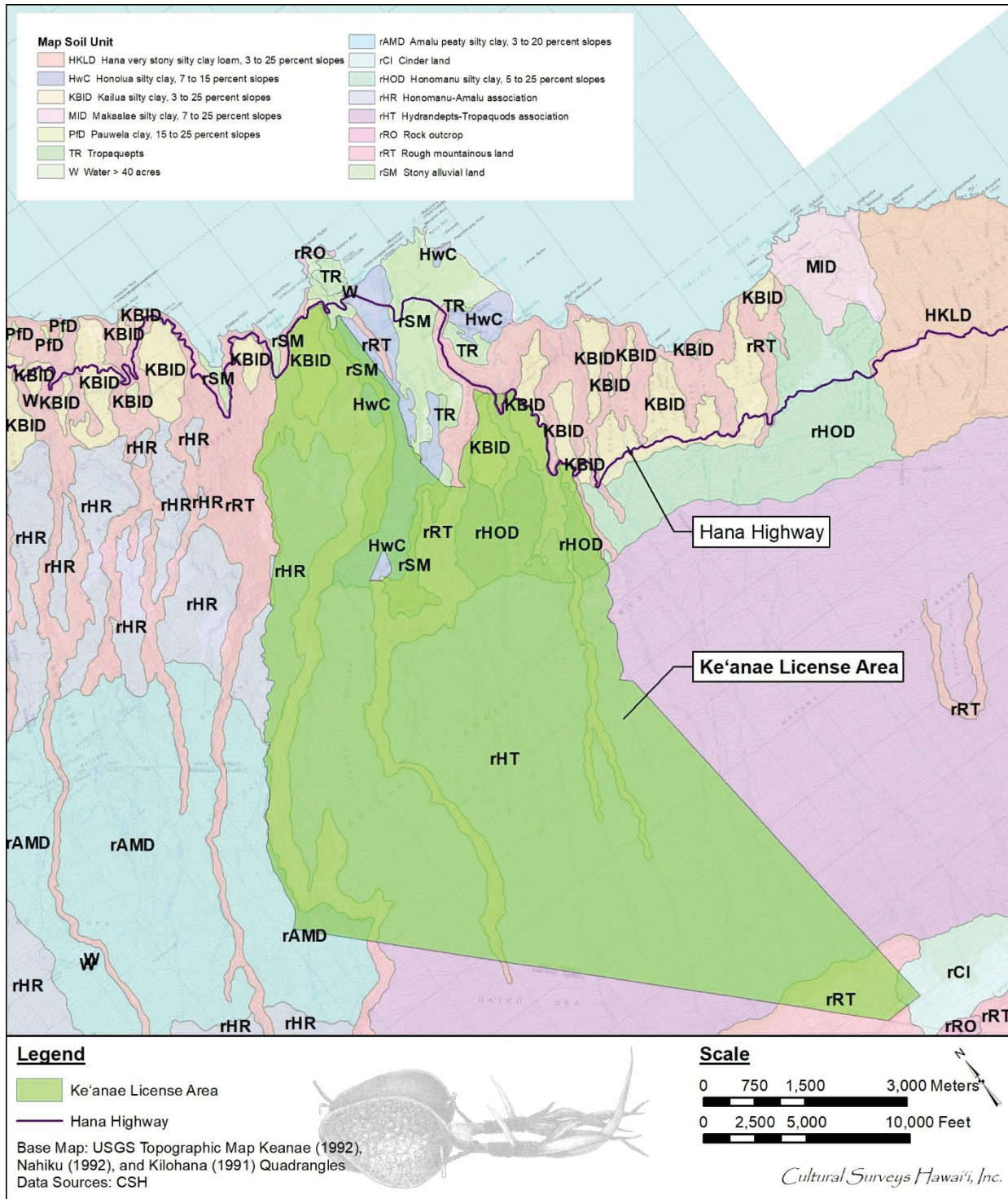


Figure 9. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972) indicating soil types within and surrounding the Ke'anae License Area (U.S. Department of Agriculture 2001)

Kailua silty clay (3 to 25 percent slopes) (KBID) soils are described as follows:

This soil is on low uplands. Included in mapping were areas of Honomanu and Makawao soils. Also included were small, steep areas near cinder cones.

In a representative profile the surface layer is dark brown silty clay about 9 inches thick. The upper part of the subsoil, about 18 inches thick, is dark-brown and dark reddish-brown silty clay that has subangular blocky structure. The lower part of the subsoil is very dark gray silty clay loam. The substratum is soft, weathered basic igneous rock. The soil is very strongly acid in the surface layer and strongly acid or medium acid in the subsoil.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 4 feet or more. ...

This soil is used for pasture, woodland, and wildlife habitat. (Capability classification IVe, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:53]

Stony alluvial land (rSM) is described as follows:

Stony alluvial land (rSM) consists of stones, boulders, and soil deposited by streams along the bottoms of gulches and on alluvial fans. In most places, the slope is 3 to 15 percent. Elevations range from nearly sea level to 1,000 feet. The annual rainfall amounts to 15 to 200 inches.

This land type is suited to pasture in the dry areas and to pasture and woodland in the wet areas. The natural vegetation consists of kiawe, klu, ilima, piligrass, and lantana in the dry areas and guava, kukui, hilograss, and Christmas berry in the wet areas. Improvement of this land is difficult because of the stones and boulders. (Capability classification VIIs, nonirrigated). [Foote et al. 1972:120]

Honolua silty clay (7 to 15 percent slopes) (HwC) are described as follows:

This soil is on smooth interfluvies on uplands. Included in mapping were small areas of Alaeloa and Olelo soils. Also included were small, gently sloping areas and small, eroded spots.

In a representative profile, the surface layer is dark-brown silty clay about 12 inches thick. The subsoil, about 58 inches thick, is dark reddish-brown and reddish-brown silty clay that has subangular blocky structure. The substratum is soft, weathered basic igneous rock. The soil is strongly acid in the surface layer and subsoil.

Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate. The available water capacity is about 1.2 inches per foot in the surface layer and about 1.4 inches per foot in the subsoil. In places roots penetrate to a depth of 5 feet or more.

[...]

This soil is used for pineapple, pasture, and woodland. (Capability classification IIIe, nonirrigated; pineapple group 3; pasture group 8; woodland group 7). [Foote et al. 1972:42]

Honomanu-Amalu (rHR) association soils are described as follows:

The soils in this association have the profiles described as typical of their respective series. The areas are almost inaccessible by vehicle or on foot. They are on gently sloping to moderately steep, intermediate uplands on East Maui. The Honomanu soils occupy the more sloping, better drained side slopes. The Amalu soils occur on the less sloping tops of ridges and interfluves. The Honomanu soils are well drained; the Amalu soils are poorly drained. Runoff is slow to very slow, and the erosion hazard is slight.

Honomanu soils make up about 60 percent of the association, and Amalu soils about 40 percent. Included in mapping were small areas of Kailua soils and many small, very steep gulches. This association is used for water supply and wildlife habitat. It is covered with dense min forest vegetation. (Honomanu part is in capability classification IVe, nonirrigated; woodland group 8. Amalu part is in capability classification VIIw, nonirrigated). [Foote et al. 1972:43]

Rough mountainous land (rRT) is described as follows:

Rough mountainous land (rRT) occurs in mountainous areas on all islands in the survey area. It consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. Elevations range from nearly sea level to more than 6,000 feet. The annual rainfall amounts to 70 to more than 400 inches. Over much of the area, the soil mantle is very thin. It ranges from 1 inch to 10 inches in thickness over saprolite. In most places the saprolite is relatively soft and permeable to roots and water.

The land surface is dominated by deep, V-shaped valleys that have extremely steep side slopes and narrow ridges between the valleys. In most places, the local relief exceeds 500 feet. The soil material on the narrow ridgetops is similar to that of the Amalu and Olokui series. Rock land, rock outcrop, soil slips, and eroded spots make up 20 to 40 percent of the acreage.

This land type is used for water supply, wildlife habitat, and recreation. The natural vegetation consists of ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui, and puakeawe. (Capability classification VIIIe, nonirrigated). [Foote et al. 1972:119]

Honomanu silty clay (5 to 25 percent slopes) (rHOD) soils are described as follows:

This soil is on the wettest parts of the northeastern slopes of Haleakala. Included in mapping were small areas of Amalu and Kailua soils and rock outcrops.

In a representative profile the surface layer is very dark brown silt loam and dark yellowish-brown silty clay about 11 inches thick, capped with an organic layer about 3 inches thick. The subsoil, about 26 inches thick, is dark yellowish-

brown and brown silty clay that has subangular blocky structure. The substratum is dark yellowish-brown loam and fragmental basic igneous rock. The soil is extremely acid in the surface layer and subsoil.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 4 feet or more.

[...]

This soil is used for water supply and wildlife habitat. (Capability classification IVe, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:43]

Hydrandepts-Tropaquods (rHT) association soils are described as follows:

Areas mapped as Hydrandepts-Tropaquods association (rHT) consist of well-drained to poorly drained soils on uplands. These soils are on the northern slopes of West Maui and the northern and eastern slopes of East Maui. They developed in volcanic ash and in material weathered from cinders and basic igneous rock. They are moderately sloping to steep. Elevations range from 1,000 to 6,000 feet: The annual rainfall amounts to 100 to 350 inches. The mean annual soil temperature is 60° F. This association is geographically associated with soils of the Amalu, Honomanu, and Olelo series.

Hydrandepts make up about 60 percent of the association, and Tropaquods 40 percent. Included in mapping were small areas of Rough mountainous land. Also included were small peat bogs.

Hydrandepts are the steeper areas of the association. These are well drained to moderately well drained soils that are similar to those of the Honomanu series. The surface layer is high in organic-matter content. The subsoil is dark-brown or dark yellowish-brown, smeary silty clay loam or silty clay. The substratum consists of volcanic ash and cinders or weathered basic igneous rock. These soils dehydrate irreversibly into fine pebble size aggregates.

Tropaquods are poorly drained soils that are similar to those of the Amalu and Olokni series. They have a peaty or mucky surface layer that overlies a dark gray to very dark gray, mottled layer. The mottled layer rests on an ironstone sheet ¼ to 1 inch thick. The ironstone is at a depth of 10 to 20 inches. It normally caps highly weathered basic igneous rock.

The soils in this association have low bearing capacity and low shear strength. They are slippery and difficult to traverse. Because of their ability to absorb water and to transmit it rapidly, these soils are important for maintenance of ground water for domestic use and irrigation.

This association is used for water supply and wildlife habitat. The natural vegetation consists of ohia, puakeawe, sedges, false staghorn fern, tree fern, and other rain forest vegetation. (Hydrandepts soils are in capability classification VIIe, nonirrigated. Tropaquods soils are in capability classification VIIw, nonirrigated). [Foote et al. 1972:46]

Nāhiku License Area

According to the USDA SSURGO database (2001) and soil survey data gathered by Foote et al. (1972), the License Area's soils in the Nāhiku License Area consist of Kailua silty clay (3 to 25 percent slopes) (KBID), Honomanu silty clay (5 to 25 percent slopes) (rHOD), Hana very stony silty clay loam (3 to 25 percent slopes) (HKLD), Rough mountainous land (rRT), Hydrandepts-Tropaquods association (rHT), and Cinder land (rCl) (Figure 10).

Kailua silty clay (3 to 25 percent slopes) (KBID) soils are described as follows:

This soil is on low uplands. Included in mapping were areas of Honomanu and Makawao soils. Also included were small, steep areas near cinder cones.

In a representative profile the surface layer is dark brown silty clay about 9 inches thick. The upper part of the subsoil, about 18 inches thick, is dark-brown and dark reddish-brown silty clay that has subangular blocky structure. The lower part of the subsoil is very dark gray silty clay loam. The substratum is soft, weathered basic igneous rock. The soil is very strongly acid in the surface layer and strongly acid or medium acid in the subsoil.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 4 feet or more. ...

This soil is used for pasture, woodland, and wildlife habitat. (Capability classification IVe, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:53]

Honomanu silty clay (5 to 25 percent slopes) (rHOD) soils are described as follows:

This soil is on the wettest parts of the northeastern slopes of Haleakala. Included in mapping were small areas of Amalu and Kailua soils and rock outcrops.

In a representative profile the surface layer is very dark brown silt loam and dark yellowish-brown silty clay about 11 inches thick, capped with an organic layer about 3 inches thick. The subsoil, about 26 inches thick, is dark yellowish-brown and brown silty clay that has subangular blocky structure. The substratum is dark yellowish-brown loam and fragmental basic igneous rock. The soil is extremely acid in the surface layer and subsoil.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. In places roots penetrate to a depth of 4 feet or more. ...

This soil is used for water supply and wildlife habitat. (Capability classification IVe, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:43]

Hana very stony silty clay loam (3 to 25 percent slopes) (HKLD) soils are described as follows:

This soil is on smooth, low mountain slopes. Included in mapping were small areas of Honomanu soils. Also included were small, steep areas near cinder cones.

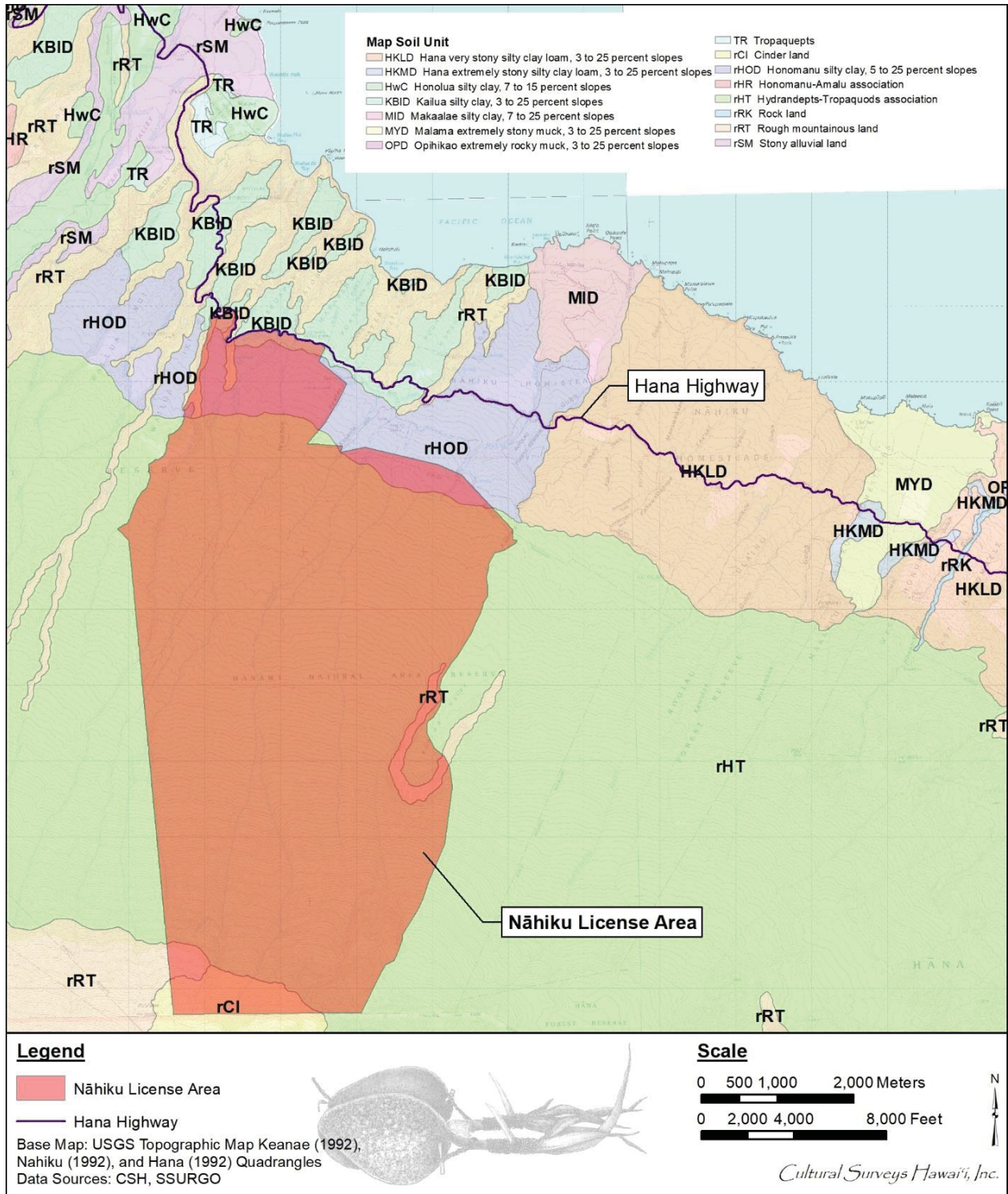


Figure 10. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972) indicating soil types within and surrounding the Nāhiku License Area (U.S. Department of Agriculture 2001)

In a representative profile, the surface layer is very dark-brown and very dark grayish-brown silty clay loam about 12 inches thick. The subsoil, about 22 inches thick, is dark-brown silty clay loam that has subangular blocky structure. The substratum is moderately weathered, pebble-size cinders overlying 4-a lava. The soil is strongly acid to medium acid in the surface layer and slightly acid in the subsoil.

Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate. In places roots penetrate to a depth of 3 to 4 feet. The available water capacity is about 1.2 inches per foot in the surface layer and 1.4 inches per foot in the subsoil. ...

This soil is used for pasture. (Capability classification VIs, nonirrigated; pasture group 11; woodland group 8). [Foote et al. 1972:37]

Rough mountainous land (rRT) is described as follows:

Rough mountainous land (rRT) occurs in mountainous areas on all islands in the survey area. It consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. Elevations range from nearly sea level to more than 6,000 feet. The annual rainfall amounts to 70 to more than 400 inches. Over much of the area, the soil mantle is very thin. It ranges from 1 inch to 10 inches in thickness over saprolite. In most places the saprolite is relatively soft and permeable to roots and water.

The land surface is dominated by deep, V-shaped valleys that have extremely steep side slopes and narrow ridges between the valleys. In most places, the local relief exceeds 500 feet. The soil material on the narrow ridgetops is similar to that of the Amalu and Olokui series. Rock land, rock outcrop, soil slips, and eroded spots make up 20 to 40 percent of the acreage.

This land type is used for water supply, wildlife habitat, and recreation. The natural vegetation consists of ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui, and puakeawe. (Capability classification VIII, nonirrigated). [Foote et al. 1972:119]

Hydrandepts-Tropaquods association (rHT) soils are described as follows:

Areas mapped as Hydrandepts-Tropaquods association (rHT) consist of well-drained to poorly drained soils on uplands. These soils are on the northern slopes of West Maui and the northern and eastern slopes of East Maui. They developed in volcanic ash and in material weathered from cinders and basic igneous rock. They are moderately sloping to steep. Elevations range from 1,000 to 6,000 feet: The annual rainfall amounts to 100 to 350 inches. The mean annual soil temperature is 60° F. This association is geographically associated with soils of the Amalu, Honomanu, and Olelo series.

Hydrandepts make up about 60 percent of the association, and Tropaquods 40 percent. Included in mapping were small areas of Rough mountainous land. Also included were small peat bogs.

Hydrandepts are the steeper areas of the association. These are well drained to moderately well drained soils that are similar to those of the Honomanu series. The surface layer is high in organic-matter content. The subsoil is dark-brown or dark yellowish-brown, smeary silty clay loam or silty clay. The substratum consists of volcanic ash and cinders or weathered basic igneous rock. These soils dehydrate irreversibly into fine pebble size aggregates.

Tropaquods are poorly drained soils that are similar to those of the Amalu and Olokni series. They have a peaty or mucky surface layer that overlies a dark gray to very dark gray, mottled layer. The mottled layer rests on an ironstone sheet ¼ to 1 inch thick. The ironstone is at a depth of 10 to 20 inches. It normally caps highly weathered basic igneous rock.

The soils in this association have low bearing capacity and low shear strength. They are slippery and difficult to traverse. Because of their ability to absorb water and to transmit it rapidly, these soils are important for maintenance of ground water for domestic use and irrigation.

This association is used for water supply and wildlife habitat. The natural vegetation consists of ohia, puakeawe, sedges, false staghorn fern, tree fern, and other rain forest vegetation. (Hydrandepts soils are in capability classification VIIe, nonirrigated. Tropaquods soils are in capability classification VIIw, nonirrigated). [Foote et al. 1972:46]

Cinder land (rCl) is described as follows:

Cinder land (rCl) consists of areas of bedded magmatic ejecta associated with cinder cones. It is a mixture of cinders, pumice, and ash. These materials are black, red, yellow, brown, or variegated in color. They have jagged edges and a glassy appearance and show little or no evidence of soil development.

Cinder land occurs on the islands of Maui and Oahu. On Maui, it is mainly at elevations between 8,000 and 10,000 feet in the Haleakala National Park. On Oahu, it is mainly at elevations between 200 and 2,000 feet, near Mount Tantalus. The annual rainfall amounts to 20 to 30 inches on Maui and 60 to 100 inches on Oahu.

Although Cinder land commonly supports some vegetation, it has no value for grazing, because of its loose nature and poor trafficability; It is used for wildlife habitat and recreational areas. (Capability classification VIIIs, nonirrigated). [Foote et al. 1972:29]

1.4.2 Winds and Rains

Makani is the Hawaiian word for wind and each geographic area throughout the Hawaiian Islands had a name for its own wind, rain, and seas. The wind associated with Hāmākualoa and Huelo is the Pe‘epūhala (“to hide under *hala* trees”), also known as Pe‘ehala, Pe‘epe‘epūhala, and Pe‘epūhalalahīnano (Akana and Gonzalez 2015:230). According to the story, *The Wind Gourd of La‘amaomao*, when a gourd was opened, a specific wind could be called to fill the sails of a canoe and take the person in the desired direction. Below is an excerpt from the story:

Koholā-pehu is of Kīpahulu,
 Koholā-lele as well,
 ‘Ai-loli is of Kaupō,
 Moa‘e is of Kahikinui [Nakuina et al. 1992:63]

According to the University of Hawai‘i 2011 *Online Rainfall Atlas of Hawaii*, between 1978 and 2007, the annual rainfall along the length of the License Area ranged from approximately 3199.6 mm to 6731.8 mm (approximately 125.97 in to 265.03 in) (Giambelluca et al. 2013). In 2014, the annual average air temperature within the License Area ranged from approximately 15.962 °C to 21.556 °C (approximately 60.73 °F to 70.81 °F) (Giambelluca et al. 2014). The elevation within the License Area ranges from approximately 30.48 m to 2286 m (100 ft to 7500 ft) above mean sea level.

1.4.3 Kahawai (Streams)

Numerous streams flowed from the backside of Haleakalā to the ocean providing not only an abundant supply of water but an ecosystem for aquatic life, which was an important food source to Native Hawaiians (McGregor 2007:109). The following streams within the License Area are listed below and depicted in Figure 11:

- Huelo License Area: Puohokamoa, Wahinepe‘e, Waikamoi (Alo Tributary), Kōlea, Punalu‘u, Ka‘aiea, ‘O‘opuola (Makanali Tributary), Puehu, Nā‘ili‘ilihaele, Kailua, Hanahana (Ohanui Tributary or Hanawana or Hanauna), Hoalua, Hanehoi, Huelo (Puolua Tributary), Waipi‘o, Mokupapa, Ho‘olawa (Ho‘olawa ili and Ho‘olawa nui Tributaries), and Honopou (Puniawa Tributary)
- Honomanū License Area: Nua‘ailua, Honomanū, Punala‘u (Kōlea and Ulunui Tributaries), Ha‘ipua‘ena
- Ke‘anae License Area: Waia‘aka, Pa‘akea, Puakea, Waiohue, Kopili‘ula, Pua‘aka‘a Tributary, East Wailuāiku, West Wailuāiki, Wailuānui (Waikani Waterfall), Kualani (or Hāmau), Waiokamilo, ‘Ōhi‘a (or Waianu), Palauhulu (Hauoli Wahine and Kano Tributaries), Pi‘ina‘au
- Nāhiku License Area: Makapipi, Hanawī, and Kapā‘ula

1.4.4 Vegetation

According to the Terrestrial Flora and Fauna Technical Report for the Proposed East Maui Water Lease (SWCA Environmental Consultants 2019) 19 different vegetation cover types exist within the License Area. Vegetation cover types include Open “uluhe” ‘Ōhi‘a Forest (10,934 ac., 33% Lic. Area), Closed ‘Ōhi‘a Forest (8,575 ac., 26% Lic. Area), Alien Forest (7,658 ac., 23% Lic. Area), Closed “uluhe” ‘Ōhi‘a Forest (1,527 ac., 5% Lic. Area), Uncharacterized Open-Sparse Vegetation (1,430 ac., 4% Lic. Area), Uluhe Shrubland (658 ac., 2% Lic. Area), Closed “uluhe” Koa-‘Ōhi‘a Forest (611 ac., 2% Lic. Area), Uncharacterized Shrubland (579 ac., 2% Lic. Area), Alien Grassland (209 ac., 1% Lic. Area), Uncharacterized Forest (172 ac., 1% Lic. Area), Native Wet Cliff Vegetation (145 ac., < 1% Lic. Area), Closed “native shrub” Koa-‘Ōhi‘a Forest (139 ac., < 1% Lic. Area), Native Shrubland/Sparse “native shrub” ‘Ōhi‘a (82 ac., < 1% Lic. Area), Deschamsia Grassland (22 ac., < 1% Lic. Area), Native “alien grasses” Shrubland (22 ac.,

< 1% Lic. Area), Open “native shrub” ‘Ōhi‘a Forest (10 ac., < 1% Lic. Area), Very Sparse Vegetation to Unvegetated (8 ac., < 1% Lic. Area), Kikuyu Grass Grassland/Pasture (2 ac., < 1% Lic. Area), and Low Intensity Development (1 ac., <1% Lic. Area). These vegetation cover types span a diverse variety of ecosystems and each have their own representative species within each cover type. Generally, each vegetation zone contains a mix of indigenous and introduced species of flora. There area also 21 endangered or threatened species present within and near the License Areas (SWCA Environmental Consultants 2019:10-11, A-11 through D-12).

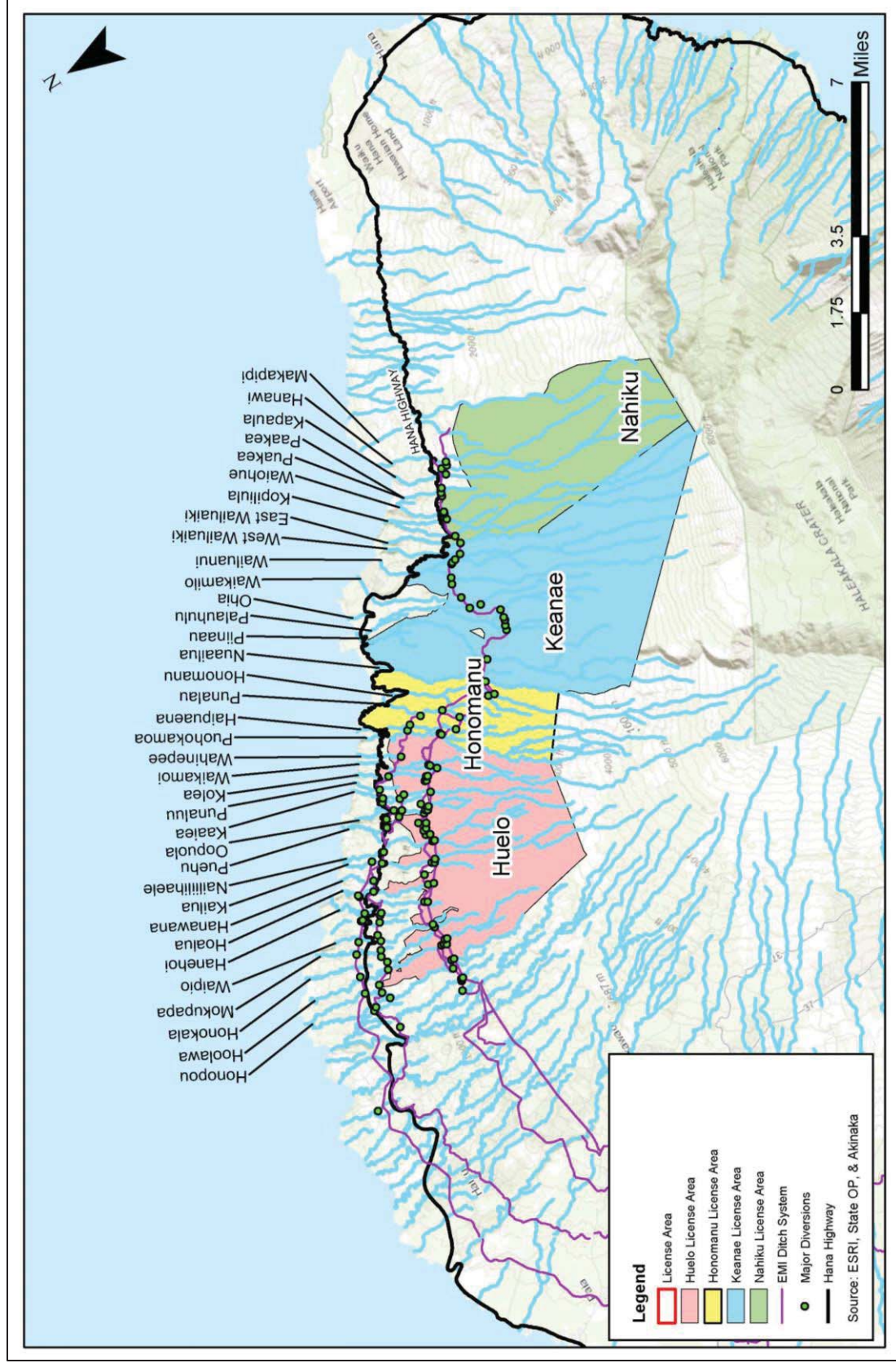


Figure 11. Client provided map that depicts the location of streams within the License Area

CIA for the Proposed Water Lease for the Nāhiku, Ke‘ānae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua‘ā, Makawao and Hāna, Maui

TMKS: Various

Section 2 Methods

2.1 Archival Research

Research centers on Hawaiian activities including *ka‘ao* (legends), *wahi pana* (storied places), *‘ōlelo no‘eau* (proverbs), *oli* (chants), *mele* (songs), traditional *mo‘olelo* (stories), traditional subsistence and gathering methods, ritual and ceremonial practices, and more. Background research focuses on land transformation, development, and population changes beginning with the early post-Contact era to the present day.

Cultural documents, primary and secondary cultural and historical sources, previous archaeological reports, historic maps, and photographs were reviewed for information pertaining to the study area. Research was primarily conducted at the CSH library. Other archives and libraries including the Hawai‘i State Archives, the Bishop Museum archives, the University of Hawai‘i at Mānoa’s Hamilton Library, Ulukau, The Hawaiian Electronic Library (Ulukau.org 2004), the State Historic Preservation Division (SHPD) library, the State of Hawai‘i Land Survey Division, the Hawaiian Historical Society, and the Hawaiian Mission Houses Historic Site and Archives are also repositories where CSH cultural researchers gather information. Information on Land Commission Awards (LCAs) were accessed via the Waihona ‘Aina (2000) Māhele database, the Office of Hawaiian Affairs (OHA) (2015) Papakilo Database, and the Ava Konohiki (2015) Ancestral Visions of ‘Āina website.

2.2 Community Consultation

2.2.1 Scoping for Participants

We begin our consultation efforts by utilizing our previous contact list to facilitate the interview process. We then review an in-house database of *kūpuna* (elders), *kama‘āina* (native born), cultural practitioners, lineal and cultural descendants, Native Hawaiian Organizations (NHOs; includes Hawaiian Civic Clubs and those listed on the Department of Interior’s NHO list), and community groups. We also contact agencies such as SHPD, OHA, and the appropriate Island Burial Council where the proposed project is located for their response on the project and to identify lineal and cultural descendants, individuals and/or NHO with cultural expertise and/or knowledge of the study area. CSH is also remains open to referrals and new contacts throughout the process.

2.2.2 “Talk Story” Sessions

Prior to the interview, CSH cultural researchers explain the role of a CIA, how the consent process works, the project purpose, the intent of the study, and how their *‘ike* (knowledge) and *mana‘o* (thought, opinion) will be used in the report. The interviewee is given an Authorization and Release Form to read and sign.

“Talk Story” sessions range from the formal (e.g., sit down and *kūkā* [consultation, discussion] in the participant’s place of choice over set interview questions) to the informal (e.g., hiking to cultural sites near the study area and asking questions based on findings during the field outing). In some cases, interviews are recorded and transcribed later.

CSH also conducts group interviews, which range in size. Group interviews usually begin with set, formal questions. As the group interview progresses, questions are based on interviewees' answers. Group interviews are always transcribed and notes are taken. Recorded interviews assist the cultural researcher in 1) conveying accurate information for interview summaries, 2) reducing misinterpretation, and 3) adding missing details to *mo'olelo*.

CSH seeks *kōkua* (assistance) and guidance in identifying past and current traditional cultural practices of the study area. Those aspects include general history of the *ahupua'a* (traditional land division extending from the mountain to the sea); past and present land use of the study area; knowledge of cultural sites (for example, *wahi pana*, archaeological sites, and burials); knowledge of traditional gathering practices (past and present) within the study area; cultural associations (*ka'ao* and *mo'olelo*); referrals; and any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the study area.

2.2.3 Interview Completion

After an interview, CSH cultural researchers transcribe and create an interview summary based on information provided by the interviewee. Cultural researchers give a copy of the transcription and interview summary to the interviewee for review and ask that they make any necessary edits. Once the interviewee has made those edits, we incorporate their *'ike* and *mana'o* into the report. When the draft report is submitted to the client, cultural researchers then prepare a finalized packet of the participant's transcription, interview summary, and any photos that were taken during the interview. We also include a thank you card and honoraria. This is for the interviewee's records.

It is important that CSH cultural researchers cultivate and maintain community relationships. The CIA report may be completed, but CSH researchers continuously keep in touch with the community and interviewees throughout the year—such as checking in to say hello via email or by phone, volunteering with past interviewees on community service projects, and sending holiday cards to them and their *'ohana* (family). CSH researchers feel this is an important component to building relationships and being part of an *'ohana* and community.

“*I ulu no ka lālā i ke kumu—the branches grow because of the trunk,*” is an *'ōlelo no'eau* (#1261) shared by Mary Kawena Pukui with the simple explanation: “Without our ancestors we would not be here” (Pukui 1983:137). As cultural researchers, we often lose our *kūpuna* but we do not lose their wisdom and words. We routinely check obituaries and gather information from other informants if we have lost our *kūpuna*. CSH makes it a point to reach out to the *'ohana* of our fallen *kūpuna* and pay our respects including sending all past transcriptions, interview summaries, and photos for families to have on file for genealogical and historical reference.

Section 3 *Ka'ao and Mo'olelo (Legends and Stories)*

Hawaiian storytellers of old were greatly honored; they were a major source of entertainment and their stories contained teachings while interweaving elements of Hawaiian lifestyles, genealogy, history, relationships, arts, and the natural environment (Pukui and Green 1995:IX). According to Pukui and Green (1995), storytelling is better heard rather than read for much becomes lost in the transfer from the spoken to the written word and *ka'ao* are often full of *kaona* or double meanings.

Ka'ao are defined by Pukui and Elbert as a “legend, tale ..., romance, [and/or], fiction” (1986:108). *Ka'ao* may be thought of as oral literature or legends, often fictional or mythic in origin, and have been “consciously composed to tickle the fancy rather than to inform the mind as to supposed events” (Beckwith 1970:1). Conversely, Pukui and Elbert define *mo'olelo* as a “story, tale, myth, history, [and/or] tradition” (1986:254). The *mo'olelo* are generally traditional stories about the gods, historic figures or stories which cover historic events and locate the events with known places. *Mo'olelo* are often intimately connected to a tangible place or space.

In differentiating *ka'ao* and *mo'olelo*, it may be useful to think of *ka'ao* as expressly delving into the *wao akua* (realm of the gods), discussing the exploits of *akua* (gods) in a primordial time. *Mo'olelo* on the otherhand, reference a host of characters from *ali'i* (royalty) to *akua* (gods) and *kupua* (supernatural beings), to finally *maka'āinana* (commoners) and discuss their varied and complex interactions within the *wao kānaka* (realm of man). Beckwith (1970:1) elaborates, “In reality, the distinction between *ka'ao* as fiction and *mo'olelo* as fact cannot be pressed too closely. It is rather in the intention than in the fact.” Thus, a so-called *mo'olelo*, which may be enlivened by fantastic adventures of *kupua*, “nevertheless corresponds with the Hawaiian view of the relation between nature and man” (Beckwith 1970:1).

Both *ka'ao* and *mo'olelo* provide important insight into a specific geographical area, adding to a rich fabric of traditional knowledge. The preservation and passing on of these stories through oration remains a highly valued tradition. Additionally, oral traditions associated with the study area communicate the intrinsic value and meaning of a place, specifically its meaning to both *kama'āina* (native born) as well as others who also value that place.

The following section presents traditional accounts of ancient Hawaiians living in the vicinity of the License Area. Many relate to an age of mythical characters whose epic adventures inadvertently lead to the Hawaiian race of *ali'i* and *maka'āinana*. The *ka'ao* in and around the License Area shared below are some of the oldest Hawaiian stories that have survived; they still speak to the characteristics and environment of the area and its people.

3.1 *Ka'ao and Mo'olelo*

3.1.1 Hi'iaka and Kapokūlani (Kapo) in Wailua Iki

In “The Epic Tale of Hi'iakaikapoloiopele” retold by Ho'oulumāhie (2008a; 2008b), Hi'iaka and her *aikāne* (friend) Wahine'ōma'ō, sail to Maui and travel on the windward side of the island stopping in Wailua Iki Ahupua'a.

They trekked on, passing Kahikinui, arriving in Kaupō, and going through into the next district. Thus they continued on until reaching Wailua Iki, where the people were celebrating the hula. A hall for the dance there was filled with men, women, and children. [Ho'oulumāhie 2008:119]

It is here that Hi'iaka and Wahine'ōma'o speak of hunger and Hi'iaka encounters her cousin Kapokūlani (Kapo) at the *hālau* (meeting hall) of Wailua Iki. From the doorway of the *hālau*, Hi'iaka calls out to her cousin hoping that they will be invited in to rest and eat.

As they stood there, the people inside were dancing. The kind of dance being performed was a hula 'ōlapa, a standing hula. They continued until that particular dance was finished, at which point Hi'iaka offered up a chant, for she had seen her cousin, Kapokūlani, sitting amid the greenery. Kapo recognized this royal little sister of the family, and her tears spilled down.

<i>Kanikanihia Hikapōloa ē</i>	Hikapōloa resounds
<i>'O ka la'i o Wailua Iki</i>	In the calm of Wailua Iki
<i>La'i malino a Kapo i noho ai</i>	The calm in which Kapo dwells
<i>I noho nanea nō i ka la'i o Kona</i>	Dwelling peacefully in the calm of Kona
5. Aloha	5. Greetings
<i>'O kānaenae aloha ihola nō ia lā</i>	This is a loving chant of affection, indeed
<i>'O ka leo</i>	A voice
<i>'O ka leo ka mea aloha ē</i>	The voice is what is cherished
<i>Noho ana Kapo i ka uluwehiwehi</i>	Kapo dwells in verdant greenery
10. <i>Kū ana i luna o Maohēleia</i>	10. Standing atop Mo'ohelāia
<i>Ka 'ōhai kū i Maunaloa</i>	The 'ōhai stands on Maunaloa
<i>Aloha mai Kaulana'ula</i>	Kaulana'ula offers affection
<i>Eia mai ka 'ūlāleo lā</i>	Here is the chanted appeal, the 'ūlāleo
<i>He waimaka</i>	Offered up with tears
15. <i>He mōhai aloha na'u iā 'oe,</i>	15. My offering of affection to you,
<i>e Kapo</i>	Kapo
<i>'O Kapokūlani, 'o Moehāunaiki</i>	Kapokūlani, Moehāunaiki
<i>E hea au iā 'oe</i>	I call out to you
<i>Ō mai ho'i.</i>	Oh do, indeed, respond.

Hi'iaka's chanting was exceedingly beautiful. No chant more lovely had ever been witnessed at Wailua. [Ho'oulumāhie 2008a:127; Ho'oulumāhie 2008b:119-120]

The deity Kapo is sometimes mentioned as a sister of Pele and Hi'iaka, while other times she is listed as a cousin. Kapo is said to have been “born of Papa (or Haumea)... with Wakea her husband. Some say that she was born from the eyes of Papa. She is of high rank and able to assume many shapes at will” (Beckwith 1970:186). Kapo is known by a number of names that relate to certain *mo'olelo*. It is held that she once lived in Wailua Iki Ahupua'a in East Maui and is mentioned in connection with this place in numerous accounts. Beckwith (1970:187) describes that, “As goddess of sorcery Kapo is worshiped principally on Maui where she acts as an akua

noho or god who possesses the deified dead and gives commands or foretells events through their worshippers.”

3.1.2 Kamapua'a Visits Kapo

Kamapua'a, translated as “Hog-Child,” was born to Hina but was disowned by Hina's husband Olopana — who believed Kamapua'a was not his son but the result of an affair between Hina and his younger brother Kahiki-ula. After becoming a scorned lover of Pele, the broken-hearted Kamapua'a took the form of a fish and roamed the Hawaiian Islands. One legend of Kamapua'a in East Maui is at the home of Kapokūlani (Kapo) in the *ahupua'a* of Wailua Iki:

...when Kapo is living at Wailua-iki with her husband Kuo'u, Kamapua'a comes to that island in his fish form and sees a rainbow resting over Kapo's house. Her husband is out fishing and she is beating tapa when the handsome stranger enters. Two men on the cliff signal to her husband and he comes running and gives Kamapua'a a whack with his paddle. The kupua sends the husband flying over the cliff, called today Kuo'u, and he falls in the shape of a huge stone pointed out today by the roadside. The gap between Wailua and Wai-lua-iki through which today runs a steep trail, still traveled by the mailman to the valley, was torn out at the time of this struggle. Kapo's house may also be seen and the mark of her vagina against the cliff. [Beckwith 1970:213]

3.1.3 Hi'u of Ko'olau

A tale based in Ke'anae tells of a shark famous in the ancient Ko'olau District of Maui called Hi'u – meaning “the tail of a fish” (Sterling 1998; Lueras 1983):

According to this story, two families in the area used to exchange food, a common practice, the couple living seaside at Ke'anae giving fish and the couple living upland giving garden produce.

One day the woman from the shore gave her sister-in-law on the hillside nothing but a fishtail in exchange for bananas and sweet potatoes. The woman took the fishtail home in her calabash, saying nothing about the scanty trade.

That night both she and her husband dreamed of a shark, and when they woke up in the morning they found a live shark swimming around in the calabash, where only a tail had been the night before.

The excited couple freed the shark in an upland pool and made offerings to it. During a heavy rain, the shark was washed down to the ocean, where...it lives to this day in an underground cave near Ke'anae wharf. [Lueras 1983:92]

3.1.4 Kihapi'ilani's Sweet Potato Patch

The historic Hāmākualoa District of Maui is located on the north side of East Maui in the area now designated as Makawao District. One legend with a direct link to the Hāmākualoa District is the legend of Kihapi'ilani and his sweet potato patch. Kihapi'ilani, son of the ruling chief of Maui Pi'i-lani, came to rule Maui by killing his older brother Lono-a-Pi'i-lani (Pi'ilani), who was the first born successor. Kihapi'ilani is often remembered on Maui for his stupendous leap from great heights into a pool of water (the sport known as *lelekawa*), and for building a stone

paved road around the island of Maui (Beckwith, 1970). Legend says that Kihapi'ilani, fleeing the ill treatment of his brother Pi'ilani, runs to Makawao where he takes up residence with a woman and her family, all the while keeping his identity secret. He lives peacefully for a time in a place called Kalaniwai. When the woman's family began to complain of his laziness, Kihapi'ilani travels to the lowlands of Kalua'ama at Ha'ikū to obtain sweet potato stalks. During his travels to the lowlands of Ha'ikū, he learns how he can take revenge on his older brother. He takes the sweet potato stalks back to Kalaniwai and plants his famous sweet potato patch, after which he continues to Wailuku to pursue his brother (Fornander 1917:236-242).

In Kamakau (1992), Kiha-a-Pi'ilani (Kihapi'ilani) is represented as more of a supernatural figure with legendary strength who runs to a place on the boundary of Kula and Makawao. It is here where he plants his great patch of sweet potatoes:

There was a famine in Kula and Makawao, and the people subsisted on *laulele*, *pualele*, *popolo*, and other weeds. One night Kiha-a-Pi'i-lani went to clear a patch of ferns to plant sweet potatoes, and on the same night he made a large one that would naturally require the labor of eighty men to clear. When morning came, the huge patch was noticed, an immense one indeed. The people said skeptically of this great undertaking, 'Where will he find enough sweet-potato slips to cover the patch?' Next day Kiha-a-Pi'i-lani went to Hamakuapoko and Hali'imaile to ask for potato slips. The natives gave him whole patches of them wherever he went; [they said]. He went to clean a number of morning-glory vines and returned. The owners who gave him the contents of their patches had gone home. He pulled up the vines and whatever potatoes adhered to them, and allowed them to wilt in the sun. After they had wilted he laid vines on them, and tied them. He went on doing this until he had enough loads for ten men to carry. Then he made a carrier ('awe 'awe) of morning-glory vines, placed the bundles of slips in it, and lifted it with great strength onto his back. The sunshine beat down on his back, the 'uki'ukiu breeze blew in front of him, the 'Ulalena rain added its share, and intense heat reflected from the 'ulei vines. [Kamakau 1992:22-33]

Fornander's account places the patch in between Makawao and Ha'ikū, on the border of the two Hāmākualoa districts of Maui. The Makawao area was noted for its sweet potato lands and has retained that reputation throughout the historic period (Sterling 1998:99).

3.1.5 Springs of Kāne

In the legend of Kāne and Kanaloa and their search for water to accompany their appetite for 'awa (kava; *Piper methysticum*), one of the first places they are known to have traveled on Maui is to the mountains of Ke'anae in the ancient district of Ko'olau. Kāne thrusts his *kauila* (*Alphitonia ponderosa*) wood staff and a spring appears. The location of this spring is marked according to Beckwith:

Two holes are pointed out just below the road across Ohia gulch beyond Keanae on Maui where Kane dug his spear first into one hole and then into the other with the words, "This is for you, that for me." The water gushing from these apertures is called "the water of Kane and Kanaloa." [Beckwith 1970:65]

From here, they travel east forming springs and fishponds in Luala'ilua, Kaupo, Kipahulu, Waihe'e, and Kahakuloa. In January 1865, the Hawaiian Newspaper *Kuokoa* printed an article by J. Waiamau concerning the springs of Kāne in Hāmākualoa, Maui.

Kaneloa said to Kane, "We have circled Hawaii let us go to Maui". They sailed to and landed on Maui. They toured Maui until they reached Hamakua. They drank awa but because there was no water they caused fresh water to flow and drank all of the awa. They continued on and the water which they had caused to flow was called the water of Kaneloa. This water flows unto this day. [Sterling 1998:101]

It is uncertain whether the water of Kaneloa in this anecdote refers to a specific place in Hāmākua or whether it refers to all the springs in the Hāmākua Districts. It is not surprising that Kāne and Kanaloa would have left their mark in East Maui as they did on the rest of Hawaiian Islands.

3.1.6 'Ai'ai, Son of Ku'ula the Fish God

Ku'ula, the god of fishers, is said to originate from the Hāna area of Maui. There he lived with his wife Hinapukui'a, his brother Ku'ulauka (god of cultivators), and Ku'ulauka's (goddess of forest growth, sister of Hinapukui'a, and wife of Ku'ulauka). Ku'ula lived during the reign of Kamohoali'i under which he served as head fisherman. At the time of his death, Ku'ula prepares for the future by instructing his son 'Ai'ai on the powers of attracting fish and on establishing fishing stations in the islands. Ku'ula gives 'Ai'ai his magic objects including: "a decoy stick called Pahiakukahuoi (kahuai), a cowry called Leho-ula, a hook called Manai-a-ka-Iani, and a stone called Ku 'ula which, if dropped into a pool, had the power to draw the fish thither" (Beckwith 1970:19). 'Ai'ai traveled around Maui returning fish to the *ko'a* (fishing ground or station) of the island by erecting *kū'ula* (stone god used to attract fish) and by teaching the local people the best fishing techniques. In the following *mo'olelo*, a number of place names within the *ahupua'a* of the License Area are mentioned.

Arriving at Waiohue Bay in Ko'olau, 'Ai'ai began to restore the *ko'a* of these waters by creating a *kū'ula*.

He next went over to Waiohue, Koolau, where he placed a stone on a sharp rocky islet, called Paka, whereon a few puhala grow. It is claimed that during the season of the kala, they come in from the ocean, attracted to this locality by the power of this stone. They continue on to Mokumana, a cape between Keanae and Wailuanui. They come in gradually for two days, and on the third day of their reaching the coast, at the pali of Ohea, is the time and place to surround them with nets. In olden times while the fishermen were hauling in their nets full of kala into the canoes, the akule and oio also came in numbers at the same time, making it impossible to catch all in one day; and as there were so many gathered in the net it took them a day and a night before they could care for their draught, which yielded so many more than could be made use of that they were fed to the pigs and dogs. The kala of Ohea is noted for its fatness and fine flavor. Few people are now living there, and the people who knew all about this are dead; but the stone that Aiai placed on that little island at Waiohue is still there. [Thrum 1907:233]

When 'Ai'ai became satisfied with his work and believed that his friends had grown proficient in the art of fishing he bestowed on them a challenge. He instructed his friends to go into the deep waters off of Wailua Nui and kill the giant *he'e* (general term for octopus).

When the canoes were made ready and drawn to the beach and the people came prepared to start, Aiai brought the *hokeo* (fishing gourd), where the *leho* (kauri shell) that Ku-ula his father gave him was kept, and gave it to his friend. . .

Then the canoes and people sailed away till they got out along the palis near Kopiliula, where they rested. . . Aiai's friend called on Ku-ula and Hina for the assistance of their wonderful powers. When he was through, he took off the covering of the gourd and took out the *leho*, which had rich beautiful colors like the rainbow, and attaching it to the line, he lowered it into the sea, where it sent out rays of a fiery light. The *he'e* was so attracted by its radiance that it came out of its hole and with its great arms, which were as long and large as a full-grown cocoanut tree, came up to the surface of the water and stood there like a cocoanut grove. The men were frightened, for it approached and went right into the canoes with the intention of destroying them and the men and capturing the *leho*; but it failed, because Aiai's friend, with his skill and power, had provided himself with a stone, which, at the proper time, he shoved into the head of the squid; and the weight of the stone drew it down to the bottom of the sea and kept it there, and being powerless to remove the stone, it died. The men seized and cut off one of the arms, which was so big that it loaded the canoes down so that they returned to Hana. When the squid died, it turned to stone. It is pointed out to-day just outside of Wailuanui, where a stone formation resembles the body of a squid and the arms, with one missing. . .

When Aiai saw that his friend and others of Hana were skilled in all the art of fishing, he decided to leave his birthplace and journey elsewhere. [Thrum 1907:234-235]

3.1.7 Eleio and the Ghost of 'O'opuola

Eleio was the messenger of the king of Maui, called Kakaalaneo. Eleio was known for his speed and was sent each morning to Hāna to bring *'awa* back to the king who lived in Lahaina. According to *mo'olelo*, "As soon as the order was given, Eleio would run off with great speed, all the way from Lahaina to Hana. The distance between these two places is about forty miles. It is said in the legend that Eleio could beat the wind in speed" (Fornander 1919:434).

One day during Eleio's journey from Lahaina to Hāna, he was stopped by the ghost Kaahualii who lived in the wilderness of 'O'opuola in East Makaīwa Ahupua'a.

In one of his trips to Hana, he met Kaahualii, a ghost, who lived in the wilderness of Oopuola. When the ghost met him, he asked that he be given some of the *awa*, but Eleio insulted him by telling him to take the hairs of his body and use it for his *awa*.

When Kaahualii heard this, he gave chase, believing that he could catch Eleio; but he was unable to catch him who ran much faster.

When Eleio came to Kakaalaneo, he saw that the meal, the awa for which he was sent, was being served. On his return from Hana Eleio while running was preparing the awa at the same time, so when he entered the house, he placed the awa in the cup, strained it and placed the cup to the mouth of Kakaalaneo. Kakaalaneo was thus enabled to drink his awa before he began on his meal.

Because of this Eleio was noted for his great speed and the people of the present generation think the story to be true. [Fornander 1919:434]

3.1.8 Pau-walu the Shark-Man

Wailua-iki Bay is associated with the dramatic story of a shark-man named Pau-walu, translated to mean “eight dead” (Beckwith 1970:141) or “many destroyed” (Nakuina 1994:27). The following *mo 'olelo* tells of Pua-walu's defeat by a young Maui fighter.

Pau-walu (“Many destroyed”) lived at Wailua, Maui. He warned men as they went to the sea that many would be killed before they returned and a shark always killed many of them as predicted. He was therefore suspected as a shark-man. Akeake (“Quick and ready”) was born beside the stream of Hau-ola and while yet a little boy went about Maui fighting champions. After overcoming Lohelohe, he, with his companion Pakolea, spent the night at the house of a friend named Ohia and learned about Pauwalu. The shark-man scoffed at so little an antagonist, but Akeake easily bound him, exposed the shark's mouth on his back, and killed him a fire. (From Beckwith's *Hawaiian Mythology*, 141; the anecdote is condensed from a manuscript by Mary Kawena Pukui. On March 14, 1993, a 12-14-foot shark bit the leg of surfer Roddy P. Lewis at Wailua-iki Bay on Maui. The shark let go after the surfer punched it on the side of the head. About a week after the shark attack, two local residents caught a ten-foot tiger shark in the area.) [Nakuina 1994:27]

3.2 *Wahi Pana* (Legendary Place)

Wahi pana are legendary or storied places of an area. These legendary or storied places may include a variety of natural or human-made structures. Oftentimes dating to the pre-Contact period, most *wahi pana* are in some way connected to a particular *mo 'olelo*, however, a *wahi pana* may exist without a connection to any particular story. Davianna McGregor outlines the types of natural and human-made structures that may constitute *wahi pana*:

Natural places have mana, and are sacred because of the presence of the gods, the akua, and the ancestral guardian spirits, the 'aumakua. Human-made structures for the Hawaiian religion and family religious practices are also sacred. These structures and places include temples, and shrines, or heiau, for war, peace, agriculture, fishing, healing, and the like; pu'uhonua, places of refuge and sanctuaries for healing and rebirth; agricultural sites and sites of food production such as the lo'i pond fields and terraces slopes, 'auwai irrigation ditches, and the fishponds; and special function sites such as trails, salt pans, holua slides, quarries, petroglyphs, gaming sites, and canoe landings. [McGregor 1996:22]

As McGregor makes clear, *wahi pana* can refer to natural geographic locations such as streams, peaks, rock formations, ridges, offshore islands, and reefs, or they can refer to Hawaiian land divisions such as *ahupua'a* or *'ili* (land division smaller than an *ahupua'a*), and man-made structures such as fishponds. In this way, the *wahi pana* of East Maui tangibly link the *kama'āina* of this region to their past. It is common for places and landscape features to have multiple names, some of which may only be known to certain *'ohana* or even certain individuals within an *'ohana*, and many have been lost, forgotten or kept secret through time. Place names also convey *kaona* (hidden meanings) and *huna* (secret) information that may even have political or subversive undertones. Before the introduction of writing to the Hawaiian Islands, cultural information was exclusively preserved and perpetuated orally. Hawaiians gave names to literally everything in their environment, including individual garden plots and *'auwai* (water courses), house sites, intangible phenomena such as meteorological and atmospheric effects, *pōhaku* (rock, stone), *pūnāwai* (freshwater springs), and many others. According to Landgraf (1994), Hawaiian *wahi pana* “physically and poetically describes an area while revealing its historical or legendary significance” (Landgraf 1994:v).

3.2.1 *Ahupua'a* Place Names

Handy et al. (1991:23-24,42) summarizes the relationship that traditional Hawaiians have had with the natural environment best in the following passage:

The sky, sea, and earth, and all in and on them are alive with meaning indelibly impressed upon every fiber of the unconscious as well as the conscious psyche. Hawaiian poetry and folklore reveal this intimate rapport with the elements, [Handy et al. 1991:23-24]

(T)he relationship which existed from very early times between the Hawaiian people . . . is abundantly exemplified in traditional mele (songs), in pule (prayer chants), and in genealogical records which associate the ancestors, primordial and more recent, with their individual homelands, celebrating always the outstanding qualities and features of those lands. [Handy et al. 1991:42]

These subtle observations of the interconnectedness of people, places, and deeds figure largely in the naming of places of note, also called *wahi pana*. The regional place names below, along with the environmental data, indicate that the lands within East Maui were widely used for many purposes relevant to traditional Hawaiian subsistence, habitation, and history. Sometimes these place names are references to the actions of historic individuals, and at other times to the deeds of legendary or mythological figures, but often are rich with the symbolic associations to the point of encompassing a comprehensive history of a place that can combine all these elements. Literal translations of the *moku* (districts) and *ahupua'a* place names within the License Area are listed in Table 1. These translations may provide some insight into what the *moku* and *ahupua'a* of the License Area were like prior to Western contact. Unless otherwise noted, translations are taken from Pukui, Elbert, and Mookini (1976) *Place Names of Hawaii*.

Table 1. *Ahupua'a* and *Moku* Place Names within the License Area (from Pukui et. al 1976 unless otherwise noted)

Name	Translation/Association
Hāmākua Loa	One of twelve ancient districts (<i>moku</i>) of Maui Island; <i>lit.</i> , “long hāmākua” where <i>hāmākua</i> means corner (p. 39)
Hanawana	<i>Ahupua'a</i> (West Hanawana and East Hanawana), point, and stream; <i>lit.</i> , “sea urchin bay” (p. 41)
Hanehoi	<i>Ahupua'a</i> , Lexicology unknown.
Honomanū	<i>Ahupua'a</i> , Land division and bay. Lexicology unknown.
Honopou	<i>Ahupua'a</i> , point, and stream; <i>lit.</i> , “post harbor” (p. 50)
Huelo	<i>Ahupua'a</i> , village, stream, and point; a game, originated by Papio, was played here; <i>loulou</i> palm leaves were woven into hammocks upon which players were laid and then tossed into the sea (p. 53)
Ke'anae	<i>Ahupua'a</i> , village, elementary school, park, lookout, homesteads, point, landing, stream, valley, peninsula, East Maui. Here, the god Ka ne, accompanied by Kanaloa, thrust his <i>kaui</i> staff into solid rock, and water gushed forth. <i>Lit.</i> , “the mullet” (p. 103)
Ko'olau	<i>Ahupua'a</i> , One of twelve ancient districts on Maui, reduced to four in 1859. The new Hana district includes the former Koolau, Hana, Kipahulu, Kaupo, and Kahikinui districts. <i>lit.</i> , “windward” (Ulukau 2010)
Makaīwa	<i>Ahupua'a</i> (West Makaīwa and East Makaīw) and bay; <i>lit.</i> , “mother-of-pearl eyes” (p. 140)
Makawao	<i>Moku</i> and <i>ahupua'a</i> ; <i>Lit.</i> , “forest beginning” (p. 142)
Mokupapa	<i>Ahupua'a</i> , gulch, and stream; <i>lit.</i> , “flat island” (p. 156)
Nāhiku	<i>Ahupua'a</i> , <i>lit.</i> , “the seven (districts of the area)” (Clark 1989:20)
Pa'akea	<i>Ahupua'a</i> , stream, and gulch; <i>lit.</i> , “coral bed, limestone” (Ulukau 2006)
Pāpa'a'ea	<i>Ahupua'a</i> and reservoir; <i>lit.</i> , “turtle shell piece”; Kiha-a-Pi'ilani made a long paved road beginning here (p. 179)
Pu'uomaile	<i>Ahupua'a</i> , <i>lit.</i> , “Hill of Mālei (a <i>kupua</i> goddess)” (p. 204)
Wailua	<i>Ahupua'a</i> (Wailua Nui and Wailua Iki), stream, village, homestead, and cove; <i>lit.</i> , “two waters” (Ulukau 2006)
Waipi'o	<i>Ahupua'a</i> (Waipioiki and Waipionui), land section. gulch, and school, <i>lit.</i> , “curved water” (p. 227)

3.2.2 Heiau of East Maui

Heiau are pre-Christian places of worship. Construction of some *heiau* were elaborate and large communal structures, while others were simple earth terraces or shrines (McAllister 1933:8). *Heiau* are most commonly known to be where important ceremony took place and are large structures with platforms or altars comprised of one or more terraces (McAllister 1933:8). The following descriptions chronical a number of *heiau* within or near the License Area.

Puu O Kalepa Heiau of Huelo Ahupua'a is located approximately 500 feet east of Huelo Protestant Church on a knoll overlooking Honopou Gulch (Thrum 1917). The name Puu O Kalepa is recorded as derived from *pu'u o ka lepa*, meaning "hill of the flag" (Ulukau 2010). This large, open *heiau* is thought to have been of the sacrificial class and was constructed from beach stones, pebbles, and basalt (Sterling 1998:105).

Pohakuokane Heiau is located east of Kailua gulch atop a ridge in Pāpa'a'ea Ahupua'a. Pohakuokane, made from smooth basalt rocks, is a small notch-shaped *heiau* set in a dense thicket of *hau* (beach hibiscus; *Hibiscus tiliaceus*) (Sterling 1998:107). Pohakuokane is translated from *pōhaku-o-Kāne* to mean "stone of Kāne" (Ulukau 2010).

In Honopou Ahupua'a, Poohoolewa Heiau is cited to have been located at Apiapi on a high bluff overlooking Honopou Gulch. This *heiau* is described as a large walled structure that is thought to have been used for sacrifices (Thrum 1917; Ulukau 2010).

In Pu'uomaile Ahupua'a is Kauhiale Heiau which is translated from *kauhi-hale* meaning "house of Kauhi" (Ulukau 2010). This *heiau* is described as a L-shaped, walled enclosure with two or three terraces located at Moii. The construction of this *heiau* was done with rough basalt stones (Sterling 1998). Pu'uomaile Ahupua'a is also home to Kupaikaa Heiau, said to have been a large *heiau* from which the sound of drums were heard (Ulukau 2010).

Ohia Heiau, located in Wailua Nui Ahupua'a about three quarters of a mile from the sea in a valley, was disassembled to build a pig pen in the late-ninetieth or early twentieth century. This *heiau* is believed to have been built by chief Kaimuki for agricultural purposes (Sterling 1998).

3.2.3 Alaloa Kihapiilani

The Alaloa (Long Road) of Kihapiilani, or Kihapiilani Highway, was constructed in the sixteenth century during the reign of King Kihapi'ilani of Maui. Kihapi'ilani is credited with completing the paved road from Hāna to Wailuku, which was initiated by his father, Pi'ilani (Fleming, 1933). The road, paved with smoothed basalt stones, unified the island and provided a means of trade, commerce, and war time protection. In describing the building of Kihapi'ilani's road, Beckwith states:

The name Kiha-pi'ilani is preserved locally about the island of Maui in connection with... the famous paved road about the island with the building of which he oppressed the people. Men are said to have stood in line and passed stones from seashore to upland. Parts of the road are still in place and may be followed where the trail cuts in a straight line up and down the deep gorges which break the windward slope of the island. [Beckwith 1970:387]

Once the road was paved however, residents of East Maui most likely benefitted from having access to the road and as did the people traveling through the windward districts, particularly given its location between Wailuku and Hāna, two prominent political centers during the last two centuries of pre-contact Hawaiian history. The Alaloa Kihapiilani traverses many East Maui locations and is a *wahi pana* mentioned in various accounts of East Maui.

3.2.4 'O'opuola

'O'opuola is the name of a wilderness area, gulch, stream, and point – all broadly located on the northwestern boundary of the ancient *moku* of Ko'olau and within the *ahupua'a* of East Makāiwa and West Makāiwa. Andrews (1922:663) translates 'o'opuola to mean, “long oopu fish.”

The wilderness area of 'O'opuola, which is along the Kihapiilani Road, was known as a place that attracted robbers. Two accounts mention the 'O'opuola wildness of East Makāiwa Ahupua'a in reference to robbers.

Robbery and theft also were frequent crimes committed in out-of-the-way places. Certain people, called Ku'ielua, took up robbery as a profession, were known as “wild men” (*hihiu*), and waylaid travelers at such remote places on the highway as 'O'opuola, 'Akiala, Kuanu'uanu, Hana'ie'ie, 'A'alaloloa, the cliffs of Molokai, Kahakuloa [on Maui], and so also on Hawaii, Oahu and Kauai. [Kamakua 1992:236]

Once the development of the paved Kihapiilani Road came to 'O'opuola, the passage through the wilderness area became less treacherous according to the following account.

When the chief and men had finished the work there [on Kihapiilani Road], the paving was begun in the forest of Oopuloa in Koolau, from Kawahinepee at Kaloa to Papaaea to Kaohekanu at Hamakualoa. This was a place made famous by robbers in the olden days. This road was treacherous and difficult for the stranger, but when it was paved by Kihapiilani this road became a fine thing. [Sterling 1998:101]

3.2.5 Pu'ukoa'e

Pu'ukoa'e (Puukaae on latter maps) of West Hanawana, is a pinnacle which juts out into Hoalua Bay, appears in the historic struggles of Hawai'i chiefs to gain control over Maui. During Kamehameha's Maui campaign around 1790, Kamehameha's troops traveled up the windward coast to Hāmākualoa District, after having invaded Hāna. Kalanikupule, the ruling chief of Maui at the time, sent his warrior Kapakahili to resist the invasion.

The battle met at a small hill called “Bosun-bird Hill” (Pu'ukoa'e) situated on the makai side of Pu'umaile at Hanawana in Hoalua, and Kapakahili was defeated. In the evening Kamehameha beached at Halehaku, went ashore, and built temporary shelters just where he stepped foot. The feather god Kuka'ilimoku encouraged him to fight, for its feathers bristled and stood upright in the direction of Hinawaikoli'i; Kamehameha therefore lost his fear of a fight with slingshot. The next morning he saw through the koa and hala trees the red gleam of feather

caples. It is said that he narrowly escaped defeat by Kapakahili's company. But reinforcements came up, Kamehameha put the enemy to flight, and pursued them along the main road or they would have rejoined their fellow warriors at Kokomo. At the ascent of 'Opaepilau, Kapakahili was exhausted and was overtaken. "Slain by Pipili," Kamehameha boasted over him. [Kamakau 1961:148]

An additional account by Fornander mentions Pu'ukoa'e as a strategic position taken in battle by Kamehameha.

Of the campaign in Hamakualoa some momentos are still pointed out. The fortified position at Puukoae on Hanawana, which was attacked and taken by *Kamehameha*, who had brought his fleet round from Hana. The hill is known as "Kapuai-o- Kamehameha," to the west of the Halehaku stream, where he encamped for the night after taking Puukoae. . . the Maui forces were routed and fled as far as Kokomo, where a final stand was made. Fighting desperately, and with hardly a hope of retrieving the fortune of the day, *Kapakahili* encountered *Kamehameha* on the field, and one of those single combats ensued in which the fate of an empire depends on the personal prowess of one or the other of the combatants. *Kapakahili* was killed, the Maui men fled and dispersed, and the road to Wailuku lay open to *Kamehameha*. [Fornander 1969:236]

3.2.6 The Bays of Wailua Iki and Wailua Nui

Samuel M. Kamakau provides a passing reference in the context of the fleet of the Big Island chief 'Umi-a-Līloa coming to the aid of the Maui chief Kiha-a-Pi'ilani in his fighting against Lono- a-Pi'ilani and the Hāna chief Ho'olaemakua. The Hāna chief initially repelled the landings of the Hawai'i-Island canoes and 'Umi-a-Līloa asks how best to get his men ashore:

Kiha-a-Pi'ilani answered, "There is a small harbor at Ko'olau called Wailua-iki, and if all the canoes can not land there, there is another landing at Wailua-nui." The blocked canoes turned about and sailed for Wailua-iki at Ko'olau.

When the canoes reached Wailua-iki, they were dismantled and set upright, and in that way the innumerable war canoes from Hawai'i could be beached. After all the canoes were beached the men began to go overland to the site of the battle [at Ulaino well to the southeast] [Kamakau 1961:29-30]

A.1.1 Honomanū Valley

The broad Honomanū valley and stream was once an area that supported a large Hawaiian community. This population utilized the bay of Honomanū for canoe fishing and the evaluated flatlands for agricultural terracing and house sites (Handy and Handy 1978). A more contemporary account of Honomanū described the evolution of the area:

Only one family still raises taro in the old patches near the sea, but abandoned terraces extend up into the valley as far as the level land goes, a little less than a mile. Above Honomanu on elevated flatlands there used to be some terraces and houses. [Sterling 1998:110]

An additional account found in Sterlings (1998) *Sites of Maui* reveals Honomanū as a *wahi pana*.

I have heard from various sources that there are a lot of burials in the upper part of this Valley and there still seems to be a certain amount of superstition attached to the place; I am told that quite a number of people do not like to be in the Valley after dark, and that the Ali'i are said to walk there at such times. . . [Sterling 1998:109]

3.2.7 Ke'anae

Ke'anae Peninsula

Ke'anae Peninsula, a lava plain that extends a mile into the sea from Ke'anae Valley, is an area known for *lo'i* (irrigated terrace) cultivation (Figure 12). Handy (1940) elaborates on the origin of cultivation on Ke'anae Peninsula saying:

The story of the founding of the Keanae *lo'i* area is highly interesting. Anciently, according to Henry Ikoa, the peninsula was barren lava. But a chief, whose name is not remembered, was constantly at war with the people of Wailua and determined that he must have more good land under cultivation, more food, and more people. So he set all his people to work (they were then living within the valley and going down to the peninsula only for fishing), carrying soil in baskets from the valley down to the lava point. The soil and the banks enclosing the patches were thus, in the course of many years, all transplanted and packed into place. Thus did the watered flats of Keanae originate. A small *lo'i* near the western side of the land formerly belonged to the chief of Keanae and has the name Ke-anae (the big mullet); it is said that the entire locality took its name from this small sacred *lo'i*. Here, as at Kahakuloa, the taro that grew in the sacred patch of the alii was reputed to be of great size. [Handy 1940:110]

Heiau of Ke'anae

The Ke'anae area is home to a number of *heiau* that now lie in ruin or have been destroyed. The names of these *heiau* have been preserved along with stories that lend to the sites significance as *wahi pana*. Lalaola Heiau, located on Ke'anae Peninsula, was an agricultural temple whose name is translated from *lālā-ola* meaning “living branch” (James 2001; Ulukau 2010). The dismantled Kukui o Lono Heiau is translated to mean “light of Lono”. Located on the shoreline of Ke'anae Peninsula, this *heiau* was strategically used as a beacon where signal fires were lit for faring fishermen and ocean voyagers (James 2001). The *heiau* known as Kaluanui Heiau is translated to mean “big pit” and is believed to have been “a double section temple of sacrifice from which *kapu* drums at one time were heard” (James 2001:118). Two more *heiau* of Ke'anae are described by James, “Kualani Heiau on the west ridge of Waiokāne Falls; and 'Ohi'a Heiau, attributed to chief Kaimukī and later broken up and used as a pigpen” (James 2001:118).



Figure 12. Ke'anae Peninsula from Hāna Highway in 1925 (Hawai'i Historic Society Collection)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

Pakanaloha Heiau was a war *heiau* dedicated to Kanehekili (god of thunder) who is an 'aumakua (personal god) of Maui Island. This *heiau* was described as a platform structure in the hills of Ke'anae and whose name is said to be derived from *pā-kanaloha* meaning "enclosure [of] Kanaloha" (James 2001; Ulukau 2010). It is said of Pakanaloha Heiau that Kanehekili was the *kahu* (guardian; honored attendant) of Pakanaloha and later died within the walls of this *heiau*. Upon his death Thrum (1908) writes that,

. . . when his brother-in-law realized the fact [that Kanehekili had died] he cut off the head [of Kanehekili] and took it to Lanai. The people of Hamakualoa, wondering at his disappearance, searched till they found his body in the temple at Keanae, and when it was made known that the guardian of the god was dead, the people came and cut his body into small pieces and distributed it. As each place all over Maui received a portion of his body it became their duty to worship the thunder. [Thrum 1908:48-49]

Kaulana-Pueo Church

In Huelo Ahupua'a is Kaulana-Pueo church. The place where this church was built was once a *hala* grove where the *peueo* (owl) returned to at night. When the *hala* grove died the people of this area decided to build a church in the old grove. An informant to Pukui said of the building of Kaulana-Pueo church that, "the people stood in line, there were not trucks at that time, and no car, to bring the stones, and all kinds of things from the beach. Stand in line. It was said that there were 200 members of that place at that time" (Sterling 1998:106). The church was thus named Kaulana-Pueo or "The Owl's Haven", memorializing the *peueo* that once lived at this site (Sterling 1998).

3.3 'Ōlelo No'eau (Proverbs)

Hawaiian knowledge was shared by way of oral histories. Indeed, one's *leo* (voice) is oftentimes presented as *ho'okupu* ("to cause growth," a gift given to convey appreciation, to strengthen bonds); the high valuation of the spoken word underscores the importance of the oral tradition (in this case, Hawaiian sayings or expressions) and its ability to impart traditional Hawaiian "aesthetic, historic, and education values" (Pukui 1983:vii). Thus, in many ways these expressions may be understood as inspiring growth within reader or between speaker and listener:

They reveal with each new reading ever deeper layers of meaning, giving understanding not only of Hawai'i and its people but of all humanity. Since the sayings carry the immediacy of the spoken word, considered to be the everyday thoughts and lives of the Hawaiians who created them. Taken together, the sayings offer a basis for an understanding of the essence and origins of traditional Hawaiian values. The sayings may be categorized, in Western terms, as proverbs, aphorisms, didactic adages, jokes, riddles, epithets, lines from chants, etc., and they present a variety of literary techniques such as metaphor, analogy, allegory, personification, irony, pun, and repetition. It is worth noting, however, that the sayings were spoke, and that their meanings and purposes should not be assessed by the Western concepts of literary types and techniques. [Pukui 1983:vii]

Simply, *'ōlelo no 'eau* may be understood as proverbs. The Webster dictionary notes it as “a phrase which is often repeated; especially, a sentence which briefly and forcibly expresses some practical truth, or the result of experience and observation.” It is a pithy of short form of folk wisdom. Pukui equates proverbs as a treasury of Hawaiian expressions (Pukui and Green 1995:xii). Oftentimes within these Hawaiian expressions or proverbs are references to places. This section draws from the collection of author and historian Mary Kawena Pukui and her knowledge of Hawaiian proverbs describing *'āina* (land), chiefs, plants, and places. The following proverbs are from Pukui's *'Ōlelo No 'eau* (1983).

3.3.1 *'Ōlelo No 'eau* #357

The following proverb is said to have been spoken by Kahekili, *ali 'i nui* (high chief) of Maui, in regards to receiving a message from Kamehameha I:

E nānā mai a uhi kapa 'ele'ele ia Maui, a kau ka pua'a i ka nuku, ki'i mai i ka 'āina a lawe aku.

Watch until the black tapa cloth covers Maui and the sacrificial hog is offered, then come and take the land.

Said by Kahekili, ruler of Maui, to a messenger sent by Kamehameha I with a question whether to have war or peace. Kahekili sent back this answer—“Wait until I am dead and all the rites performed, then invade and take the island of Maui.” [Pukui 1983:43]

3.3.2 *'Ōlelo No 'eau* #505

Below is an *'ōlelo no 'eau* that concerns a thief named Po'okea who lived during the reign of Kahekili:

Hāwele kīlau i ka lemu, 'āha'i ka pua'a i ka waha; ke hele nei o Po'okea.

Draw the fine loincloth under the buttocks; the pork finds its way into the mouth; Po'okea now departs.

Po'okea was a very clever thief during the reign of Kahekili of Maui. Whenever he eluded his pursuers, this was his favorite boast. Any reference to one as being a descendant or relative of Po'okea implies that he is a thief who steals and runs. [Pukui 1983:60]

3.3.3 *'Ōlelo No 'eau* #697

The following saying is about the area known as 'O'opulua in the Ko'olau region of Maui. The area was once feared due to thieves.

He koa ka mea hele ho'okāhi i 'O'opulua.

Only a warrior dares to go alone to 'O'opulua.

Said of a venture fit only for the brave. The way to 'O'opulua, Maui, was feared because of robbers. [Pukui 1983:77]

3.3.4 'Ōlelo No'eau #982

This proverb discusses a certain species of the *weke* (goatfish; *Mullidae*) whose brain contains toxins that can disturb sleep, nightmares, and in some cases hallucinations (Waikiki Aquarium 2017):

He weke, he i'a pahulu.

It is a weke, the fish that produces nightmares.

The head of the *weke* fish is said to contain something that produces nightmares. The nearer to Lāna'i the fish is caught, the worse the effects of the nightmares. Pahulu was the chief of evil beings (*akua*) who peopled the island of Lāna'i. When Kaulula'au, son of Kaka'alaneo, ruler of Maui, was a boy, he was banished to Lāna'i because of his mischief. By trickery, he rid the island of evil beings, and the spirit of Pahulu fled to the sea and entered a *weke* fish. From that time on, nightmares have been called *pahulu*, and a person who has had a nightmare is said to have been under the influence of Pahulu. [Pukui 1983:105]

3.3.5 'Ōlelo No'eau #1029

Below is a proverb expressed of a person who goes *mauka* (towards the mountain) for water:

Ho'i hou ka wai i ka uka o Ao.

The water returns again to the upland of Ao.

A Maui expression referring to a person who goes upland for water. This saying came from the battle of Ka'uwa'upali, when Kamehameha defeated the warriors of Maui in 'Īao. The stream was dammed with bodies, and the water ran red with blood. The people had to travel far inland to find uncontaminated water. [Pukui 1983:110]

3.3.6 'Ōlelo No'eau #1514

The Kama'oma'o Plain is located from the Pu'unēnē to Nu'a'ailua Stream in Honomanū, Ko'olau and is place associated with ghosts according to the following three proverbs.

Ka 'ōlohe puka awakea o Kama'oma'o.

The bare one of Kama'oma'o that appears at noonday.

The plain of Kama'oma'o, Maui is said to be the haunt of ghosts (*'ōlohe*) who appear at night or at noon. Also a play on *'ōlohe* (nude), applied to one who appears unclothed. [Pukui 1983:164]

3.3.7 'Ōlelo No'eau #1481

Kama'oma'o, ka 'āina huli hana.

At Kama'oma'o, land of activities.

Ghosts who do not go to the *pō* of their ancestors often wander about in certain areas. Kama'oma'o, Maui, is such a place. The activities of such ghosts usually annoy the living. [Pukui 1983:160]

3.3.8 'Ōlelo No'eau #1761

Ke kula o Kama'oma'o ka 'āina huli hana.

The plain of Kama'oma'o — that is the place where plenty of work is to be found.

A taunt to one who talks of looking for work but does not do it. The plain of Kama'oma'o, Maui, was said to be the haunt of ghosts whose activities were often terrifying. [Pukui 1983:189]

3.3.9 'Ōlelo No'eau #1850

The below proverb concerns the people of the Moku of Ko'olau.

Ko'olau hauwala'au.

Ko'olau of the loud voices.

The inhabitants of Ko'olau, Maui, were said to be loud of voice. [Pukui 1983:199]

3.3.10 'Ōlelo No'eau #2215

Similar to the above 'ōlelo no'eau, this proverb also refers to the people of the Nāhiku as speaking loudly.

Nāhiku hauwala'au.

Much loud-talk Nāhiku.

Said of loud-voiced people. Refers to Nāhiku, Maui. [Pukui 1983:242]

3.3.11 'Ōlelo No'eau #2393

The resilience and independence of the people of East Maui has been well noted.

'Oi'oi o Maui Hikina.

East Maui forges ahead.

Those of East Maui are said to be very active and able to withstand anything. [Pukui 1983:261]

3.4 Oli (Chant)

Oli, according to Mary Kawena Pukui (Pukui 1995:xvi–xvii), are often grouped according to content. Chants often were imbued with *mana* (spiritual power); such *mana* was made manifest through the use of themes and *kaona*. According to Pukui, chants for the gods (prayers) came first, and chants for the *ali'i*, “the descendants of the gods,” came second in significance. Chants “concerning the activities of the earth peopled by common humans,” were last in this hierarchy (Pukui 1995:xvi–xvii). Emerson conversely states,

In its most familiar form the Hawaiians—many of whom [were lyrical masters]—used the oli not only for the songful expression of joy and affection, but as the vehicle of humorous or sarcastic narrative in the entertainment of their comrades. The dividing line, then, between the oli and those other weightier forms of the mele, the inoa, the kanikau (threnody), the pule, and that unnamed variety of mele

in which the poet dealt with historic or mythologic subjects, is to be found almost wholly in the mood of the singer. [Emerson 1965:254]

While *oli* may vary thematically, subject to the perspective of the *ho‘opa‘a* (chanter), it was undoubtedly a valued art form used to preserve oral histories, genealogies, and traditions, to recall special places and events, and to offer prayers to *akua* and ‘*aumākua* alike. Perhaps most importantly, as Alameida (1993:26) writes, “chants... created a mystic beauty... confirming the special feeling for the environment among Hawaiians: their *one hānau* (birthplace), their *kula iwi* (land of their ancestors).”

3.4.1 Hi‘iaka *Oli*

During Hi‘iaka’s travels throughout Hawai‘i, a number of chants, which reference place names within or near the License Area, are recited. The following chants are taken from accounts of Hi‘iaka’s epic journey.

Hi‘iaka in Wailua Iki Ahupua‘a

While Hi‘iaka and her friend Wahine‘ōma‘o traveled through East Maui, they stopped at a *hālau* in Wailua Iki Ahupua‘a to rest and eat. While in Wailua Iki, Hi‘iaka offered a number of *oli* to her cousin Kapokūlani (Kapo) and to people of the *hālau*. The following *oli*, which references Ka‘ena, was chanted by Hi‘iaka to her cousin Kapo:

<i>‘O Kapokūlani ‘oe, ‘o Moehāunaiki ē</i>	It is you, Kapokūlani, Moehāunaiki
<i>E hea au, e ō ‘oe</i>	I call out, oh do respond
<i>‘O nā lehua wale i Ka‘ena</i>	The lehua of Ka‘ena
<i>Ke kuia maila a lawa</i>	Are strung together generously
<i>5. I lei no ka wahine</i>	5. To make a lei for the woman
<i>Kapokūlani, ki‘eki‘e, ha‘aha‘a</i>	Kapokūlani, of lofty station, of humble station
<i>Ha‘aha‘a ka lā o ka ‘ike</i>	Humble is the day of visitation
<i>He ‘ike kumu, he ‘ike lono kēia iā ‘oe</i>	This is foundational knowledge, received knowledge for you
<i>E Kapokūlani, Kapo ali‘i o ia moku</i>	O Kapokūlani, royal Kapo of the island
<i>10. Kā ‘ia e ke akua ke kahu ‘ike ‘ole a ka maka</i>	10. Established by the gods is the guardian unseen by the eye
<i>‘O ka ‘okia ‘ula i ka lā</i>	Cut off and reddened by the sun
<i>I ‘ula nō i ka wai ālialia</i>	Red indeed in the collected waters
<i>He wai ālialia, he waili‘ulā</i>	Collected waters, water of the mirage
<i>E wele ka wāwae ke</i>	The foot clears a pathway,
<i>hele ma kahakai o Ki‘ia</i>	moving along the shore of Ki‘ia

15. *E ki'i 'oe a i kō kahu* 15. You fetch, get your guardian
'O kāu 'elele nō ia e mana'o ai That is the messenger you shall choose
Eia mai ka pua'i lā Here is the upwelling,
No Kinolauwahine. For Kinolauwahine.

[Ho'oulumāhiehie 2008a:130-131; Ho'oulumāhiehie 2008b:123]

Kapo then responds and recites the following *oli* to her cousin Hi'iaka, which mentions the Ko'olau district of East Maui:

'O 'oe ia, e Wahinepō'aimoku It is you, Wahinepō'aimoku, Island-
 encircling woman
Wahine i ka poli o Kinolauwahine Woman in the bosom of Kinolauwahine
E Hi'i i ka u'i o luna O Hi'i of the beauty above
E ke aka kilohi, ho'ohihi a ke O image to gaze upon, entrancing to the
kanaka people
 5. *Akāka wale ka luna o Haleakalā* 5. Clear indeed are the heights of Haleakalā
I ka uē a ke kini a'o Ko'olau At the cry of the multitudes of the Ko'olau
 district
Ke laulau a'e nei au i ke aloha I enfold my affection into a bundle
I pū'olo wai hīnalo na'u nei ē A fragrant bundle made by my hand
E ō mai 'oe i kō inoa Give response to your name
 10. *E Hi'i ē!* 10. O Hi'i, oh
Aloha mai! Welcome!

[Ho'oulumāhiehie 2008a:96; Ho'oulumāhiehie 2008b:123-124]

Hi'iaka and the Spirit of Mana-mana-ia-kalu

While traveling the coast of Maui in canoe, Hi'iaka and her *aikāne* Wahine'ōma'o, encountered the spirit of the deity Manamanaiakalua, who had taken form in the body of a woman with no hands. The woman possessed by the spirit of Manamanaiakalua was fishing when she was spotted by Hi'iaka and company. It was when the spirit of Manamanaiakalua lost the fish she had been pursuing that she recited the following *oli* which mentions Honomanū:

Sitting down on a convenient rock, she mourned aloud:

Aloha wale ka pali o Pi-na-na'i, How dear the cliff of Pi-na-na'i,
Ka lae iliili ma-kai o Hono-manū, e! And the pebbly cape at Hono-manū!
He u ko'u, he minamina, e-e, How I mourn for the loss of my fish!
I ka lilo ka i'a i ka poho o ka lima — They were swept from the reach of
 my hand

A lilo, e-e!

They are gone, forever gone!

[Emerson 1915:72]

Hi'iaka, Kapo, and the *Lehua* Blossom *Lei*

While stringing a *lehua* (flower of the 'ōhi'a tree; *Metrosideros macropus*) blossom *lei* at a spring called Hoakalei at Kualakai Oahu, Hi'iaka is visited by her sister Kapo. Announcing her presence Kapo offers a chant to Hi'iaka. Hi'iaka responds with a chant that mentions Kapo's home at Wailua Iki, Maui. At this moment Ho'oulumāhie writes that:

Hi'iaka heard this chant, and when she turned and looked in the direction of the voice, she saw her elder sister looking at her, Kapo, who had come to O'ahu from Maui quite some time earlier in her duties with the hula.

And when Hi'iaka saw her, she wept with love for her elder sister.

Then she chanted this chant.

'O 'oe ia, e Waialua Iki*

E ka lāuli, pali o Uli

Ua hele wale 'ia e Li'awahine

E ka wahine kūhea pali

5. *Kui pua lei o Hoakalei ē*

E lei au

E lei ho 'i au i nā hala pala 'īloli

o Hanakahi

Ua maka 'ele'ele wale i ke anu

Ua 'āha 'i 'ia e ke kina 'u i 'a

o Mahamoku i Wai'oli

10. *'O ku 'u makani Lawalawakua*

Kūpani kapa o Waialua Iki

Honi pua 'ala Kaiāulu

'Ae, ke lei nei au i nā lehua maka noe

I nā lehua lihi wai o Hoakalei

15. *Ku 'u lehua i Hilo One*

I nā kaha o Ko'olina me Kaupe'a

E lei au ē.

It is you, Waialua Iki* (*Wailua Iki is used throughout most of the story)

O shaded darkness, cliffs of Uli

Easily traversed by Li'awahine
 By the woman who beckons from the cliffs
 5. String garlands of flowers from Hoakalei
 I am adorned
 I wear the lei of speckled, ripe hala of Hanakahi
 With tips gone dark from the cold
 Carried along by the kīna'u eel of Mahamoku at Wai'oli
 10. My gusting wind, the Lawalawakua
 Kapa-buffeting wind of Waialua Iki
 The Kaiāulu wind bears the scent of fragrant flowers
 Yes, I wear the lei of tiny, misty-eyed lehua
 The lehua from the water's edge of Hoakalei
 15. My precious lehua of Hilo One
 From the strands of Ko'olina and Kaupe'a
 I shall be adorned with lei.
 [Ho'oulumāhiehie 2008a:292; Ho'oulumāhiehie 2008b:272-273]

3.4.2 Ke-a-ulu-moku of the Māmākua Districts

Ke-a-ulu-moku was a poet-prophet chief from the Māmākua Districts of Maui, born in the early eighteenth century. Ke-a-ulu-moku, having moved from his home on Maui to Hawai'i Island, was homesick for the windward side of Maui and composed an *oli* to express his love for his home (Kamakau 1961). The following *oli* mentions the places of Haneoho'i of Honopou, Huelo, Mokupapa, Hoalua of Hanehoi, Pu'ukoa'e (Puukaae on latter maps) of West Hanawana, and Kailua of Pu'uomaile:

<i>...Aloha wale o'u makua</i>	...Affection for my parents
<i>Mai na 'aina Hamakua,</i>	Who belong to Hamakua,
<i>He mau 'aina Hamakua elua,</i>	The two districts of Hamakua,
<i>No'u mua kaikua'ana i noho ai.</i>	Where my elder brothers live.
<i>He ala pali na'u he mau ali'i ia...</i>	My hillside trails are theirs to rule...
<i>Ua ua lehua, he lehua hala,</i>	The lehua trees blossom, the yellow lehua,
<i>U a i ka lehua o Kailua.</i>	When the rain comes to the lehua of Kailua.
<i>Lehua maka konunu i ka wai,</i>	The lehua petals are heavy with raindrops,
<i>Konunu konunu, oha'ha'.</i>	Heavy, heavy and full-blown.
<i>Halana makapehu wale no kie ia,</i>	They know not the pangs of thirst

Pehu, ua mae ka maka mua o ka hinalo ho'i. That wilt the first-blown pandanus bloom.
Ho'i ka ua ma Haneho'i, The rain returns by way of Haneho'i,
Ma ka lae o Pu'umaile i Hoalua, Along the brow of Pu'umaile to Hoalua,
Ma kahakua o Pu'ukoa'e Over the ridge of Pu'ukoa'e,
Ma ke alo pali o Huelo. Before the face of the cliff of Huelo.

[Kamakau 1961:112-113]

3.4.3 *Ka Wai a Kāne* (The Water of Kāne)

This *oli* recounts the story of Kāne's life giving waters and speaks of the locations of these waters. This *oli* makes an indirect reference to the springs of Kāne, said to have been created in the mountains of Ke'anae when Kāne thrusts his *kauila* wood staff into the earth (See section 3.1.5). Emerson (1909) explains that the line "*Wai Kau a Kane me Kanaloa*" relates to, "when Kane and Kanaloa were journeying together Kanaloa complained of thirst. Kane thrust his staff into the pali near at hand, and out flowed a stream of pure water that has continued to the present day. The place is at Keanae, Maui" (Emerson 1909:258):

*...E ū-i aku ana au ia oe,
 Aia i-hea ka Wai a Kane?
 Aia i-lalo, i ka honua, i ka Wai hu,
 I ka wai kau a Kane me Kaualoa—
 He wai-puna, he wai e inu,
 He wai e mana, he wai e ola.
 E ola no, e-a!*

...One question I ask of you:
 Where flows the water of Kane?
 Deep in the ground, in the gushing spring,
 In the ducts of Kane and Loa,
 A well-spring of water, to quaff,
 A water of magic power—
 The water of life!
 Life! O give us this life!
 [Emerson 1909:258-259]

3.5 *Mele* (Songs)

A number of late nineteenth and twentieth century *mele* concern or mention place names of the *ahupua'a* located within the License Area. These particular *mele* may also be classified as *mele wahi pana* (songs for legendary or historic places). *Mele wahi pana* such as those presented here may or may not be accompanied by *hula* (dance) or *hula wahi pana* (dance for legendary or historic places).

3.5.1 Mele Ka'i to Kaulilua

This *mele ka'i*, a prayer chant accompanied by dance, is dedicated to the goddess Kapo who once resided in Wailua Iki.

1. *O 'oe 'ia e Wailua'iki*
 2. *I ka lā uli pali o Wai'oli*
 3. *Ua hele 'ia e Li'awahine*
 4. *Mai mele ka leo pali [E ka wahine kāhea pali]*
 5. *Ku'i lei pua o Hoakalei---*
 6. *E lei a---u*
 7. *E lei ho'i au I nā hala i pala i loli i ke kai e*
 8. *Kū maka 'ele'ele wale i ke anu*
 9. *lā hina 'ia e ke Kīna'u*
 10. *E o[la] Mahamoku ma Wai'oli*
 11. *Makani lawalawa kū puni*
 12. *Kāhea ka luna o Kama'e*
 13. *He malihini ka puka [ko] ka hale la*
 14. *E ho'i mai*
1. It is you (whom I seek) o Wailua'iki (another name for Kapo)
 2. On the dark. sun-touched hill of Wai'oli
 3. Li'awahine came here
 4. Her voice chanting on the *pali* [The woman calling on the *pali* (cliff)]
 5. Stringing the flower wreaths of Hoakalei
 6. A wreath for me
 7. A wreath of *hala* (pandanus keys) that has ripened (speckled) by the sea
 8. That was darkened (speckled black) by the cold
 9. And shaken down by the Kina'u (breeze)
 10. Mahamoku (the blustering wind) renews life at Wai'oli
 11. The wind that blows in and about the forests
 12. When it calls (to you) from the top of Kama'e
 13. For visitors have come to the door of our house
 14. O return. [Hawaiian Drum Dance Chants :n.p.]

3.5.2 Ke'anae

Recorded by Eleanor McClland Heavey in the mid-twentieth century, the following *mele* speaks to the character of Ke'anae:

Ke'anae, on the shores of Maui isle
 There's a place called Ke'anae
 Where I stayed for awhile
 In the old Hawaiian style
 In the quietness, the peacefulness of Ke'anae

 From the mountain to the sea
 Blooms a lovely awapuhi

Pampered by the falling rain
 You can hear the sweet refrain
 In the quietness, the peacefulness of Ke'anae

This is the land where taro grows
 Like the days of long ago
 All the kupa 'āina know
 Like the riches of our sea
 In the quietness, the peacefulness of Ke'anae

So before my mele ends
 Let me add another line
 To the folks in Ke'anae
 Keep up your sweet Hawaiian style
 In the quietness, the peacefulness of Ke'anae [Huapala 2018 *Ke'anae*]

3.5.3 Huelo

Two lovers, a boy from Huelo and a girl from Ke'anae, debate who is from the more beautiful hometown on Maui. The following *mele* is the boy's ode to his beloved hometown of Huelo:

E ho'i ana i ka uka (hiu)
I ka uka 'iu'iu o Huelo (lawe)
I laila nō e pili ai (sure)
Me ka 'ō'ō hulu laha 'ole

Kāhiko nō e ka nani
Uluwehi ke 'ike aku
Ho'ohihi kahi mana'o
I ka wai hu'i wai o ka ona

Ke noe mai a ka ua
Kilihune mai la i uka
E ho'opulu ana i ka lihi
Lau lipo o ka 'awapuhi

Ha'aheo nō e ka ua
Kilihune lā i ka nahele
Ho'opulu i ka lihlihi
Lau lipo o ka 'awapuhi

'O ka hone mai a ka 'iwi
I ka ō mahina la'ila'i
I mahie luna li'a loko
I hoapili mau 'oe no'u

Let us wander to the highlands
 To the high hills of Huelo
 There we can come together
 Like the feathers of the 'O'o bird

Beautiful from days of old
 See the lushness
 My mind is enraptured
 By the cold, intoxicating water

 When mist and rain commences
 It sprinkles the mountains
 Drenching the edges of
 The leaves of the yellow ginger

 Cherished is the rain
 The gentle rain of the forest
 Drenched are the petals
 And leaves of the ginger growing in profusion

 The sweet sound of the 'iwi
 In the peaceful moonlit night
 Enhances my delight and desire
 For you, my close companion [Huapala 2018 *Huelo*]

3.5.4 *Malu I Ke Ao*

This *mele* from the Shelter of Light Church mentions the broader areas of Makawao, Hāna, and Ko'olau:

'Ohi e ka 'i'o o ka lā'au,
No Makawao no ia,
Me ka ua 'Ukiukiu
Anuanu 'ino ('ohu'ohu no),
E aho no e komo mai
I ka Malu o Ke Ao

Hui:
Malu i ke ao
Ke ahi o Wailuku,
Kepaniwai a'o 'Iao

Nani Moloka'i Nui A Hina,
Hape hape nu ia,
Hui 'oli'oli no
I ka Malu o Ke Ao,
E aho no e komo mai
I ka Malu o Ke Ao

Hana ua lani ha'aha'a
Na pali o Ko'olau
Na pohaku o auahi
Wela i ka lā
E aho no e komo a'e
I ka Malu o Ke Ao

Picked is the tree mushroom
 It is indeed from Makawao
 With the 'Ukiukiu rain
 Cold indeed (adorning indeed)
 One had better come in
 Under the Shelter of Light

Chorus:
 Shelter of Light
 The fires of Wailuku,
 The dammed waters of 'Iao

Beautiful is Moloka'i Nui A Hina,
 Happy, happy New Year,
 Come together in joyful rejoicing,
 Under the Shelter of Light
 One had better come in
 Under the Shelter of Light

Hana of the low rains
 Cliffs of the Ko'olau
 Stones of auahi
 Heated by the sun
 It is better to come inside
 In the Shelter of Light [Huapala 2018 *Malu I Ke Ao*]

3.5.5 Wailae Nui

The *mele*, Wailua Nui, was composed in 1999 by Lei'ohu Ryder. This *mele* speaks to the beauty and ancestors of the Wailua Nui area:

*Ka i ka nani
 Wailua Nui
 Ike wahipana la*

*Ho 'oheno lai
 Ke i ka nani
 Ho 'olohe pu 'uwai*

*Eo kapiliwai elua
 Eo ka manulani la*

*Ke kua hine
 No Wailua
 Me ka maluhia la*

*Na pohaku po 'okela
 No pu wai maha
 Ke koko ola nei*

*Na mele ohana
No Wailua Nui
Ho 'okipa ana mai*

The beauty
Wailua Nui
Is a sacred place indeed

Fragrance in the calm
Is very beautiful
To listen to the heart

Greetings (ancestors) bound of the two waters
Greetings birds of heaven

My ancestors/kupuna wahine of Wailua
Are in peaceful slumber

Foremost are the stones
That call the waters to rest
Giving life to the blood of the land

This song for the families of Wailua Nui
Hospitable always [Ululua Productions]

Section 4 Traditional and Historical Accounts

4.1 Pre-Contact to 1800s

4.1.1 Traditional Background of Hāmākua Loa Moku

The division of Maui's lands into political districts first occurred during the rule of Kaka'alaneo under the direction of his *kahuna* (priest) named Kalaiha'ōhi'a (Beckwith 1970:383). The *moku o loko*, or *moku* as it is most commonly called, literally means "to cut across, divide, separate" (Lucas 1995:77). When used as a term of traditional land tenure, a *moku* is similar to a political district that can contain smaller divisions of land such as *'okana*, *kalana*, *ahupua'a*, *'ili*, and *mo'o*.

According to Mary Pukui et al. (1974:49), the literal translation of Hāmākua Loa is "long Hāmākua, where Hāmākua means corner." There are several place names in the various *ahupua'a* which make up this *moku* that are recorded by Pukui et al. (1974). Much of the historical and traditional information is related to adjacent *ahupua'a* and is recounted here briefly because of the close relationship to the adjacent *moku* of Ko'olau.

Agriculture and Habitation

The earliest estimation of the initial occupation of East Maui highlights settlement along the coastal region about AD 1200 (A. E. Haun et al. 2004). The abundance of traditional land divisions and place names between Hāmākua Loa and Hāna are suggestive that this period of habitation was extensive after initial establishment. To this effect, Handy (1940:109) observed that "the minute *ahupua'a* characteristic of this coast indicates a dense population."

E.S. Craighill Handy made some of the earliest observations of habitation and cultivation within the Hāmākua Loa Moku. Sterling (1998:100) relates observations made by Handy regarding cultivation near perennial watersheds in Peahi:

Shallow Kuiaha Gulch was not explored, but its stream must have watered a few taro patches on flats near the sea. According to Henry Ikoa and George Akiu, there were small terraced areas watered by Hoolawa, Waipio, Hanehoi, Hoalua, Kailua, and Nailiilihaele streams. These all have abundant water, but flow in deep gulches having practically no flatland suitable for terracing. Presumably stream taro used to be planted along the beds of these water courses well into the uplands, and forest taro throughout the lower forest. [(Handy in Sterling 1998:100)]

Cultivation in this region was not entirely dependent on perennial water and further utilized dry-zone agriculture on the slopes of Haleakalā above the coast. To this effect, Sterling (1998:101) references Handy's account from local informants:

On eastern Maui the semi-dry slopes of Hamakua must have been planted with sweet potatoes by the people living along the coast from Maliko to Waipio. Samwell says, probably referring to this region: "This island is mountainous, the sides of the hills are covered with trees, from thence to the water side are large

open plains on which stood their houses and where they have their plantations of sweet potatoes, taro, etc.” (Handy in Sterling 1998:101)

Within this area there are also some *heiau* that seem associated with agricultural practices (see Section 0, for more detailed discussion) and rituals. This seems suggestive of the extent of traditional cultivation practices within Hāmākua Loa where both wetland and dryland techniques were utilized to maximize food diversity and harvests, and where ceremonial centers like *heiau* would help to ensure the harvests sought by Hawaiians. Evidence of similar activities increase the farther one goes east along the coast toward Hāna.

Open Ocean Fishing Traditions of East Maui

As a life near the shore would suggest, Native Hawaiians depended heavily on their access to ocean resources just as they depended upon the products of the land. In *Tales and Traditions of the People of Old: Nā Mo'olelo a ka Po'e Kahiko*, Hawaiian historian Samuel Kamakau (1991:78) states:

Ka po'e kahiko [the people of the old days] had many ways of catching fish. Perhaps there are no other people in the world like Hawaiians in doing this. The people of Maui, at Ko'olau, worshipped sharks – in order to be saved from being eaten by a shark when they went fishing (Kamakau 1991:78).

Documentation regarding Native Hawaiian tenancy, land use practices, and fishing rights are also found in the records of the Māhele 'Āina. The Māhele 'Āina gave *hoa'aina* (common people engaged in agriculture) an opportunity to acquire fee-simple property interest on land which they lived and actively cultivated. The lands awarded to the *hoa'aina* became known under the title of *kuleana* lands. Claims for some fishery resources made to the Land Commission of the Kingdom of Hawai'i were given Land Commission Award (LCA) numbers, some of which remain in use today. First-hand accounts from native tenants generally spanning the period from ca. 1819 to 1855 have become an important part of recognizing the traditional significance of these land use practices and fishing rights (Waihona 'Aina 2000).

In a series of articles about fishing from 1902 recounted in *Ka 'Oihana Lawai'a: Hawaiian Fishing Tradition* by Daniel Kahā'ulelio (2006), an open ocean type of fishing was the preferred method of fishing used in deep waters along the coast of East Maui. In waters of ten or more fathoms deep the use of *kākā* line fishing and the *kūkaula* line fishing techniques were developed and employed, which are defined by Kahā'ulelio (2006:45) as:

In this [*kākā*] kind of fishing, no stone weight was needed to anchor the canoe and it drifted to and fro moving with the current. The line was five *ka'au* in length, which was the equivalent of 200 fathoms, and that was about the depth of the fishing grounds desired to reach. Two or three men was enough for this type of fishing and each man had from forty to fifty hooks on his line.

This is the way in which it was done. The leader that fastened the hook to the line was a yard or so in length, and it would be tied along with a coconut stem to keep it firmly in place. The hooks were fastened at intervals the length of each coconut stem, lest the hooks be mixed up and entangled. This was done until all forty or fifty hooks were fastened on. Bait was secured in the evening and the hooks of all

the fishermen baited before time. When all was ready, then, just about daylight they set out, arriving at the fishing grounds when it was light. The man in the rear would release his line first, then the next man and so on. With a stone weight at the bottom of the line, to make it sink correctly, As the second man began lowering his line, the first already felt a jerking on his and as soon as he knew that all of his hooks had been taken he hauled in the line. They all did this. Then the sails were set up and the Ma'a'a breeze did the work of bringing them home. (Kahā'ulelio 2006:45)

Kahā'ulelio continues and defines *kūkaula* fishing:

This is still in use, and only where the fishing ground is shallow, from fifty, sixty to seventy fathoms deep and not any deeper than that. If at the depth of eighty fathoms, then only small fish will be caught such as the 'ukikiki [A species of snapper fish (*Apsilus brighami*)] and small 'ula'ula [red snapper (*Etelis coruscans*)]. At sixty or fifty fathoms in depth, the fish would snatch at the hook if the current is right.

The line is 80 or 120 fathoms in length and to it we tie coconut husks for signals when the hook is taken. It is made in this way; the first husk is tied on at forty fathoms and that is called the *nuku*, or snout; at five more fathoms, another is fastened on, this is the *alo*, or face; at the next five fathoms, another is fastened on, called the *kua*, or back; at the next five fathoms, is the *manamana*, the branching; at the next five, the *i'aiki*, or little fish; the next is the *kuaokai'aiki*, the back of the little fish; the next is *moe*, the recumbent, and that is the last of the coconut husk signals. (Kahā'ulelio 2006:45)

Using these techniques, Native Hawaiians were able to catch deep water fish from the waters off the north and east shores of Maui. This practice was not isolated to Hāmākua Loa Moku only and represents techniques used across many deep sea fisheries including those located off the coast of neighboring Ko'olau Moku to the East.

4.1.2 Traditional Background of Ko'olau Moku

The *kālana*, or subregion, that forms the *moku* of Ko'olau has been defined as a collection of *ahupua'a*, including Honolulu Nui, Honolulu Iki, Honopou, Wailua, Honomanū, Kali'i, Kukui [Nāhiku], Ke'anae, Keopuka, [Ka]Pa'akea, Puakea, Kapehu, Kapā'ula, Kea'ā, Pauwalu [Ke'anae], Waiahole, Waiohue, Waianu, 'Ula'ino and Makapīpī [Nāhiku] that supported important population centers on the island of Maui. Handy stated that Ke'anae and Wailua Nui were regions that supported intensive and extensive wet-taro cultivation (Handy et al. 1991:272). It was further noted that, in this region of Maui, the *ahupua'a* are marked from stream to stream, rather than from ridge to ridge (McGregor 2007:83).

Ko'olau Moku, on the northeast coast of Maui is located in between Hāmākua Loa Moku to the west and Hāna Moku to the east. A literal translation of *Ko'olau* is "windward" (Pukui et al. 1974:117). Additionally, the name Ko'olau has been traditionally applied to the districts located on the windward side of many Hawaiian Islands (Soehren 2002-2010). Although Ko'olau Moku extends from O'opuola Point to beyond Nāhiku, the lands from Wailua to Ke'anae are

considered to be some of the denser areas of habitation throughout the region (Handy et al. 1991:499-501).

With regard to political influence and the course of pre-Contact Hawaiian history, it has been noted that there may have been some rivalry within Ko'olau Moku between the *ahupua'a* of Ke'anae and neighboring Wailua Nui (Handy 1940:109-110). These interregional rivalries, however, would give way to larger political battles concerning the rule of Maui Island and the line of succession between the sons of Pi'ilani (Kamakau 1992:22-29), and later, the consolidation of power and unification of the Hawaiian Islands under Kamehameha I (Group 70 International et al. 1995).

Chief Pi'ilani united all of Maui under his rule between the sixteenth and seventeenth centuries. Pi'ilani's sons, Lonopi'ilani and Kiha-a-Pi'ilani, were contenders for control of Maui. Kiha-a-Pi'ilani eventually took refuge at Hāna while fleeing the warriors loyal to his brother. While in Hāna, Kiha-a-Pi'ilani took as his wife Koleamoku, who had been betrothed to Lonopi'ilani, which again put the two brothers to warring. Kiha-a-Pi'ilani was on the run from his brother across Maui until a ritual ceremony performed by the *kahuna nui* [high priest] revealed that he must flee Maui to preserve his life, but would eventually return to conquer and unify the island (Kirch 2012:208).

At this time, the reigning chief of Hawai'i Island, 'Umi-a-Liloa, was married to Pi'ikea, the daughter of Pi'ilani and sister to Lonopi'ilani and Kiha-a-Pi'ilani. This marriage had formerly brought peace between the island polities of Hawai'i and Maui. Kiha-a-Pi'ilani and his wife Koleamoku fled Maui and set out to his sister's residence asking for help from 'Umi's household on Hawai'i Island. In response to this, 'Umi "[h]aving received favorable auguries from the high priest, Kaoleioku, 'Umi summoned the chiefs of the various districts to prepare for the invasion of Maui" (Fornander 1880:98). 'Umi not only sided with Kiha-a-Pi'ilani and sent an invasion fleet to Hāna, but also sent along one of his most notorious warriors, Pi'imaiwa'a, who had been instrumental in the battles that won 'Umi all of Hawai'i Island. The campaign met with difficulty in taking Hāna before the Hawaii Island men had even made ground on Maui. Samuel Kamakau (1992:293) relates the account:

When 'Umi-a-Liloa arrived with the later company he heard how his canoemen were unable to go ashore and how they were held at bay by the mighty Maui warrior, Ho'olae-makua. He asked Kiha-a-Pi'i-lani, "Is there no other way of getting the war canoes ashore? We can fight them better on shore, for our present position is an unstable one." Kiha-a-Pi'i-lani answered, "There is a small harbor at Ko'olau called Wailua-iki, and if all the canoes cannot land there, there is another landing at Wailua-nui." The blocked canoes turned about and sailed for Wailua-iki at Ko'olau. (Kamakau 1992:29)

In Hāna, at the fortress hill of Ka'uiki, Lonopi'ilani's forces under the command of Ho'olaemakua, withstood the Hawai'i forces until a nighttime raid overwhelmed them. In *A Shark Going Inland is my Chief*, Kirch (2012:210) tells that Kiha-a-Pi'ilani's men:

...fell upon the slumbering Maui forces. Many were killed, or leaped to their deaths off the steep cliffs encircling the hill. But in the darkness a few escaped, including Ho'olaemakua. Kiha sent Pi'imaiwa'a in search of Ho'olaemakua in the

backlands of Hāna... His hands were brought back to Kiha to confirm his death.
[(Kirch 2012:210)

With this battle, Kiha-a-Pi'ilani gained control of East Maui. Kiha-a-Pi'ilani's brother, Lonopi'ilani, reportedly died of fright before his brother's campaign had a chance to reach Wailuku (Kirch 2012). The death of his brother left Kiha-a-Pi'ilani as the standing ruler of Maui.

In Fornander's "Legend of Kihapiilani," after Kiha-a-Pi'ilani and 'Umi's forces conquered the fortress of Ka'uiki at Hāna, Kiha-a-Pi'ilani began to construct a "roadway from Kawaipapa to the forests of Oopuloa [*sic*];" which, "was made and paved with smooth rocks" (Fornander 1918:180). The roadway Kiha-a-Pi'ilani built was the Ke Alaloa o Maui, which his father (Pi'ilani) had begun some time earlier. The portions of the Alaloa that Kiha-a-Pi'ilani constructed extended one of the first continuous overland routes on the north shore of Maui to help connect the distant communities of the eastern districts to the central isthmus. The section built at this time began in Ko'olau and stretched all the way to Hāmākua Loa (Moses Manu in Sterling 1998:108). For Kiha-a-Pi'ilani, asserting his influence in the region by way of public works was important both socially and economically as the "Makanali, Waikamoi, Puohokamoa and Ha'ipua'ena streams are found in this region of Ko'olau. Here, Native Hawaiian families settled and cultivated gardens in the narrow valleys fed by small streams" (McGregor 2007:91). By connecting the region via a paved trail, the agricultural and human resources became more accessible and could be mobilized in times of need with greater ease. An additional advantage of the Ke Alaloa o Maui was that word could be sent between villages and ceremonial centers of any invading forces from either Maui or Hawai'i Island encroaching upon the region, which was especially valuable during the middle to late pre-Contact period when the north shore of Maui was changing hands frequently between polities from both Islands (Kirch 2012:206-216).

It was also during this time that Kiha-a-Pi'ilani is believed to have built the massive structure Pi'ilanihale in the Hāna region. This site would later be known as the tallest *heiau* in the entire archipelago. It was built to house the royal line of Pi'ilani in East Maui and was likely the principal *luakini heiau* [war temple] of Kiha-a-Pi'ilani. Kiha-a-Pi'ilani also began restoring Honua'ula Heiau just inland of Pu'u Ka'uiki around this time (Griffin 1987). Following this notable battle over the Hāna and Ko'olau districts were the pre-Contact wars between Kahekili and Kalani'ōpu'u recounted earlier in this report (see Section 4.1.1).

Place Names of Ko'olau, Maui

In the preface of *Place Names of Hawaii* (Pukui et al. 1974:x), Samuel Elbert states that:

Hawaiians named taro patches, rocks and trees that represented deities and ancestors, sites of houses and heiau, canoe landings, fishing stations in the sea, resting places in the forests, and the tiniest spots where miraculous or interesting events are believed to have taken place.

Place names are far from static ... names are constantly being given to new houses and buildings, land holdings, airstrips, streets, and towns and old names are replaced by new ones ... it is all the more essential, then to record the names and the lore associated with them [the ancient names] now. (Pukui et al. 1974:x)

The regional place names below, along with the environmental data, indicate that the lands within Ko'olau Moku were widely used for many purposes relevant to traditional Hawaiian subsistence, habitation, and history. The perennial watersheds that are abundant on this side of the island bear many names associated with agricultural, domestic, and recreational uses of the local streams and pools. Additionally, locations are named according to the type of resources associated with the area, such as Aihonu (eating of the turtle), which could be reflective either of the region as a harvesting area or as being associated with a specific notable instance of marine hunting and consumption. Along with references to food and resource gathering, many names are also present in the area that are names of fighting strokes in *lua* fighting or in some other way indicate violent past times and incidences of warfare or strife. In this vein, some of the place names are also associated with conquering polities and bear the names of the chief that took on the construction of sacred *heiau* or other vital infrastructure, such as the Alaloa trail that connects the deep vales of the region to other distant *moku*. This is also not surprising given the long history of political struggles between Maui and Hawai'i Island chiefs for the wetter East-Maui region stretching from Hāna to Nā Wai 'Ehā in the centuries leading into the period of Western contact. Other names simply exemplify the physical features of the named places in relation to common objects or stories. Some names also will remain elusive within the context of their meaning, obscured by the passage of time and the coveting or overall loss of the oral traditions that credit names to places of significance. Literal translations of many of the place names for land areas and divisions in Ko'olau Moku are listed in Table 2 and may provide insight for the area prior to Western contact.

Legends of Ko'olau Moku

Oral tradition passed from one generation to the next provides valuable insight into the pre-Contact cultural landscape of Ko'olau Moku. As with many of the named places in the archipelago, there is a rich oral tradition regarding the exploits of the legendary figures of Hawaiian mythology in the region.

The Ko'olau region of Maui was made famous as the part of the island that the demi-god Maui chose to ascend to the top of Mauna Haleakalā to capture the rays of the sun-god Lā, in order that Lā would be forced to travel more slowly through the heavens during the day. This action would help his mother, Hina [wife of Akalana], to dry the *kapa* [tapa] that she had beaten out [traditional bark-cloth made of the *wauke* bark]. The eastern gap of the mountain of Haleakalā, named the Ko'olau Gap, was the place the demi-god Maui mounted the summit. As the legend goes, once Maui ascended the slope he caught Lā in a noose, beat Lā into submission, and compelled him ever after to travel more slowly (Westervelt 1910:140).

Within the larger *moku* of Ko'olau lies the fertile region of Ke'anae. This region also bears the storied visits of gods and legends that passed through and reside in the region. The waters that feed Ke'anae were said to have been brought forth by the god Kāne, who thrust his *kauila* staff into solid rock to bring forth the waters of Ke'anae, similar to the flows of life giving water he is accredited with creating in a similar fashion in Hāmākua Loa while in the company of Kanaloa (Beckwith 1970:64; Sterling 1998:101).

Table 2. Place Names within Ko'olau Moku [from Pukui et al. (1974) unless otherwise noted]

Name	Translation/Association
Āhole	Islet; <i>lit.</i> , “fish”; specifically <i>Kuhlia Sandvicensis</i> (p. 6)
Aihonu	Place name in Pauwalu along Waikamilo stream; <i>lit.</i> , “eating of turtle” (Soehren 1963)
Alaloa	Ancient paved trail; <i>lit.</i> , “long road” also known as Pi'ilani Trail; paved trail that ran around both east and west Maui (Handy et al. 1991:490)
Aluea	Islet; <i>lit.</i> , “sagging” (Soehren 1963:194)
Hahāhā	Bay east of Pauwalu Point; <i>lit.</i> , “pant, breathe hard”; noted as a place for shell fish gathering (Soehren 1963:192)
Hāmau	Stream flowing behind Lakini and into Waiokamilo Stream, within Wailuanui; <i>lit.</i> , “silent, silence, hush” (Pukui and Elbert 1986:55)
Hanawī	Stream; <i>lit.</i> , “seeking freshwater shellfish” (Handy et al. 1991:110)
Hau'oli Wahine	Gulch, stream, and waterfall in Ke'anae; <i>lit.</i> , “feminine happiness” (Soehren 1963:192)
Honomanū	Land division and bay, Ke'anae qd., Maui
Ho'okuli	Place name in Ke'anae; <i>lit.</i> , “to feign deafness” (Pukui and Elbert 1986:80)
Ho'olio	Hill used as a marker in Wailua; <i>lit.</i> , “horse” or “horse like”; sometimes the noun, <i>lio</i> , is used as a general term for quadrupeds (dogs, pigs, etc.) (Pukui and Elbert 1986:80, 207)
Huo	Astrological name of an unidentified star (Pukui and Elbert 1986:91)
Ka'alani	Place name of trigonometrical station used in geodetic surveys; <i>lit.</i> , “Those about the chief, members of the royal court” (Pukui and Elbert 1986:107)
Ka'aunaku	<i>Ili 'āina</i> ; <i>lit.</i> , “separate” (Soehren 1963:194)
Kahukahu	Trigonometrical station located on northeast Ke'anae Park; <i>lit.</i> , “dedicate with prayer” (Soehren 1963:192)
Kake'e	<i>Ili 'āina</i> ; <i>lit.</i> , “abrupt turn” (Soehren 1963:194)
Kaki'i	Land area name in Wailua; <i>lit.</i> , “to strike at, aim at, smite” or “to brandish threateningly, as in a war club” (Pukui and Elbert 1986:120)
Kala'alaea	<i>Ili 'āina</i> in Wailua; <i>lit.</i> , “remove red ochre” (Soehren 1963:194)
Kaleiomanu	Stream in upper Ke'anae Valley; <i>lit.</i> , “a <i>lua</i> fighting stroke” (Pukui and Elbert 1986:122)

Name	Translation/Association
Kalihi	<i>Ili 'āina</i> in Wailua; <i>lit.</i> , “the edge” (p. 77)
Kali'i	Land area <i>makai</i> of Pauwalu; the act of hurling spears at a chief as he landed from a canoe, in order that he might exhibit his dexterity and courage in dodging them, almost ritualistic (Pukui and Elbert 1986:123)
Kaluanui	Ditch and <i>heiau</i> ; <i>lit.</i> , “the big pit” (p. 79); the pig god, Kama-pu'a, was born here, as a foetus; he was thrown away by an older brother but rescued by his mother, Hina (Westervelt in Pukui et al. 1974:79)
Kalunapuhi	<i>Ili 'āina</i> in Wailua; <i>lit.</i> , “the high place” (Soehren 1963:194)
Kama'ino	Trigonometrical station and ridge in Ke'anae; <i>lit.</i> , “naughty child” (p. 80)
Kamilo	Point, stream, and <i>heiau</i> ; <i>lit.</i> , “the <i>milo</i> tree” (p. 81)
Kano	Stream and falls in upper Ke'anae; <i>lit.</i> , “large, hard stem (as on a banana bunch)” (Pukui and Elbert 1986:129)
Ka'ōiki	Place name in upper Pauwalu; <i>lit.</i> , “small thrust” (p. 86)
Kapa'akea	Land division and stream in Ke'anae; <i>lit.</i> , “the coral/limestone surface” (p. 86)
Kāpae	<i>Ili 'āina</i> in Ke'anae; <i>lit.</i> , “to set aside/deviate from” (Pukui and Elbert 1986:131)
Kapā'ula	Trigonometrical station between Waiohue and Pa'ea stream, boundary marker between Ke'anae and Wailua Ahupua'a; <i>lit.</i> , “the red enclosure” (p. 89)
Kaulanamoā	Place name on Ke'anae flats; <i>lit.</i> , “chicken roost” (Soehren 1963:192)
Kaulani	<i>Mauka</i> lands in Ke'anae flats; <i>lit.</i> , “to rely on/support the chief” (Pukui and Elbert 1986:136)
Kaumakani	Hill forming the boundary of Wailua; <i>lit.</i> , “place (in) wind” (p. 94)
Kauwalu	Islet; <i>lit.</i> , “eight landed” (Soehren 1963:192)
Kawe'e	Point of Ke'anae Park; no translation, formerly named Kahukahu, <i>lit.</i> , “to offer food and prayers to a god, or to the spirit of a dead person” (Pukui and Elbert 1986:114)
Ke'anae	Land section, village, stream, point, valley, peninsula; <i>lit.</i> , “the mullet (fish)”; Here, the god Kāne, accompanied by Kanaloa, thrust his <i>kauila</i> staff into solid rock, and water gushed forth (p. 103)
Ke'anae Uka	Land section; <i>lit.</i> , “upland Ke'anae” (p. 103)
Ke'elaimaka	Land section in upper Ke'anae; <i>lit.</i> , “fascinates the eyes” (Soehren 1963:192)

Name	Translation/Association
Keōpuka	Islet; <i>lit.</i> , “the perforated sand” (p. 109)
Kī‘apu	<i>Ili ‘āina</i> ; <i>lit.</i> , “ti-leaf drinking cup” (p. 109)
Ki‘inematikua	<i>Ili ‘āina</i> ; possible mistranslation of Kanemiiku‘e, meaning “dark brown Kāne (god)”; area known for growing <i>olona</i> (Soehren 1963:192)
Ki‘ioli‘olio	Place name in Ke‘anae; <i>lit.</i> , “loud cries of birds” (Soehren 1963:192)
Kīkahō	Small ridge in Kupa‘u; <i>lit.</i> , “to splash” or “to speak/interrupt rudely” (Soehren 1963:148)
Kīkau	Hill forming boundary between Ha‘ikū and Wailua south of Honomanū; <i>lit.</i> , “to give freely and with good will” (Soehren 1963:149)
Kīkokiko	Place name in Ke‘anae; <i>lit.</i> , “dotted, spotted, or speckled” also “to peck or nibble” (Pukui and Elbert 1986:150)
Kilo	Area near base of Waianu Valley; <i>lit.</i> , “stargazer, seer, to watch closely” (Soehren 1963:151)
Kīpapa	<i>Ili</i> in Ke‘anae; <i>lit.</i> , “placed prone (as in a slain warrior)” (p. 112-113)
Koleamoku	<i>Ili ‘āina</i> in Ke‘anae; named in honor of the first Hawaiian to learn the use of herbs in healing and was subsequently deified after death (Pukui and Elbert 1986:162)
Ko‘oiki	Land area in Ke‘anae flats; <i>lit.</i> , “small prop or support” (Soehren 1963:192)
Ko‘olau	<i>Moku</i> , gap, stream, ditch, gulch, and falls; <i>lit.</i> , “windward” (Pukui and Elbert 1986:166)
Kūālani	<i>Heiau</i> and trigonometric station above Pu‘uililua; <i>lit.</i> , “sour, as in unclean calabashes that have previously held <i>poi</i> ” (Pukui and Elbert 1986:170)
Kūāpōhaku	<i>Ili ‘āina</i> in Ke‘anae; <i>lit.</i> , “turn to stone” (p. 119)
Kukuilono	Trigonometric station near Ke‘anae Point; <i>lit.</i> , “light of Lono (god)” (p. 122)
Kūpau	<i>Heiau</i> above the road in Ke‘anae Valley; <i>lit.</i> , “entirely finished” or “fearful, shrinking, rare” (Pukui and Elbert 1986:185)
Lo‘iloa	<i>Ahupua‘a</i> ; <i>lit.</i> , “long taro patch” (p. 133)
Ma‘ino	Land section near Nāhiku; <i>lit.</i> , “defacement” (p. 139)
Makahuna	Land section in Ke‘anae flats; <i>lit.</i> , “hidden point” or “hidden eyes” (p. 140)
Makoloaka	Islet; <i>lit.</i> , “creeping shadows” (Soehren 1963:194)

Name	Translation/Association
Mii'ulu	<i>Ili 'āina</i> in Wailua; <i>lit.</i> , “stiff from exercise” (Soehren 1963:194)
Moana	Land area above Kupa'u; <i>lit.</i> , “ocean, open sea” (Pukui and Elbert 1986:249)
Mokuhala	Islet; <i>lit.</i> , “pandanus island” or “island passed by” (p. 155)
Mokuhōlua	Islet; <i>lit.</i> , “sled island” (p. 155)
Mokuhuki	Islet; <i>lit.</i> , “pulling island” (p. 155)
Mokumana	Islet; <i>lit.</i> , “divided island” or “divided district” (p. 155)
Nāhiku	Land section, village, ditch, and landing; <i>lit.</i> , “the sevens” in reference to the districts of the area (p. 160)
‘Ōhi‘a	<i>Ili 'āina</i> in Waianu; <i>lit.</i> , “ō'hia tree”, location of two famous springs called Waiakāne and Waiakanaloa, where Kāne thrust his staff into two rocks to procure water for himself and Kanaloa (p. 168)
Pa'akamaka	<i>Ili 'āina</i> in Wailua; <i>lit.</i> , “close the eye” (Soehren 1963:194)
Pa'akea	Land section, gulch, and stream; <i>lit.</i> , “coral bed, limestone” (p. 173)
Paehala	<i>Ili 'āina</i> in Ke'anae; <i>lit.</i> , “row/cluster of pandanus trees” (Soehren 1963:192)
Pāhoa	<i>Ili 'āina</i> or <i>ahupua'a</i> east of Ke'anae; <i>lit.</i> , “short dagger” (Pukui and Elbert 1986:300)
Pakanaloa	<i>Heiau</i> in Ke'anae Valley; Temple of Kahuna Kahekili, rumored descendent of the earliest “gods” (Ashdown 1971:45); upon his death, he was dismembered and distributed among other temples where his remains were deified ((Beckwith 1970:48-49)
Pāku'i	Trigonometric station near shore beneath Wailuanui Catholic Church; <i>lit.</i> , “attached/add on” (p. 176)
Pālaha	Place name where Pōhaku'oki'āina is found on brink of Haleakalā Crater; <i>lit.</i> , “spread out/extended/flattened” (Pukui and Elbert 1986:307)
Pālahulu	Stream in Ke'anae; <i>lit.</i> , “to take all of a fish catch for a chief instead of dividing it” (Pukui and Elbert 1986:310)
Pali Kahekili	Leaping place above Waiohuli Pond in Ke'anae; <i>lit.</i> , “precipice of Kahekili” (Pukui and Elbert 1986:312)
Paliuli	Cave near Hāna, where Queen Ka'ahumanu was rumored to have been born; <i>lit.</i> , “green cliff”; a legendary paradise of plenty (p. 178)
Pana'ewa	<i>Ili 'āina</i> in Ke'anae flats; named for the legendary home of a <i>mo'o</i> destroyed by Hi'iaka (p. 178)

Name	Translation/Association
Papihii	Promontory east of Wailuaiki; bears earlier name of Poahonu, <i>lit.</i> , “choked with debris” (Soehren 1963:194)
Pā‘ula	Land area by ocean near Kopili‘ula; <i>lit.</i> , “red enclosure” (p. 181)
Pauwalu	Point near Ke‘anae; <i>lit.</i> , “eight destroyed”; named after a Moloka‘i shark-man who killed seven of a family’s children, until he was caught and killed using the eighth as bait (p. 182)
Pōhakukane	<i>Ili ‘āina</i> in Ke‘anae; <i>lit.</i> , “Kāne’s stone” (Pukui and Elbert 1986:334)
Pōhaku‘oki‘āina	Boundary <i>pu‘u</i> marking the corners of the current Makawao and Hāna districts, and the traditional Hāmākua Loa, Ko‘olau, Hāna, Kipahulu, Kaupo, Kahikinui, Honuaula, and Kula <i>Moku</i> ; <i>lit.</i> , “stone dividing land” (Ulukau 2006)
Puakea	<i>Ahupua‘a</i> , <i>‘ili ‘āina</i> , stream and gulch in Ko‘olau; <i>lit.</i> , “white blossom” (Ulukau 2006)
Pueo	Hilltop on west rim of Ke‘anae Valley; <i>lit.</i> , “owl” (Soehren 1963:194)
Pu‘u‘alaea	Peak in Wailua on Halakalā Crater; <i>lit.</i> , “red ochrous hill” (p. 195)
Pu‘u o Koholā	<i>Heiau</i> located in Honomanū; <i>lit.</i> , “hill of the whale” (Ulukau 2006)
Pu‘u Olu	Fishpond at southern end of Pauwalu Point; <i>lit.</i> , “restful place” (Soehren 1963:194)
‘Ula‘ino	Land section near Hāna, Maui. <i>lit.</i> “stormy red”
Wai‘aka	Pond; <i>lit.</i> , “reflection water” or “shadowy water” (p. 219)
Waiakamoi	Watershed in Ke‘anae; <i>lit.</i> , “water by the threadfish” (p. 219)
Waianu	<i>Ahupua‘a</i> between Ke‘anae and Wailuanui Streams; <i>lit.</i> , “cold water” (p. 221)
Waia‘ōlohe	Pond located within Ke‘anae Stream; <i>lit.</i> , “water of, or used by, ‘ōlohe” where ‘ōlohe means bare, naked, or hairless (Pukui and Elbert 1986:285; Ulukau 2006)
Wai‘āpuka	<i>Ili ‘āina</i> in Ke‘anae; <i>lit.</i> , “water coming out” (p. 221)
Wai‘eli	<i>Ili ‘āina</i> in Wailua; <i>lit.</i> , “dug water” (p. 221)
Waikamilo	Stream in Wailuanui; <i>lit.</i> , “water of the <i>milo</i> tree” (Soehren 1963:194)
Waikamoi	Land division, stream, and ridge trail; <i>lit.</i> , “water of the <i>mo‘i taro</i> ” (p. 222)
Wailua	<i>Ahupua‘a</i> and <i>‘ili ‘āina</i> ; <i>lit.</i> , “two waters” (Soehren 1963:194)
Wailuaiki	Stream and land division in Wailua; <i>lit.</i> , “small two-waters” (p. 224)

Name	Translation/Association
Wailuanui	<i>Ili 'āina</i> in Wailua; <i>lit.</i> , “large two-waters” (p. 225)
Waiokilo	Waterfall at base of Waiokamilo Stream in Wailuanui; <i>lit.</i> , “landmark water” (Soehren 1963:194)
Waiokukui	Waterfall on Waiokamilo Stream; <i>lit.</i> , “water of the candlenut tree” (Soehren 1963:194)
Waiokuna	Waterfall on Palauhulu Stream; <i>lit.</i> , “water of <i>kuna</i> (a freshwater eel)” (Soehren 1963:194)

Beckwith (1970:65) further describes the site of this famous watershed in Keʻanae:

Two holes are pointed out just below the road across Ohia gulch beyond Keanae on Maui where Kane dug his spear first into one hole and then into the other with the words, "This is for you, that for me." The water gushing from these apertures is called "the water of Kane and Kanaloa. (Beckwith 1970:65)

According to the historian Samuel Kamakau, cited in Maly and Maly (2001), god-associated accounts in the lands of Pāpaʻaʻea, ʻO-opuʻola and Keʻanae centered around the god Kāne. Kāne's attributes also included *ka wai ola* – the waters of life, *kalo* [irrigated taro], sunlight, and a manifestation of thunder and lightning. These associations lend themselves to this wet, windswept, and sometimes stormy side of Maui. Kāne's attributes named Kānehekili, Kanewawahilani, Kahoalii, Kauilanuimakehaikalani, among many other gods belonging to the upper and lower strata of the firmament were called "gods of the heavens." The first *kahu* who observed the *kapus* [taboos] of these gods was named Hekili (Thunder). He lived at Pāpaʻaʻea, where he was born in a place where thunder claps very loudly, with double claps, and where flashes of lightning smashed to pieces the forest of ʻO-opuʻola (found between Hāmākua Loa and Koʻolau Moku) (Maly and Maly 2001:13).

According to Martha Beckwith (1970) Kāne-hekili was the god worshipped by those who claimed an *ʻaumakua* (family spirit) in the thunder. In the forest uplands within the proximity of the *heiau* "Pakanaloa," erected back of Keʻanae at a place where violent thunderstorms occur, thunder being the divine form of the god Kāne-hekili. This god was said to have been seen in his human form as having one side of his body black and the other side white. Kahekili, the last ruling chief of Maui, was tattooed black on one entire side of his body (termed *pahupū*, *lit.* 'cut in half') to show he belonged to the family of the thunder god (Kirch 2012:248; Maly and Maly 2001:13).

The stream heads in many of the deep valleys in the region also hold a special significance as sacred spaces in Hawaiian traditions. The region of Waikamoi in the uppermost [*mauka*] portions of Kalialianui Ahupuaʻa and Honomanū Ahupuaʻa, within the Piʻinaʻau Stream valley situated *mauka* of Keʻanae, are lands that represent some of the most significant native forest resources remaining in the Hawaiian Islands. These forests are part of a unique cultural landscape, in that the native flora, fauna, mist, rains, water, natural phenomena and resources, were all believed to be *kinolau* (the myriad body-forms) of gods, goddesses, and lesser nature spirits of Hawaiian antiquity (Maly and Maly 2001:ii). The reluctance of the *makaʻāinana* (commoners) to venture into these inland sacred spaces is further documented in Honomanū. J.C. Elliott in Sterling (1998:109) provides an account of a *kapu* (taboo) surrounding Honomanū Valley:

I have heard from various sources that there are a lot of burials in the upper part of this Valley and there still seems to be a certain amount of superstition attached to the place; I am told that quite a number of people do not like to be in the Valley after dark, and that the [spirits of] aliʻi are said to walk there at such times. (Sterling 1998:109)

The deep valleys of East Maui are not the only geographic spaces with gods and spirits residing within them. Many common features of the landscape such as caves, hills, gulches, and streams are also known to have legendary associations. Another tale tells of a famous shark of

Ko'olau called Hi'u (the tail of a fish) (Sterling 1998:109). In *On the Hana Coast*, Youngblood et al. (1983:92) relates the tale:

According to this story, two families in the area used to exchange food, a common practice, the couple living seaside at Ke'anae giving fish and the couple living upland giving garden produce.

One day the woman from the shore gave her sister-in-law on the hillside nothing but a fishtail in exchange for bananas and sweet potatoes. The woman took the fishtail home in her calabash, saying nothing about the scanty trade.

That night both she and her husband dreamed of a shark, and when they woke up in the morning they found a live shark swimming around in the calabash, where only a tail had been the night before.

The excited couple freed the shark in an upland pool and made offerings to it. During a heavy rain, the shark was washed down to the ocean, where...it lives to this day in an underground cave near Ke'anae wharf. (Youngblood et al. 1983:92)

Trails and Access

The initial occupation of this portion of Maui first occurred along the coastal region about AD 1200 (A. E. Haun et al. 2004). Of great importance to the reign of Pi'ilani, and to his subjects, was the creation of a network of roads extending throughout Maui. Each road was laboriously constructed of hand-fitted, adze-trimmed, basalt blocks laid in a mosaic to form paths four to six feet wide. One of these roads extended approximately 60 miles and connected Wailuku with Hāna. Around AD 1480, Pi'ilani's son, Kiha-a-Pi'ilani, had the road extended beyond Hāna: through the Kaupō Gap and across the Haleakalā Crater (Duensing 2005).

According to Fornander, Pi'ilani's son, Kiha-a-Pi'ilani, upon becoming *mo'i* of Maui, devoted himself to the improvement of his island:

Kihapiilani who thus forcibly succeeded his brother as *Moi* of Maui, had been brought up by his mother's relatives in the court of *Kukaniloko* of Oahu ... Having, as before related, through the assistance of his brother-in-law *Umi* obtained the sovereignty, he devoted himself to the improvement of his island. He kept peace and order in the country, encouraged agriculture, and improved and caused to be paved the difficult and often dangerous roads over the Palis of Kaupo, Hana, and Koolau – a stupendous work for those times, the remains of which may still be seen in many places, and are pointed out as the “Kipapa” of *Kihapiilani*. His reign was eminently peaceful and prosperous, and his name has been reverently and affectionately handed down to posterity

Kihapiilani had two wives – *Kumaka*, who was of the Hana chief families, and a sister of *Kahuakole*, a chief at Kawaipapa, in Hana. With her he had a son named *Kamalalawalu*, who succeeded him as *Moi* of Maui. *Koleamoku*, who was the daughter of *Hoolae*, the Hana chief at Kauwiki ... with her he had a son called *Kauhiokalani*, from whom the Kaupo chief families of Koo and Kaiuli descended. *Kamalalawalu* followed his father as *Moi* of Maui. He enjoyed a long and

proseperous reign until its close, when his sun set in blood and disaster (when Kahekili lost to Kamehameha I) (Fornander 1880:206-207).

A 1908 photograph depicts an unknown portion of the *alaloa* (long trail) in East Maui, paved with sub-angular and rounded basalt stone as it meanders through thick vegetation (Figure 13).

This *alaloa* was studied and described by anthropologist Martha Foss Fleming as follows:

...the method of building this paved roadway consisted of a line of men standing from the sea and handing stones one to the other until they reached the required place. Here the stones were placed into position. The trail was paved with flat, hard beach stones. (Fleming 1933:5)

Sections of the trail remained at Ka'elekū and between Wailua and Ke'anae in the 1930s (Fleming 1933:5). At the turn of the century, in the early 1900s, portions of the trail remained usable between Nāhiku, Kailua and Halehaku (Dodge 1916:347).

Maly and Maly (2001:398) further note that in addition to *alahahele* (trails) and *alaloa* that extend generally parallel to the shoreline, there were also trails that connected the near shore areas with the uplands in each *ahupua'a*. In this fashion the *ahupua'a* and *moku* were connected to each other, while also containing roads that enabled access to the *'ili*, *lele*, and other constituent small-scale land divisions within the individual *ahupua'a*.

Agriculture and Habitation

Evidence of cultivation in Ko'olau starts as far west as O'opuola Gulch that marks the traditional boundary between Ko'olau and Hāmākua Loa Moku. Sterling (1998:108) references Handy's description of the gulch who's "stream, and likewise Waikamoi, Puohokamoa, and Ha'ipua'ena streams watered small patches." A little further to the east the valley of Honomanū affords yet more evidence of stream cultivation. Honomanū Valley is best characterized as a large stream with a broad deep valley and a good beach for fishing canoes. In ancient times, Honomanū was said to have supported a sizable population. Terrace walls attesting to this were observed by Handy et al. (1991:498):

...as far as the level land goes – a little less than a mile. Above the valley, on elevated flatlands, there used to be some terraces and houses. These upland slopes were doubtless planted with all the plants that flourish where there is much rain, but they were too wet for sweet potatoes. (Handy et al. 1991:498)

Sterling (1998:110) further cites Handy regarding the attributes of pre-Contact Honomanū Valley that made it suitable for such habitation:

This valley anciently supported a large population, having a fishing bay of first rank, and a deep, flat valley bottom watered by a large stream. Only one family still raises taro in the old patches near the sea, but abandoned terraces extends up into the valley. [(Handy in Sterling 1998:110)

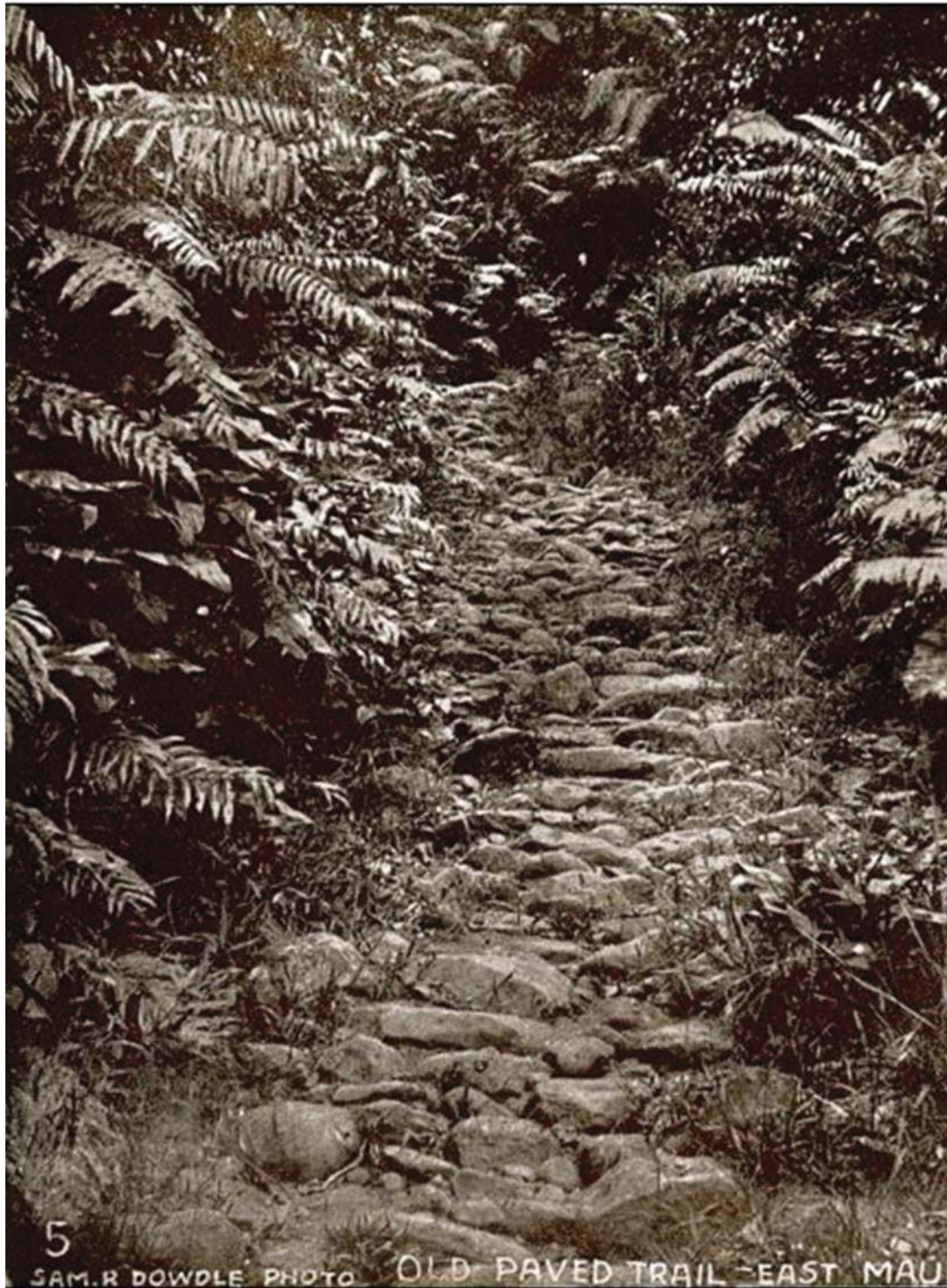


Figure 13. 1908 photograph by Sam Dowdle of a section of the Pi'ilani Alaloa, the King's Highway, as it appeared in East Maui

Additional testament to the productivity of the region comes from neighboring Nuuailua Stream to the East, where “This smaller, flat-bottomed valley between Honomanū and Ke‘anae, now uninhabited, was formerly the site of a settled community which raised wet taro in terraces” (Handy in Sterling 1998:111). Continuing east of Nuuailua Stream, the region of Ke‘anae offers abundant evidence of traditional Hawaiian subsistence activities.

The accepted pre-Contact settlement pattern for the region of Ke‘anae and Wailua Nui centers on the series of occupational episodes that utilized the Pālahulu Stream for taro (*Colocasia esculenta*) cultivation. A cultural landscape study (Group 70 International et al. 1995) recorded the intensive use of the Ke‘anae and Wailua Nui region for taro, identified three separate field systems, and noted the processes by which community cooperation led to the field system operation. Studies of the history of land use indicate that flat and terraced lands within Ko‘olau Moku were intensively and continuously used for wetland taro cultivation or *lo‘i* agriculture from the pre-Contact era up until the present day (Group 70 International et al. 1995; Handy et al. 1991). In regards to development in pre-Contact times Handy (1940:109-110) states:

In the extensive confines of Keanae Valley...the old Hawaiians planted a great deal of dry- or forest-land taro; but it was only in the lower part of the valley, on the eastern side, that wet patches were developed, although a vast area in the remainder of the valley might have been capable of such development...It is on the broad flat peninsula of lava that extends for nearly a mile into the sea from the western line of the valley, that Keanae’s famed taro patches are spread out in striking evidence of old Hawaii’s ingenuity. (Handy 1940:109-110)

According to traditional accounts this valley was made suitable for agriculture by the hands of Hawaiians in service of their chief, providing testament to long-term habitation planning in pre-Contact times. Handy (1940:110) relates the tale:

Anciently, according to Henry Ikoa, the peninsula was barren lava. But a chief, whose name is not remembered, was constantly at war with the people of Wailua and determined that he must have more good land under cultivation, more food, and more people. So he set all his people to work (they were then living within the valley and going down to the peninsula only for fishing), carrying soil in baskets from the valley down to the lava point. The soil and the banks enclosing the patches were thus, in the course of many years, all transplanted and packed into place. Thus did the watered flats of Keanae originate. [(Handy 1940:110)

It seems that the expansion into the valley floor may have been prompted by population pressure, hence the chief’s desire to increase food yields and insulate against the periodic famine common to Maui and Hawai‘i Island cultivation. Evidence of these famine cycles are seen in Honomanū Valley in the form of a *ka imu ki*, or *tī* leaf oven, used during times of shortage to render grated *tī* root into an edible famine food (Handy 1940:206).

From Ke‘anae to Hāna evidence of Hawaiian cultivation and habitation have been noted extensively. According to Kirch (1996:72) the geologically younger region of East Maui was once densely populated. The fertile volcanic soils in the region of Hāna included extensive tracts of dryland sweet potato (*Ipomoea batatas*) augmented by dryland taro, yams (*Dioscorea* spp.), sugar cane (*Saccharum officinarum*), and breadfruit (*Artocarpus altilis*). Irrigated taro was

raised in *lo'i* [fields] in the narrow valleys. In the period of time prior to contact with the West, the irrigated taro fields of the Ke'anae Peninsula, the *heiau* at Wai'anapanapa, and the Pi'ilanihale Heiau were each major edifices physically attesting to the importance of the district of Hāna (Kirch 1996:69-71).

Additional evidence of habitation within Ke'anae comes from the presence of a derelict fishpond, Pu'u Olu Pond, situated just off of Pauwalu Point (Handy 1940:208). In addition to the pond there is also a habitation site closely associated with it, as the terrace comprising the platform of the residence is within a few feet of the Pu'u Olu Pond (Handy 1940:209). This residence shares a boundary wall with the pond and commands a view of a nearby natural arch beneath Pauwalu Point. A second platform, designated as a foundation for another thatch house, was observed on a slope of Paepaemoana Point. This foundation had its inner area paved with rough cobbles, with the exception of a smaller area delineated with larger stones containing finer internal paving between them (Handy 1940:210). It seems likely that the difference in paving within the inner areas reflect different spatial uses of the foundation.

East of Ke'anae are the terraced areas of Wailua, ranging between the boundaries of Wailua Nui and Wailua Iki. Handy (1940:110) noted that:

Wailua-nui has even more extensive terracing than Keanae, sloping seaward from the base of the cliff around which the road winds. About half of the terraces are still cultivated by Hawaiians. On the whole, Wailua is today richer agriculturally than Keanae. Wailua-iki, Waiohue, and Hanawai Streams supported small terraces on diminutive flats near the sea. (Handy 1940:110)

The agricultural development of this region is further attested to by the presence of at least four *heiau*. Two of these ceremonial structures, Heiau of 'Ōhi'a (Walker Site 94) and Kaluanui Heiau (Walker Site 95), were identified within a third of a mile from the sea and were designated as agricultural in their associations and uses (Walker 1931b:169-170).

The last of the intensified cultivation and habitation areas on East Maui before reaching Hāna is the Nāhiku region. This land area encompassed the *ahupua'a* from Kaliae to 'Ula'ino and their accompanying watersheds. According to Handy et al. (1991), Nāhiku was a fertile *ahupua'a*, which was cleared and terraced with irrigated taro cultivated in the tradition of Native Hawaiians. In ancient times, the settlement at Nāhiku spread over gently rising ground above the shore with a number of groups of *lo'i* watered from Makapīpī Stream (Handy et al. 1991:501). Along the shore, there was a *hala* forest that extended from 'Ula'ino to Hāna (Wenkam 1970). The region above Nāhiku was traditionally forested with native trees such as *koa*, *'ōhia lehua*, and sandalwood. In regards to the Nāhiku region, Handy (1940:175) states:

Nahiku has a number of terraces, some still under cultivation, below the village. The people of this genuinely Hawaiian community also cultivate dry taro patches about their houses.

Throughout wet Koolau, the wild taro growing along the streams and in the pockets high on the canyonlike walls of the gulches bespeaks former planting of stream taro along the watercourses, on the sides of the gulches, and in the forest above. The same is true of the wild taros seen here and there in the present forest

above the road and in protected spots on what was formerly low forest land, now used as pasture. (Handy 1940:175)

These lands represent the last significantly sized portion of agricultural land before reaching Hāna Moku. The area between the two was sparsely populated, but evidence of cultivation on a smaller scale exists in this area as well. According to Handy (1940:111):

From Ulaino to Hana extends a *hala* forest, growing upon recent lava flows which cover the coast from Ulaino to Hana Bay. At Ulaino and Honomaele there are a number of places where dry taro is still planted by Hawaiians together with other small subsistence plantings. Formerly there was scattered planting all along the coast and forest plantations inland, between Ulaino and Nahiku, which are connected by an old trail crossing the lowlands near the coastline. (Handy 1940:111)

Thus, even the regions considered too arid for *lo'i* cultivation still supported sporadic small scale cultivation of subsistence crops by isolated families. By looking at the spatial associations of cultivation, habitation and access to sites of significance to traditional Hawaiians (i.e., access trails, fish ponds, and *heiau*) a clear pattern of intensive, predominantly coastal, occupation is seen throughout the lands of Hāmākua Loa and Ko'olau Moku.

Heiau

A *heiau* was a large ceremonial structure accompanying most larger pre-Contact Hawaiian settlements. The name literally means “place of worship” (Pukui et al. 1974:44). The *heiau* structure was an architectural feature as well as social institution of Hawaiian society and like many social institutions has served several functions over time. How *heiau* were used depended largely on the communities they served, the times during which they were actively built and used, and the types of subsistence practiced by the Hawaiians who used them. In *On the Road of the Winds*, Kirch (2000:290,295) cites water availability and ecosystems as two significant primary factors affecting the development of *heiau* use:

The older islands of Kaua'i, O'ahu, Moloka'i, along with the western half of Maui, display deeply weathered and dissected landforms, with valleys and permanent streams well suited to irrigate terrace agriculture... In striking contrast, geologically younger East Maui and Hawai'i - while they account for 74 percent of the total land area - mostly lack permanent streams and have large tracts of young lava flows. (Kirch 2000:290)

Kirch (2000:295) stresses the relationship of these ecosystem characteristics to political and social organization in the archipelago through the production of agricultural surplus:

Irrigation works in the western isles, and dryland field systems in the eastern group, both constitute forms of landesque [*sic*] capital intensification, but with rather different socioeconomic outcomes. . . With irrigation, higher yields could be produced per unit of labor and greater surpluses could be extracted by the chiefs. In the dryland regions, greater labor inputs were required and the limits of intensification were more quickly approached, making the extraction of a surplus that could be put to political use more contentious.

Two contrastive pathways to political (and ideological) transformation emerged. The chiefly elite of the western islands invested heavily in irrigation works, while their religious system emphasized Kane, god of flowing water and procreation. On Maui and Hawai‘i Island, in contrast, the chiefs exercised a cycle of territorial conquest, promulgating a legitimating ideology based on the cult of Ku, a human sacrifice demanding god of war, who seasonally alternated with Lono, god of rain and thunder. (Kirch 2000:295)

By depending on naturally existing streams for the creation of their agricultural surplus, how dry or wet an island was had a strong influence on scarcity and ultimately the stability of the local chiefdoms. This, in turn, had an effect regarding which god or godly attribute was worshipped and honored at the *heiau* sites. This is reflected in the Makahiki religious cycles of Maui and Hawai‘i Islands, where the war god (Kū) reigns for the eight driest months of the year, yielding to the agricultural god (Lono) of thunder and rain for the remaining four-month long wet season of cultivation (Kirch 2012:251-254). Since Hawaiian chiefdoms were dependent on the production of a surplus to support a non-laboring class such as the *ali‘i*, in the event of the loss of “the continued ability of a system to yield sufficient surplus, chiefly power was undermined. When such conditions did arise...a considerable struggle for power ensued” (Kirch 2000:323). In this manner, the limitations of the dryland agricultural systems of the eastern archipelago helped to develop a strong tradition of war and contention mingling with seasonal periods of ceremonial peace. Reflecting these cycles, *heiau* were constructed for both agricultural and political purposes, both of which were important to the peoples of the drier eastern islands.

Being a younger island with fewer perennial watersheds, Maui was steeped in many struggles between warring chiefs before the archipelago was ultimately unified under Kamehameha I, the last of the invading chiefs from Hawai‘i Island. Thus many *heiau* were built upon the island of Maui along its northeastern shore, a route routinely used by both Hawai‘i and Maui Island armies in their long struggle to gain control the wet Hāna region of East Maui, one of the wettest and most productive regions between the two islands. In this respect, *heiau* were a necessary institution to legitimize the rule of any reigning or conquering chief. In *A Shark Going Inland is My Chief*, Kirch (2012:229) elaborates:

New systems of ideas and beliefs—such as those of kings as divine beings—get actively reinforced through the use of ritual symbols...especially in ritualized public displays... The increasingly elaborate *heiau* rituals, carried out by full time priests on the impressive stone platforms, served to reinforce further the power and prestige of the chiefs and king. (Kirch 2012:229)]

Despite this observation, *heiau* were not only intended for the use of chiefs and kings in establishing their legitimacy. Kamakau in Kirch (2012:213) tells us that “Heiaus were not all alike; they were made of different kinds according to the purpose for which they were made.” Among these alternate types are the smaller coastal enclosures serving as *ko‘a* (shrine) for fishermen, the *heiau ho‘o‘ulu‘ai* located further inland for assuring crop fertility, and longer and later-built double court *heiau* which were usually much larger constructions with an elongated terrace overlooking a second lower-level terrace (Kirch 2012:213).

One of the earliest systematic studies of Native Hawaiian architecture was conducted by Winslow Metcalf Walker on Maui in the years between 1928 and 1929. In this study Walker compiled and expanded upon the earlier work of Thomas G. Thrum (1909b) and J.F.G. Stokes (1916), in addition to completing a survey of Maui Island for the Bernice P. Bishop Museum (Walker 1931b). By the time that Walker conducted his survey, many of the *heiau* sites previously observed on East Maui had been reduced in number from 182 to 134, citing that many structures had been destroyed by the cultivation of sugarcane and pineapple (Walker 1931b:97). In *Archaeology of Maui*, Walker (1931b:97-98) details novelties of the *heiau* he observed:

No two of them are built according to the same plan, but the general appearance of many is similar. The *heiau* are all quite simple in construction, native rock from the vicinity are used without any attempt at cutting or facing. Platforms are built by extending the natural level of some hill or eminence of ground and thus producing a solid rock filled platform with a sheer or terraced front. (Walker 1931b:97-98)

The largest of these terraced *heiau*, Pi'ilanihale (Walker Site 102) located in Hāna, is the largest in the state and is built over a large bluff, contributing to its massive 15 m profile (Walker 1931b).

About AD 1450, Pi'ilanihale was built at Honomā'ele near Hāna. The name of the structure translates to "Home of Pi'ilani" and likely refers to the *heiau* as the royal residence of the Pi'ilani Family, a long and storied dynasty of Maui chiefs from the sixteenth century (Sterling 1998:123). In *Sites of Maui*, Sterling (1998:123) cites a Walker (1931) plan view map (Figure 14) and his description of the impressive structure:

It is a stone platform 340 x 415 feet terraced in several steps on the north and east sides. The north slope is the highest seen anywhere, five step terraces built up to a height of 50 feet from the bottom of the hill. The south and west sides are enclosed by a great wall 10 feet high and 8 to 10 feet thick. . . The only structures found [on top] were the low walls indicated in the plan. . . The top appeared to be entirely paved with small pebbles and chunks of lava. A few pieces of coral were found. A house site is located just beyond the west wall, and the ruins of other structures in the cane fields below indicate all that is left of a former village. (Sterling 1998:123)

Due to its striking features and large scale Pi'ilanihale is currently preserved within the Kahanu Garden pandanus forest in Hāna.

Of the 230 structures that Walker (1931) surveyed on Maui, 39 of the recorded *heiau* (Walker Sites 64 through 102) were documented near the License Area and are depicted in Figure 15 and listed in Table 3. At the time of his writing, Walker (1931) identified 20 of the 39 *heiau* within the combined Hāna and Makawao Districts, leaving 19 of the *heiau* as either unidentified or presumed destroyed.

Within the modern Makawao District, containing the traditional *moku* of Hāmākua Loa, ten *heiau* were identified. Six of the ten identified structures (Walker Sites 64, 67, 68, 74, 77, and 78) were observed to be largely intact, of a generally larger size than those located east toward

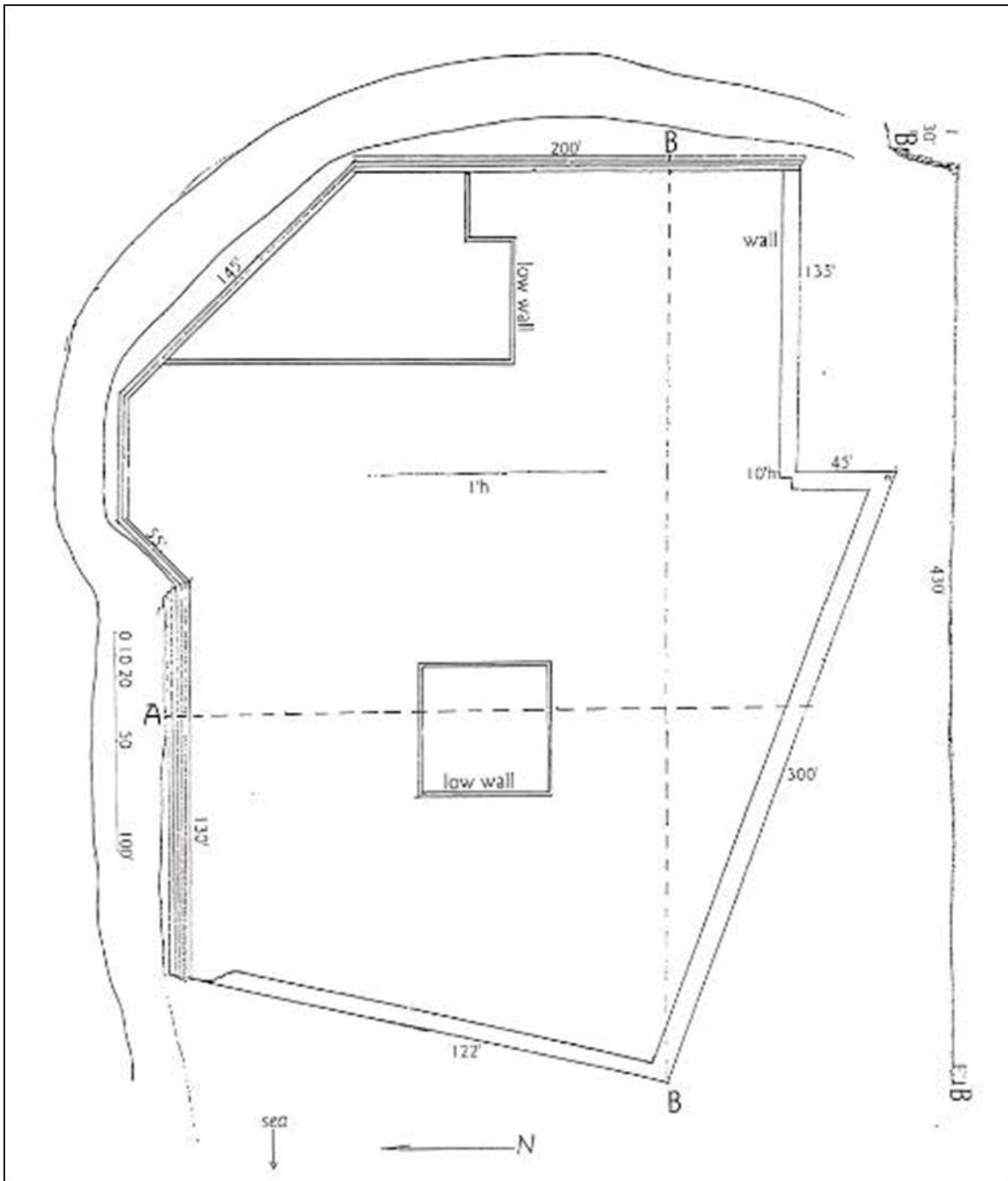


Figure 14. Walker (1931) plan view map of Pi'ilanihale Heiau, reprint from Sterling (1998:123)

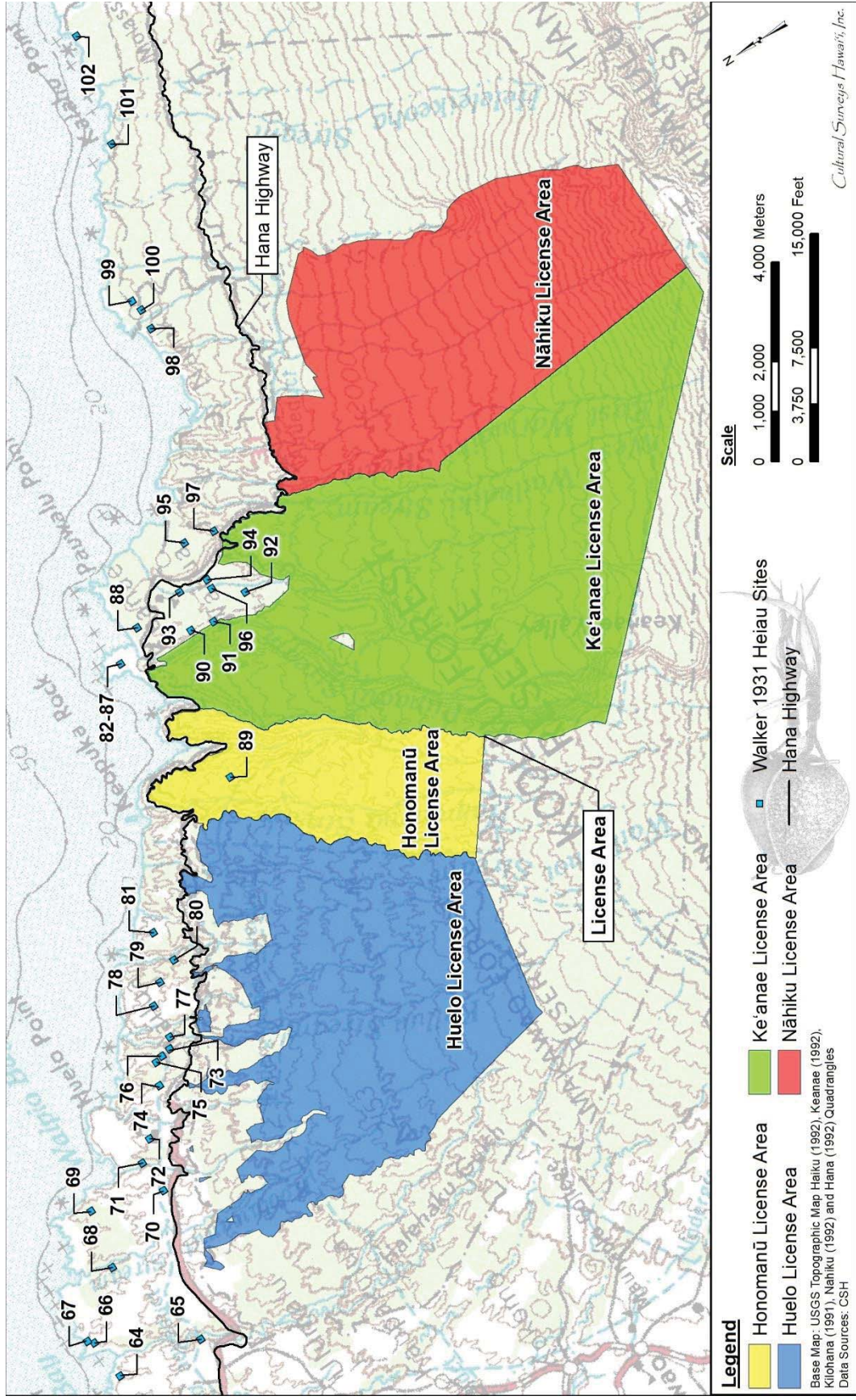


Figure 15. Portions of the 1992a Haiku, 1992c Keanae, 1991 Kilohana, 1992d Nāhiku, and 1992b Hana U.S. Geological Survey 7.5-minute topographic quadrangle series showing Walker heiau sites 64 through 102 with overlay of project License Areas

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TMKs: Various

Table 3. Walker Heiau Sites Located Near the License Area, as Documented in Sterling (1998)

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
64	Mokahio	--	--	--	Irregular <i>heiau</i> , terraced on several sides; walls and terrace facings measure 130-x-60-x-35-x-50-x-20-x-50-x-55 ft; greatest distance front to back - 85 ft; constructed of water-worn stones and pebbles; interior disturbed; outline follows hill contour; on top of a small knoll within a gulch a quarter mile from the sea (p. 102)
65	Kaapahu at Kakipi	--	--	--	Destroyed
66	Unknown	--	--	--	Moderately sized <i>heiau</i> ; north side measures 128 ft, east side 120 ft; 68 ft from northeast corner a wall divides the <i>heiau</i> in two; back wall measures 115 ft; front wall facing is 4 ft high; north and west sides terraced in two to three steps; no coral or pebbles seen; partly destroyed to plant pineapples; on a bluff above Halehaku Bay, 50 yd. from the sea (p. 103)
67	Piilani	--	--	--	Massive beach rock <i>heiau</i> ; 10 ft high, 60 ft wide; 2 ft terrace forms rear wall against hill; terraced on front; oriented parallel to the shore for 150 ft; interior once paved, now heavily overgrown; no coral found; numerous enclosures at hill base indicating a past village site; on shore of Halehaku Bay, 50 yd. from the sea (p. 103)

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
68	Poohoolewa Heiau	Honopou	Makawao	Ho'olawa	Large walled <i>heiau</i> , possibly sacrificial class; 300 ft long, 130 ft wide at front; large 200 ft open court off front wall; remaining 100 ft divided into two 50 ft enclosures with walls 5 ft high and 6 ft thick; constructed of beach stones, pebbles, and basalt; western side collapsed to permit planting of pineapples; At Apiapi on high bluff beyond Honopou Gulch to the east (p. 105)
69	Puukaupu Heiau	Honopou	Makawao	Ho'olawa	Destroyed
70	Mokupapaaku a Heiau	Honopou	Makawao	Mokupapa Gulch	Destroyed
71	Oanapele Heiau	Waipioiki	Makawao	Waiopio	Measures 60-x-100 ft, has terraced face 10 ft high; structure was demolished to provide stone for the road; at Pu'uoneone, 200 ft north of school and main road (p. 105)
72	Puokalepa Heiau	Waipionui	Makawao	Waipionui	Outline indicates 65-x-100 ft <i>heiau</i> ; front is faced 20 ft high against hillside; Stokes reports it as sacrificial class; 800 ft east of protestant church, atop small hill above steep unnamed gulch (p. 105)
73	Kupaikaa Heiau	Hanehoi	Makawao	Hanehoi	Large <i>heiau</i> ; 48 ft high wall on east side, 94 ft high wall on north side; northwest corner 20 ft high, built of three terraces; partly washed out from irrigation ditch failure; Drums heard from this heiau; At Hinalakahi on hillside below Kailua ditch, west of Kailua Protestant Church (p. 105)

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
74	Pohakuokaia Heiau	West Hanawana	Makawao	Hanawana	Notched-shaped <i>heiau</i> ; measures 60-x-30-x-20-x-12-x-28-x-50 ft; basalt walls 3 ft high and 6 ft thick; constructed of beach stones, no coral or pebbles seen; at Hoalua, below church, on bluff near end of pineapple field (p. 106)
75	Honomauloa at Hanawana	East Hanawana	Makawao	Hanawana	Destroyed
76	Halepaahau at Hanawana	Papa'a'ea	Makawao	Nā'ili'ilihale	Destroyed
77	Kaulihale Heiau	Papa'a'ea	Makawao	Kailua	L-shaped <i>heiau</i> with walled enclosure; measures 200 ft long and 137 ft wide; two to three terraces on sides; northeast corner is triple terraced 10 feet high; 38-x-22 enclosure in northwest corner. Constructed of rough basalt, no coral or pebbles; at Moii in Pu'uomaile, <i>mauka</i> of road, opposite of store (p. 106)
78	Pohakuokane?	West Makaiwa	Makawao	Nā'ili'ilihale and Puehu	Small notched-shaped <i>heiau</i> ; measures 66-x-36-x-32-x-6-x-32-x-36; walls are 4 to 6 ft thick and 5 ft high at corners; constructed of water worn basalt rocks; in dense <i>hau</i> thicket on ridge, east of Kailua Gulch, below road (p. 107)
79	Halekanalao at Papea	West Makaiwa	Makawao	Puehu	Destroyed
80	Kalacohia at Papaeiki	East Makaiwa	Hāna	O'opuola	Destroyed

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
81	Nakeikiikalalo makaiwa at Makaiwa	East Makaiwa	Hāna	Ka'aiea	Destroyed
82	Kukuionono	Ke'anae	Hāna	Pi'ina'au	Destroyed / not found; on point of Ke'anae peninsula (p. 109)
83	Lalaola	--	--	--	Destroyed / not found; on point of Ke'anae peninsula (p. 109)
84	Pakanalao	--	--	--	Destroyed / not found; said to have been a war <i>heiau</i> to Kanehekili; on upper slopes of Ke'anae peninsula (p. 109)
85	Lelewi at Ko'olau	--	--	--	Destroyed / not found
86	Paliuli	--	--	--	Destroyed / not found
87	Kanekauolono	--	--	--	Destroyed / not found
88	Kamokukupeu	Ke'anae	Hāna	Ohia	Destroyed / not found
89	Puu o Kohola at Honomanū	Honomanū	Hāna	Punala'u	Destroyed / not found
90	Kawalimukala at Pauwalu	Ke'anae	Hāna	Pi'ina'au/ Palauhulu	Destroyed / not found
91	Kupau	Ke'anae	Hāna	Pi'ina'au/ Palauhulu	Destroyed; 84 ft terrace wall all that remains; above road in Ke'anae valley near ditch trail (p. 109)
92	Kualani	Ke'anae	Hāna	Waiokamilo	Destroyed / not found; on top of west ridge, at Waiokane Falls (p. 109)

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TMKs: Various

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
93	Kamilo Heiau	Wailuanui	Hāna	Waiokamilo	Small <i>heiau</i> enclosure; measures 22-x-25 ft walls, 3 ft high and 3 ft thick; constructed of basalt stones and some pebbles; at Kawaloa in dense <i>hau</i> and <i>puhala</i> grove, north side of stream (p. 112)
94	Heiau of Ohia	Wailuanui	Hāna	Waiokamilo	Dimensions lost, stones removed to build pig pen; likely agricultural <i>heiau</i> , built by chief Kaimuki; at Ohia in the valley, 3/4 mi. from the sea (p. 113)
95	Kaluanui Heiau	Wailuanui	Hāna	Wailuanui	Series of enclosures; measures 15-x-29 ft; south terrace is 11 ft wide; west wall is 6 ft wide and 4 ft high; higher terrace on one side; Stokes (1916) mentions oval pit in terrace pavement near southern end, measuring 6.5-x-4 ft and 2 ft deep; pit not present in 1931; at Kaluanui east of taro <i>lo</i> 'i, 1/3 mi. from the sea (p. 113)
96	Kukuiaupuni Heiau	Wailuanui	Hāna	Waiokamilo	Terraced platform; one platform measures 50-x-42 ft and 12 ft tall; second platform measures 47-x-51 ft and 5 ft tall; complex faces north by northwest; 200 ft open space between both terraces; on top of slope at Pauwaloa, 300 ft south of road and 500 ft southwest of the school (p. 113)
97	Makehau Heiau	Wailuanui	Hāna	Wailuanui and West Wailuaiki	Upper terrace outlines all that remains; measures 72-x-43 ft and is 5 ft high; waterworn stones and pebbles observed on platform surface; said to have once contained two platforms; eight coconut trees growing there were said to have been planted by Kaniho, last <i>kahu</i> of the <i>heiau</i> ; on level land at Makehau, 1/4 mi. from the Wailua road and 150 ft from the Makehau road (p. 113)

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TMKs: Various

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
98	Kaluakelea Heiau	Ko'olau	Hāna	Makapīpī	<i>Heiau</i> measuring 50-x-45 ft; three low terraces at northwest corner, 6 ft high; no coral or pebbles seen; partly destroyed by rubber plantation; at Honolulunui, on ridge west of Makapīpī Gulch (p. 114)
99	Pohoula Heiau	Ko'olau	Hāna	Kūhiwa Gulch	Open platform <i>heiau</i> ; measures 72-x-72-x-65-x-64 ft; two terraces form top, the higher one measuring 36-x-25 ft, rising 1 ft above the lower; northeast corner is 8 ft high; east wall is 3 ft high and 4 ft thick; constructed of water-worn stones and pebbles, no coral seen; faces the sea; near Nāhiku village, on east side of Makapīpī Gulch (p. 114)
100	Haleaka Heiau	Ko'olau	Hāna	Kūhiwa Gulch	Platform <i>heiau</i> ; 4 ft high in front, 6 ft high wall in back; northwest slope is double terraced; constructed of water worn stones; interior features trampled by cattle and pigs; located on a high hill; on east bank of Makapīpī Stream, 300 yards from the school (p. 115)
101	Heiau at Lanikele	Ula'ino	Hāna	Heleleikeoha	Walled <i>heiau</i> ; measures 116-x-90 ft; south and east walls are 6 to 8 ft high, and 12 ft thick; east wall is double terraced; gate on south wall is 8 ft wide, 4 ft high and 12 ft deep, low 2 ft wall closes the interior end; no interior structures noted, only a stone heap; outer terrace paved with pebbles, contained only scattered stone within; perched atop a high shoreline bluff, west of a canoe landing and trail up Lanikele Gulch; may have been a strategic fortification, though not corroborated (p.115-116)

Walker Site No.	Name	Ahupua'a	District	Adjacent Watershed	Description per Walker (1931b)
102	Piilanihale Heiau	West Honoma'ele	Hāna	Honoma'ele Gulch	Platform <i>heiau</i> ; platform measures 340-x-415 ft; several (up to 5) terraces make up the north and east sides, up to 50 ft high; south and east sides enclosed by wall 10 ft high, and 8 to 10 ft thick; paved with small pebbles and lava cobbles; no high internal walls or terraces; two low walls observed in northeast corner and center of platform; scattered coral pieces seen; internal features minimally mapped due to vegetation density; house site observed beyond west wall; evidence of remnant village in cane fields below structure; paved road leading up western slope of <i>heiau</i> , possible extension of the Alaloa (Kihapiilani Trail); Largest <i>heiau</i> on Maui and tallest in the archipelago; name means "Home of Piilani," indicating site as possible royal abode of the Piilani family of Maui chiefs, reigning in the 1500s; on a shoreline hill near Kalahu Point (p. 123)

Hāna, and bore a few distinct features regarding the 'class' of *heiau* documented. Three of the six sites were considered large *heiau* as they each had at least two dimensions near or greater than 100 feet. One of these named Po'oho'olewa Heiau (Walker Site 68) was interpreted as a possible sacrificial *heiau* and had walled exterior dimensions of 300 by 100 ft, with an open court stretching out 200 ft from the structure (Sterling 1998:105). The other two large sites include the Pi'ilani Heiau (Walker Site 67) with its long beachfront terrace and remnant village foundations, and the L-shaped Kauhihale Heiau (Walker Site 77) several kilometers to the southeast (Sterling 1998:103,106). Another *heiau* of interest in this area was Pōhaku o Kāne (Stone of Kāne) Heiau.

Within the modern Hāna District, containing the traditional *moku* (districts) of Hāna and Ko'olau, 11 *heiau* were identified by Walker (1931). Five of the 11 *heiau* were observed to be largely intact, three of which (Walker Sites 93, 95, and 96) were located slightly inland of the coast and were smaller in that they measured less than 50 ft along any single dimension (Sterling 1998). The two remaining structures are of a significantly larger scale as they are roughly two to six times the size of the smaller *heiau*. One of these is the forementioned Pi'ilanihale Heiau (Walker Site 102) in Hāna. The second is the *heiau* at Lanikele (Walker Site 101) with high stacked walls and cobblestone paved exterior, thought by Walker (1931) to be a fortification due to its perch over a canoe landing 150 ft below it on the shoreline (Sterling 1998:115-116).

Many of the structures that Walker (1931) located within the Hāna and Makawao Districts were partially damaged from neglect, agriculture, civil projects, or some combination of the three. Modernity impacted the traditional ceremonial structures in a variety of ways. The *heiau* that were observed intact were largely overgrown and unkempt due to the passage of time and the neglect furnished upon them resulting from native Hawaiians abandoning the old *kapu* religious system with the arrival of missionaries to the Kingdom of Hawai'i in the 1800s. One example of this is Makehau Heiau (Walker Site 97) that was observed largely intact but partially collapsed (Sterling 1998:113). Many of the remaining structures that were either partially intact or missing altogether were unintentionally impacted by the advent of agriculture to the region during the historic period.

Kupaikaa Heiau (Walker Site 73) was partially washed down the hillside it sat upon when the irrigation ditch upslope failed and sent a torrent of agricultural water down the hillside (Sterling 1998:105-106). Haleaka Heiau (Walker Site 100) was largely trampled down into the soil from wandering cattle and pigs grazing in the region (Sterling 1998:115). Some *heiau* were destroyed intentionally, either for use of their materials or to make way for the development of agricultural pursuits. Kaluakilea Heiau (Walker Site 98) was intentionally destroyed while the Koolau Rubber Company was clearing fields for planting (Sterling 1998:114). Oanapele Heiau (Walker Site 71) was demolished in order to harvest its stone for the paving of local roads (Sterling 1998:105). The combined effect of neglect, the passage of time, and heavy handed agricultural clearing have been extremely detrimental to the longevity of most native Hawaiian architecture, and the state of East Maui's *heiau* stand as a physical testament to that damage. This can be further exemplified by the fact that 19 *heiau* could not be located and were assumed destroyed, comprising 48 percent of all know sites recorded between 1909 and 1931.

Of the 39 documented *heiau* sites, only one lies within the License Area. This *heiau* is named Pu'u o Koholā and was presumed to be located within the current Honomanū License Area.

According to Walker (1931), this site was not observed during his survey of Maui Island, thus not much can be said regarding its structure, size, or ceremonial purpose (Sterling 1998:109). Given the wetness of the tropical jungle, the high and steep cliffs of the region, and the propensity for devastating landslides, it is possible that the site of the temple could have been washed out. Another account of this rumored *heiau* comes from Inez Ashdown who places this *heiau* just south of Kaumahina Wayside Park along the *mauka* side of Hāna Highway just west of Honomanū. In *Ke Alaloa o Maui: The Broad Highway of Maui*, Ashdown (1971:54) states:

Where the Kaumahina park is now on land of that name, there stood a big temple and around it and its village grew an abundance of bananas, 'ohia-ai, rice and taro all in and around Punalu and above there to Kolea. Four streams above there form waterfalls over the cliffs and flow into Honomanu Bay. Nuailua stream does not reach far up the slope but it once watered large taro lands in olden times. [(Ashdown 1971:54)

A portion of a U.S. Geological Survey (1992) map of the Ke'anae region (Figure 16) also confirms the same place-name of Pu'u o Kolohā belonging to a local *pu'u* (hill) located south of the Kaumahina Wayside Park in the approximate location that Ashdown (1971:54) describes. Here again we see a *heiau* situated atop a very high promontory near rushing waters typically harnessed for the community that would have resided near such a ceremonial structure. Whether this site was washed down the hill from erosion caused by the nearby falls, was reclaimed by the jungle, or was impacted during the construction of the park remains uncertain. As later adventurers, businessmen, and homesteaders would discover during the ensuing historic period, the high cliffs and jungles of East Maui can hide many difficulties for the would-be explorer.

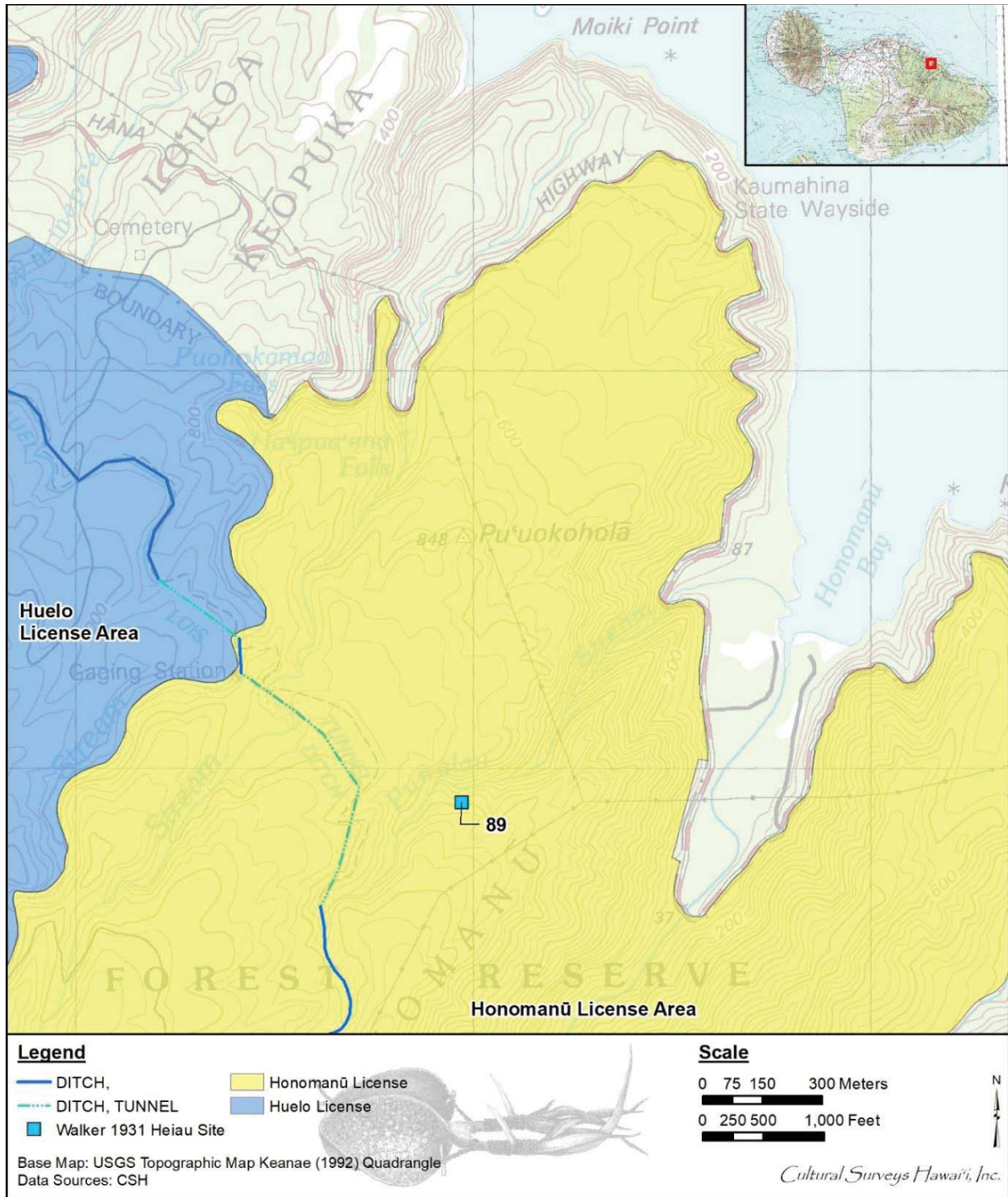


Figure 16. Portion of the 1992 Keanae U.S. Geological Survey 7.5-minute topographic quadrangle series showing the approximate location of Pu'u o Koholā heiau (Walker Site 89), roughly corresponding to the location of Ashdown's unnamed heiau near Kaumahina Wayside Park

4.2 Historic Background of East Maui

4.2.1 Early Historic Period (1778 to Mid-1800s)

With regard to political influence and the course of Hawaiian history, it has been noted that there may have been some rivalry within Ko'olau Moku between the *ahupua'a* of Ke'anae and neighboring Wailuanui. This rivalry, however, would give way to larger political battles concerning the rule of Maui Island and the line of succession between the sons of Pi'ilani (Kamakau 1992:22-29), and later, the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International, Inc. et al. 1995).

Chief Pi'ilani united all of Maui under his rule during the sixteenth or seventeenth century. Pi'ilani's sons Lonopi'ilani and Kiha-a-Pi'ilani fought for control of Maui. Kiha-a-Pi'ilani eventually took refuge at Hāna. While in Hāna, Kiha-a-Pi'ilani took as his wife Koleamoku, who had been betrothed to Lonopi'ilani, which again put the two brothers to warring. Kiha-a-Pi'ilani and his wife Koleamoku fled to Hawai'i Island to enlist the aid of Umi. Umi was married to Pi'ikea, the daughter of Pi'ilani (sister of Lonopi'ilani and Kiha-a-Pi'ilani), a marriage that had formerly brought peace between the islands of Hawai'i and Maui. However, Umi sided with Kiha-a-Pi'ilani and sent an invasion fleet to Hāna. In Hāna, at Ka'uiki, Lonopi'ilani's forces, under the command of Ho'olaemakua, withstood the Hawai'i forces for a while until a nighttime raid overwhelmed them. With this battle Kiha-a-Pi'ilani gained control of Maui.

During the last half of the eighteenth century the battles between Maui and Hawai'i were carried on by the high chiefs Kahekili of Maui and Kalani'ōpu'u of Hawai'i. Kalani'ōpu'u was in control of the Hāna and Kīpahulu areas from ca. 1759 to 1765 when Kahekili won out. However, the Hawai'i forces were able to regain control from ca. 1775 to 1783. With the death of Kalani'ōpu'u in 1782, Kahekili regained control of Hāna, which he retained, though not without further battles with Hawai'i Island forces (i.e., Kamehameha), until his death in 1794. With the death of Kahekili and the assistance of newly acquired foreign power (canons, muskets, men) Kamehameha gained control not only of Maui, but of all the Hawaiian Islands, except Kaua'i, by 1795.

This period also saw the arrival of the first European explorer, Captain James Cook, on his pan-pacific voyage. This occurrence would inevitably lead to the arrival of even more European explorers, merchant vessels, and missionary passengers across all Hawaiian Islands, including Maui. The interactions between Hawaiians and these newly arrived visitors would come to mark the reshaping of traditional land use patterns in Hawai'i toward the islands we see today.

European Explorers

In 1778, when Captain James Cook's ships returned from their North American explorations, they stopped at Hāna and encountered Hawaiians for the first time on board the decks of their ships. This came just before the well-known incident that cost Captain James Cook his life on Hawai'i Island when he attempted to kidnap Kalani'ōpu'u for use as ransom (Cordy 2000:294).

In *Exalted Sits the Chief*, Ross Cordy (2000:294) places Kalani'ōpu'u at this first point of contact between Hawai'i and the West:

Kalani'ōpu'u had regrouped and again invaded Maui ca. 1778-pillaging Kaupō and Kaho'olawe...and raiding and engaging Kahekili's forces in Ko'olau and Hāmākualoa. It was during this campaign when Captain Cook arrived off Maui's Hāmākualoa in November 1778. Kalani'ōpu'u went on board briefly, wearing a helmet with yellow and black feathers and a long feathered cloak. (Cordy 2000:294)

Kalani'ōpu'u and Kamehameha I (then, in the war company of Kalani'ōpu'u) both visited Cook's ships, indicating who controlled the East Maui region.

In December 1788, William Douglas, commanding the British ship, *The Iphigenia*, arrived at Hāna and continued to sail on to the island of Hawai'i where he presented Kamehameha with a swivel cannon. This cannon was mounted on a large double canoe, together with a number of muskets and a quantity of ammunition. In his account of Maui from aboard *The Iphigenia*, Meares (1791:335-336) wrote the following passage:

We had no longer appeared off Mowee than a great number of canoes came off with hogs, yams and plantains.-On this side of the island there is a large town, the residence of Titeeree, the sovereign of Mowee, who was at this time on a visit to Taheo, king of Atooi, in whose absence the government was left to the care of Harwallanee, brother-in-law to Tianna, of whose arrival he was no sooner informed, than he ordered a present of hogs to the ship; but before it arrived Tianna had observed his brother of shore, and having dressed himself in his best apparel, desired that message might be sent to invite him on board.-On his arrival they met as brothers should do after a long separation; the whole of their conduct to each other was affectionate; they melted into tears, and almost drew the same from the eyes of those who held them. After their first emotions had subsided, the chief requested Captain Douglas to remain with him for a few days, and engaged to supply him with any quantity of provisions that might be demanded; but as he saw no place where they could come to an anchor in safety, the surf at the same time beating with great violence, and an heavy swell with the wind blowing in shore, Captian Douglas was under the necessity of declining the invitation. (Meares 1791:335-336)

Battles at Hāmākua Loa and Hāna Districts

Given the state of warfare between Maui and Hawai'i Islands in the late pre-Contact period, there are storied accounts of the actions of passing armies in their disputes over ownership of the resources of East Maui.

4.2.1.1.1 Ke Alaloa O Maui

Kiha-a-Pi'ilani "is credited with finishing the paved road around the island (Ke Alaloa o Maui), which his father (Pi'ilani) had begun" (Griffin 1987:9). The paved roadway was utilized in Hāmākua Loa by a group of missionaries touring Maui in 1828.

...having descended from the summit of Haleakala, they came down to a small village on the Halehaku seashore. On the next day, proceeding toward Hana, they came upon 'a pavement said to have been built by Kihapiilani, a king

contemporary with Umi, an ancient king of Hawaii ... It extends more than 30 miles, and is a work of considerable magnitude. This pavement afforded us no inconsiderable assistance in traveling as we ascended and descended a great number of steep and difficult paries (palis)' ... [Kuykendall 1931:4]

In describing the building of Kiha-a-Pi'ilani's road Beckwith (1970:387) states, "men are said to have stood in line and passed stones from seashore to upland." Once the road was paved however, residents of Hāmākua Loa most likely benefitted from having access to the road and to the people traveling through the district, particularly given its location between Wailuku and Hāna, two prominent political centers during the last two centuries of pre-Contact Hawaiian history.

The Alaloa also served as an instrument of transportation in wartime, which during the last half of the eighteenth century, was very frequent. During these times, the people of Hāmākua Loa and the surrounding districts (between Hāna and Wailuku) who were situated near the war path including canoe landings, the Alaloa and the cultivated and inhabited places in between were subject to plundering by warring chiefs. Kamakau (1992:230) remarks on the impacts of war on the commoners, "wars were frequent in old days and entailed robbery and murder of the common people." Between 1778 and 1779, Kalani'ōpu'u invaded Hāmākua Loa after purportedly being provoked by a resident.

As he was sailing just off Kahakuloa, a certain man was sitting on the crest of Pu'ukoa'e, and as the war canoes came in sight the man made a gesture of contempt ... At Hamakualoa Ka-lani-'opu'u landed and engaged in battle, but Kahekili hastened to the aid of his men, and they put up such a fierce fight that Ka-lani-'opu'u fled to his canoes. Landing at Ko'olau he slew the common people and maltreated the captives by urinating into their eyes. [Kamakau 1992:91]

4.2.1.1.2 *Battle of Kapalipilo*

Kalani'ōpu'u and his forces invaded Maui, taking the districts of Hāna and Kipahulu and the Kau'iki Hill. Kau'iki Hill is also referred to as the "fort of Kau'iki." Kau'iki Hill is a "natural fort and people on it are general safe from assault, being protected on all sides by steep and inaccessible cliffs (Sterling 1998:135)." Several battles were fought, however, Kamehamehanui and the Maui forces attempted and failed to reclaim Kau'iki Hill.

Suddenly, therefore, he [Kalaniopuu] concentrated his forces and war-canoes at Kohala, and, without previous rupture of peace or declaration of war, he invaded Maui, where Kamehamehanui then ruled as Moi, and made a descent in the Hana district. Little or no resistance was offered, and in a short time he possessed himself of the two valuable districts of Hana and Kipahulu, as well as the celebrated fort on Kauwiki Hill overlooking the harbour of Hana. The date of this invasion is approximately, and probably correctly, fixed at 1759.

But Kamehamehanui, though taken by surprise by the invasion of East Maui by Kalaniopuu, was not a man to yield to such a usurpation and affront without an effort to recover the lost districts With these forces Kamehamehanui set out for Hana and laid siege to the fort on Kauwiki. Several battles were fought with the

Hawaii army under Puna, especially at Makaolehua and at Akiala, where the Maui forces were victorious, and in which the valour of Kaohelani is greatly extolled. The fort of Kauwiki, however, withstood all attempts to take it, and, after a prolonged and unsuccessful [sic] siege, Kamehamehanui withdrew his forces, and left Hana in possession of Kalaniopuu, while Puna remained as its governor and chief; and it does not appear that Kamehamehanui again attempted to drive the Hawaiians out of Hana. In the native legends this campaign is called the war of "Kapalipilo". [Fornander 1880, 2:146-147]

4.2.1.1.3 *Kalani 'ōpu 'u Landing on Maui*

In an excerpt from *Account of the Polynesian Race*, Fornander (1880) describes the account of Kalani'ōpu'u landing on Maui to reprovision after a successful military campaign on Lāna'i:

Then, rounding Kahakuloa, he stood to the eastward, and landed at Hamakualoa, on Maui, where he plundered the country, and committed fearful barbarities on the people, until Kahekili came to their support with his forces, and after several encounters, drove Kalaniopuu on board of his fleet. Foiled in Hamakualoa, Kalaniopuu made his next descent in the Koolau district, committing similar depredations and barbarities there. While there, he was joined by Mahihelelima, the Hawaii governor of the adjoining Hana district, with a select force of warriors, and being thus enabled to rally and hold his ground against Kahekili, he again attempted the invasion of Hamakualoa, where the war was protracted, with varying success, for several months. [Fornander 1880:2:157]

4.2.1.1.4 *Landing of the Canoes*

Samuel M. Kamakau provides a passing reference in the context of the fleet of the Big Island chief 'Umi-a-Līloa coming to the aid of the Maui chief Kiha-a-Pi'ilani in his fighting against Lono- a-Pi'ilani and the Hāna chief Ho'olaemakua. The Hāna chief initially repulsed the landings of the Hawai'i Island canoes and 'Umi-a-Līloa asks how best to get his men ashore:

Kiha-a-Pi'ilani answered, "There is a small harbor at Ko'olau called Wailua-iki, and if all the canoes can not land there, there is another landing at Wailua-nui." The blocked canoes turned about and sailed for Wailua-iki at Ko'olau.

When the canoes reached Wailua-iki, they were dismantled and set upright, and in that way the innumerable war canoes from Hawai'i could be beached. After all the canoes were beached the men began to go overland to the site of the battle [at Ulaino well to the southeast] [Kamakau 1961:29-30]

When 'Umi-a-Līloa's fleet arrived in Maui, the canoes were so numerous, the shores between the boundaries of Hāna and Ko'olau were completely filled with canoes.

Also at the place called the surf of Keanini as far as Pueokahi it was choked with the canoes of the Hawaii people, and so it was off Mokuhano and Naniuakane and Kaihalulu. At Aleamai, Haneoo and Hamoa, these places were completely filled with canoes. At Honokalani and at Honomaele and Ulaino, the boundaries of Hana and Koolau, the canoes were thick. The last of the canoes landed on further at Opikoula, Nahiku, Waiohue, Wailuaiki and Wailuanui in Koolau.

When Hoolaemakua saw the numbers of canoes and men, he and his men prepared to fight the men of Hawaii when the Hawaii warriors arranged themselves on the plain of Kuakaha. [Sterling 1998:122]

4.2.1.1.5 *Battle at Puu Koa'e*

Around 1790, Kamehameha and his forces land on Maui at Hāna. After having invaded Hāna, Kamehameha's forces traveled to Hāmākua Loa. Kalanikupule, ruling chief of Maui at the time, sent his warrior Kapakahili to resist the invasion.

When Kalanikupule heard of the landing of Kamehameha at Hana, and that he was marching with his force through the Koolau district, he sent Kapakahili with the best troops he had through the Hamakua districts to meet and resist the progress of the invader. [Fornander 1969:2:236]

The battle met at a small hill called "Bosun-bird Hill" (Pu'ukoa'e) situated on the makai side of Pu'umaile at Hanawana in Hoalua, and Kapakahili was defeated. In the evening Kamehameha beached at Halehaku, went ashore, and built temporary shelters just where he stepped foot. The feather god Kuka'ilimoku encouraged him to fight, for its feathers bristled and stood upright in the direction of Hinawaikoli'i; Kamehameha therefore lost his fear of a fight with slingshot. The next morning he saw through the koa and hala trees the red gleam of feather capes. It is said that he narrowly escaped defeat by Kapakahili's company. But reinforcements came up, Kamehameha put the enemy to flight, and pursued them along the main road or they would have rejoined their fellow warriors at Kokomo. At the ascent of 'Opaepilau, Kapakahili was exhausted and was overtaken. "Slain by Pipili," Kamehameha boasted over him. [Kamakau 1961:148]

Of the campaign in Hamakualoa some momentos are still pointed out. The fortified position at Pu'ukoa'e on Hanawana, which was attacked and taken by Kamehameha, who had brought his fleet round from Hana. The hill is known as "Kapuai-o-Kamehameha," to the west of the Halehaku stream, where he encamped for the night after taking Puukoae ... the Maui forces were routed and fled as far as Kokomo, where a final stand was made. [Fornander 1969:2:236]

4.2.1.1.6 *Battle of Great Canoes*

In 1790, Kamehameha then began to muster his armies for a planned invasion of Maui. That summer, Kamehameha landed at Hāna. In a battle known as "Kaua o Kawa'anui," (Battle of Great Canoes) Kamehameha defeated the Maui advance guard there, after which he sailed for Hāmākua Loa, sweeping the remaining Maui defenders along the coast and back into 'Īao Valley, and annihilating them at the battle called "Kaua i Kapaniwai o 'Īao," (Battle of the Dammed Water of 'Īao), during which the slain warriors were said to have been so numerous, that they dammed the water of 'Īao Stream. Kamehameha then returned to Hawai'i to settle disputes there. In his absence, both Kahekili and the High Chief of Kaua'i, Ka'eo kūlani formed an alliance to retake Hāna. After that success, both chiefs launched an attack on Kamehameha at Waipi'o on Hawai'i, where they were both defeated. After the death of Kahekili in 1793, Kamehameha assumed the rule over all of Maui, through his victory over the High Chief

Kahekili's successor, the High Chief Kalanikūpule, in the battle of Nuʻuanu on Oʻahu in 1795 (McGregor 2007:99).

Missionaries

Evidence of a cohesive religious population in East Maui is best described by the first Europeans to visit Keʻanae. From the journal of William Richards (1829) comes information that the region between Honomanū and Wailua was densely populated:

We went on board the canoe, and rowed a few miles, avoiding some difficult *paries* [steep cliffs]. After landing, we walked a few miles further, to Wailua, where we put up for the Sabbath. Very early the morning [of the Sabbath], the horns, summoning the people to the house of God, were heard in every direction; and we soon perceived that the call had not been heard with indifference. At the early hour, the house was thronged with attentive worshippers. [The next day] we examined the schools, which were large. About 10 o'clock, A.M., the princess [Nahienaena] arrived, and addressed the people; after which, we proceeded on our way [to Hāna]. [(Richards et al. 1829:249)

The Hāna region of Maui was known as “one of the most isolated places in these islands, remote and difficult to access” (Bishop 1861). Because of the many treacherous ravines and unpredictable flooding, Native Hawaiians usually rode on horseback to a point before Keʻanae, then completed the journey to Hāna by canoe. Before the establishment of the Hāna protestant mission in 1837, missionaries reached East Maui no more than once or twice a year. From the early writings of the protestant missionaries in the Sandwich Islands, it appears that the first excursion to Hāna by an American protestant teacher was made in 1823. In regards to this, Richards and Stewart (1825:141) in *The Missionary Herald* write:

...A similar adventure is related by Honorii [Native assistant to the missionaries], in a late visit to the eastern part of the island of Mowee, whither he went in the company of Keoua, wife of Governor Adams. That part of the island [Hāna] had never been visited by missionaries, and Honorii took occasion to preach to them Jesus Christ. He found them wholly uninstructed, and exceedingly attached to their idols, and disposed to resist every argument in favor of a change in their religion. Before he left the place, he ascended a neighboring hill which overhangs the sea on the top of which were several huge stones erected, covered with tapa (native cloth), and dignified with the appellation of gods. With the aid of some of his company, he succeeded in displacing them from their beds, and rolled them into the sea. (Richards and Stewart 1825:141)

The Protestant mission station of Hāna was administered in its early days by the Reverend Mark Ives and his wife, Mary Ann Brainerd Ives. The Ives were protestant missionaries who had both arrived from New England in 1836 (Judd et al. 1969:122). The Ives were joined by the Reverend Daniel Toll Conde and his wife Mrs. Andelucia Lee Conde, who were stationed in Hāna following their arrival in 1838 (Judd et al. 1969:72). The isolated missionary station of Hāna was serviced by the 39 ton schooner *Missionary Packet* which had been built in 1825 at

Salem, Massachusetts, for use between the Hawaiian Islands, as well as other schooners and steamships (Mifflin 1983:19).

4.2.1.1.7 Catholic Missionaries and the Pa'akaula of 1843

Protestant missionaries, having a strong presence in Hawai'i by the early 1800s, had almost exclusive claims to managing the salvation of its inhabitants, but the Catholic Church was soon to follow its protestant fellows to Maui's shores. Catholic missionaries had found a favorable foothold with a few courtiers of Kamehameha III just a year after he passed the Edict of Toleration in 1839. This Edict allowed religious freedom for all inhabitants of the Kingdom of Hawai'i. Six years later, the first Catholic missionaries arrived in the busy whaling town of Lahaina and found themselves amid a population receptive to their teachings, despite the fact that many of the *ali'i*, the protestant missionaries, and the Queen Regent Ka'ahumanu were outwardly opposed to their presence on Maui (Speakman 1978:87-88). The earliest Maui converts to the recently arrived faith were two brothers, Helio and Petero Kaeloa from Wailuku (Schoofs 1978:291). The next generation of catechist converts were soon to follow, especially Helio Kaiwiloa who passionately converted from the fold of the Protestant Church into Catholicism. Helio Kaiwiloa had left East Maui to be officially baptized, shortly before returning to Maui to travel the East Maui districts preaching the Roman Catholic faith (Speakman 1978:87-88).

Helio Kaiwiloa's influence was significant during his lifetime spent preaching in remote East Maui. Robert Schoofs (1978:257) in his *Pioneers of the Faith* describes Helio:

Kaiwiloa assiduously studied his Christian doctrine and shared his knowledge with others. Going from house to house in Kahikinui he was not a little surprised to find many catechumens. He gathered them in a little chapel, where they said their prayers together and took part in the instructions. Kaiwiloa covered several adjacent villages, displaying great zeal in propagating the faith. (Schoofs 1978:257)

The increase in the number of catechumens acquired by Catholics in the Hāna district became a point of concern for Protestant missionaries, and in 1843 they prevailed upon Judge Mahune of Wailuku to send policemen to investigate the activities of Catholics and catechumen, arrest them, and transport them to Wailuku to stand trial. The charges were simple, that Kaiwiloa had gathered the catechumen once weekly in his private home for the purpose of practicing communal prayer. Perhaps perceived as a type of conspiracy, it was deemed unlawful and ordered to be stopped (Schoofs 1978:260).

Eventually, the Wailuku police made it to remote East Maui to begin the arrests. In one of the first villages they reached they arrested a half-dozen Catholics and moved onto the next village, gathering a few more of the faithful at every stop along the long road back to Wailuku (Schoofs 1978:260). All along the way additional arrests were tied together to manage the ever increasing crowd of offenders, this is why the procession was named the *pa'akaula* (sometimes *pakaula*), or the "tying, binding with ropes" (Speakman 1978:88). Schoofs (1978:260) then relates the impressive display of solidarity that followed:

The catechumen of Maui had agreed on the following line of conduct. If any Catholic or catechumen were arrested for any crime other than for his religion, nobody would take an interest in the case. But if, however, anyone were arrested for religion's sake, all would declare their solidarity and voluntarily join the arrested one.

This is precisely what was done. Going eastward, the ever increasing band passed through Kaupo and Kipahulu, and continued the journey along the north coast of the island until they reached Wailuku. A striking feature of this procession was that the prisoners were dressed in their Sunday best and were wearing gay floral wreaths. (Schoofs 1978:260)

This large display crossed every major *moku* on their way into Wailuku to stand trial, allowing the procession to preach as they travelled through Hāna, Nāhiku, Ke'anae, Kailua, Ha'ikū, and Pā'ia (Speakman 1978:87). The entire distance travelled by the officers and their prisoners covered close to 90 miles of difficult terrain over the course of a month. There were also periodic rests along the way which afforded the persecuted Catholics time to speak with the inhabitants at their brief respites and proselytize, gathering more catechumen into their fold as they proceeded (Schoofs 1978:260).

By the time that the procession had reached Wailuku for their trial the crowd was too massive for the courts to handle. Seeing the size of the crowd containing the Catholics and their sympathizers, Judge Mahune bid all the participants to "go home" and dismissed the charges against the Catholics (Schoofs 1978:260). Helio and his catechumen had prevailed against the persecution perpetrated by Protestant influences entrenched in Maui. An unexpected benefit of this persecution was that the number of catechumen on Maui had nearly tripled during the ordeal, bringing the count near a thousand adherents. The faithful Catholics then walked the long road back to their homes lead by Helio Kaiwiloa, spreading their faith along the way (Speakman 1978:88). Although religious ideas were developing at a rapid pace in the Hawaiian Islands after European contact, another major change was simultaneously taking place surrounding the relationship of Native Hawaiians to the land they inhabited for generations immemorial, The Māhele.

4.2.2 The Māhele and Kuleana Act

The most significant change in land-use in the Hawaiian Archipelago came with The Māhele of 1848 which brought about the privatization of land in Hawai'i. The word *māhele* meaning literally "to divide, cut, partition" (Pukui and Elbert 1986:219), hastened the shift of the Hawaiian economy from that of a subsistence based economy to that of a market based economy. During The Māhele, all of the lands in the kingdom of Hawai'i were divided between *mo'i* (king), *ali'i* (chief/ruler), *konohiki* (land manager), and *maka'āinana* (tenants of the land) marking passage into the Western land tenure model of private ownership. On 8 March 1848, Kamehameha III further divided his personal (*mō'ī*) holdings into lands he would retain as private holdings and parcels he would give to the newly budding Hawaiian Government in trust. This act paved the way for government land sales to foreigners as a source of funding for government operations, and in 1850, the legislature granted resident aliens the right to acquire fee simple land rights (Moffat and Fitzpatrick 1995:41-51).

Native Hawaiians who desired to claim the land on which their families had historically worked and resided were required to present testimony before the Board of Commissioners to Quiet Land Titles. Upon acceptance of a claim the Board granted a Land Commission Award (LCA) to the successful applicant. The awardee was then required to pay, in cash, an amount equal to one-third of the total market value of the awarded parcel as a commutation fee. If this payment could not be made in cash, an acceptable substitute was to cede the one-third of the awarded parcel to the government as payment for the commutation fee (Chinen 1958:13).

By 1850 portions of *mō'ī*, *ali'i*, *konohiki* and government LCAs were being sold to help pay commutation fees owed by their awardees and for simple cash profits from selling so-called unused land. As these lands belonging to Hawaiian elites had historically been cultivated by the *maka'āinana* in pre-Contact times, when the lands were being sold many tenant farmers were being inadvertently dispossessed of their homes and arable plots that lied within the sold portions of land. In acknowledgment of this dispossession, the Board passed resolutions authored by the Privy Council through the legislature in 1850 that aided in the protection of the rights of tenant farmers whose homes and plots were essentially owned by overarching LCA awardees (who may have owned the entire *ahupua'a* or *'ili* in which the plots were located). The plots awarded to tenant farmers in this fashion were termed *kuleana* lands, or simply *kuleana* (*kuleana* meaning "right, privilege, responsibility") (Chinen 1958:29-31; Pukui and Elbert 1986:179). Under this type of land acquisition, claimants were required to produce accurate surveys of the claimed plots, and to have these claims scrutinized by the Board to ensure that claimants were not attempting to acquire waste-lands or additional arable lands with "the seeming intention of enlarging their lots" (Chinen 1958:30). Upon completion of this process, Chinen (1958:30) states that:

The native tenants were awarded their *kuleanas* free of commutation. The owner of the *ahupua'a* or *'ili kupono*, out of which the individual *kuleanas* were taken, was deemed responsible for the settlement of the whole government commutation... Though other lands escheated to the government upon the death of an owner without an heir, the *kuleanas* escheated to the owner of the *ahupua'a* or *'ili kupono* within which it was located. (Chinen 1958:30)

This change in escheating was because the overarching LCA owner was deemed to have "reversionary interest" in the parcels due to having been responsible for its commutation fee to the government (Chinen 1958:30). This reclamation of *kuleana* land would later come to have repercussions across large tracts of land as Western disease continued to run rampant in Hawaiian populations, and as people drifted toward more populous city centers, leaving many *kuleanas* abandoned and heirless. Patrick Kirch drives at the inevitable conclusion of the escheating of these lands in a time of Western economic expansion by stating that "By the 1870s, vast tracts of lands had been acquired by an expanding class of white sugar planters. Mostly of American origin..." (Kirch 2012:287). Similar acquisitions in the name of commerce were also being carried out in leeward ranching lands where abandoned and heirless *kuleanas* also existed.

Kuleana claims could be made for nearly any resource procuring activity from agricultural plots, to fishing grounds, to rights to harvest naturally existing vegetation, to naturally existing and artificially channeled water sources. Within the Māhele records for the four license areas (Figure 17 through Figure 20) there are claims for terrestrial agricultural features such as *lo'i*,

pākanu (garden, planting enclosure), *'auwai* (artificial irrigation canals, used to feed *lo'i*), *kula* (fields, open pasture), *pali* (cliff, precipice, or steep hill suitable for cultivation of select plants), *kīhāpai* (small cultivated patch or orchard), *mo'o* (ridge for similar purpose as *pali*), and *pō'alima* (small agricultural patches tended in traditional times solely for chiefly tribute) (Pukui and Elbert 1986:147,178,305,312,334). There are also *kuleana* claimed for their naturally occurring vegetation and the right of tenants to collect these resources, such as *'ie* (aerial roots of the *'ie'ie* vine, used in plaiting, basketry, and wicker weaving), *olonā* (shrub with fibrous bark used in fishnets, baskets, and to construct *tī* leaf raincoats and capes), *wauke* (paper mulberry used in making *tapa* cloth), *hala* (pandanus tree) and wildy occurring *kalo* (taro) and sweet potato (Pukui and Elbert 1986:50,94,256,286). Lastly are the *kuleana* claims over aquatic resources such as off-shore fisheries (documented as "sea" in LCA awards) and *muliwai* (river mouth, freshwater pool behind a shoreline sand bar) that are naturally occurring and not man made (Pukui and Elbert 1986:256).

Kuleana claims were slightly more complicated in that many of these claims were made to lands within several *ahupua'a* or *'ili kupono* that lie in neighboring land divisions. These claims were documented, in their entirety, within the individual Māhele books for different land divisions. This means that often multiple separate claims to any one person will be duplicated within the record books of different land sections, though the parcels comprising the entirety of the claim are distributed among several larger land divisions distant to each other. Resulting from this process the entire contents of *kuleana* claims will be fully enumerated in its respective table, though only a portion of an individual's *kuleana* claim may be present in the accompanying map for the specific license area. LCAs documented within the four license areas are displayed below in Figure 17 through Figure 20 and listed in Table 4 through Table 7.

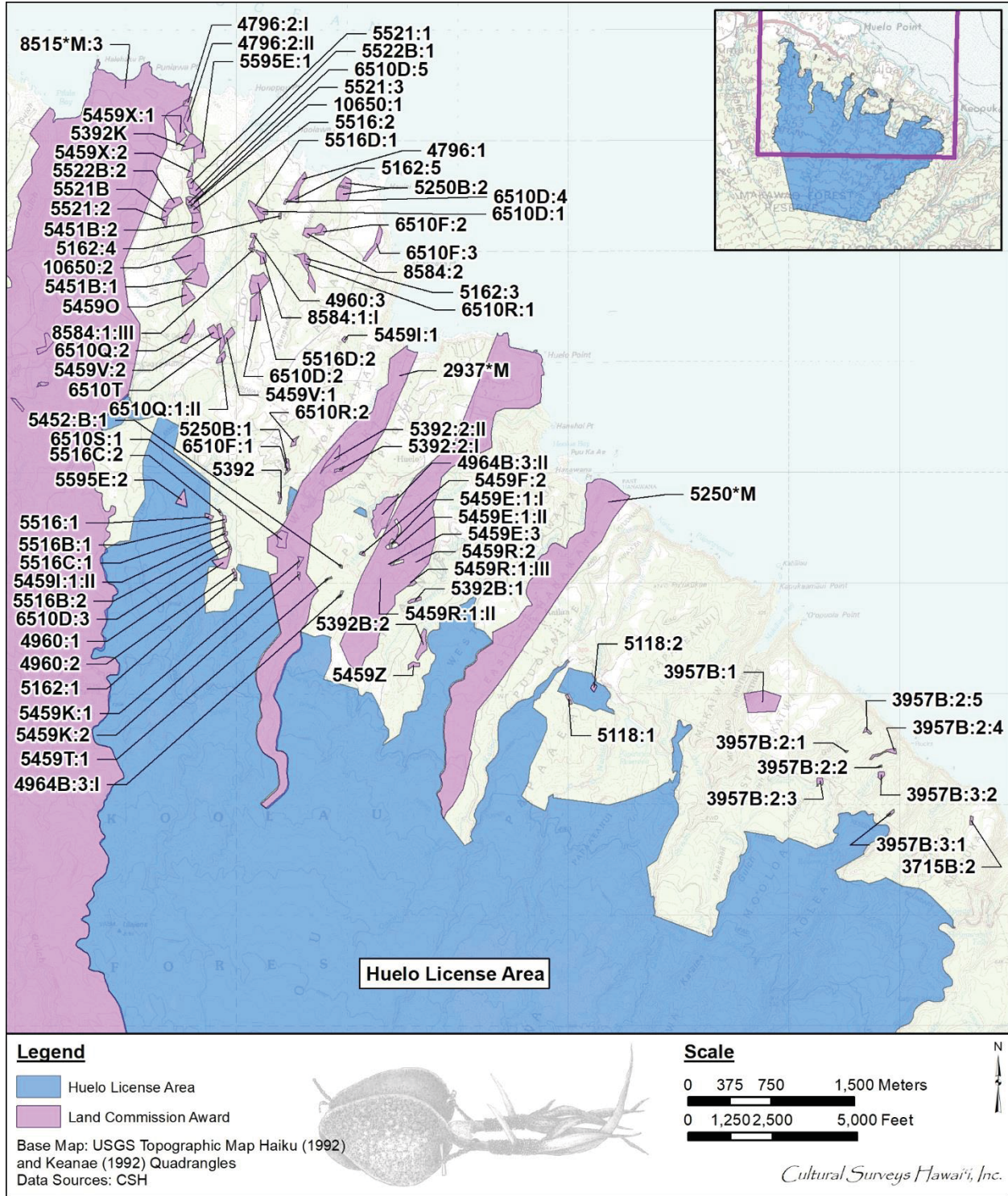


Figure 17. LCAs within and in proximity to the Huelo License Area (U.S. Geological Survey 1992a, c)

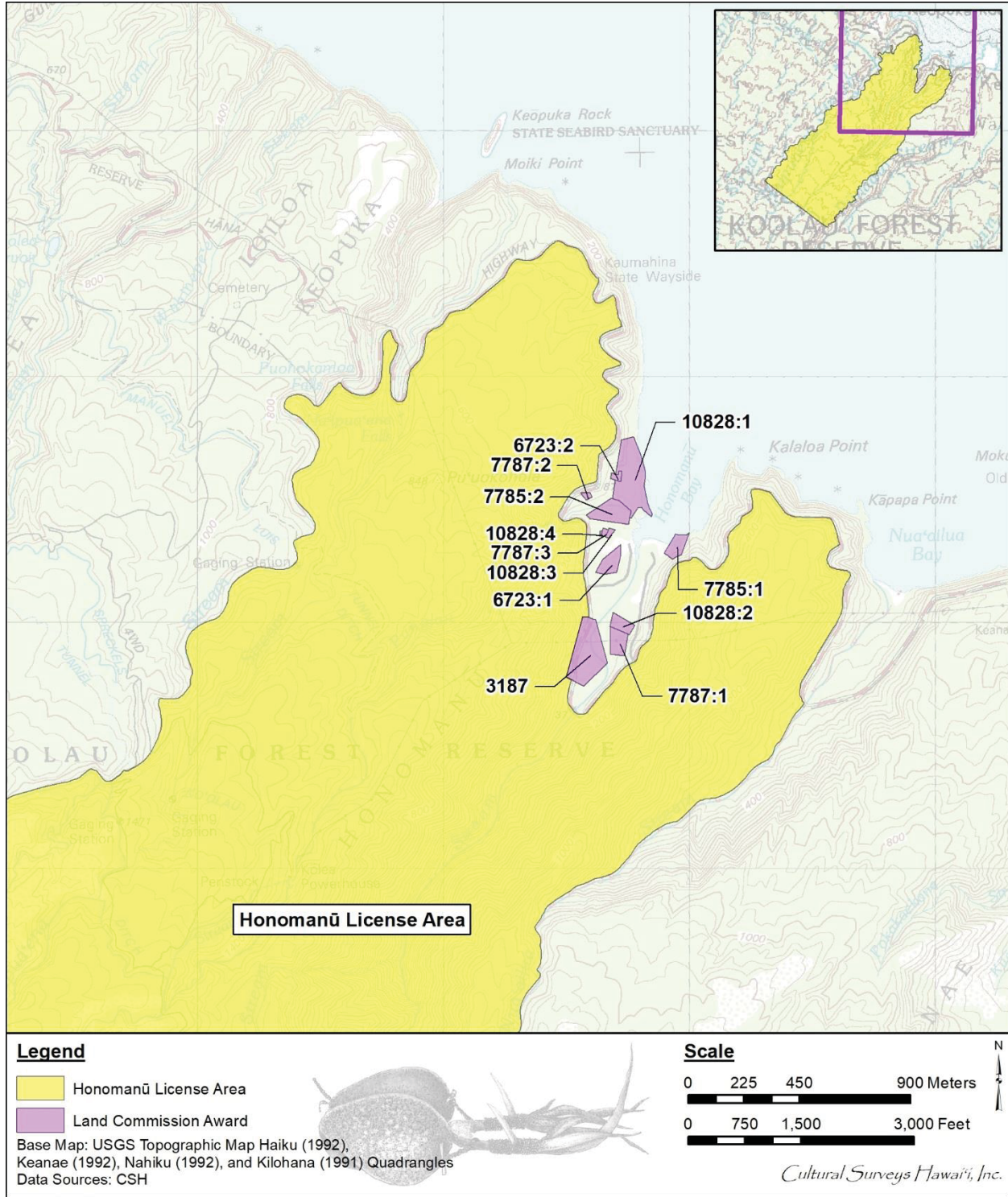


Figure 18. LCAs within and in proximity to the Honomanū License Area (U.S. Geological Survey 1991, 1992a, c, d)

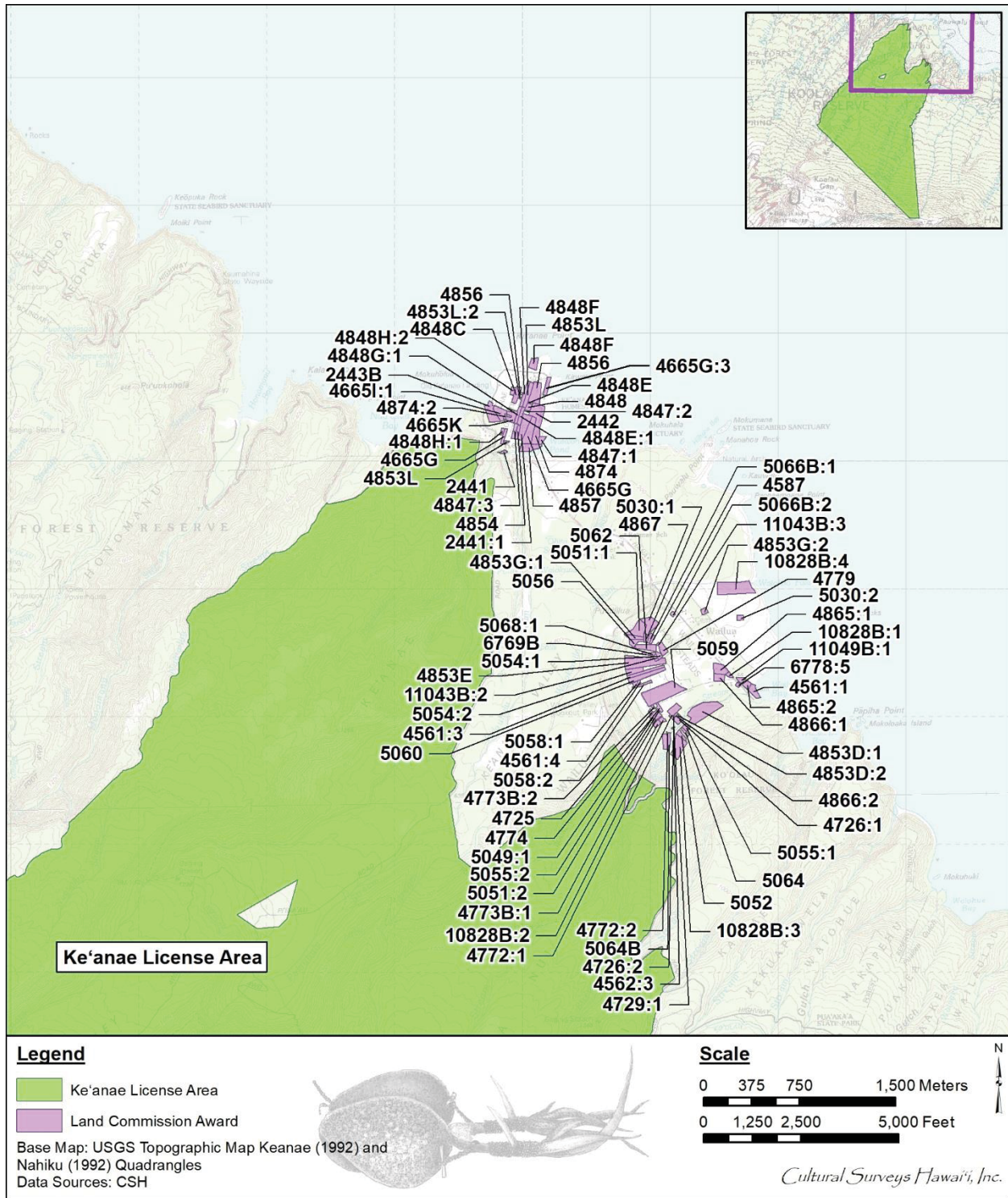


Figure 19. LCAs in proximity to the Ke'anae License Area (U.S. Geological Survey 1992c, d)

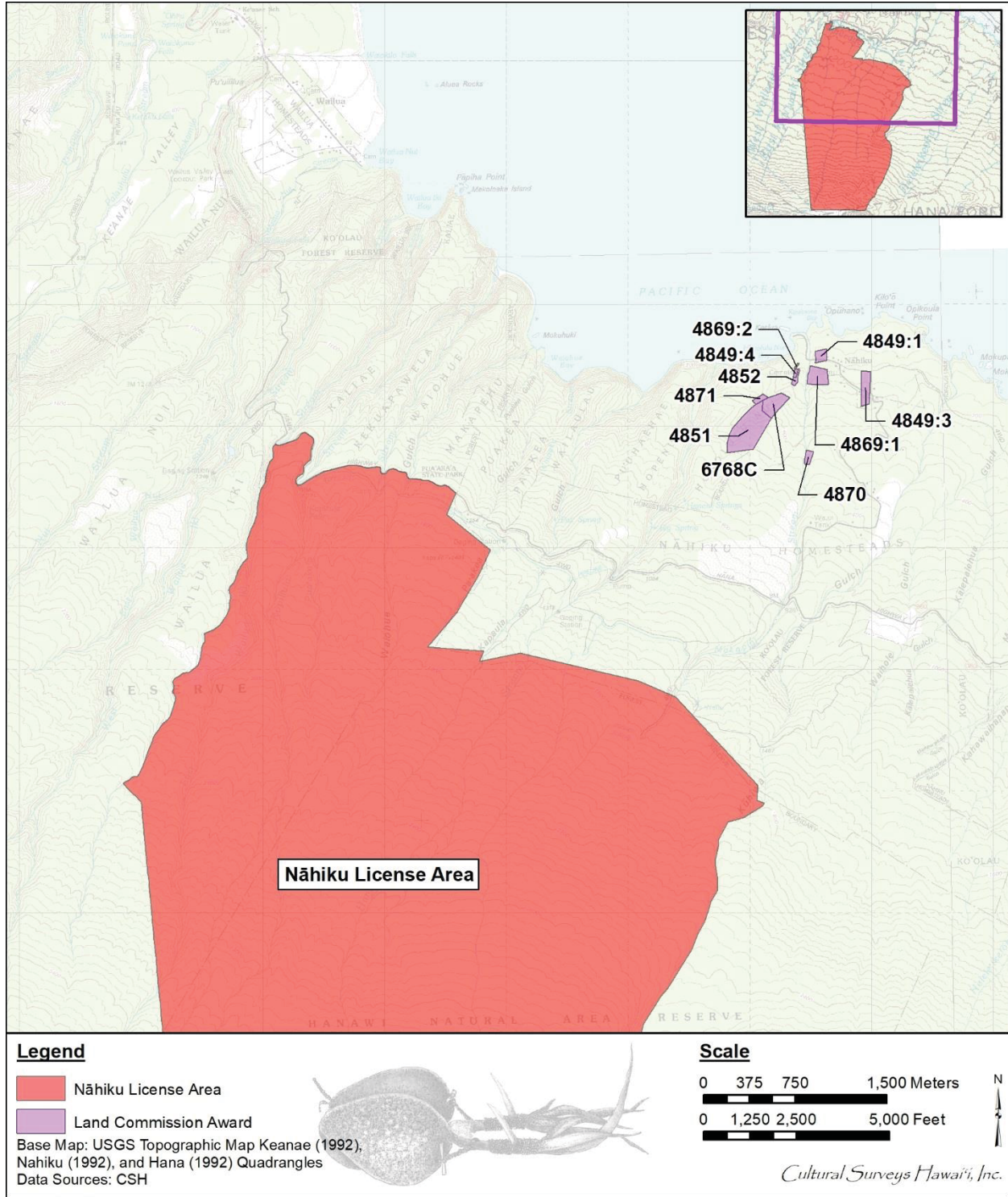


Figure 20. LCAs in proximity to the Nāhiku License Area (U.S. Geological Survey 1992b, c, d)

Table 4. LCAs within and in proximity to the Huelo License Area (Waihona 'Aina 2002)

LCA #	Claimant	'Ili	Land Use
2937M	Harbottle, William	NA	Possible residence and the sea
3715B	Kekuahani	Keopuka, Loiloa	Two <i>lo 'i</i> , <i>kula</i> , sea shore, <i>pali</i> , an <i>olonā</i> pasture, and government road
3957B	Keuoho, Luka	Punalu'u	Two <i>kīhāpai/pākanu, pali</i> , and a stream
4796	Kealoha	Waikakulu, Paniawa, Punahale	Three <i>lo 'i</i> , two <i>kula</i> , three <i>kīhāpai</i> , sea shore, and two <i>pali</i>
4960	Kapahu	Halepohaku, Kahauiki, Kahikiloa	Four <i>lo 'i</i> , two <i>kula, pali</i> and a stream
4964B	Kaiewe Kamakau II	Kapalaoa, Kauulu, Wailaahili, Waialaea	One house lot, a government road, a road, <i>pali</i> , and the sea
5118	Kaualeleiki	Papaaea, Ha'ikū, Hanawana	Five <i>lo 'i</i> , a house lot, two <i>kula, pali</i> , government road, two streams, and <i>wauke</i>
5162	Kamohai	Haniapuaa, Halelua, Kahakona, Waikakulu	Five <i>lo 'i</i> , a <i>kula</i> , a <i>pali</i> , and sea shore
5250B	Uheke	Keaweula, Paomai	One <i>lo 'i</i> , a <i>kula</i> , a <i>pali</i> , and sea shore
5250*M	Kanui	Kawahae, Keahou	Two <i>lo 'i</i> , a <i>kula</i> , a <i>pali</i> , three <i>pō 'ālima</i> , and a stream
5392	Huluhulu	Puolua, Hanehoi, Waipi'o	Two <i>pali</i> , a stream, and sea shore
5392B	Kawahine	Popopanui, Nuukele	Three <i>lo 'i</i> , three <i>pō 'ālima</i> , two <i>pali</i> , and a <i>kula</i>
5392K	Makahikipuni	Kapapaanae	One <i>lo 'i</i> , a <i>pō 'ālima</i> , a stream, and a <i>pali</i>
5451B	Palea	Kahauiki, Ulukaa	25 <i>lo 'i</i> , four potato <i>mo 'o</i> , 'ie, three <i>pō 'ālima</i> , a stream, a <i>pali</i> , and a road to the sea
5452	Pia	Mauluku	19 <i>lo 'i</i> , five potato <i>mo 'o</i> , a house lot, and <i>wauke</i>
5459E	Kuluwaimakalani	Makauke, Hanehoi	Two <i>lo 'i</i> , two <i>kula</i> , a <i>pō 'ālima</i> , and a <i>pali</i>
5459F	kaahaiea	Palau, Ohia	Three <i>lo 'i</i> , two <i>kula</i> , a <i>pō 'ālima, pali</i> , and <i>olonā</i>
5459K	Kamaau	Waipi'o, Holawa, Mokupapa	Two <i>lo 'i</i> and <i>pali</i>

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TMKs: Various

LCA #	Claimant	'Ili	Land Use
5459I	Pohina	Ohia, Opae	Three <i>lo 'i</i> , a <i>kula</i> , <i>pali</i> , a stream, sea shore, and a government road
5459O	Hewahewa	Papuaa, Pohaku	One <i>lo 'i</i> , a <i>pali</i> , a stream, and a road
5459R	Pahia	Kahuku, Pulehu	Two <i>lo 'i</i> and one <i>pō 'alima</i>
5459T	Lalahili	Ohia, Kawahapuluhua	One <i>lo 'i</i> , a <i>kula</i> , a house lot, and a <i>pō 'alima</i>
5459V	Kaliki	Kuamoohua	One <i>lo 'i</i> , a <i>kula</i> , and two <i>pō 'alima</i>
5459X	Imihia	Kaalukanu, Papamuku, Puniawa	Four <i>lo 'i</i> , a <i>kula</i> , potatoes, three <i>pō 'alima</i> , a stream, the sea, and a <i>pali</i>
5459Z	Kaleo	Mohala	One <i>lo 'i</i> , a <i>kula</i> , and a <i>pō 'alima</i>
5516	Hillawe	Kaloiki, Kamania	Two <i>lo 'i</i> , a <i>kula</i> , two <i>pō 'alima</i> , a stream, and a <i>pali</i>
5516B	Mua	Kuahanahana	Two <i>lo 'i</i> , a <i>kula</i> , and a <i>pali</i>
5516C	Kaio	Halenoni	One <i>lo 'i</i> , a <i>pali</i> , and a stream
5516D	Naoopu	Kuahanahana	Two <i>lo 'i</i> , two <i>kula</i> , a stream, and a <i>pali</i>
5521	Nakaikuaana	Halaula, Kamania, Kapahi	Four <i>lo 'i</i> , four <i>kula</i> , a stream, a <i>pali</i> , and shattered <i>koa</i>
5521B	Kanewaa	Halaula	One <i>lo 'i</i> and a <i>kula</i>
5522B	Kaopu	Halaula, Papamuku	One <i>lo 'i</i> , a <i>kula</i> , a <i>pō 'alima</i> , a <i>pali</i> , and a stream
5595E	Kepaa	Hunananiho	27 <i>lo 'i</i> , a stream, freshwater shrimp, two <i>pō 'alima</i> , and seven <i>koa</i> trees
6510D	Manoa	Kauhamao, Waikakulu, Halumaumau, Kahikiloa, Kamania	Five <i>lo 'i</i> , a house lot, three <i>pō 'alima</i> , and two <i>pali</i>
6510F	Hanauwaha	Puukoapu, Maoli, Kauhiulu, Pukuhale, Waikakulu	Five <i>lo 'i</i> , four <i>kula</i> , a <i>pō 'alima</i> , and two <i>pali</i>
6510Q	Kawaha	Kalanikahuli, Waiohiwa, Kalualaea	Three <i>lo 'i</i> , <i>kula</i> , and <i>pali</i>

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TMKs: Various

LCA #	Claimant	'Ili	Land Use
6510R	Naone	Kauhiulu, Lapo	Two <i>lo 'i</i> , a <i>kula</i> , a <i>pali</i> , and a stream
6510S	Makue	Lui, Panau, Haliimaumau, Waikakulu	Four <i>lo 'i</i> , a <i>kula</i> , a <i>pō'ālima</i> , a stream, and a <i>pali</i>
6510T	Kuewa	Waiohiwa	One <i>lo 'i</i> , a <i>kula</i> , a <i>pali</i> , and a stream
8515*M	Keoni Ana/John Young, Jr	Owa, Puako, Haleu, Halehaku, Holili	No details for Halehaku LCA
8584	Keoho	Kahaniki, Kahakona, Waikakuhe, Kaiui, Kaluaalaea, Ukulei	14 <i>lo 'i</i> , <i>kula</i> , sweet potatoes, 'ulu, two 'ōhi'ā trees, <i>moku mau 'u</i> , two <i>pali</i> , three streams, and shattered <i>koa</i>
10650	Pia	Kamania, Uohale, Ulukee, Puniana, Kawaipaa	Five <i>lo 'i</i> , a <i>kula</i> , sweet potatoes, two <i>pali</i> , <i>wauke</i> , a gobey fish stream, forest, and a road to the mountains.

Table 5. LCAs within and in proximity to the Honomanū License Area (Waihona 'Aina 2002)

LCA #	Claimant	'Ili	Land Use
3187	Kekio, Z.	Kekia, Keehue	<i>Kalo</i> patch, stream, and <i>pali</i>
6723	Malaiula	Palawai, Niulii	One <i>kīhāpai</i> , <i>lo 'i</i> , and a stream
7785	Kinolau	Halelaau	A <i>pali</i> and a stream
7787	Wahine	Kanaha	Six <i>lo 'i</i> , <i>pali</i> , and stream
10828	Palaile	Niulii, Okuhekuhe, Halelaau	Nine <i>lo 'i</i> , <i>pali</i> , 'auwai, and a fish pond

Table 6. LCAs in proximity to the Ke'anae License Area (Waihona 'Aina 2002)

LCA #	Claimant	'Ili	Land Use
2441	Kealina, Tito	Lalaola, Kuoo, Pahoa	19 <i>lo 'i</i> , a <i>kula</i> , forest, <i>olonā</i> , two house lots, 'auwai, and stream

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TMKs: Various

LCA #	Claimant	'Ili	Land Use
2442	Kaea	Analoa, Kiapu	Six <i>lo 'i</i> , a <i>kula</i> , forest, <i>hala</i> grove, and a stream
2443B	Kanehaku, I	Kanemakue	Two <i>lo 'i</i> , a pond, a <i>kula</i> , forest, <i>olonā</i> , the sea, a stream, and a <i>pali</i>
4561	Wahinemaikai	N/A	Two <i>lo 'i</i> , <i>pali</i> , government road, ' <i>auwai</i> , and stream
4562	Wailaahia	Kaakee, Maulu, Palolena, Paula	13 <i>lo 'i</i> , <i>pali</i> , stream, and a house lot
4587	Hoonoho	N/A	12 <i>lo 'i</i> , one <i>kula</i> , and a house lot
4665G	Ehu	Kalihi, Pahoa, Kukuiohoko	17 <i>lo 'i</i> , a house lot, <i>pali</i> , stream, the sea, and <i>olonā</i>
4665K	Kanuku	Panaewa, Kuoo, Makaiwa	One house lot, the sea, <i>olonā</i> , stream, and <i>pali</i>
4665I	Kauakahi/Kanakahi	N/A	Three <i>lo 'i</i> , a <i>pali</i> , stream, and <i>olonā</i>
4725	Moo	Paakamaka	Nine <i>lo 'i</i> and a <i>kula</i>
4726	Makaole	Paulae, Kaonohikaa, Pohonui, Pohoiki	23 <i>lo 'i</i> , two <i>kula</i> , streams, the sea, <i>olonā</i> , a path/road
4729	Moo II	Makuku, Paulae, Palolena, Maulu	Eight <i>lo 'i</i> , a house lot, and stream
4772	Naiwi	Makaku, Waieli, Waikani, Maulu, Keononalu, Kalimapuhi, Kaahu	Nine <i>lo 'i</i> , a path/road, a stream, and a <i>pali</i>
4773B	Nakihei	Kalimapuhi, Paakamaka	Ten <i>lo 'i</i> , an ' <i>auwai</i> , a stream, and a <i>pali</i>
4774	Nalimanui	Kealia	Residence and a <i>pali</i>
4779	Naiapea	Keononalu	18 <i>lo 'i</i> , <i>kula</i> , and <i>kīhāpai</i>
4847	Malaelua	Kuoo, Paehala	11 <i>lo 'i</i> , a house lot, <i>pali</i> , the sea, a foot path, and ' <i>auwai</i>
4848	Kuluhiwa	Ololokeahi, Pīlanolipi, Ohia	Nine <i>lo 'i</i> , a <i>kula</i> , stream, and <i>pali</i>
4848C	Keiiaea	Kuoliolio	One house lot, a <i>kula</i> , and a <i>pali</i>
4848E	Maewaewa 2	Lalaola, Ololokeahi	One <i>lo 'i</i> and a house lot
4848F	Maewaewa 1	Kekaele & Kukuioolono, Kehaele	The sea

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TMKs: Various

Table 7. LCAs in proximity to the Nāhiku License Area (Waihona 'Aina 2002)

LCA #	Claimant	'Ili	Land Use
4561	Wahinemaikai	N/A	Two <i>lo 'i, pali</i> , government road, ' <i>auwai</i> , and stream
4849	Kalohelau, wahine	Kahoomanamana, Koakumanamoana	Three <i>lo 'i</i> , one <i>kula</i> , a house lot, road, a foot path, a pig pen, a stream and <i>pali</i>
4851	Aoao	Kahooana	A stream
4852	Uwaua	Kawiwi	Possible residence and a stream
4869	Kaumoki/Kaomoai ki	Kaohe, Kaohipoka	One house lot and a <i>pali</i>
4870	Kealiiokekanaka	Waawaa, Haawaa, Waikupo	Four <i>lo 'i</i> , a pig pen, stream, ' <i>auwai, olonā</i> , forest, and <i>pali</i>
4871	Kalahie	Olopana	Stream, forest, and the sea
6768C	Naholo	Ihuhinui	A house lot, <i>lo 'i</i> , road, stream, <i>pali</i> , and beach

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TMKs: Various

4.2.3 Mid- to Late 1800s

The foundation for private land ownership set by the Māhele of 1848 began a very marked pace of development across the entire archipelago, and Maui was no exception to the age of Western development that was about to dawn across the island. The Māhele enabled many foreigners and foreign nationals to acquire land for the establishment of ranching and plantation operations, including the infrastructure projects that were aimed at supporting these land-intensive industries (aqueducts, roads, etc.). All of this was happening alongside civic development in the more populated areas as the Hawaiian economy grew, a growth funded in part by the government land sales to foreigners. Additionally, many foreign nationals who relocated to Maui to work were enabled to acquire their own homestead lands, and thus establish themselves and future generations on the island, increasing the ethnic and cultural diversity of Maui. Though these changes would signify a new period of economic growth for the Kingdom of Hawai'i as a whole, the pace of development would continue to impact the social and environmental landscape of East Maui.

Disease in East Maui

One of the earliest impacts of European contact on Native Hawaiians was the spread of Old World diseases into island populations. With the arrival of Captain Cook in the late 1770s came the initial introduction of venereal disease and possibly respiratory ailments (Kirch 2012:158). Kirch also suggests that venereal disease is often overlooked in disease impact studies since it does not usually kill its victim “although its effects on a population with no prior exposure may have been more severe than usual” (Kirch 2012:158). Resulting from the introduction of venereal disease, the birthrate very likely plummeted because of the severe effects of disease on women’s reproductive organs who have never been exposed to them. The number of rampant diseases was to increase steadily alongside the number of traders, merchants, and visitors arriving from distant shores. To this effect Kirch (2012:158) observes:

Later ships brought even more virulent diseases: dysentery, measles, tuberculosis, smallpox, and leprosy. Before Cook the islands were free of all these old-world scourges; consequently, Hawaiian bodies did not have antibodies or resistance against them. As we now know, such ‘virgin soil’ epidemics can have devastating effects on indigenous populations. (Kirch 2012:158)

Although there is serious debate about the actual count of the Hawaiian population at first contact with Europeans, making an exact figure for the depopulation of Hawaiians by disease difficult to grasp, the known effects of the introduction of foreign disease make a population reduction from 500,000 in 1779 to 130,000 fifty years later seem feasible (Kirch 2012:158). Given the histories of European contact in other previously unexposed locations it is likely that morbidity can account for much of the decline. Though early mortality rates are sporadic at best and often inaccurate in their measurements, there is some evidence of the impact of disease in Hawai'i in this early period.

Lack of demographics regarding salient mortality rates is best explained by logistical issues present in the developing nation of Hawai'i in the early to mid-1800s. In *Historical Statistics of Hawaii*, Robert Schmitt (1977:40) explains that “statistics on deaths by cause of death are particularly lacking in long term comparability, not only because of serious underregistration in

the early years but also because of major changes instituted from time to time in classification procedures.” The first statewide collection of mortality statistics associated to a cause of death did not occur until the early 1900s, and then the statistics were only in terms of individuals affected and were not tabulated according to either ethnic heritage or nationality. Regardless of this glossing of demography, the early records show tuberculosis being particularly ravaging in the beginning of the 20th century. The first half of the 1900s regularly shows over 1,000 active cases of tuberculosis with as many as 531 deaths annually (Schmitt 1977:80). Record keeping for infectious disease (barring those transmitted by intercourse) gained more coherence by the mid-1900s, demonstrating the most commonly reported disease afflictions across the archipelago were leprosy, tuberculosis, gonorrhea, syphilis, chicken pox, influenza, measles, mumps, pertussis, shigella, and typhoid (Schmitt 1977:80-82).

From the early census data it becomes evident that one of the most alarming among the contagions was influenza, which in some years had death tolls well above 1,000 souls, with some years having as many as 6,677 (Schmitt 1977:82). Such observations were frequently reported in the local newspapers, such as with an article by J.S. Green (1857:1) in *The Pacific Commercial Advertiser*, where the author reported that “we have all been afflicted with the influenza, natives and foreign residents. Not a few of the aged and feeble among the people have died.” Sporadic reports begin to appear with regular frequency in newspaper editorials after this, such as a 10 February article in the *Daily Honolulu Press* (1883:1):

In the month of July of this year we had a visitation of Influenza. . . Very many among the foreign population were attacked, and it prevailed extensively among the natives, death not infrequently resulting with the latter, from disposing causes. Among these was John Young (Keoni Ana) the Minister of the Interior, aged only 47 (*Daily Honolulu Press* 1883:1)

Even with the high instance of mortality among Hawaiians, it should be noted that the person responsible for the census of the Kingdom in the mid-1800s, Richard Armstrong, thought the reported numbers were far too low. He believed that for every reported death two to three went unreported (Daws 1968:140). Flu was not the only concern in the Hawaiian Islands as made apparent by a newspaper advertisement in the 4 October 1892 *Evening Bulletin* announcing the closure of all Hawaiian Ports with the sole exception of Honolulu, due to Cholera outbreaks (Macfarlane 1892:2) (Figure 21). Despite the remoteness and relative isolation of East Maui there was still sporadic reporting of disease afflictions affecting the population there.

Smallpox made an appearance in the early newspaper reports regarding disease among residents of East Maui. There is a November 1853 account of the first case of small pox in Hāmākua Loa from a passenger aboard the schooner *Sally* (The Polynesian 1853a:2). In a 24 December 1853 update of the account, the Commissioners of Public Health provide a description of how the disease arrived in the region as follows:

The woman, as near as we could learn from herself and her husband, left the schooner on Friday evening, and staid over night not far from Kahului. The next day she made her way home: traveling, as we suppose through Hamakuapoko, Maliko and Kalanakahua, and reached her mother’s house, at Haiku, on Saturday night. This was one of five or six houses built as close together as they could

stand; and we think from 12 to 20 persons occupied these houses. Sabbath morning some 30 individuals passed within a few rods of the house, on their way to meeting. Once of us rode to the house and saw the woman. At 2 o'clock, P.M., he returned to the house, with the magistrate of the district, and found the woman's face covered with the small pox. She was ordered to be removed to the infected district, and the house was immediately destroyed, and the village deserted. No other case of the small pox have we had in Hamakualoa. (The Polynesian 1853b:2)

The following month, another update on small pox in East Maui is provided in the 21 January 1854 edition of Polynesian as follows:

A correspondent on East Maui writes,—"I am happy to report the state of things on this part of the island, as prosperous. There have been from six to ten cases of small pox in Hamakua, and three deaths. No new case during the past six weeks. We can now report freedom from the small pox, if no new case should be introduced from abroad. There has been no case in Koolau, none in Kula, none in Honuaula, and but one or two in Wailuku. We hear that there are but few cases remaining in the districts of Hana, Kipahulu and Kaupo." (The Polynesian 1854)

These accounts may have been related to a Honolulu epidemic of smallpox in 1853 and 1854 (Daws 1968:139) and of its impacts to the neighbor islands. It was a large pan-Hawaiian problem of which the population was wholly unprepared. Daws (1968:140) relates the scene of devastation in the more populated cities:

The Hawaiians had never given much attention to Western ideas about medical treatment, and in this instance they paid a terrible price...Hawaiians fell sick everywhere. Some were abandoned and died alone; their bodies were left to rot. Others were buried where they lay, without coffins, in graves so shallow that wandering pigs and dogs could unearth them. Some native families nursed their sick at home, devotedly and uselessly, and carefully laid the dead under the dirt floors of their thatch huts or in their house yards, following their old burial practices and condemning themselves to follow the dead into the grave. (Daws 1968:140)

Partly because of the cultural gulf that existed between the Hawaiian and Western cultures, many people who had neither the antibodies, or the knowledge, to combat European scourges passed away.

Although large epidemics were rare in the eastern districts of Maui, when they did arrive, they often had devastating effects. On 2 October 1869, a brief call to action was published in *The Pacific Commercial Advertiser* describing a deadly epidemic that was occurring in Honomanū and throughout the Island of Maui as follows:

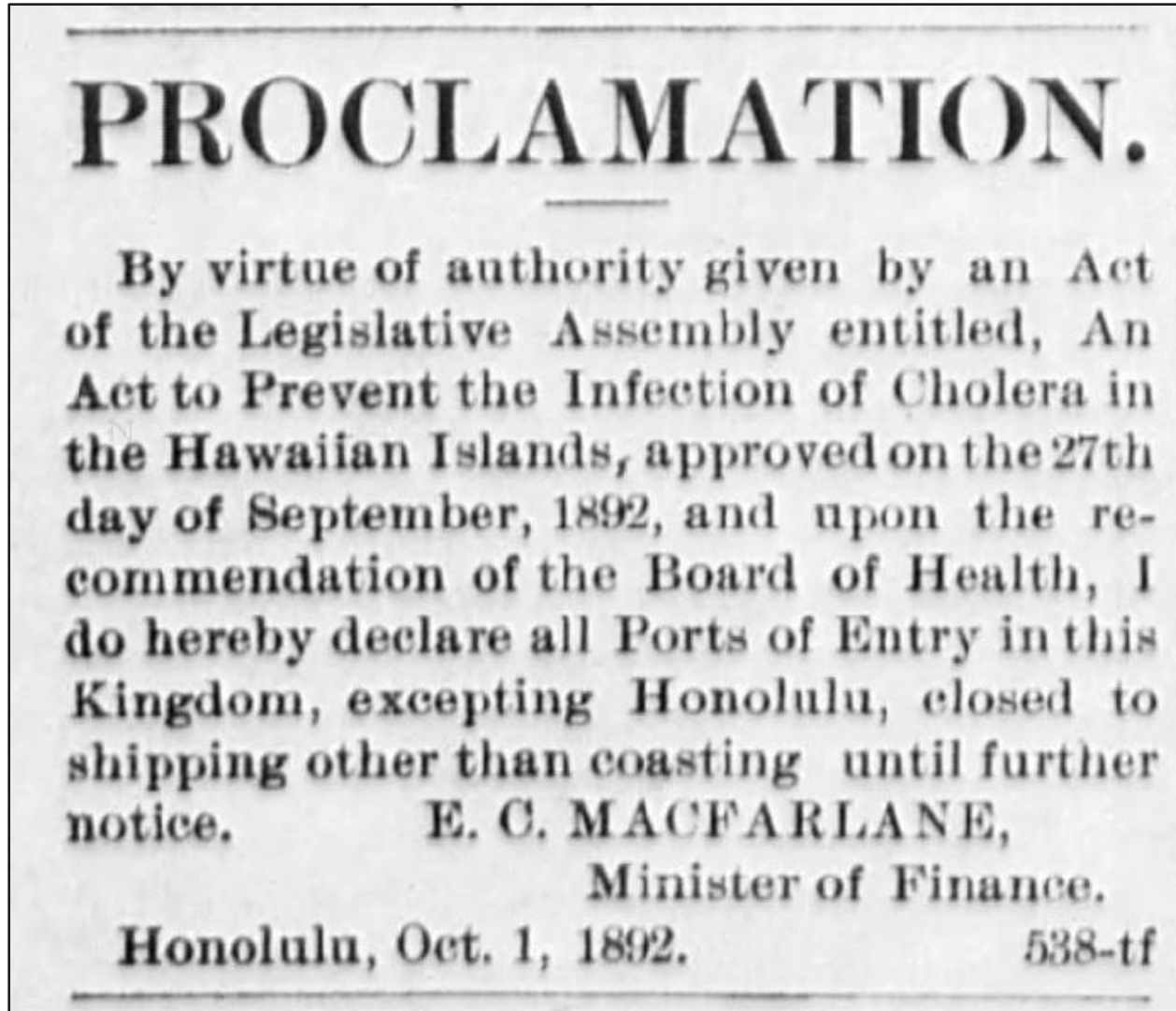


Figure 21. Announcement of port closure published in a Honolulu paper resulting from a cholera outbreak (Evening Bulletin 1892:2)

By a letter received yesterday from East Maui, we learn of the continued ravages of the epidemic fever which has prevailed for months on that Island. Rev S. Kamakahiki states, under date of the 23d, that since the 1st of September there have been fifteen deaths at Honomanu and seven at Keanae, and that a large number of the natives were sick. From another source we learn that the once numerous population of Honomanu valley has dwindled down to two or three families. In behalf of these dying natives, we ask the Board of Health if all has been done that can be done to save them and stay the ravages of the fever? If not, is not the Board censurable? (The Pacific Commercial Advertiser 1869b:3)

The ailment to blame for the 1869 outbreak was never explicitly named, but given the poor state of disease reporting in general in more populous areas (Figure 22) it is unsurprising that only small attention was paid to this affliction from Honolulu newspapers. The testament of the reporter clearly shows that even something as common as fever could have terrible repercussions on isolated and non-immune communities. The precise impact of various diseases on the populations of East Maui is wanting in terms of public recordation, but it does call to mind the many reports of early island wide archaeological studies (Stokes 1916; Thrum 1909b; Walker 1931b) that report evidences of extensive habitation and agricultural features lying abandoned throughout East Maui.

Linton L. Torbert in Honua'ula

As early as the mid-1800s, there was a small farming settlement located at Honua'ula, complete with a small landing servicing passing merchant ships traversing the southeast corner of Maui on their way to Kahului, Honolulu, and beyond. A prominent figure associated with Honua'ula at this time was Linton L. Torbert, an established rancher and agriculturalist operating a sizable tract of land in the Kula uplands and a small plantation at Honua'ula (Ulupalakua Ranch 2017). Torbert was a native of Newton Pennsylvania and his entry into the Territory of Hawai'i went quietly unnoticed.

In *Chapter of Firstling's*, Thrum (1909a) reports that, circa 1820, a large red variety of Irish potato was introduced to Hawai'i by Captain Jos. Vaughn. Some of these potatoes were sent to Governor Hoapili on Maui where they flourished better than on other islands (Thrum 1909a:129). Torbert was a prominent figure in the potato trade that had developed between California and Hawai'i between 1845 and 1856 while he oversaw the growing of corn and potatoes on his *kula* lands on the western slope of Haleakalā. Torbert's foodstuffs were then shipped to California by way of island merchant ships to fuel the population boom associated with the California gold rush. Tolbert was also one of the first individuals to plant sugar cane on Maui under the direction of King Kamehameha III (Ulupalakua Ranch 2017), in addition to being appointed as a committee member of the Royal Hawaiian Agricultural Society (The Polynesian 1850).

In February 1846 Torbert was charged, along with one of his employees named Benjamin Furbush, in the killing of a man named Aki in the Honua'ula region. Although both men were found guilty of the crime their sentences were commuted upon payment of \$200 each for extenuating circumstance (Cushing 1985). Robert L Cushing in his account of the proceedings found within *The Beginnings of Sugar Production in Hawaii* (Cushing 1985:22) stated that:

The circumstances of the shooting, described in the newspaper account of the trial, suggest that there was some provocation, that it was also to some extent accidental, and that Torbert and Furbush provided as much assistance as they could to Aki, in spite of which he died (Cushing 1985:22)

The exact reasons for the shooting are never explicitly detailed in Cushing's account of the incident, but neither the shooting or the verdict seemed to have adversely affected Torbert's standing in the Honua'ula community. According to Cushing, "Torbert had lived several years in the district and bore among all classes an excellent character. [He] had, by his good habits and friendly conduct won the esteem of the natives" (Cushing 1985:22).

In early 1851, Torbert had become intolerant of the conditions of drunkenness in the town of Kalepolepo surrounding the nearest entrepot and landing located downslope of his *kula* plantation, acting as the closest port of sale for his *kula* produce. As part of an editorial responding to a proposed lightening of taxes on imported beer into Hawai'i, Torbert lends his account of the conditions at Kalepolepo to an unnamed "Pastor of Makawao" in *The Polynesian* (1851b:1) as follows:

Kula is full of potatoes, nearly ripe, of a fine quality...so that, with the blessings of God on good management there is nothing to prevent gains flowing in like a river...and yet there is danger that all these benefits will be counteracted by the beer shops at Kalepolepo, and other places along that shore. The people tell me they have great trouble with their teamsters... After a taste of the wretched beverage, they care little for their teams or for their loads; neglect all till they have filled themselves with this vile compound... They fill their kegs with the good creature, and take with them a sufficient quantity to make their friends drunk at home. Of this I have no doubt, and the fact is as alarming as it is shameful. (The Polynesian 1851b:1)

The decline of Kalepolepo entrepot may be the reason that L. L. Torbert began advertising the selling of his potatoes on commission from his plantation at Honua'ula starting in 1851 (The Polynesian 1851a) (Figure 23). Having worked in the region since the 1840s, Torbert used Honua'ula as a port of sale for his goods until at least 1855 (The Polynesian 1855b). During his period of operation at Honua'ula, Tolbert was renowned for the quality of his goods. In the 1852, published meetings of the Royal Hawaiian Agricultural Society in a column appearing in *The Polynesian* (1852:2), Torbert was awarded third place in the islands for the quality of his sugar cane and first place for his Irish potato specimens. Several years later, Torbert was also awarded first place for the quality of beef (The Polynesian 1855a). Despite Torbert's excellent products, the Honua'ula plantation was put up for auction in mid-1855 (The Polynesian 1855b).

In 1862, Torbert moved to O'ahu, and died in Honolulu in 1871 at the age of 55 (The Hawaiian Gazette 1871; The Pacific Commercial Advertiser 1862). Although the growing and shipping operations by Torbert at Honua'ula were eventually closed, sugar would continue to be grown in the region by small growers, as well as by the East Maui Plantation and several decades later by the Nahiku Sugar Company.

Year	Disease	Deaths ¹
1804	"okuu" (cholera?)	< 15,000
1818	"catarrhs and fevers"	60
1825	unnamed	"Great"
1826	influenza	"Thousands"
1839	mumps	"Great numbers"
1848-1849	measles, whooping cough, influenza	10,000
1853	smallpox	5,000-6,000
1857	influenza, dengue	"Many"
1870-1871	scarlet fever	"Great"
1878-1880	whooping cough	68
1881	smallpox	282
1888	whooping cough	104
1889-1890	measles, dysentery	26
1895	cholera	64
1899-1900	bubonic plague	61
1918-1920	influenza	1,700
1928-1929	cerebrospinal meningitis	68
1936-1937 ²	measles	205

Figure 22. Table of epidemic mortality rates within the Hawaiian Archipelago demonstrating insufficiencies in detailed documentation prior to the late 1800s, from Schmitt (1977:58)

THE BEST QUALITY
of
IRISH POTATOES
IN ANY QUANTITY,
at the
LOWEST PRICES,
on the
Shortest Notice,
by
L. L. TORBERT,
at
HONUAULA, EAST MAUI.

Cargoes bought on commission at \$1 50 per ton
or 12 1-2 cents per bbl.

Enquire in *Honolulu* of A. P. Everett, or Makee,
Anthon & Co.

There is a greater proportion of the RED pota-
toes at Honuaula than at any other part of the po-
tato region.

Honuaula is the most convenient anchorage at
the Island of Maui, to get cargoes on board. 6m-17*

Figure 23. Advertisement from *The Polynesian* (1851a:1) for L. L. Torbert's sale of commissioned potato cargo from Honua'ula

The Stranger's Home of Wailuanui

The 4 September 1869 edition of *The Pacific Commercial Advertiser* provides an account of an August 1869 journey through East Maui from the harbor in Hāna to central Maui by reporter "H.M.W." The account describes the lush landscape, referring to the region as "The Largest [Mountain] Apple Orchard in the World" and "The Switzerland of Hawaii" (*The Pacific Commercial Advertiser* 1869a:3). During the trip, heavy rains in Wailua Nui created flood conditions that made the streams of the area impassable and the travelers were invited to stay at the house of Hiniau, described in the following passage:

Here we sought refuge in a neat native house, whose landlord, a well-to-do native, named Hiniau, invited us in, and urged us to stop for the night, as it would be impossible to cross the next stream, which was considered dangerous when swollen. This we found to be correct, as the river forms a narrow gorge, where the road passes, and the water tumbles through it from ten to twelve feet deep, compelling travelers to stop till it subsides, which it generally does as rapidly as it rises. Our host, who was an eccentric genius, decidedly loquacious and somewhat of a jester as we found, was full of praise of the resources of the valley and his house, which he called *hale malihini* or the Stranger's Home, - and on being interrogated, said he could furnish food in abundance such as fowls, pigs, fish, eggs, potatoes, taro, poi, pine-apples, oranges, bananas, &c. (*The Pacific Commercial Advertiser* 1869a:3)

In addition to characterizing the extreme abundance of resources that were locally available in Wailua Nui, the traveler's account provides early documentation of how stream freshets affected access and travel through the region.

The Growth of Early Sugar in East Maui

With the decline of the whaling industry in the Pacific in the mid- to late-1800s, the Hawaiian Islands attracted a new generation of managers, professionals, and entrepreneurs who would reshape the landscape for Western enterprises and pursuits. Samuel T. Alexander and Henry Perrine Baldwin were prominent in this movement. Alexander had been sent from his family home at Lahainaluna to study at Oahu College (Punahou School) in Honolulu followed by studies at Williams College in Massachusetts. Alexander returned to Lahainaluna in 1862 as a teacher, and he is credited with using irrigation for improving the town's sugar cane and banana yields with his students (Dean 1950). Reverend Dwight Baldwin (1798-1886) had arrived in the Hawaiian Islands in 1831 and was stationed at Lahaina between 1835 and 1870. During the early 1850s, Rev. Baldwin had been granted 2,675 acres of land in northwest Maui. This land holding became the basis for enterprises expanding over areas of West Maui undertaken by his son, Henry Perrine Baldwin, during subsequent decades of the nineteenth century (Dean 1950).

With the ratification of the treaty of reciprocity with the United States in 1876, the future success of sugar in the Hawaiian Islands seemed assured. At that time, several small plantations in the districts east of Wailuku and Kahului and north of Makawao developed new plans to expand the growing of sugar. The Haiku Plantation, managed by Samuel T. Alexander, as well as the Paia Plantation of Henry P. Baldwin, and the Grove Ranch Plantation of T. H. Hobron all suffered from frequent drought. In 1867, S. T. Alexander proposed a massive construction

project to bring mountain water from the streams of East Maui west to their plantations along the slopes of Haleakalā (Kuykendall 1967:64).

The stockholders of the Haiku Plantation agreed to back the project. On 30 September 1876, the government of Hawai'i gave permission to the plantations of East Maui to take water from the principal six streams of the region and convey the water by ditch to their fields, for an annual rental of \$100. The grant for the water was to last for a period of twenty years, with the stipulation that the ditch construction be completed within the next two years (Kuykendall 1967:64). The system by which mountain water was brought from East Maui to the Haiku Plantation fields in Ha'ikū and further west onto the isthmus of Maui was the breakthrough that the sugar industry needed to flourish (Wilcox 1996:127).

The "Hamakua Ditch Company" was organized on November 2, 1876, and specifically allotted the shares and costs and the divisions of water to the various plantations, as thus;

The ownership, share of costs and division of water were 9/20ths Haiku Sugar Company, 5/20ths the Alexander and Baldwin Company, 2/20ths James Alexander, and 4/20ths T. H. Hobron. Construction of the Hamakua Ditch, which consisted of a combination of an open ditch, tunnels and iron pipes, was carried on throughout 1876-1877. Funding for the project was accomplished by the agency of Castle & Cooke. Castle & Cooke agreed to finance the project, with the belief that Samuel Alexander and Henry Baldwin could bring the ditch project in for between \$25,000 to \$50,000 (Kuykendall 1967:64).

Thrum (1877:39-42) in *Hawaiian Annual and Almanac for 1878*, published a description of the project:

The digging of the ditch was a work of no small magnitude. A large gang of men, sometimes numbering two hundred, was employed in the work, and the providing of food, shelter, tools, etc., was equal to the care of a regiment of soldiers on the march. As the grade of the ditch gradually carried the line of work high up into the woods, cart-roads had to be surveyed and cut from the main road to the shifting camps. All the heavy timbers for flumes, etc. were painfully dragged up hill and down, and in and out of deep gulches, severely taxing the energies and strength of man and beast, while the ever-recurring question of a satisfactory food supply created a demand for everything eatable to be obtained from the natives within ten miles, besides large supplies drawn from Honolulu and abroad. (Thrum 1877:39-42)

When construction got under way, Sam Alexander and Henry Baldwin began to find out what a monumental job they would have to tackle. Torrential rains and landslides plagued the project. Workers had to hack their way through jungle and descend sheer cliffs by rope. When the men balked at the final barrier of the sheer drop of over 300 feet at the Māliko Gulch, Henry Baldwin, who had lost an arm in a sugar mill accident, shamed them into returning to work by sliding down a rope with his one good arm (Taylor et al. 1976:87).

In July 1877, the first water began flowing through the ditch. Approximately 60 million gallons of water a day were soon running through the ditch system. The ditch system had cost

\$80,000, which was paid for by Castle & Cooke. At the same time that the success of the Hamakua Ditch became known in the islands, the wealthy refiner of beet sugar in San Francisco, Claus Spreckels, arrived in Honolulu. Seeing the early success of the Alexander and Baldwin partnership, Spreckels moved fast to do business with the sugar growers of Hawai'i. Within three weeks, he had bought more than half the sugar crop of 1877 and was laying plans to take over the industry as a one-man monopoly (Taylor et al. 1976:87).

Spreckels had watched the Hamakua-Haiku Ditch development on Maui with special interest, hoping it would fail so that he could pick up the pieces. Anticipating the success for the future of sugar at East Maui, Spreckels acquired 8,000 acres of barren plain adjacent to Ha'ikū and the Alexander & Baldwin properties. He then leased 24,000 acres of Crown land in Wailuku through an agreement with a prominent member of the royal family. In 1882, Spreckels was able to obtain title to these lands in fee simple. All he needed was water. Here, Spreckels turned to his friend, Kalakaua; the newly-elected king of the Hawaiian Islands. Kalakaua dismissed his cabinet, whom had previously turned down Spreckels' application for water from the same general area as Alexander & Baldwin's Hamakua Ditch. A new cabinet was appointed by the king, who then approved a new right to water for Spreckels. Spreckels went on to build his own ditch and develop his Maui lands into a profitable sugar plantation (Taylor et al. 1976:88-89).

Spreckels was quick to consolidate his gains. His sugar venture on Maui was named "Hawaiian Commercial & Sugar Company." His expenditures on irrigation and mill machinery were lavish, and his Spreckelsville plantation was nothing short of magnificent. When Claus Spreckels received permission to the use of water found in East Maui, he built his own ditch from Honomanū stream to Maui's south shore (Wilcox 1996).

Sugar in Hāmākua Loa

By the late 1870s, the sugar industry had made its way to Hāmākua Loa. The first record of a sugar plantation in the Hāmākua Loa area appears in the 1879 Hawaiian Annual in a list of plantations. Huelo Sugar Plantation is documented as situated in "Hamakua, Maui". There is evidence, however, that cane was being grown prior to 1879. An 1877-78 map of Hāmākua Loa depicts a cane field *makai* of the main road in the vicinity of present day Huelo Town (RM 1064, Hawaii State Survey Office). In addition, a store named "Honopou Store" is noted on the western bluff overlooking Ho'olawa Bay. An 1881 map of the Huelo Sugar Plantation (RM 862) depicts good sugar lands, and Huelo Sugar Mill (SIHP # -1504) situated in Honokalā Ahupua'a.

It is unknown when the first sugar mill was built here, although it probably existed by 1879. Peter Cushman Jones of C. Brewer reported that the year 1879 had been difficult due to the company's lack of funds (Sullivan, 1926). Apparently, the situation did not improve much because by 1895, the company had gone out of business. The company's failure was attributed to the distance from the mill to the Ho'olawa Landing (*Maui News*, March 31, 1900). A second sugar mill was erected in 1901, this one situated near the landing. In March 1902, *Maui News* reports the mill is a success "an improvement over the old Huelo Sugar Company which had old-fashioned machinery, one set of rollers, one vacuum pan, no triple effects" (March 29, 1902). According to the Hawaii Register of Historic Places, the "second mill was situated to utilize water from Hoolawa Stream and to be close to the landing in Hoolawa Bay. Processed sugar in bags was sent down to the landing on a simple inclined tramway." A local informant believed the

company went out of business in 1905 (Hawaii Register of Historic Places, Short Form, Site 50-50-06-1505).

No doubt the Huelo Sugar Plantation had a great impact on those living in Hanawana and surrounding areas. During this time, many provisions were needed in order to operate the sugar mill, one of which was wood. Documentation of a matter pertaining to wood cutting in the area gives a clear picture of the transformation of the landscape in Hanawana and the surrounding *ahupua'a*. In 1891, the Deputy Sheriff of Maui, L.A Andrews was sent to Hāmākua Loa to investigate the cutting of woods on government lands. Apparently, Huelo Plantation had contracted certain residents to cut and cart woods to the Plantation from their own Plantation lands. Those who were questioned claimed they did not know the boundaries between government lands and Plantation lands and therefore may have mistakenly cut wood off of government lands. The sheriff, however, had a different view of the situation:

They cut all the wood from the flat lands of the Plantation several years ago and three years ago when I was at Huelo were cutting from the sides of the pali and carting from the bottoms of the gulches. [Hawaii State Archives, Department of the Interior, Land, 1891]

This suggests that by the late 1870s, early 1880s, in the formative years of the Huelo Plantation, most of the plateau lands had been deforested. By the late 1880s, the wood supply was beginning to dwindle and more inaccessible areas such as gulches and cliff sides were being harvested. During the period of the wood cutting investigation, people were spilling over into government land and in some cases, privately owned land to procure a good supply of firewood to sell to the Plantation.

The Rise of Commercial Enterprise in Hāna

A 2 February 1897 article in *The Hawaiian Star* discusses the future of the Hāna region from the perspective of the continued growth of industry and commerce in Hawai'i at the turn of the century (The Hawaiian Star 1897). Hāna and the undeveloped slopes of East Maui are described as one of the last natural environments remaining in the State in the following excerpts:

The district of Hana is one of the least known to the general public of any districts on the Islands. Beyond the fact that there are three sugar plantations, viz: Hana, Reciprocity and Kipahulu, the average citizen of Honolulu knows very little about it. It is one of the districts that, like Kona and Puna, will one of these days awake out of sleep.

The prospects of the Hana district are good. The sugar plantations lie on the belt of the undulating land at the extreme east of the Island. To the northwest of Hana Plantation there is an extent of country stretching for twelve or fourteen miles, which, at one time, supported a large population, but which at present time has only a scattered villages here and there.

The energy to develop these lands must come from without, it can never come from within. Again, it is not only energy and capital that are required, but roads. The roads of the portion of the Hana district have hardly been touched since the

days of Dr. Judd, who, so far as memory serves, had the present so-called road constructed. (The Hawaiian Star 1897:4)

The ambition for successful commercial cultivation in East Maui continued to be the focus of all endeavors throughout the mid- and late-1800s. Sugar, coffee, and rubber plantations were started throughout the region with high hopes of success. A 19 December 1898 article in *The Hawaiian Star* documents a large land sale in Nāhiku and describes the beginning of “the awakening” of the region to foreign industry in the following excerpts:

The land sale which took place at Paia on Saturday afternoon, December 17th, was indeed a phenomenal one. There were three lots for sale, and each of them sold for a little over five times the appraised price.

The lands in question are situated in Nahiku among the Palis of East Maui. A couple years ago it would have been hard to give the land away and no one wanted it, unless the chances of permanent government and therefore capital were assured. So the land lay a waste of guava scrub, ferns, ohia, kukui, lauhala and so forth. The thundering waterfalls crashed over the cliffs and the streams roared over their rocky beds to the ocean, with no tribute to the soil in the shape of irrigation. For miles there would be no habitation.

Now all this is being changed. The district, one of the most fertile on the Islands, awakes out of its lethargy. The valleys which have only heard the roar of the cataract and the rush of the stream will wake to the sound of the steam whistle and the ax, and man will enter upon his kingdom. Cultivation and civilization will reign, but the wild beauty of the Koolau district will be gone. Again this is progress under annexation. (The Hawaiian Star 1898)

East Maui Irrigation Company

The prospect of growing sugar in Hawai'i was very appealing to the Kingdom as it would provide a renewable economic base. This view was further exemplified in 1876 by “An Act to Aid the Development of the Resources of the Kingdom” in which eminent domain rights reserved for public purposes (such as water) could be applied by the government to private enterprises for the development of sugar (Wilcox 1996). Along with the Reciprocity Act of 1876 that allowed the duty-free export of Hawaiian sugar to the mainland U.S., the groundwork had been set for the start of the sugar industry in the archipelago (ASCE 2001). This new industry would require a vast amount of water as exemplified by the poem about sugarcane named *The Crop* by Beryl Blaich: “And water, all the water you can find, dig, direct, scrounge, divert, tunnel and hold. Bring the water tribute to me, King Cane” (Beryl Blaich in Wilcox 1996:v).

The East Maui Irrigation Company (EMI) ditch system (EMI Aqueduct System) was constructed to deliver water from the abundant watersheds of East Maui into coastal and central isthmus plantations to aid in sugar production. The EMI Aqueduct System has been in use for over 134 years and continues to collect water today for both private and municipal entities. In its current state, the EMI Aqueduct System contains 50 miles of tunnels, 24 miles of open ditches, inverted siphons and flumes, 388 intakes, eight reservoirs, and a solar powered radio telemetry system to monitor ditch flow. The catchment begins at roughly 1,300 ft elevation and delivers

water to central Maui at an elevation of 1,150 ft, covering 18 miles from its western to eastern extent (ASCE 2001).

Built at a time when Hawai'i was still an independent kingdom, the EMI Aqueduct System was the first of its kind both in the Pacific and on the West Coast of the U.S. It is also the largest privately financed, constructed, and managed irrigation system in the U.S. The initial construction of the first section of the ditch system in the 1870s, named Old Hamakua, began the engineering trend of catchment ditches that would later fuel the sugar industry on Kaua'i, O'ahu, Hawai'i, and Maui, making sugar the major economic sector of Hawai'i for over a century. The EMI Aqueduct System itself is composed of a mosaic of multiple smaller ditches, all built at different times by different groups of financiers and engineers (ASCE 2001).

Hawai'i was moving through many economic and demographic shifts in the late 1800s following the intensification of Western commerce, including the continued drift of rural populations toward town centers, which made water a highly contested and protected resource on islands such as O'ahu where these demographic trends were most pronounced. This is largely because water had to be diverted from distant watersheds to support growing cities. The legality surrounding watershed catchment was continuously challenged for leaving too-little water for residents where streams were diverted by the government (Wilcox 1996). Regardless of the dismay this may have caused, the costs of abandoning water catchment had to be carefully balanced by the Kingdom, since much more than the municipal water supply hung in the balance. In *Sugar Water: Hawaii's Plantation Ditches*, Carol Wilcox (1996:27) states:

Hawaii moved steadily through this transition because it always had something that it could trade. At first the orient traded for Hawaiian sandalwood; then the whaling fleet needed crew and provisions; there was California Gold Rush market; the Westerners wanted land-and these commodities all became available. Both the markets and the resources, however, were limited, and before long they were "used up." Unless it developed a new commodity, Hawaii ran the risk of becoming a political and economic non-entity, a backwater nation. This did not fit the vision that the monarch, the resident haole, or the people had for the future of the kingdom. (Wilcox 1996:27)

Old Hamakua, the first catchment marking the start of the EMI Aqueduct System, was constructed during the reign of King Kalākaua. This section of ditch was constructed by Henry P. Baldwin, Samuel T. Alexander, and James M. Alexander between 1876 and 1878 under the name of the Hamakua Ditch Company. The result of the project was 17 linear miles of non-lined ditch (Wilcox 1996). This ditch was servicing Ha'ikū fields by July 1877 with the water it harvested from Kailua, Hoalua, Huelo, Ho'olawa, and Honopou streams on their way to the terminus at Nā'ili'ilihale Stream.

The second addition to the ditch system was the Spreckels Ditch, also known as the Haiku Ditch, constructed between 1879 and 1880 amid much controversy regarding how Claus Spreckels secured the water rights from the Kingdom by manipulating his financial ties to the monarchy (see Section 0). The lease granted to Spreckels gave him rights to all water not already in use by 30 September 1878, the same date as the deadline for the completion of the Old Hamakua Ditch. Taking advantage of his unrestricted access to all streams not currently under

collection, the Haiku Ditch was twice as long, three times as large, carried 50 percent more water than the Hamakua Ditch, and stretched from Honomanū Stream to the Kīhei boundary (Wilcox 1996). The ditch was thirty miles long and could deliver up to 60 million gallons per day (mgd), costing nearly half a million dollars by the time it was completed (ASCE 2001). The breadth and scale of this endeavor would redefine standards of water collection for the sugar industry in Hawaii. The massive Haiku Ditch was the first developed by a foreign engineer, named Herman Schussler, a trend that would continue for all future additions to the EMI Aqueduct System (Wilcox 1996). Shortly after Spreckels formed the Hawaiian Commercial and Sugar Company (HC&S), construction also began on Center Ditch (1898), Manuel Luis Ditch (1900), and the Lowrie Ditch (1899-1901) by Schussler (ASCE 2001).

In 1898, Spreckels lost controlling interest of HC&S to the agency of Alexander & Baldwin, who took up and completed construction of the Manuel Luis and Lowrie ditches. Along with the Center Ditch, these two sections completed a lower elevation catchment running through the Hāmākua Loa and Ko‘olau regions. Most notable was the Lowrie Ditch, sometimes called the Lowrie Canal, named after the manager from the HC&S plantation and mills at Spreckelsville, William J. Lowrie. The 22 mile-long Lowrie Ditch could deliver 60 million gallons per day and contained seventy-four tunnels (totaling 20,850 ft, with a single tunnel of 1,955 ft), nineteen flumes (totaling 1,965 ft), and twelve siphons carrying water from distant Honomanū Valley to the central isthmus (Figure 24 and Figure 25). This ditch was also engineered by a foreign expert, E. L. Van Der Neillen, and constructed by Japanese laborers under the direction of Carl Jensen (Wilcox 1996).

Following the completion of the Manuel Luis/Center/Lowrie Ditch extensions, the next large irrigation project for the Hamakua Ditch Company would be the Koolau Ditch, constructed between 1904 and 1905 by M.M. O’Shaughnessy. This extension of irrigation catchment reached an additional 10 miles toward the Hāna Region and consisted of 7.5 miles of tunnel and 2.5 miles of open ditch and flume. Given the extreme difficulty of working in the narrow and deep gulches of the region it was necessary to build a road alongside the ditch where it passed into tunneled rock, the span of these borings ranged from 300 to 2,710 ft in length (Wilcox 1996). It is this road that was famously travelled by author Jack London in 1905 (The Honolulu Advertiser 1914). This newest ditch section extended out to Makapīpī Stream in Nāhiku and cost the Hamakua Ditch Company \$511,330 to complete. The Koolau Ditch was constructed concomitantly with the New Hamakua ditch, transferring the Ko‘olau water further west toward Hāmākua Loa, located parallel to the Lowrie ditch but further upslope (Figure 26) (Wilcox 1996).

In 1908 the Hamakua Ditch Company was succeeded by their new business entity, EMI. The purpose of this new entity was to develop and administer the surface water collection for all plantation entities under the Alexander & Baldwin umbrella, including the newly acquired Kīhei Plantation. Shortly after this transition, in 1912, EMI added lining to the Koolau Ditch bed and started construction on the Kauhikoa Ditch. The Kauhikoa Ditch collected the water originating in the Koolau/New Hamakua ditches and carried them further west through Ha‘ikū, Pā‘ia, and further out to Pu‘unene in the central isthmus. This newest extension was completed in 1915 at 29,910 linear ft and carrying 110 million gallons per day. Shortly after starting the Kauhikoa



Figure 24. Surface water collection along the walls of Honomanū Valley (Wilcox 1996)



Figure 25. Photo of Banana Intake in Honomanū Valley (CSH 2018)



Figure 26. Koolau Ditch water diversion at Pi'ina'au stream (Courtesy of EMI)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

Ditch, EMI also started construction of the New Haiku Ditch in 1913. Construction of this lower altitude ditch, running from Halehaku gulch in Peahi to dry North Kīhei, was completed in 1914 with a finished length of 54,044 ft and a daily delivery of 100 mgd. The much longer New Haiku Ditch was completed faster than its Kauhikoa contemporary as the terrain it had to traverse was less severe (Wilcox 1996). Plans for the last major addition to the EMI Aqueduct System, the Wailoa Ditch, was started in 1918. By the time this ditch was completed in 1923 it was the highest capacity channel in the entire network and had a greater median flow than any natural river in Hawaii. The Koolau Ditch was connected to the new Wailoa section, being diverted away from the New Hamakua Ditch, and connected to a series of hydro-electric power plants on the north shore of Maui (Figure 27). The Wailoa Ditch consists of 51,256 ft of mostly lined tunnel, and its water capacity ranged from 160 mgd upon completion to a later increased capacity of 195 mgd. This ditch ran parallel to, and above, the earlier New Hamakua and Kauhikoa Ditches (Wilcox 1996).

Accompanying the water collection infrastructure were 12 siphons, 62 miles of road, 15 miles of telephone line, and numerous small feeders, dams, reservoirs, intakes, pipes, and flumes (Figure 28). The totality of the collection system was managed by four license areas (Huelo, Honomanū, Ke‘anae, and Nāhiku) that dictated the circumstances and conditions under which EMI could collect the runoff from the various Government lands it crossed. The development and improvement of the EMI Aqueduct System over time has cost nearly \$5,000,000, compared to its modern assessment of nearly \$200,000,000 to create a comparable system. In addition to supplying Alexander & Baldwin’s private sugar cane plantations with water, EMI also provides Maui County potable water for domestic purposes from the various license areas of East Maui (Wilcox 1996).

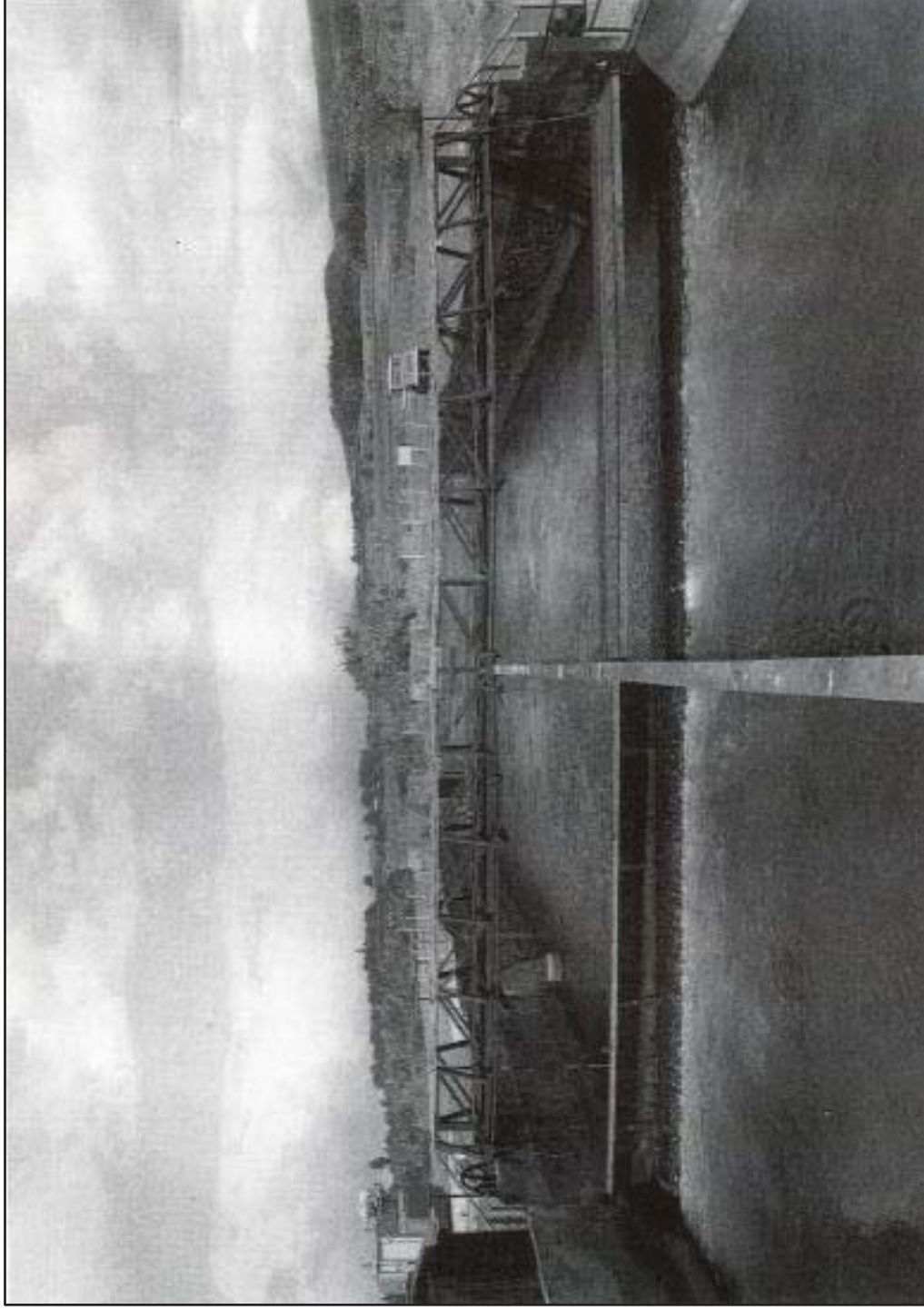


Figure 27. Wailoa forebay, a section of Wailoa Canal that drops into a low-head hydro-electric power plant (Wilcox 1996:118)

CIA for the Proposed Water Lease for the Nāhiku, Ke‘ānae, Honomanū, and Huelo License Areas (East Maui Aqueduct System),
Multiple Ahupua‘ā, Makawao and Hāna, Maui

TMKs: Various

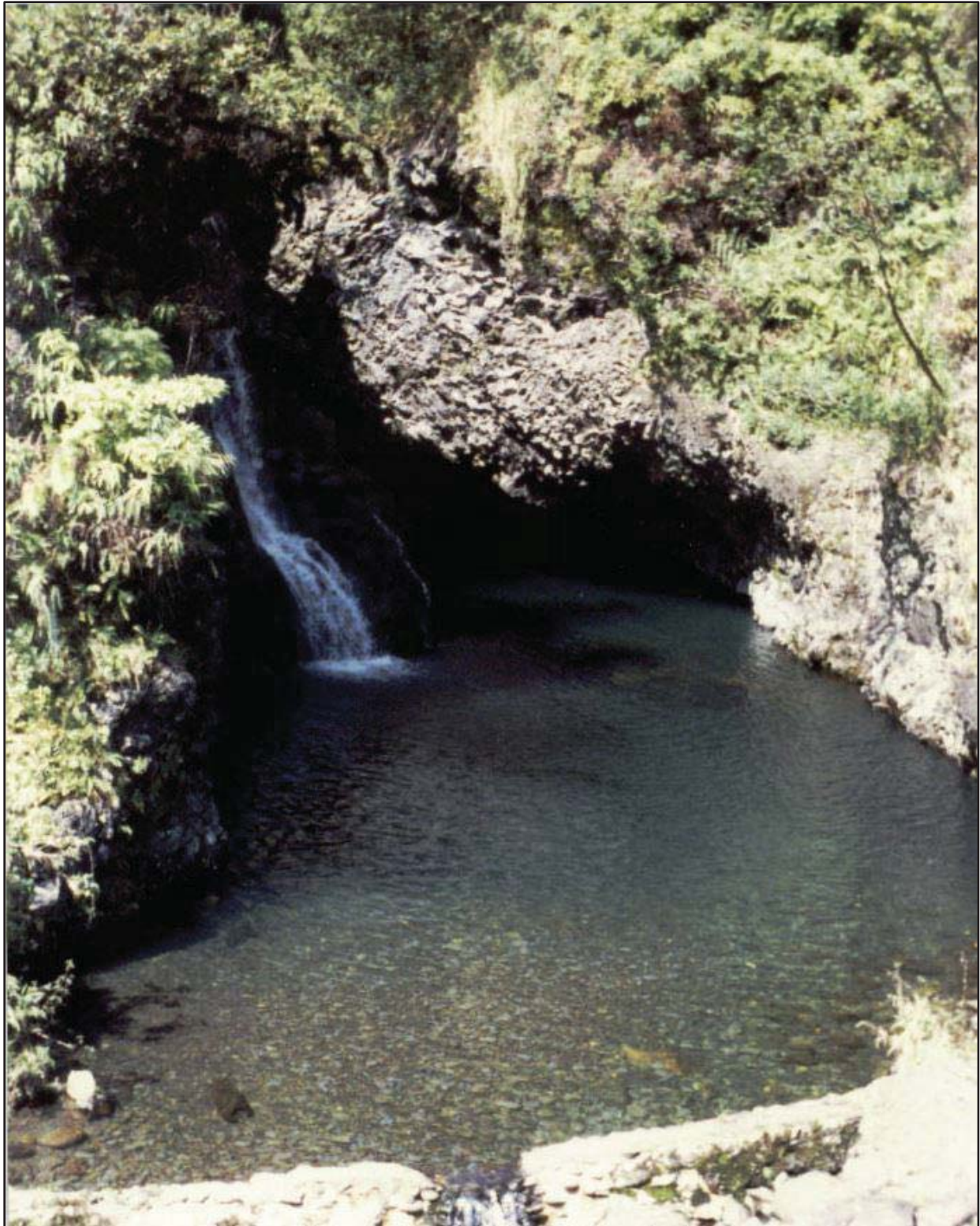


Figure 28. Collection of water at Hanawī Dam near Ke‘anae (Courtesy of EMI)

Nahiku Sugar Company

In the late 1890s, sugar was grown in the Nāhiku region of East Maui by the Nahiku Sugar Company. Smaller sugar growers likely planted in the region prior to the establishment of this larger plantation due to the proximity of the area to the Makapīpī Stream watershed. From the beginning, water rights for the Makapīpī watershed were jointly shared between the Nahiku Sugar Company and multiple homesteaders who collectively formed the body of the company's sugar growers. The business of growing sugar at the plantation in Nāhiku was also dependent upon local farmers in that a significant portion of the land under cultivation by the company was deeded to the same homesteaders who held a portion of the water rights (Honolulu Advertiser 1902:2). For a brief period, the Nahiku Sugar Company was acquired by Alexander & Baldwin. In early 1899, Alexander & Baldwin took 250 shares and were appointed agents for the 370 acre Nahiku Sugar Company. Even with significant financial backing, profits declined, and by mid-summer 1900 development work on the plantation had stopped.

In addition to the day-to-day operations, the Nahiku Sugar Company completed the construction of a landing for the Territorial Government of Hawaii in 1901 and constructed rail lines for a derrick at the landing. There is no record of the use of locomotives on the rail lines that the Nāhiku plantation constructed, although the neighboring Hana Plantation began railroad operations in 1883 (Conde 1993:30). The construction of the landing at Nāhiku placed the plantation owners in additional financial hardship, and in the House of Representatives general assembly on Tuesday 25 June 1901, the *Honolulu Advertiser* reported that it was agreed upon that “the amount expended on Nāhiku landing be paid the incorporation by the Government, at whose suggestion the landing had been taken in hand and finished” (1901b:9-14). Deferring the landing's construction cost to the Government proved to be of minimal short-term financial benefit to the company.

In 1902, local homesteaders petitioned their Congressman, Delegate Wilcox, not to grant additional water rights to the Nahiku Sugar Company that would infringe on the already established rights of the local farmers who had since had a falling out with the Company. Water rights and land were shared from the start, so when local homesteaders refused to plant additional cane for the mill in response to a perceived threat to their individual water rights, the Nahiku Sugar Company petitioned for additional water rights from neighboring watersheds in inaccessible gulches to the northwest to supplement the shortage. Since the initial licenses were upheld, and the homesteaders' rights protected, the Nahiku Sugar company was forced to “either get more land under cultivation, or the plantation must be given up” (Honolulu Advertiser 1902:2).

Eventually, the founding homesteaders gave up on the Sugar operation altogether, putting the company at risk of collapse due to insufficient land and water access for continued cane cultivation. In a *Honolulu Star Bulletin* article dated 24 July 1943, Mrs. Shaw, widower of a Nahiku Sugar Company homesteader, summarized the failed operation as follows:

Mr. Shaw and I moved from Paia, Maui, to our newly acquired homestead of 125 acres at Nahiku, on the windward side of Maui. At that time the land was in its virgin state and unimproved...and Mr. Shaw planted cane for the Hana plantation while plans were being developed for the Nahiku Sugar Co. The prospects for this

new company were so promising that all those owning land there were planning to plant for the newly organized plantation, but unfortunately the company failed. In 1903 we had to vacate our homestead and came back to Honolulu. (Honolulu Star Bulletin 1943:6)

In 1902, a merger was planned with the Hana Sugar Plantation by which the Hāna plantation would pay an annual rental of \$4,500 over a 26 year lease which included a valuable set of water rights (Thompson 1902:272). In 1904, Alexander & Baldwin bought out all the remaining stock in the Nahiku Sugar Company (Dean 1950:62). Efforts were made by the company to diversify their planting operations, potentially adding a new income stream to the business by dedicating ten percent of their arable land (200 acres) to the cultivation of latex rubber (Pacific Commercial Advertiser 1910). The rubber industry had a short boom in the region around this time with several other rubber plantations opening around the Nahiku Sugar Company. Attempting to capitalize off this new regional industry did not pan out for the company, since in the years leading to 1920, all rubber plantations in the area had closed (see Section 4.3.1.1.1). Eventually, all the former sugar plantation land at Nāhiku was acquired by HC&S and EMI under the parent corporation of A&B (Hatch 1922:1410).

4.3 Twentieth Century to Present

4.3.1 1900s

According to the Census Bulletin of 1900, the population of Hāna District was reported to be 5,276 and the population of Makawao District was reported as 7,236 (Thrum 1909a:18). The Board of Health reported 755 births and 422 deaths in Maui County in the year 1900 (Schmitt 1977:13). An interesting population dynamic of this period of time is that while the populations of the Wailuku and Makawao districts continued to grow by at least a thousand inhabitants every ten years, there is a corresponding negative effect on the population of Hāna. Official census figures have the Hāna population shifting from 5,276 persons in 1900 to only 969 persons in 1970 (Schmitt 1977:13-14). While disease and urban drift may play a role in these figures, there is also the added regional strain of the establishment, and subsequent collapse, of agricultural industries throughout the East Maui region. While East Maui was originally slotted for agrarian development in the eyes of the early developers, this industry would, during the course of the twentieth century, gradually give way to tourism as its primary draw to visitors and businessmen.

A feature section in the 4 September 1910 edition of the Honolulu Advertiser documents an August 1910 tour through the Hāna District of Maui by H.M. Ayres, a reporter for the paper (The Honolulu Advertiser 1910:13). The tour, which began on the government road and then continued along the Koolau Ditch trail, provides a first-hand account of the region, albeit from an outsider's perspective, along with photographs of homesteads, homesteaders, landscapes, and prominent structures. While passing through Honomanū Gulch, Ayers relates "...there is none more impressive in the islands. Its beauty baffles description and were its attractions name widely known, tourists in plenty would assuredly visit..." (The Honolulu Advertiser 1910:13). Continuing along the ditch trail to Ke'anae, Ayers stopped at the house of Halemano and recounts the following observations of life in Ke'anae:

At the house of Halemano we were made very welcome, supper being ordered by our host at a Chinese restaurant nearby. He naively remarked that poi and fish

were no good for haoles. Halemano, who is postmaster and political boss of the precinct, is a dignified old native. His house is on the campaign circuit and when election time rolls round there are stirring times at his residence. His daughter, Aunie, is easily the belle of the district.

Many of the Keanae girls have Chinese husbands and appear to be quite happy with them. They are better providers than the Hawaiians and this probably accounts for the phenomena.

Before leaving Keanae we offered to buy a squid stone from Halemano but the old man refused to part with the relic, declaring that it was his wife's and that he didn't need the money-a rare thing with the average Hawaiian today.

While we were in Keanae the natives were conspicuous by their absence. Returning for some article that I had forgotten, after my departure, I found quite a gathering discussing the business of the malihini haoles while across the rice fields men, women, and children were hastening toward the house of Halemano. (The Honolulu Advertiser 1910:13)

Nāhiku was the next stop on the tour for Ayers who was welcomed by C.S. Austin, manager of the American-Hawaiian Rubber Company. Ayers described the rubber industry in Nāhiku (described in greater detail in subsequent sections) and provides the following account of the work and resources in the region:

There is a very good class of Hawaiian at Nahiku, industrious and contented. The rubber affords them more or less constant employ and fish are very plentiful off the shore. The natives working for Mr. Austin regard him as a friend. He speaks their language fluently and both he and his mother have, by their helpful attitude, endeared themselves in the hearts of the Hawaiians of Nahiku. (The Honolulu Advertiser 1910:13)

The account of Mr. Ayers illustrates a significant degree of social interaction and integration between the lifestyles of the Native Hawaiians, *haole* (foreign) businessmen, and the various ethnic laborers and homesteaders that had adopted the region as home. Though agrarian industries were still trying to scratch profits from the rocky slopes of Makawao and Hāna District's coastal plantations at this time, the makings of East Maui as a destination of note for travelers to the islands was in the making. Tourist activity would become more frequent with the advancement of local infrastructure into the region, eventually supplanting agriculture as the economic cornerstone of the region.

Jack London

In the summer months of 1907, renowned travel writer Jack London and his second wife Charmian, stopped at Maui on the South Pacific portion of their sailing trip around the world to travel the ditch trail across the Hāna District. His horseback travels around Haleakalā and overland to Hāna appeared in his book "The Cruise of the Snark," a non-fiction account of London's travels and experiences during their world tour that was published in 1911. In select excerpts from London's book reprinted in *The Honolulu Advertiser* (1914:10) the beautifully rugged East Maui coast is described as follows:

The windward side of Haleakala is serried by a thousand precipitous gorges, down which rush many torrents, each torrent of which achieves a score of cascades and waterfalls before it reaches the sea. More rain comes down here than in any other region in the world... Hundreds of inches of rain annually, on fertile soil, under a tropic sun, means a steaming jungle of vegetation. A man, on foot, cutting his way through, might advance a mile a day, but at the end of a week he would be a wreck, and he would have to crawl hastily back if he wanted to get out before the vegetation overran the passage way he had cut. (Jack London in The Honolulu Advertiser 1914:10)

London also observed the lay of the land near the Ko'olau Gap in Haleakalā Crater, travelling into Hāna, Ke'anae, and eventually Nāhiku. As a keen observer and seasoned writer, London took notice of the abundance of water flowing from the local watersheds. London also inspected the rubber plantation at Nāhiku and traveled by way of the Nāhiku Ditch Trail, of which he commented:

Water means sugar, and sugar is the backbone of the Territory of Hawaii, wherefore the Nahiku Ditch, which is not a ditch, but a chain of tunnels. The water travels underground appearing only at intervals to leap a gorge, travelling high into the air on a giddy flume and plunging into and through the opposing mountain. This magnificent waterway is called a "ditch," and with equal appropriateness can Cleopatra's Barge be called a box-car... There are no carriage roads through the ditch country, and before the ditch was built, or bored, rather, there was no horse-trail... O'Shaughnessy was the daring engineer who conquered the jungle and the gorges, ran the ditch and made the horse-trail. He built enduringly, in concrete and masonry, and made one of the most remarkable water-farms in the world. Every little runlet and dribble is harvested and conveyed by subterranean channels to the main ditch. But so heavily does it rain at times that countless spillways let the surplus escape to the sea. (Jack London in The Honolulu Advertiser 1914:10)

Turning his attention from water collection of the Nāhiku Ditch to the engineering feat of the ditch trail running alongside of it, London comments on the trials of the passage:

The horse trail is not very wide. Like the engineer who built it, it dares anything. Where the ditch plunges through the mountain, it climbs over: and where the ditch leaps a gorge on a flume, the horse trail takes advantage of the ditch and crosses on top of the flume. That careless trail thinks nothing of travelling up or down the face of precipices. It gouges its way out of the wall, dodging around waterfalls or passing under them where they thunder down in white fury; while straight overhead the wall rises hundreds of feet and straight beneath it sinks a thousand... The only relief from the flumes was the precipices; and the only relief from the precipices was the flumes, except where the ditch was far underground, in which case we crossed one horse and rider at a time, on primitive log-bridges that swayed and teetered and threatened to carry away... The ceaseless iteration of height and depth produced a state of consciousness in which height and depth were accepted as the ordinary conditions of existence; and from the horses back to

look sheer down four hundred or five hundred feet became quite commonplace and non-productive of thrills. And as carelessly as the trail and the horses, we swung along the dizzy heights and ducked around or through the waterfalls... I advise only those with steady nerves and cool heads to tackle the Nahiku Ditch trail. (Jack London in *The Honolulu Advertiser* 1914:10)

Some of the heights experienced by riders on London's overland expedition were said to have shaken even the steadiest nerves. London relates an incident involving a lifelong cowboy from a local ranch with a reputation for fearlessness, having to dismount his horse while crossing a particularly deep gorge on a flume, gladly surrendering his reputation for the security of knowing he would be returned safely to his wife and children (*The Honolulu Advertiser* 1914).

The creator of the ditch system and its horse trail traveled in London's narrative, Michael M. O'Shaughnessy, was considered at the time the world's foremost irrigation engineer. O'Shaughnessy arrived in the Hawaiian Islands in 1899, and engineered the 1904-1905 Koolau Ditch through Nāhiku, referred to by London as the "Nahiku Ditch" (Wilcox 1996:117). Of the condition surrounding the construction of this section of the Koolau Ditch and its accompanying trail, O'Shaughnessy reported:

The country was so steep and precipitous that little ditching could be employed, and it was necessary to make four and one-half miles of wagon road and eighteen miles of stone paved pack trails to facilitate during construction the transportation of supplies. About 4,000 barrels of cement and 100,000 pounds of giant powder were used. In all, ten mountain streams are intercepted, which are admitted into the main aqueduct through screens of grizzly bars spaced three quarters of an inch apart (O'Shaughnessy in Wilcox 1996:117)

London's visit to East Maui could not have been better timed and his observations more appropriate considering the ongoing development of agricultural endeavors in the Hāna District. Surely his descriptions of the local watersheds, his experiences in plantation communities, and the feats of engineering that connected them would reach many readers abroad by way of his penmanship. Even the impressive engineering feats London witnessed in this environment could not detract from the wildness of the surrounding countryside he observed:

The vegetation ran riot over that wild land. There were forests of koa and kolea trees, and candlenut trees... Wild bananas grew everywhere, clinging to the sides of the gorges, and, overborne by their great bunches of ripe fruit, falling across the trail and blocking the way. And over the forest surged a sea of green life, the climbers of a thousand varieties, some that floated airily, in lacelike filaments, from the tallest branches; others that coiled and wound about the tree like huge serpents; and the one, the ie-ie, that was for all the world like a climbing palm, swinging on a thick stem from branch to branch and tree to tree and throttling the supports whereby it climbed... In fact, the ditch country is nothing more nor less than a huge conservatory. Every familiar variety of fern flourishes, and more varieties that are unfamiliar, from the tiniest maidenhair to the gross and voracious staghorn, the latter the terror of the woodsmen, interlacing with itself in

tangled masses five or six feet deep and covering acres. (Jack London in The Honolulu Advertiser 1914:10)

London's visit to the Nāhiku Ditch trail and to East Maui capture both the wildness of the countryside and the efforts of twentieth century business men to tame it in the name of commerce. The living in this area was rough and isolated, a fact that would become better known to the many agriculturalists who called Nāhiku their home during this period of plantation development in the area. Even with the collapse of the Nahiku Sugar Company's planting operations around the same time, the wild country with its abundant water and volcanic soils would continue to be a powerful draw for agriculturalists seeking their fortunes.

Haiku Pineapple Cannery

During the first part of the 20th century Hawaiian Commercial and Sugar Company was acquiring land in Hāmākua Loa which suggests that sugar cane continued to be cultivated in the area (Lib. 843:386, 857:283). However, there is no documentation of where cane was cultivated and in what years. At around this same time, Alexander & Baldwin opened the Haiku Pineapple Cannery (Daniel 1995). Much of the land in the Ha'ikū area was leased to grow pineapple. During his survey of the heiau of Maui, Winslow Walker documents several heiau in Hāmākua Loa as having been partially destroyed in order to cultivate pineapple. Poohoolewa Heiau in Honopou (west of Hanawana) and Pohakuokaia Heiau are mentioned in association with pineapple fields (Walker 1931:90, 92). A local informant also indicated that pineapple was grown "to Kakipi Gulch and almost to Kailua", from around the mid 1920s to the mid 1930s (personal communication, S. DeCoite, April 16, 2001).

Rubber Plantations in Nāhiku

In the early 1900s, Nāhiku became the site for several competing rubber plantations attempting to serve a growing demand for rubber used in automobile tires (Lindsay 1907:289-290). The *Hawaiian Gazette*, in a 1906 article, detailed the prospective changes to the region resulting from the introduction of rubber a year prior:

A little over a year ago a few homesteaders dwelt in Nahiku, living on their land chiefly because they hadn't money enough to go elsewhere. Wild bananas gathered in the jungles, mixed with guavas from the lower hillsides and washed down with milk from the cattle that wander in the forest, this was their means of subsistence. But the last year has demonstrated that rubber trees will grow in the district and the Nahiku of a year ago would scarcely be recognized now. (Hawaiian Gazette 1906:6)

Rubber planting was welcomed into the community by the residents as an avenue to bring income to the region after the closure of the nearby sugar plantation. With the local Nāhiku Sugar Company's difficulties in growing commercial sugar in the area, the Nāhiku region fell into a state of "innocuous desuetude...so the district has lain idle and the residents there have grown poorer and poorer until many families were on the verge of starvation" (Hawaiian Gazette 1906:6) Outlook for the profitability of rubber was good according to industry experts. R.H. Anderson, having studied rubber cultivation in Brazil, the West Indies, and Mexico, made a visit to Nāhiku in 1905 to survey the environmental conditions. During this visit Anderson planted a

handful of rubber trees to monitor their growth rate, and tapped several existing trees serving as shade near Nāhiku Landing to gauge latex output of local rubber. After witnessing good latex flow from the mature trees near the landing, and the several feet of growth of his experimental saplings in just a few short weeks following heavy rains, Anderson was convinced that “rubber trees would not only grow, but would produce rubber” (Hawaiian Gazette 1906:6). This visit by Anderson set the stage for the emergence of the rubber industry as attested by the *Hawaiian Gazette* nearly a year later:

That little grove of trees planted by Mr. Anderson in January, 1905, is now a thriving young orchard...so high that a man on horseback may ride beneath their lower branches without bending his head. And other orchards are being planted all along the nearby slopes of Haleakala, the primeval forest is falling before the axes of forces of laborers, and little rubber saplings from a foot to ten or eighteen feet in height are springing up everywhere to eventually clothe the mountain sides. (Hawaiian Gazette 1906:6)

Four chief rubber companies operated in the region by 1907, with all companies dedicating a combined total of 1,100 acres to the cultivation of cerea (*Manihot glaziovii*) and hevea (*Hevea brasiliensis*) rubber tree varieties, with the former being favored over the latter due to its high “first returns” (Pacific Commercial Advertiser 1910:9-12). The first plantations to open in the region were the Nahiku Rubber Company and the Koolau Rubber Company in 1905, followed a year later in 1906 by the opening of the Hawaiian-American Rubber Company and the Alexander & Baldwin-owned Nahiku Sugar Company, who began cultivating rubber trees on former cane land. When taken together, the combined plantings of the four major companies were more than 280,000 individual rubber trees, with the fields being tended by Japanese, Portuguese, and Hawaiian laborers living in the region as homesteaders or in plantation labor camps. Growing rubber was a difficult business to start in Nāhiku considering that the average maturity rate for a rubber tree is between three and five years, resulting in the first ‘experimental’ tapping of these crops in 1910 to determine quality, and not emerging onto the national market until a sizable crop could be harvested in 1911. Some companies, such as the American-Hawaiian Rubber Co., attempted to diversify their plantation by cropping corn in the spaces between the furrows of rubber trees in an effort to offset the costs associated with the long wait for the rubber trees to reach productive maturity (Pacific Commercial Advertiser 1910). Attempting commercial agricultural operations in a region as isolated as Nāhiku in the early 1900s proved to be an insurmountably difficult undertaking for the growing rubber enterprise on East Maui.

4.3.1.1.1 *The Nahiku Rubber Company*

The Nahiku Rubber Company was in operation as early as 1905. As the first rubber plantation on Maui, the Nahiku Rubber Company sought to spearhead the new burgeoning demand for rubber on the international market. At the time of the company’s founding, automobile manufacturing was a booming industry and automobile tires cost the average consumer between \$25 and \$40 a piece “because rubber was scarce and expensive, most of the world supply being gathered from wild trees in the Amazon valleys of Brazil” (Smith 1943:10). Accompanying literature of the time regarding the cultivation of rubber in the tropical British Colonies of Malay and Ceylon was filled with highly optimistic accounts of the big profits to be made in the

industry. Expecting significant returns from the undertaking the Nahiku Rubber Company, promoters purchased approximately 900 acres of land and immediately started clearing fields and building roads, labor camps, and houses for the staff (Figure 29) (Smith 1943).

Expenditures on the Nahiku Rubber Company facilities were soon augmented by the difficulties encountered by the early growers once planting had started (Figure 30). The first crop had been comprised of 50,000 rubber tree seeds imported from Brazil, some of the seeds germinated while the rest had failed to sprout. In the wake of these losses the company decided to scout the island for established trees already growing in people's residences, and the company offered cash to acquire the domestic trees to their plantation. With the plantation being as remotely located as it was, the company would cut the trees down and transport the stumps to the fields for replanting, which the managers viewed as a shortcut to bypass the long wait for seedlings to reach maturity (Figure 31). Very soon the capital for the project was expended, and the company began selling stock to raise more money for the plantations day to day costs of operation. Economic forecasts for the rubber industry did not live up to their expectations, and by the time that the Nahiku Rubber Company had a fully planted and matured 250 acres ready for tapping, the price of rubber had bottomed out at 16 cents per pound. Depending heavily on an all-inclusive low of one dollar per pound for their product, the domestic rubber market in Hawai'i could not remain profitable. The Nahiku Rubber Company, Ltd., managed by David Colville Lindsay at that time, was closed on January 20, 1915 (Siddall 1917:175).

4.3.1.1.2 Koolau Rubber Company

In June of 1905, William A. McKay organized the Koolau Rubber Company at Nāhiku, and served as managing director during its first year of operation (Nellist 1925). By 1906, a year after the Koolau Rubber Company was founded, the prospects for the rubber plantation looked promising. A *Maui News* article from 1906 echoed this optimism by stating that "It is confidently expected that the growing of rubber will be one of the most successful industries on the island and will make possible the utilization of many acres of land that are now useless" (The Maui News 1906:13). The optimism was partly justified because upon return from an inspection of the plantation, the company representatives R.A. Wadsworth and W.L. Decoto reported a fifteen foot growth of the previous year's crops that had been planted from seed. The luxuriant growth of the crop exceeded their expectations. The costs of cropping the rubber trees were also small for the time, costing the company only six dollars per acre to clear the dense vegetation and only about one cent per hole for planting saplings. At the time of this assessment, Koolau Rubber Company had only planted 25 acres of their 300 acre holdings and were expecting their next shipment of saplings later that year (The Maui News 1906).

By 1914, the Koolau Rubber Company had nearly its entire acreage planted and was poised to produce its maximum output, but the simultaneous fall of rubber prices on the world market forced the company into considerable financial hardship. Prices had dropped so drastically that the cost alone of tapping the trees on the plantation would have drained all the profit from the company's sales and would incur debt. The company had not been a profitable venture from the start and had been carried for some time by a small number of wealthy shareholders waiting patiently for the projected returns. In the end, rubber prices never rose to a profitable value for the Koolau Rubber Company and the prospect of severe economic atrophy had finally won out over the determination of the shareholders to keep the company in operation. In 1914, the

Koolau Rubber Company published its notice of intention to foreclose on the \$30,000 dollar mortgage from the First National Bank of Wailuku and begin winding down operations immediately (Honolulu Star Bulletin 1914).

4.3.1.1.3 American-Hawaiian Rubber Company

As early as 1906, the American-Hawaiian Rubber Company was in operation in East Maui with over 65,000 juvenile trees in the ground (The Hawaiian Star 1906c). In 1908, American Hawaiian Rubber Company fields were evaluated by F.T.P. Waterhouse who was particularly well pleased with the growth of the rubber trees. The hevea variety of rubber tree was the primary crop at this plantation with higher year to year yield being cited as the reason this species was chosen over the more commonly planted cerea tree. The company also experimented with castilloa rubber trees from Mexico and with interstitial planting of select food crops between the widely spaced rubber trees. The use of hevea trees was initially not as beneficial as had been anticipated by the American-Hawaiian Rubber Company. Initially, the hevea trees were planted during the winter months as this was when the seed crops originating in the southern hemisphere were maturing and rife for shipment, the abundance of which made the cost of procurement less expensive. Even though the trees in the region were generally doing well, this error in planting times was cited as being the reason why timely maturation and first yields were lacking (The Honolulu Advertiser 1908). As with the neighboring plantations in the area, once the trees were planted and growing the enterprise became a waiting game until the trees were mature enough to harvest. An article in *The Honolulu Advertiser* (1910:13) relates the continued optimism as harvest approached:

The product is of prime quality, there is a keen demand for it as a result of samples sent out, and the price continues to rule high. Small wonder that the Nahiku rubber planters impatiently watch the growth of their trees and pray that the price of rubber may keep up. They have had a hard row to hoe, but have stuck manfully to their work...There seems to be no doubt as to the ultimate success of the rubber enterprise, which has been removed for beyond the experimental stage, as far as paying returns are concerned. (The Honolulu Advertiser 1910:13)

New techniques, cultivation of a variety of species, planting additional crops between rubber trees, and patience did not pan out for the American-Hawaiian Rubber Company, and in 1917 the company gave notice of foreclosure on their mortgage in local newspapers (Honolulu Star Bulletin 1917).



Figure 29. Nāhiku hillsides planted with rubber tree saplings; plantation manager's house visible on the ridge (Pacifiic Commercial Advertiser 1910)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various



Figure 30. Seedlings being planted at the Nahiku Rubber Company (Pacific Commercial Advertiser 1910)



Figure 31. Nahiku Rubber Company Manager C. H. Anderson riding among his rubber tree saplings (The Honolulu Advertiser 1908)

4.3.1.1.4 Nahiku Sugar Company

Unlike other rubber ventures in the region, the Nahiku Sugar Company approached the planting of rubber with a bit more caution and tempered enthusiasm than their neighboring competitors. Whether this approach was resulting from the failure of the plantation to successfully crop sugar a decade earlier is uncertain, but by the time that the rubber industry had begun to grow in the region the Nahiku Sugar Company lands were in a severe state of neglect (The Hawaiian Star 1907). Sometime between late 1905 and early 1906, Alexander & Baldwin hired a new manager for the former sugar plantation at Nāhiku by the name of J Sylvester from Portland Maine (The Hawaiian Gazette 1908). By late 1907 Sylvester had planted nearly 100 acres in cerea rubber trees mimicking the other local plantations with a rough planting of about 400 individual trees per acre under cultivation (The Hawaiian Gazette 1907). Details about rubber crops specific to Nahiku Sugar Company regarding the product quality and progress of growth are scarce, but in general, their rubber crops seem to have lacked the same profitability as the neighboring plantations. By the time that the manager of the Nahiku Rubber Plantation, W.A. Anderson, brought a group of potential investors through the region to evaluate the state of rubber growth in East Maui, The Nahiku Sugar Company manager had decided that the next years plantings would not be as close together and that he would be experimenting with hevea variety trees in the next plantings (The Hawaiian Gazette 1908). The new planting techniques either came too late or were of little profit to the company as under two years after first planting a portion of their land to rubber the plantation manager announced that no more rubber would go into the ground until the already developing downward trend in rubber's market value reached a more favorable standing (The Maui News 1907).

While rubber cultivation was in full swing, the plantation managers made it their business to regularly test the crop productivity to better gauge the long term financial viability and estimate future yields, especially W.A. Anderson who managed the Koolau Rubber Company and oversaw a government experimental station for the express purpose of evaluating the local rubber industry. Initial rubber tree tapping in 1912 yielded an "enormous quantity" of the valuable latex sap, and appeared to bode well for the profitability of the local plantations (The Maui News 1912:1). Although the sap was voluminous it was found to lack the elastic qualities that would have made it ideal for tire production, and instead the rubber produced in East Maui was only suitable for "machine belts and other articles which do not demand the elastic qualities" (The Maui News 1912:1). Just how profitable the non-elastic latex sales would be was unclear at the time of the published article, as the market for those goods was not in as much demand as the need for automobile tires.

Ultimately a decline in the price of rubber doomed the Maui rubber industry. After testing for several years, the rubber growers concluded that it would not be profitable to continue. It was found that the temperature was hardly warm enough for rubber to grow best and that labor was much more expensive than at Malaysian plantations (O. W. Freeman 1927:64).

Ke'anae

Ke'anae is located on the windward flank of Mauna Haleakalā in the Hāna District and traditional *moku* of Ko'olau within the *ahupua'a* of Ke'anae. Once a site of intensified Native Hawaiian agriculture and habitation, and later becoming a center for missionary and agricultural

activities during the 1800s, Ke'anae packed several hundred years of historical development into a single stream-fed coastal valley peninsula. Though the region experienced varying degrees of economic boom and bust over its storied history, that history would become the next major draw to the region and supply income to its residents where subsistence and industry fell short.

4.3.1.1.5 Ke'anae Homesteads

Ke'anae has been an active agricultural community for many generations. Studies of the history of land use in Ke'anae indicate that the lands have been used intensively for wetland taro cultivation, or *lo'i* agriculture, historically and during pre-Contact times (Group 70 International et al. 1995:70; Handy et al. 1991). As Native Hawaiian populations of the islands declined with the arrival of Western disease, so too did the need for taro, resulting in unattended *lo'i* in the Ke'anae area. In the second half of the nineteenth century, the market for rice grew significantly with increasing demand from Chinese laborers on sugar plantations in Hāna. After successfully completing labor contracts, Chinese immigrants looking for independent pursuits took advantage of an opportunity to grow their own staple, rice (Wright 1974b). With a pond field irrigation system already in place in Ke'anae, the region was ripe for conversion from taro cultivation to rice. Chinese entrepreneurs commonly leased former *lo'i* lands from Hawaiian owners for rice cultivation (Group 70 International et al. 1995). Tax records for 1890 indicate that the rice lands in Ke'anae and Wailuanui comprised approximately 67.84 acres out of a total of 163.322 acres in pond-field agriculture. Two years later, this number rose to 75 acres in Ke'anae and Wailuanui while other lands on Maui (Honokowai, Waikapu, Wailuku, Waiehu, and Waihe'e) registered a combined acreage of 175 (Group 70 International et al. 1995; Linnekin 1985).

The Chinese farming community flourished in Ke'anae, and with an increase in population came the construction of buildings necessary for production and housing related to the rice plantations, as well as the establishment of socially-related organizations. An article in *The Hawaiian Star* (1906b) reports of two saloons "run by Chinamen". The Li Hing Society Building (SIHP # 50-50-07-1510), a two-story wooden structure with a second story front porch, was built in 1908 and served as a place for Chinese social, religious, and educational purposes until the early 1950s (Figure 32) (Wright 1974b). After falling into disuse, the building was subject to repeated vandalism until, in 1981, it was demolished (Group 70 International et al. 1995). Remnants are now stored at the Kwock Hing Society in Keokea, Kula (Wright 1974b).

In 1906, 14 applications were received out of the 16 Ke'anae homestead applications made available at that time to Hawaiians. Stipulations required occupants to build a residence and cultivate taro on the homestead parcels, which each averaged about two to three acres including from a half to a whole acre of taro land (*The Hawaiian Star* 1906a). Concerns regarding these homesteads were reported:

It is very probable that many of the applicants do not realize, or have not taken the time to consider the conditions under which the land is to be awarded to them, but fully expect to lease out their land to the Chinese there for planting rice, and let their kula land lie idle, and when the first two years are up a great many of them will doubtless forfeit their lots. The Hawaiians there have been asking for homestead for several years back and it is now up to them to make good. (*The Hawaiian Star* 1906a:5)

Hawaiians did grow taro on these early homesteads (Figure 33), mostly for home consumption. Rice farming declined sharply following 1910, and by 1935 ceased entirely (Group 70 International et al. 1995). Around 1920, many Hawaiians returned and began commercially cultivating taro on Ke'anae Homesteads (Figure 34). Due to its important cultural and historical significance, the Ke'anae Peninsula taro complex has been designated SIHP # 50-50-07-3933.

4.3.1.1.6 Transportation Infrastructure

Prior to the construction of the Belt Road to Hāna, horse trails, developed when engineers constructed ditch systems between East Maui and the central Maui isthmus, were the only means of overland travel. Travelers leaving Ha'ikū on horseback for Ke'anae descended and ascended 22 major valleys before arriving at Ke'anae. Along the way, the traveler would have visited Native Hawaiian villages at Huelo, Kolia, Waiakamoi, Wahinepe'e, Puahokamoa and Honomanū. Inter-island steamships made regular stops at the Ke'anae Landing, but were considered expensive (\$2.00 for deck passage) (The Maui News 1926).

Reports of an exceptional account of a Chinese merchant departing from Ke'anae Landing to ship rice to Makawao was published in *The Honolulu Republican* (1901:9) newspapers:

On account of the refusal of the Wilder Steamship Co. to carry rice from Keanae to Maliko, T. Awana, one of the most enterprising Chinese in the Islands, has contrived another means by which he can convey his rice to Maliko, and from there to Makawao in carta. Awana has built a Chinese sampan, and rigged it with Chinese sails. The boat was built at Maliko of white pine, and it can carry about five tons of merchandise. It is manned by a crew of about ten Chinamen, whom Awana has selected from his number of workmen. These Chinese at first were not accustomed to the motion of the boat, and on this account it took some time before the boat reached Maliko from Keanae with its first load of five tons of rice. From Maliko the boat leaves for Keanae with small loads of food-stuff to supply Awana's customers on the other side. Awana owns large patches of rice in the Keanae District. All the riggings and gear for the sampan were made by Awana, even the rope which he uses to fasten the sampan to its moorings in Maliko. Mr. Awana also grinds his own coffee for sale in his store at Makawao, keeps cattle, and engages in several other enterprises, all of which he attends to personally. The rice which reaches Maliko from Keanae is carried to his store at Makawao in ox carts, where it is sold in large quantities (Honolulu Republican 1901:9)

An article in *The Honolulu Advertiser* (1901a:11) further describes the crew and trip:

...The crew consisted of ten sailors six Chinese and four Hawaiians. The trip over was a rough one, the six Chinese being sick from the motion of the waves not to mention the effort of rowing in a choppy sea. As the wind was contrary, the sampan had to be rowed over, eight oarsmen working at one time. They sailed back again in three hours with the assistance of one of their two square sails. Five tons of rice was the cargo brought from Keanae. The start was made on the 28th and the return during the 30th. (Honolulu Advertiser 1901a)



Figure 32. Historic Rice Mill (SIHP # 50-50-07-1510) in the Ke‘anae Historic District (The Honolulu Advertiser 1910)



Figure 33. Undated photograph of the irrigated fields of Ke'anae (CSH Archives)

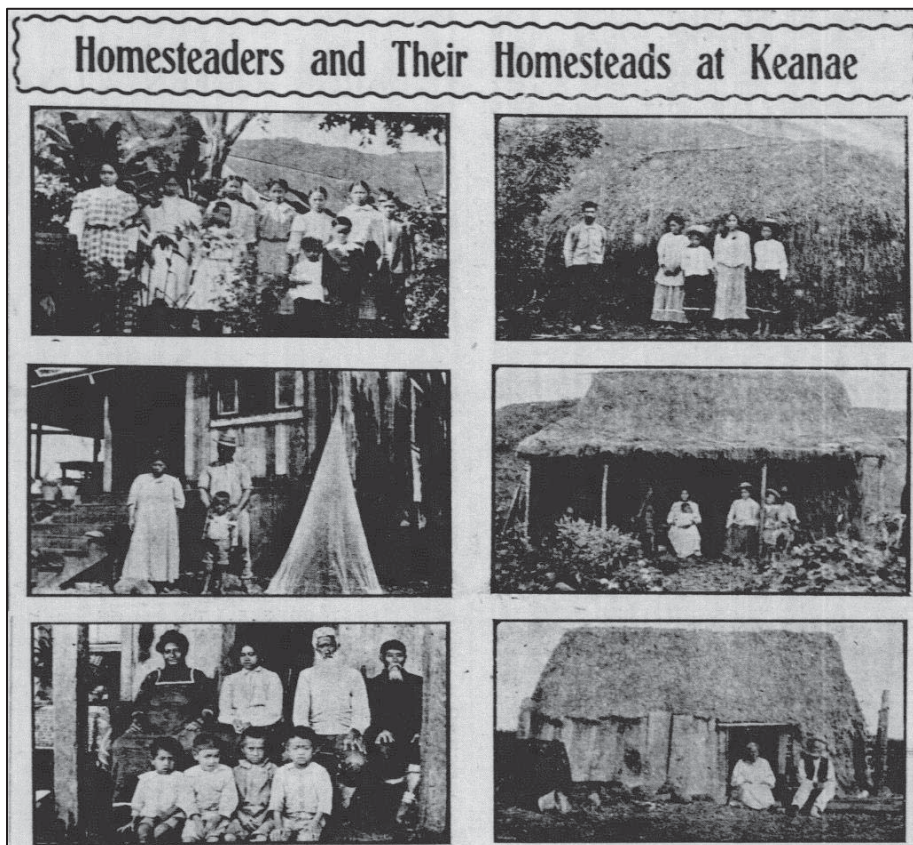


Figure 34. Portraits of Ke'anae homesteaders and their residences (The Honolulu Advertiser 1910:13)

After 1927, use of the landing had discontinued. In 1992, remnants of Ke'anae Landing were assigned SIHP # 50-50-07-2957 (Group 70 International et al. 1995).

In 1912, a narrow road and bridges were completed that connected Kailua to Nua'ailua Bay near Ke'anae, and by 1915, other contractors had built a road connecting Hāna to Ke'anae. However, this Hāna connection ended in the Ko'olua forest instead of tying into the road to Kailua (Group 70 International et al. 1995). Two historic concrete tee beam bridges were constructed near the entrance of Ke'anae Peninsula in 1916, Pi'ina'au Stream Bridge and Palauhulu Stream Bridge (Group 70 International et al. 1995).

By 1922, the Hāna Belt Road had been completed between Kuiaha and Kakipi Gulch. In 1923, the County Board of Supervisors requested more prison labor for roadwork between Kailua and Ke'anae. While road work continued toward Ke'anae, survey work commenced between Ke'anae and Kopili'ula. In June 1925, the grand opening of the Kailua-to-Ke'anae portion of the Belt Road was celebrated by a procession of automobiles to Ke'anae. Territorial Governor Wallace Farrington dedicated the opening of the road with County Board of Supervisors Chairman Samuel Kalama and others (Figure 35) (The Maui News 1926). A highly anticipated *luau* was held on Kamehameha Day to celebrate the opening of Hāna Belt Road into Ke'anae:

The celebration will be the first time that the Keanae folk as a community have been brought into direct contact with those of the rest of the island, and all the district is determined to make the affair a rousing success. Hawaiian delicacies in fish and fruit are promised in lavish supply from the Hana and Keanae country, and June 11 has been written down a day of ill omen for the pigs and steers of Central Maui.” (Honolulu Star Bulletin 1925:21)

4.3.1.1.7 Churches

The Ke'anae Protestant Church (SIHP # 50-50-07-1511), also referred to as Ke'anae Congregational Church or Ke'anae Church (Figure 36), is a stone structure with wooden doors and a single interior open space located near the ocean on the Ke'anae Peninsula. A small cemetery adjoins the north side of the church. While materials were being gathered as early as 1857, the church was not built and dedicated until 1860 (Group 70 International et al. 1995). Construction was not entirely completed until 1863. Painted on the east wall behind the pulpit is the church's given name, “Lanakila Ihiihi O Jehova Ona Kaua,” meaning “Sacredness, Success of Jehova, the Son of God” (Wright 1974a).

According to legend, and an article in the *Honolulu Star Bulletin* (1949:16), the coral used as a source of lime for the mortar to build the church washed ashore from divine intervention:

It seems that the Keanae people had no coral on their beach, and since coral is essential for making the lime to hold the stone structure together, the Hawaiians prayed for help.

A great storm arose which washed quantities of coral onto the beach, more than needed.

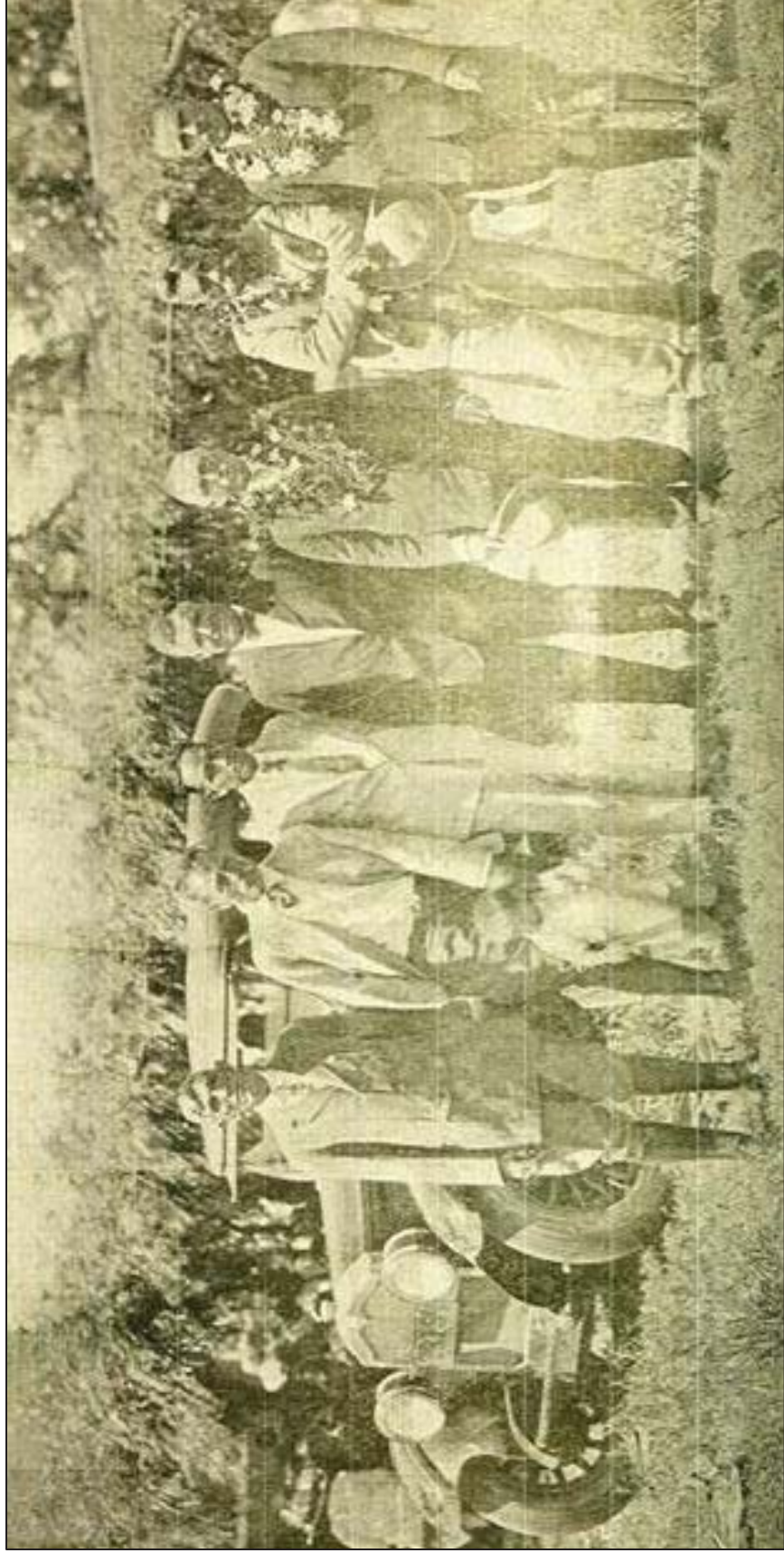


Figure 35. A group of Maui County Supervisors pose with Governor Farrington in Ke'anae; left to right: R.A. Drummond, W.F. Kaae, County Engineer P. Low, Sheriff C. Crowell, Governor W. Farrington, Chairman S. Kalama, and D.T. Fleming (The Maui News 1926)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

The people believed God had answered their prayers. So, they set to work with a will to haul the great trees down from the mountain and to gather the stone needed for the building. (Honolulu Star Bulletin 1949:16)

The surveyor responsible for completing the NRHP form for Ke'anae Church, J. C. Wright (1974a:3), further describes the Ke'anae Church as an "excellent example of the early stone mission church erected in distant outposts with indigenous materials." This large structure, which included an attached social hall, not only served the congregational needs of the local Ke'anae inhabitants, but also provided a gathering place for surrounding communities (Wright 1974a).

On 1 April 1946, a *tsunami* (Japanese for tidal wave) generated by an earthquake in the Aleutian Islands off the coast of Alaska, struck the Ke'anae Peninsula. The height of the *tsunami* runup over two separate spots at Wailua was measured at 4.8 m (15.7 ft) and at 5.1 m (16.7 ft) (World Data Center 1977). The Ke'anae Church was the only structure left standing when the *tsunami* receded (Bartholomew and Bailey 1994), although the assembly hall was destroyed (Group 70 International et al. 1995). The church sustained some damage from the 1946 *tsunami*, and by 1968, time had weathered the structure to a point of having a leaky roof, a near collapsing ceiling, and a saggy floor (Wright 1974a).

Mr. Harry K. Pahukoa, Jr., and his mother, Mrs. Nary Aima Pahukoa, with the assistance of the other four families of the church and a carpenter friend, began repairs on the church. Though slow at first, help from the community did materialize. Funds and chandeliers were donated, and volunteers helped refinish pews, paint the walls, and install electricity. The roof, windows, doors, and floors were all repaired. Through diligence, faith, and dedication, the Pahukoa's dreams of repairing the church were realized, and their efforts have helped secure this historic site for posterity. More than 350 people attended the rededication of Ke'anae Church on 27 July 1969 (Wright 1974a). In addition to Ke'anae Protestant Church, another historic church is also present in Ke'anae. Wailua Mormon Church (SIHP # 50-50-07-1514) is a one-story wooden building situated between Ke'anae School and Wailua Homesteads Road. It was built in 1934 and dedicated in 1935. It served a small Mormon community in the Ke'anae area before it was eventually abandoned and used mostly as a residence. In 1974, the church had only five members (Wright 1974c).



Figure 36. 1958 photo of Ke'anae Protestant Church (CSH Archives).

4.3.1.1.8 Ke'anae School

The first school in Ke'anae was located on the peninsula near the Ke'anae Congregational Church. The main portion of the present day Ke'anae School was built in 1912 with subsequent additions. The school provided a common learning place for children in kindergarten through eighth grade, in which the older students commonly assisted the younger pupils (Lum 1969). Initial enrollment was for 63 students (Penkiunas 1992). This number fluctuated throughout the years, but the curriculum continued to include traditional Hawaiian values and practices, including Hawaiian language and the cultivation of and traditional uses for plants (Figure 37 and Figure 38) (Tanji 1978). According to the Penkiunas (1992:10), Ke'anae School is a “surviving example of a small rural school” that “represents the small wooden vernacular building found in many rural areas” and is the “last remaining two-room schoolhouse on Maui” (Figure 39) (Penkiunas 1992:10) It has been designated SIHP # 50-50-07-1630. After much debate regarding the school's closure, the last class was held at Ke'anae School in 2005. It was officially closed in 2010 (The Honolulu Advertiser 2010).

4.3.1.1.9 YMCA camp complex, Ke'anae Arboretum, and Ke'anae Quarry

The Ke'anae Prison camp was used from about 1925 to 1939. In the 1920s, prisoners at the camp worked on the construction of the Hāna Belt Road. The prison camp was converted to a Civilian Conservation Corps (CCC) camp in 1934, where islanders were employed to plant thousands of eucalyptus and other tree species, such as *koa* and *wauke* in the region. In 1946, the camp again housed prisoners who renovated the *lo'i* located at the nearby Ke'anae Arboretum. The Ke'anae Arboretum *lo'i* complex (SIHP #50-50-07-3922) consists of 14 *lo'i* on two to three acres west of Pi'ina'au. These *lo'i* have existed much longer than the arboretum, which was started in 1942 but did not open to the public until around 1970. The prison camp was closed in 1950. YMCA received a lease for the camp in 1949. Today the site is a YMCA camp that can be rented by the public. The YMCA camp complex consists of a group of plantation style wooden buildings. The manager's residence, constructed in 1934, is the oldest building in the complex. The YMCA camp site offers panoramic views above Ke'anae Peninsula and overlooks Ke'anae Landing and Ke'anae Quarry (Group 70 International et al. 1995).

Ke'anae Quarry (SIHP # 50-50-07-3943) is located on a hill beneath the YMCA camp. It was used during the 1920s by prisoners who helped build the Hāna Belt Road with the blue rock that was crushed at the quarry. Features encountered at the quarry indicate the site was also used during World War II (WWII). When the quarry was first documented by Group 70 International et al. (1995), old machinery, a WWII gun emplacement, and a rock platform were observed. The platform may be the grave site of a former worker who died during a blasting accident.

Today, Ke'anae consists of taro fields, small residential areas, and parks. In addition to taro, residents now also grow bananas, yams and other wetland crops (James 2002). Though the landscape has undergone some changes, Ke'anae, with its *lo'i* and preserved historic infrastructure, offers a glimpse into the traditional and historic land use in East Maui.

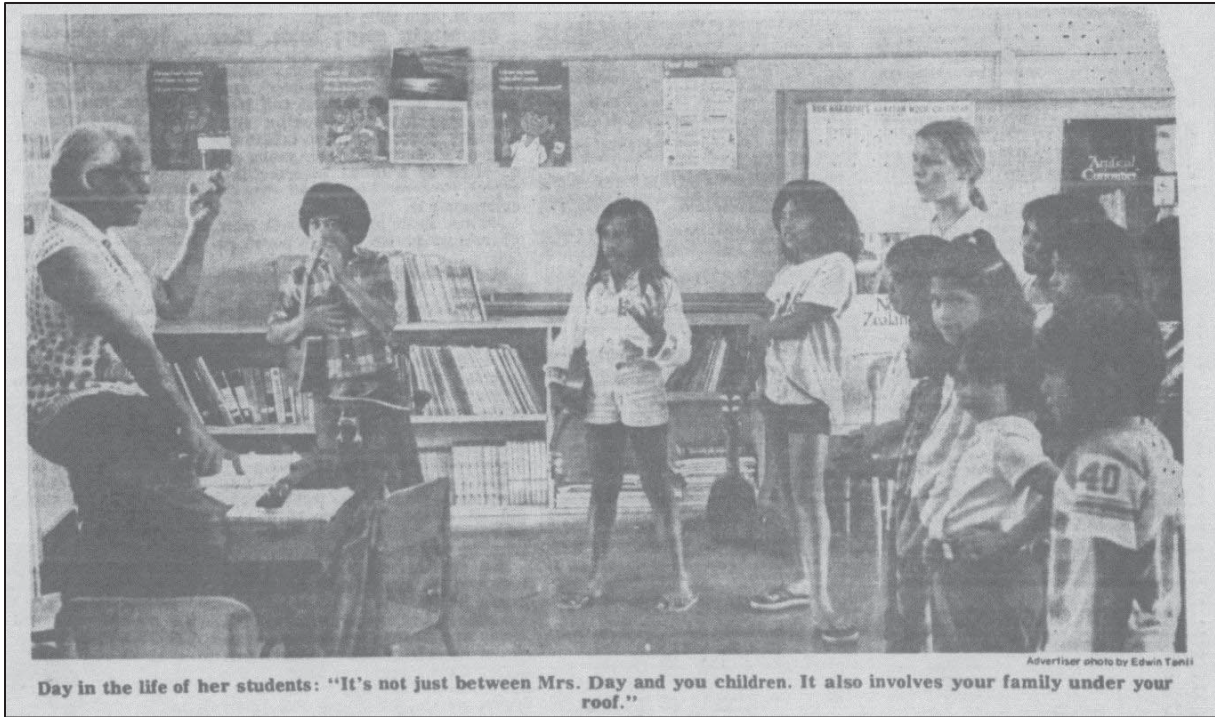


Figure 37. Mrs. Apolonia Day teaching her students at Ke‘anae School in 1978 (Honolulu Advertiser 1978)



Figure 38. Ke‘anae School students playing football (Honolulu Star Bulletin 1969)



Figure 39. 2013 Photograph of Ke'anae School (Wikimedia 2016)

Hāna Highway Historic District

The Hāna Highway Historic District, which extends from Hoalua Bridge near Huelo in the Makawao District to Koukouai Bridge in the Kīpahulu District, includes 78 contributing feature components dating to over 50 years old. The Hāna Highway was also recognized as a Millennium Legacy Trail in 2000, and in 2001 was nominated to the National Register of Historic Places (NRHP). A total of 73 contributing resources of the Hāna Highway Historic District were documented within the district's NRHP registration form (Duensing 2001). A Historic American Engineering Record (HAER) No. HI-75 for the Hāna Belt Road was published by the National Park Service in 2005 to provide descriptions of the historic architectural and engineering features of the Hāna Historic District (Duensing 2005). Of the 78 component features of the Historic District approximately 56 of the bridges/culverts exist between Hāna and the central isthmus of Maui along the north shore of the island (Figure 40).

The general path of the road is much older than the existing historic highway. It has predecessors as early as the time of the Maui King Pi'ilani's Alaloa ("long road") and Kihapi'ilani's addition to the Alaloa known as "The Kings Trail" in the 1600s, to the time of the "Ditch Trail" that ran alongside the early water catchment and diversion ditches for agriculture in the early 1900s. The Hāna Highway was first built with the intent to circumscribe East Maui with a levelled road surface in 1900, complete with gulch spanning bridges. The initial roadwork of the early 20th century was piecemeal and incremental at best, sometimes making use of horse and foot trails connecting otherwise isolated sections of road (Duensing 2005). Dawn E. Duensing in Hāna Belt Road HAER HI-75 (2005:29) describes the difficulty of working on the early road as follows:

The work required in the Hana District was quite extensive due to the heavy rainstorms and freshets. At times flooding during the winter rainy season made it impossible to travel on the Hana Road...mail carriers were unable to complete their rounds, so the SPW [Superintendent of Public Works] ordered foot bridges built over deep gulches. Travelers were stuck with difficult overland travel on horseback or by steamers, which used what one resident called the "most impractical landings." (Duensing 2005:29)]

Many of these problems were alleviated with the passing of the County Act of 1905 that established county government throughout the State of Hawai'i, an important function of which was to appoint a county engineer by the name of Hugh Howell to oversee civic projects like the Hāna Belt Road. Replacement of the bridges was of utmost importance to the Hāna Belt Road project since "many of the [existing] bridges had deteriorated from rot and had trusses that were considered dangerous" (Duensing 2005:30). Howell's program of replacing the truss type bridges with concrete pier-type bridges was first implemented across 'Ohe'o Gulch amounting to a 70 foot span. Although construction of these new type of bridge foundations were expensive, Howell argued that it represented an economic reconstruction since concrete piers required less maintenance than the trusses, which reduced necessary maintenance cost from an estimated \$50 per year to \$5 per year. Part of these savings in maintenance also originated in Howells use of crude oil and carbolineum to help protect the wooden superstructure against the moist tropical air and environment (Duensing 2005).

Construction of the road was slow for several years as the existing funding for the project was extremely limited and insufficient, having originated at that time from small amounts of money parceled out yearly by the government for the completion of consecutive sections of the road. This financial difficulty combined with the physical difficulty of building the road had the project approximately 10 years behind schedule by 1909. The formation of the Maui Loan Fund Commission (MLFC) in 1911 enabled the project to move forward with a more permanent capital improvement by replacing all timber bridges with concrete. The formation of the MLFC and the regularity of funding it provided enabled the construction of the first several concrete bridges enumerated among the Hāna Highway Historic District. The bridges constructed during the initial implementation of this funding were those named: Waikomai, Kōlea, Honomanū, Nua'ailua, Mo'omonui, Waiakoi, Pa'ihi, South Wailua (Honolewa), and Koukou'ai (Duensing 2005).

By 1920, the project saw the completion of many additional concrete bridges to the belt road, however, the belt road itself was far from complete as it still did not connect at several points. Also during 1920, the MLFC decided that it would suspend funding for the Hāna Belt Road for a few years to allocate funds to roads nearer the central isthmus that were seasonally inhibiting pineapple harvests due to poor conditions. The suspension of the belt road project would last until 1923 when Maui's business and civic leaders, along with the Hawai'i governor Wallace Farrington, became proponents of a resurgence of civic interest in the project. This revitalized interest fueled a massive organized effort to complete the section of the road from Kailua to Ke'anae, which was completed by its projected finish date in 1925 (Duensing 2005).

The construction of the next section of the Hāna Belt Road was begun shortly after the completion of the Kailua to Ke'anae section, and was boosted by a substantial bond from President Calvin Coolidge issued to the Territory of Hawai'i that included \$150,000 for completion of the proposed 3.5 mile stretch from Ke'anae to Wailua Iki. This stretch would prove to be the most difficult portion of road to create due to the many serried ridges of hard volcanic stone that had to be blasted through, and because of the occasional slipping of steam shovels into deep gorges and mechanical issues associated with their employment in the process of rock breaking. Occasional flooding and landslides were also a discouraging element of constructing the belt road, having been responsible for several instances of burying the steam shovels under their downslope aftermath. The final stretch of road was completed with the construction of Wailuanui Bridge in 1926, which had itself been setback by a landslide that sent 600 bags of concrete needed for its construction coursing down the adjacent gulch and out to sea (Duensing 2005).

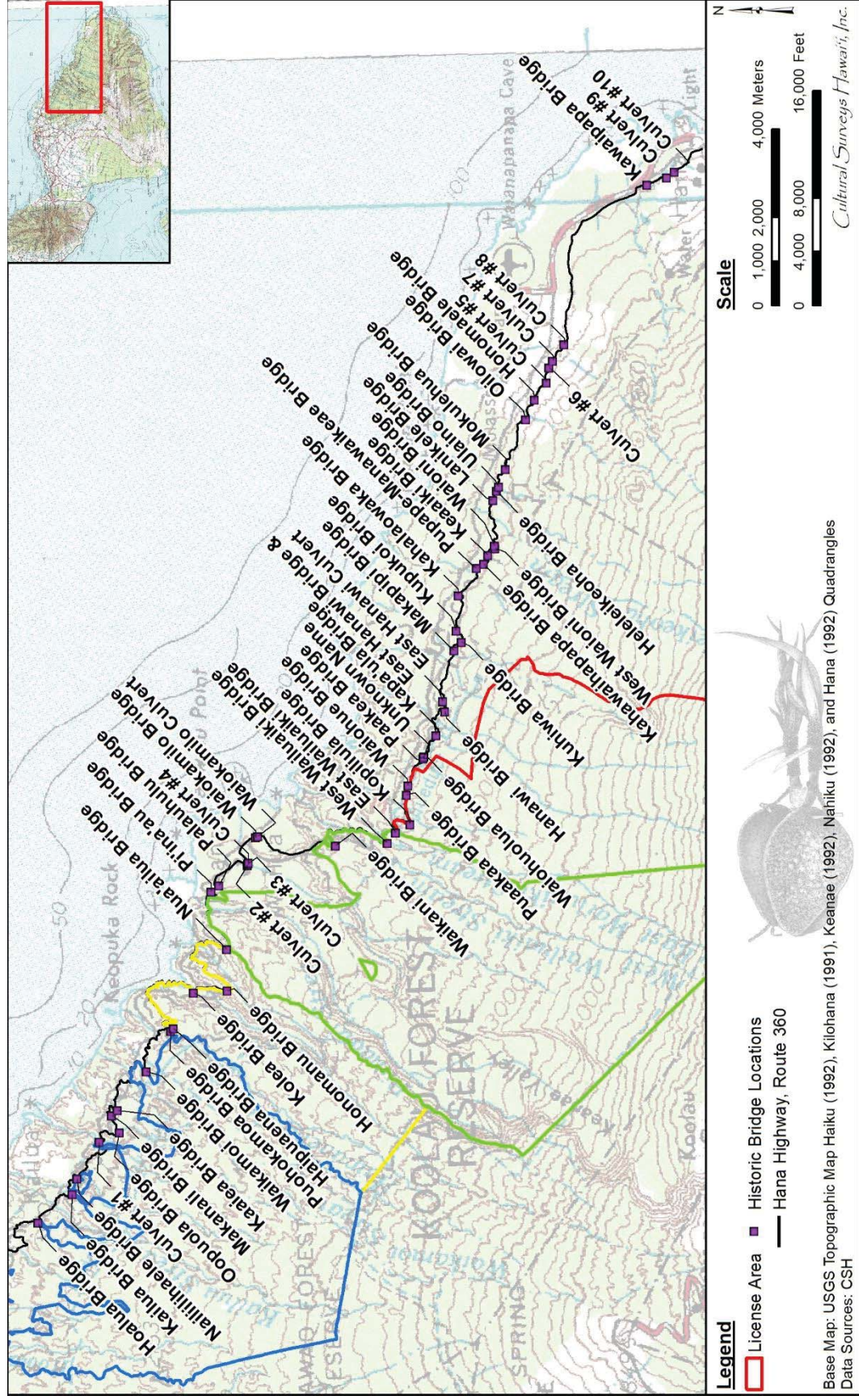


Figure 40. Portion of the 1992 Haiku, 1991 Kilohana, 1992 Keanae (U.S. Geological Survey 1991, 1992a, c)

CIA for the Proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas (East Maui Aqueduct System), Multiple Ahupua'a, Makawao and Hāna, Maui

TMKs: Various

The Hāna Belt Road was completed and opened to the public in 1926 and effectively ended Hāna District's centuries of geographic isolation from the rest of the island. Although the public had begun travelling the road, several bridges were operational but incomplete. All the original bridges that comprise the historic road were not completed until 1947, and the road itself lacked a complete pavement up until the 1960s (Duensing 2005).

The type of component structures of the Hāna Historic District consist mostly of bridges and culverts, including: masonry arch bridges (Figure 41), concrete bridges (Figure 42), concrete arch bridges, and stone and concrete culverts. Since the road had been scarcely maintained since the final paving of the surface in 1962, it had been ravaged by the passing of time, showing few contemporary improvements aside from the addition of guardrails and pavement patch on the road surface.

In the 1990s, the State of Hawai'i responded to the need to repair the Hāna Belt Road and implemented a preservation plan for the entire length of state-owned road between Huelo and Hāna. The preservation plan called not for the preservation of the bridges themselves, but instead sought to retain the "character" of the road with its narrow bridges and winding cliffside roads. This proved to be a challenge as the funds offered by the Federal Highway Administration (FHWA) required the roads to be widened to their standard widths of 36 feet, with some of the existing roads only being about 16 feet wide. Ultimately the historic width of the bridges was allowed to remain narrow (Figure 43), conditional upon approval by the FHWA on a case by case basis. As a result of this ongoing maintenance work the historic district has been thoroughly researched and described in detail by multiple studies (Duensing 2001, 2005; McCurdy et al. 2014; MKE Associates LLC and Fung Associates 2013; Nagamine Okawa Engineers Inc. and Fung Associates 2015; Oceanit 2000; Wilson Okamoto & Associates 2001)

Ultimately, the Hāna Belt Road was deemed a historic property of significance due to the efforts and achievements surrounding its construction. Duensing (2005:55-56) clarifies the roads effect on the region:

The Hana Belt Road was a substantial public works achievement...during an era when Maui, especially Hana, was quite isolated from the rest of the world... the Hana Belt Road also involved the expertise of highly trained engineers and designers...Although some of the construction work was contracted out, county employees did nearly all the design and engineering work. (Duensing 2005:55-56)

In that the Hāna Belt Road still serves its original function of connecting isolated Hāna to the central plains, and that it has undergone very little cosmetic changes in the ensuing 70 years since its construction, it has a preserved character and function that has changed very little since its construction. Although the Hāna Belt Road was constructed to more sufficiently connect and develop the remote eastern side of the island, the opposite effect has been documented because of the narrow winding nature of the historic highway. Duensing (2005:59) clearly illustrates this point as follows:

The lack of easily-travelled, high-speed traffic artery has served to impede substantial development...There are no fast food chain restaurants, chain stores, strip malls or sprawling subdivisions along the Hana Belt Road. Travelers...are served by the occasional roadside stand and must drive all the way to Hana for

limited conveniences such as groceries, gas, and restaurants. With a sizeable population of residents of Hawaiian ancestry, Hana is often cited as Maui's "most Hawaiian community". [(Duensing 2005:59)

By way of reduced efficiency of travel to the Hāna region, a problem the Hāna Belt Road was originally constructed to rectify, the east side of the island has developed at a significantly slower pace than the vacation communities located on the southern and western shores of Maui. The novel architectural features of an early 20th century road combined with an awe inspiring slow drive through densely vegetated jungle and deep gulches have afforded the Hāna Belt Road a character uncommon in most civic projects of the early 20th century. This is the reason why the Hāna Belt Road was later deemed the Hāna Historic District and afforded protection on behalf of the United States Government and placed on the National Register of Historic Places in 2001 (Yucha and Hammatt 2017a).



Figure 41. Hāhālawe Bridge, a characteristic masonry arch style bridge (Wilson Okamoto & Associates 2001)



Figure 42. Papahawahawa Stream Bridge, a concrete beam and slab style bridge (Wilson Okamoto & Associates 2001)



Figure 43. Hāna Belt Road near Waiele Bridge, illustrating the narrow roadway tightly encroached upon by bedrock ridges and jungle vegetation (Wilson Okamoto & Associates 2001)

4.3.2 Modern Land Use

When the sugar industry in the Hawaiian Islands began to decline, tourism emerged as one of the largest economic sectors across the state. Prior to the 1970s, the region of East Maui remained a collection of communities isolated by a 50 mile long road legendary for its twisting turns and landslides. Recent improvements to the bridges and roads now allow over 700,000 visitors yearly to tour East Maui (Wood 2003). Tourism through East Maui was augmented by the burial of Charles Lindberg at Kīpahulu in 1974 at the Palapala Ho'omau Congregational Church graveyard, and has since continued at an ever-increasing pace, with the purchase of large tracts of land in Hāna by celebrities such as Steven Tyler, George Harrison, Jim Nabors, Kris Kristofferson, and Oprah Winfrey.

After leaving Pā'ia and Ha'ikū toward the east, the Hāna Highway crosses the Huelo region and enters the beginning of the rain belt that feeds the dense north-shore jungles of East Maui. In addition to containing many small groupings of isolated residences, the Huelo region has many points of environmental interest. Chief among these is the popular Twin Falls Fruit Stand that contains many gardens of edible flora and a network of trails leading visitors through the forest to small pools and the waterfalls that feed them. The Huelo region also offers many hiking trails (including the Bamboo Forest trails), Huelo Point Lookout, Jungle Zipline, and several smaller lodgings and eco-retreats. Kaulanapueo Church, built in 1853, is among one of the more prominent historic features of the area. These attractions are in addition to the numerous small beaches and waterfalls that can be observed proximate to the Highway, in addition to the residence of American singer/songwriter Steven Tyler.

As the Hāna highway passes through the Ke'anae region it skirts the edge of the large Ko'olau Forest Reserve that spans the highlands between Huelo and Hāna. The Ko'olau Forest Reserve, Hāna Forest Reserve, Haleakalā National Park, and Kīpahulu Forest Reserve form a continuous band of adjoined conservation lands that comprise a significant portion of East Maui. The conservation lands of Ko'olau and Hāna, spanning the entire northeast portion of East Maui, also make a significant portion of their land holdings available as a game reserve for licensed hunters (State of Hawaii 2015a, b). In these lands, hunters are allowed to hunt feral pigs and goats by means of rifle, handgun, shotgun, archery, and dogs year round with limited vehicle access (State of Hawaii 2018). These conservation lands also contain a number of smaller hiking trails into the tropical hinterlands of East Maui, as well as Pua'a Ka'a State Wayside Park, Wailua Valley State Wayside Park, Honomanū Park, Kaumahina State Wayside Park, Ke'anae Valley Lookout Park, Waikamoi Nature Trailhead, Garden of Eden Arboretum, and Ke'anae Arboretum. This stretch of Hāna Highway also crosses the historic regions of Ke'anae Peninsula, Ke'anae Valley, Honomanū Valley, and Nāhiku that are home to small rural communities and various small roadside shops and food/fruit stands that service weary travelers seeking a respite from the winding roads. Another notable visitor attraction on this stretch of the Hāna Highway is the Saint Gabriels Mission Coral Miracle Church built in 1860 out of locally sourced stone and coral mortar (Hana Picnic Lunch Co. 2018).

The Nāhiku region of East Maui, located east of Ke'anae, houses a small community separated from other residential areas by dense forests on its east and west flanks. Attractions for the traveler in this area include the Nahiku Viewpoint and Wayside Park, the Nahiku Church (built in 1867), and the private estate of the late George Harrison of the early rock group The

Beatles (Google Maps 2018; Yucha and Hammatt 2017b). The community in this region consists largely of multi-generational family homes connected by a single lane road that winds alongside the residences down to the coast, the state of which provides little incentive for all but the most adventurous of travelers.

The scenic city of Hāna in East Maui has been known for some time as a place left aside by the vagaries of commercial development that has changed the cultural landscape of distant towns such as Lahaina and Kīhei. Many travelers to the island seek to visit the Hāna coast for a view of the “Real Hawaii” that has since lapsed in the towns and cities of the busier central and western portions of the island (Hawaii Web Group 2017). Visitors soon discover that beyond the road to Hāna, with its beautiful vistas and lush forests punctuated by streaming waterfalls, there are not many activities or amenities commonly available to them in resort areas. Hāna town today is marked by an abundance of domestic residences, relatively uncrowded beaches, hiking trails, campgrounds, cultural attractions and festivals, historic sites, and offers a host of guided tours to visitors.

Located of the eastern tip of Maui on the windward side of the Island, Hāna is both very lush in foliage and cool in temperature. Hāna Town contains its own fire station, county council office, community center, three churches, two general stores, and a single gas station serving the residents. Domestic amenities aside, there are also two smaller inns, the slightly larger Travaasa Hotel (With its plantation style accommodations and pool/spa), the Luana Spa Retreat, Hāna Treasures gift shop, and a small host of restaurants and food trucks largely servicing the visitors who find their way out to this remote town. A noteworthy addition is the residence of singer/songwriter/actor/rogue scholar Kris Kristofferson just within the south side of Hāna town on a sizable piece of property off the main Highway (Real Geeks 2013). American TV icon, Jim Nabors also used to have a few hundred acres of macadamia nut fields in the region, before selling the land to the National Tropical Botanical Garden in 2002 (Pignataro 2017). Hāna is also home to the Hāna Ranch and the famous lava-stone constructed Fagan’s Cross, erected by Paul Fagan on the Ranch lands he had purchased in the 1940s (Hawaii Web Group 2017).

Hāna hosts a collection of tours that appeal to the naturalist, those interested in Hawaiian culture and history, and for those just seeking an afternoon of natural beauty. This sector is perhaps the largest economic draw to the region. In addition to being allowed to take rented vehicles down the scenic 50 mile Hāna Highway over historic bridges and through state park recreation areas, there are also five major providers of Road and Air tours of the region (TripAdvisor LLC 2018). Most of these tours take a few hours (by air) to a whole day (by road) and shuttle visitors to a variety of local attractions of the region such as various volcanic and coral sand beaches, Ka‘eleku cavern lava tubes, Haleakalā National Park hiking trails and campground, Wainapanapa State Park and campground, Ono Organic Farm, local farmers markets, snorkeling reefs, various art galleries, and Hāna museum and cultural center among many smaller attractions.

Being one of the remote vestiges of old Hawai‘i, Hāna offers much in the way of cultural and historic activities for those interested in the Hawaiian culture. Most notable is the Hāna Cultural Center and Museum that houses a variety of physical artifacts and photographic displays of the history of the town. The Cultural Center also has on its grounds the federally recognized monument of the Historic Hāna Courthouse in addition to a replica of a traditional pre-Contact

chiefly residence named Kauhale Village (Hana Cultural Center and Museum 2017). Another notable site is the Kahanu Garden which is part of the National Tropical Botanical Garden, a Hawai'i based non-profit institution. In addition to housing a large pandanus forest among other plants of ethnobotanical significance to the Hawaiian People, the grounds also contain one of the largest ceremonial *heiau* in the state, Piilanihale Heiau. Additionally, one can see the fortress hill of Ka'uiki on the coast of Hāna town, the site of a historic battles between Maui and Big Island chiefs prior to Western contact and the birthplace of Queen Ka'ahumanu, a notable figure in the Hawaii's transition to modernity following Western contact (Hawaii Web Group 2017; Sterling 1998). The Hāna Taro Festival is also a notable attraction to visitors to the region. The festival, held annually between the spring months of March and May, displays many aspects of Hawaiian culture both past and present including traditional arts and crafts, live poi pounding, hula performances, Hawaiian music, farmer's market, and food and drink booths.

4.4 Previous Archaeological Research

4.4.1 Early Maui Island Surveys

The earliest archaeological studies on the island of Maui were a part of island-wide surveys conducted in the early 1900s (Stokes 1916; Thrum 1909b; Walker 1931b). These studies tended to focus on the compiling of descriptive lists of large scale architecture or traditional ceremonial *heiau* sites. The *heiau* sites in the vicinity of the current License Area have been described in the context of the historic background of East Maui (see Section 3.2.2).

Between 1931 and 1976, only sporadic archaeological studies were undertaken in the area. Following the passage of the National Historic Preservation Act in 1966 and HRS Chapter 6E, which established the Historic Preservation Program in 1976, archaeological studies occurred as a condition of development on a more frequent basis. In this vein, the lands surrounding the current License Area have been subject to a variety of studies including archaeological assessments, reconnaissance surveys, field inspections, archaeological inventory surveys (AIS), archaeological literature reviews and field inspections (LFRI), monitoring, cultural landscape studies, and preservation plans. The previous studies conducted within and around the current License Area are described in the following subsections.

4.4.2 Hāna Highway Archaeological Studies

The previous archaeological studies conducted for the Hāna Highway Historic District area summarized in Table 8 and depicted extending throughout multiple license areas.

S. D. M. Freeman et al. (2004)

Between June and August 2004, CSH completed archaeological monitoring for the Hāna Highway Improvements Huelo to Hāna Project at mileposts (MPs) 4.2, 19.1, and 23.7, which included TMKs: [2] 2-1-001; 2-1-002; 2-1-004;001-005; 2-2-009:005, 006, 009, 010, 012, and 013 (S. D. M. Freeman et al. 2004). No historic properties were identified.

Table 8. Previous Archaeological Studies with Hāna Highway Historic District

Reference	Type of Study	Location	Results
S. D. M. Freeman et al. (2004)	Archaeological monitoring	Hāna Hwy mileposts 4.2, 19.1, and 23.7 (TMKs: [2] 2-1-001; 2-1-002; 2-1-004; 001-005; 2-2-009:005, 006, 009, 010, 012, and 013)	No significant findings
McCurdy et al. (2014)	Literature review and field inspection	Eleven areas along the Hāna Hwy from Huelo to Hāna, including MPs 8.1, 11.2, 13.0, 14.7, 14.9, 15.7, 16.3, 17.7, 19.0, and 21.5 (TMKs: [2] 1-1-001:999; 1-1-002:999; 1-1-007:999; 1-1-008:999; and 1-2-001:999 pors.)	Identified and assigned temporary feature designations to five additional features of the Hāna Hwy Historic District (SIHP # 50-50-07-1638), including an example of the cut and fill method employed during the construction of the Hāna Belt Rd (Feature MP 8.1), five concrete guide posts (Feature MP 8.2), a retaining wall and culvert (Feature MP 15.7), a retaining wall (Feature MP 17.7), and a rock culvert and headwall (Feature 21.5)
Madeus and Hammatt (2017)	Archaeological monitoring	Hāna Hwy MPs 10.4, 14.0, and 16.0 (TMKs: [2] 1-1-001:022, 023 por., 044, 999 por., and 1-1-002:002, 012 por.)	No significant findings

McCurdy et al. (2014)

Between 12 July and 15 August 2013, CSH completed the fieldwork component of a literature review and field inspection report for the proposed Hāna Highway Improvements, Huelo to Hāna Phase II Project (McCurdy et al. 2014). Eleven areas were investigated during the field inspection (pedestrian survey), including MPs 8.1, 11.2, 13.0, 14.7, 14.9, 15.7, 16.3, 17.7, 19.0, and 21.5 (TMKs: [2] 1-1-001:999; 1-1-002:999; 1-1-007:999; 1-1-008:999; and 1-2-001:999 pors. Five additional contributing features of the Hāna Highway Historic District (SIHP # 50-50-07-1638) were identified and documented. These features, likely components of Hāna Highway construction ca. 1923, include an example of the cut and fill method employed during the construction of the Hāna Belt Road (Feature MP 8.1), five concrete guide posts (Feature MP 8.2), a retaining wall and culvert (Feature MP 15.7), a retaining wall (Feature MP 17.7), and a rock culvert and headwall (Feature 21.5).

Madeus and Hammatt (2017)

Between 23 July and 31 October 2012, CSH monitored ground disturbing activities associated with Hāna Highway emergency road repairs at MPs 10.4, 14.0, and 16.0 (TMKs: [2] 1-1-001:022, 023 por., 044, 999 por., and 1-1-002:002, 012 por.) (Madeus and Hammatt 2017). No historic properties were identified.

4.4.3 Huelo License Area Archaeological Studies

Previous archaeological studies conducted within or near the Huelo License Area are depicted in Figure 44 and summarized in Table 9.

Sinoto and Pantaleo (1992)

Intermittently between 17 June and 3 September 1992, Aki Sinoto Consulting conducted an AIS of the East Maui Waterline Project (TMKs: [2] 2-5-003, 004, 005; 2-7-003, 007-011, 013, 016-020; 3-8-051, 059, 061, 070, and 071), consisting of surveys of gulches and pedestrian surveys, mostly along existing paved roads and cane roads (Sinoto and Pantaleo 1992). Easternmost parcels surveyed in this study are located near the current License Area. No cultural materials were observed during this AIS.

Kennedy et al. (1992)

From the end of July to the beginning of August 1992, Archaeological Consultants of Hawaii, Inc. carried out an AIS with subsurface testing at a parcel located about one mile inland from the ocean, near Hanawana Stream, and adjacent to the *mauka* side of the Hāna Highway in West Hanawana Ahupua'a, (TMK: [2] 2-9-010:003) (Kennedy et al. 1992). Three historic properties were recorded, including a set of five mounds associated with post-Contact agriculture (SIHP # 50-50-06-3132), six agricultural terraces with two 'auwai and three walls associated with both pre- and post-Contact agriculture (SIHP # -3133), and a complex of two irrigated terraces with one 'auwai and five wall segments associated with both pre- and post-Contact agriculture (SIHP # -3134). In addition, a ceramic and concrete scatter was discussed but was only addressed as Temporary site # T-1.

D. L. Fredericksen (1996)

In April 1996, Xamanek Researches conducted a limited AIS on a 25.12 acre Ho'olawa Point parcel in Ho'olawa Bay, Huelo (TMK: [2] 2-9-02:014 por.) (D. L. Fredericksen 1996). The following pre-Contact artifacts were encountered during this pedestrian survey: an adze blank, three utilized basalt flakes, a large piece of red ochre, a piece of volcanic glass, and several water-worn stones. SIHP # 50-50-06-4167, an old roadway, was identified on the surveyed parcel. Historic cultural materials associated with SIHP # -4167 encountered near the roadway include glass and porcelain sherds, one piece of *Conus* shell, broken Maui Soda bottles from the 1920s/30s, a possible old wagon wheel rim, and pieces of rusting metal track. SIHP # -4196, a historic grave with inscription "JHO Nokaupu Make Feb 14 1918" was also observed on the property. Ho'olawa Landing, SIHP # -2956 was identified to the east of Ho'olawa Stream, beyond the property borders but within close proximity to the surveyed area; brick and concrete footings, four large pieces of rusting machinery, and a set of railroad car wheels were observed in association with SIHP # -2956. Both SIHP # -4167 and # -2956 comprise part of a historical complex associated with the sugarcane industry. Also, a rock shelter that was likely used historically and during the pre-Contact era was observed near but beyond the property boundary.

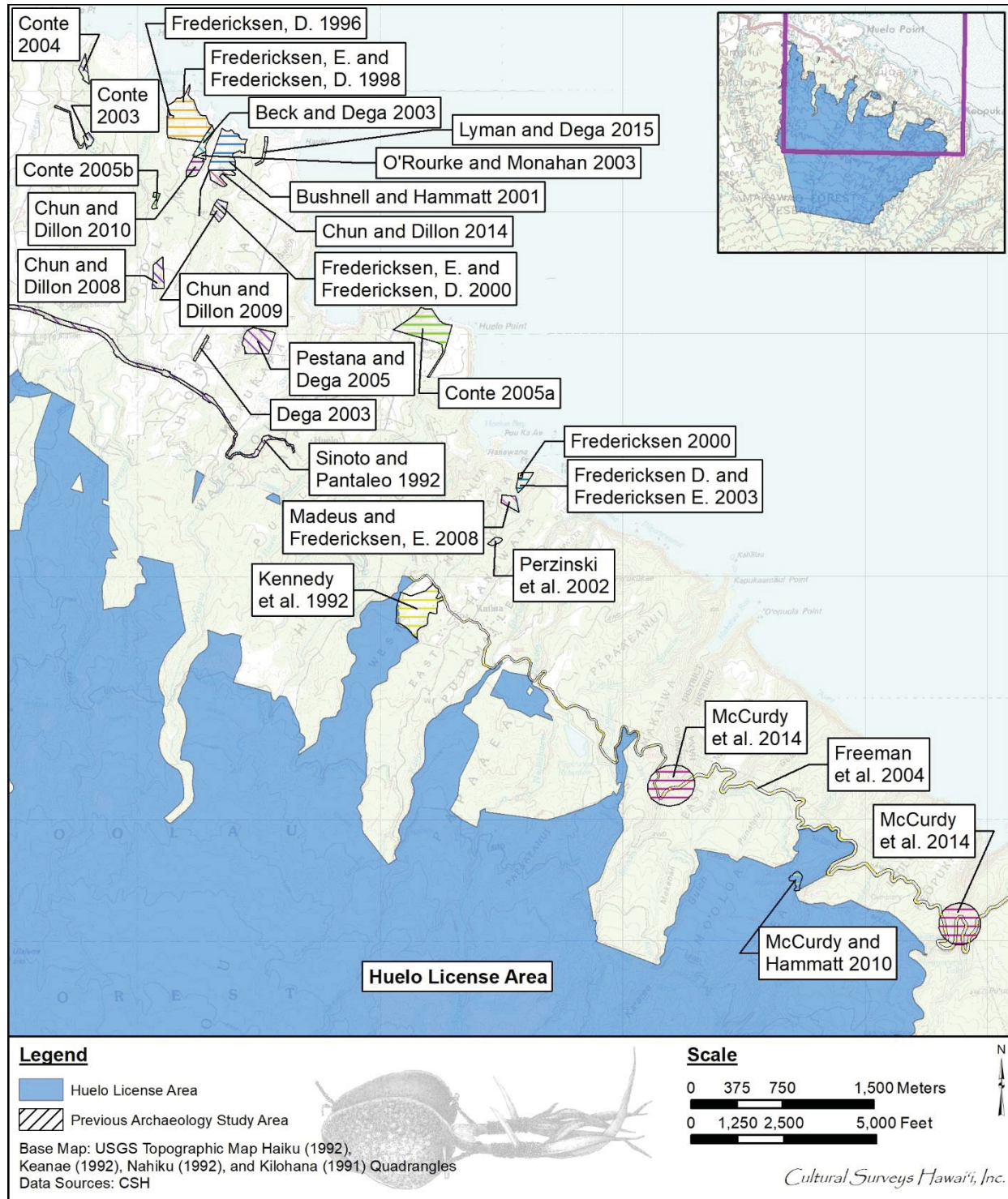


Figure 44. Previous Archaeological Studies within or near the Huelo License Area (U.S. Geological Survey 1991, 1992a, c, d)

Table 9. Previous Archaeological Studies within the Huelo License Area

Reference	Type of Study	Location	Results
Sinoto and Pantaleo (1992)	AIS	East Maui Waterline Project (TMKs: [2] 2-5-003, 004, 005; 2-7-003, 007-011, 013, 016-020; 3-8-051, 059, 061, 070, and 071)	No significant findings
Kennedy et al. (1992)	AIS	Parcel located about a mile inland from the ocean, near Hanawana Stream, and adjacent to the Hāna Hwy in West Hanawana Ahupua'a (TMK: [2] 2-9-010:003)	Documented three sites, including a set of five mounds (SIHP # 50-50-06-3132), six agricultural terraces with two 'auwai and three walls (SIHP # -3133), and a complex of two irrigated terraces with one 'auwai and five wall segments (SIHP # -3134); assigned temporary site #T-1 to a ceramic and concrete scatter
D. L. Fredericksen (1996)	Limited AIS	25.12-acre Ho'olawa Point parcel in Ho'olawa Bay, Huelo (TMK: [2] 2-9-002:014 por.)	Documented SIHP # -4196, a historic grave and SIHP # 50-50-06-4167, an old roadway with associated artifacts; noted SIHP # 50-50-06-2956 (Hoolawa Landing) with associated brick and concrete footings, four large pieces of rusting machinery, and a set of railroad car wheels to the east of Ho'olawa Stream near the surveyed area; noted a rock shelter near, but beyond the property boundaries

Reference	Type of Study	Location	Results
E. M. Fredericksen and Fredericksen (1998a)	AIS	25.12-acre Ho'olawa Ranch Property at Ho'olawa Point (TMK: [2] 2-9-002:014)	Reidentified SIHP # 50-50-06-4167 (Ho'olawa Landing Road) and SIHP # -2956 (historic grave). Documented five additional sites: SIHP #s 50-50-06-4234 (historic grave); # -4235 and -4236 (surface scatters); -4237 (subsurface pre-Contact fire pit with a 14C date range from AD 1435 to 1660); and -4238 (stone feature with a possible burial; observed SIHP # 50-50-06-2956 (Hoolawa Landing) and a rock shelter/temporary habitation site (SIHP # -4239) outside property borders
E. Fredericksen (2000)	AIS Phase I	Northwestern terraced area on a parcel of land near the mouth of Hanawana Stream in Hanawana Valley, Hanawana Ahupua'a (TMK: [2] 2-9-011:018)	Documented two terraced features of agricultural and habitation complex SIHP # -4153; reported 14C date range from AD 1425 to 1665 for a charcoal sample; noted three small terraces, a cobble and boulder platform, an enclosure, a rock cupboard, a possible canoe landing area, and a depression for ground salt water evaporation on state lands beyond the property borders
E. M. Fredericksen and Fredericksen (2000)	AIS	2-acre Lot 7-B of Huelo Hui Partition Subdivision located within 400 meters of the ocean crossed by Honokala Stream, and bordered by North Honokala Rd (TMK: [2] 2-9-002:005 por.)	Documented two historic properties: a pre-Contact wetland agricultural site (SIHP # 50-50-06-4084) and a leveled area associated with post-Contact ranching or agriculture (SIHP # -4816)

Reference	Type of Study	Location	Results
Bushnell and Hammatt (2001)	AIS	Roadway access easement and 15-acre parcel in coastal Ho'olawa, bordered by Honokala Stream and Waikakulu Gulch (TMKs: [2] 2-9-02:017, 021, and 035)	No significant findings
Perzinski et al. (2002)	AIS	West Hanawana, between Hāna Hwy and the coast (TMKs: [2] 2-9-011:004 and 005)	Documented an agricultural complex consisting of fifteen terraces (SIHP # 50-50-06-5206), and an 'auwai (SIHP # 50-50-06-5205); reported a 14C date range from AD 990 to 1220 obtained from sediments underlying a terrace retaining wall
Dega (2003)	Archaeological assessment	5 acres at Ho'olawa Point (TMKs: [2] 2-9-001:071, 072 and 075)	No significant findings
Beck and Dega (2003)	AIS	Approximately 3.5 acres in coastal Ho'olawa, transected by Waikakulu Gulch and Stream (TMK: [2] 2-9-012:016)	No significant findings
O'Rourke and Monahan (2003)	AIS	Approximately 0.75 acres in Ho'olawa (TMK: [2] 2-9-002:042)	Described two historic properties: SIHP # 50-50-06-5459, a human burial, and SIHP # -5460, a lithic reduction center
Conte (2003)	Limited AIS	0.371-acre access easement corridor in coastal Honopou Ahupua'a (TMKs: [2] 2-9-001:004, 018, and 019)	No significant findings

Reference	Type of Study	Location	Results
D. L. Fredericksen and Fredericksen (2003)	AIS Phase II	3.094 acres in Hanawana Gulch in Hanawana Ahupua'a (TMK: [2] 2-9-011:018)	Documented 52 previously unreported features from SIHP # -4153, including a leveled area, pavement, a cupboard, 47 terraces, an alignment, and a possible terrace remnant; identified numerous artifacts; reported date ranges for five charcoal samples: AD 1520 to 1590, AD 1620 to 1680 and AD 1730 to 1810 (Sample 1), AD 1640 to 1960 (Sample 2), AD 1460 to 1640 (Sample 4), AD 1670 to 1950 (Sample 5), and AD 1420 to 1520 and AD 1580 to 1630 (Sample 6)
Conte (2004)	AIS and preservation plan	2.541-acre Souza Property (TMK: [2] 2-9-001:009) at coastal Honopou Point, Honopou Ahupua'a	Documented three features of SIHP # 50-50-06-5638, including two terraces and an alignment, interpreted as <i>māla'ai</i>
Conte (2005b)	AIS	1.095-acre parcel located a half a mile from Ho'olawa Bay bordered north by Ho'olawa Stream (TMK: [2] 2-9-001:075)	Documented Features A-E (<i>lo'i</i> terrace remnants) of SIHP # 50-50-04-5720
Conte (2005a)	AIS	Bolles Property, a 20-acre parcel located on the coast between Waipi'o Bay and Huelo Point (TMK: [2] 2-9-07:052)	Identified SIHP #s: 50-50-06-5746, -5747, -5748, -5749, 5750, and -5751, which included terraces, walls, and a possible trail alignment
Pestana and Dega (2005)	Archaeological assessment	11.15 acres near Waipi'o Bay, Huelo (TMK: [2] 2-9-005:023)	No significant findings
Chun and Dillon (2008)	AIS	5.128-acre lot in Ha'iku, Ho'olawa Ahupua'a (TMK: [2] 2-9-003:028)	Documented SIHP # 50-50-06-6438, a stacked rock wall interpreted as remnants of an <i>'auwai</i>

Reference	Type of Study	Location	Results
Madeus and Fredericksen (2008)	AIS	3.136-acre parcel in Hanawana Ahupua'a (TMK: [2] 2-9-011:017)	Reported one historic property: SIHP # 50-50-06-6362 a pre-Contact agricultural complex with 19 stepped agricultural terrace features
Chun and Dillon (2009)	AIS	2.0-acre lot in Huelo, coastal Honokalā (TMK: [2] 2-9-002:041)	Identified five <i>lo'i</i> and three terraces in pre-Contact agricultural complex SIHP # 50-50-06-4084; documented SIHP # -6627, a historic trash pit
McCurdy and Hammatt (2010)	AIS	4.0-acre parcel in Kōlea Ahupua'a (TMK: [2] 1-1-001:050)	Identified one plantation era reservoir/water control system SIHP # 50-50-13-6682; with six associated features
Chun and Dillon (2010)	AIS	3.75-acre Lot in Ha'iku, coastal Ho'olawa on an easement of Ho'olawa Road (TMK: [2] 2-9-002:011)	Reported one site documented previously by O'Rourke and Monahan (2003): SIHP # 50-50-06-5460, a lithic reduction center
Chun and Dillon (2014)	Archaeological assessment	3.65-acre lot in Ha'iku on a Ho'olawa Road easement bordered by Honokala Stream (TMK: [2] 2-9-002:020)	No significant findings
Lyman and Dega (2015)	AIS	Rohr Family access road at Honokalā Point in Honopou Ahupua'a, (TMK: [2] 2-89-002:019 por.)	Documented two new sites: SIHP # 50-50-06-8254, a terrace retaining wall, and SIHP # -8255, a pre-Contact to historic ditch for <i>'auwai</i>

E. M. Fredericksen and Fredericksen (1998a)

In 1996, Xamanek Researches continued an AIS of a 25.12-acre Ho'olawa Ranch Property at Ho'olawa Point (TMK: [2] 2-9-02:014) (E. M. Fredericksen and Fredericksen 1998a). An earlier survey of this property was limited to the western portion where Ho'olawa Landing Road (SIHP # -4167) with associated artifacts and a historic grave (SIHP # -2956) were reported (D. L. Fredericksen 1996); these two sites were reidentified during this more thorough subsequent AIS, which included both pedestrian surface survey throughout the property and subsurface testing. Five additional archaeological sites were also documented: a historic grave (SIHP # 50-50-06-4234), two surface scatter remnants (SIHP #s -4235 and -4236), a pre-Contact fire pit (SIHP # -4237) and a rock alignment including a possible burial (SIHP # -4238). Artifacts observed at the surface associated with the surface scatter remnant SIHP # -4235 include a basalt adze blank, utilized basalt flakes, a utilized volcanic glass flake, and red ochre, and water-worn pebbles; subsurface artifacts include a volcanic glass flake, two basalt flakes (one fire-cracked), charcoal, rusted metal, a possible fishing hook tab and pig bone. No artifacts were encountered during subsurface testing at surface scatter remnant SIHP # -4236; however, a volcanic glass flake, two pieces of volcanic glass shatter, and a basalt flake were observed at the surface. The fire pit (SIHP # -4237) was encountered below the surface at a level area overlooking Ho'olawa Bay and the Hāna Coast; associated subsurface cultural materials include rusted metal water-worn pebbles, fire-cracked rocks, charcoal, basalt flakes, volcanic glass debitage, and a pecking stone. Analyzed charcoal collected from the fire pit (SIHP # -4237) returned a calibrated (2 sigma, 95% probability) 14C date range of AD 1435 to 1660. A possible basalt pecking stone was observed at the surface in association with the stone feature with a possible burial (SIHP # -4238), while subsurface testing revealed modern bottle glass, utilized basalt and water-worn pebbles. Also, Ho'olawa Landing (SIHP # -2956) and a rock shelter were again observed outside the property boundary, as they had been in the D. L. Fredericksen (1996) AIS. The rock shelter, interpreted as a temporary habitation site, not formerly assigned a SIHP # was designated SIHP # -4239.

E. Fredericksen (2000)

In February 2000, Xamanek Researches, conducted Phase 1 of an AIS of a northwestern terraced area on a parcel of land near the mouth of Hanawana Stream in Hanawana Valley, Hanawana Ahupua'a (TMK: [2] 2-9-011:018), consisting of a visual inspection with mapping of the area and two test unit excavations (E. Fredericksen 2000). Two terraced features were documented: an approximately 15 m x 6 m leveled area with a partially intact retaining wall (Feature A), and a narrow approximately 14 m long terrace (Feature B) located upslope from Feature A. Only one artifact was observed on the surface, a grindstone located near Feature A. During subsurface testing, charcoal deposits, a red ochre manuport, four basalt flakes, and a piece of *kukui* nut shell were encountered. A charcoal sample yielded radiocarbon dates from AD 1425 to 1665. The features documented in this study appeared to be part of the SIHP # -4153, likely an agricultural and habitation complex, which was noted as extending both downstream and upstream on adjacent parcels of state-owned land. SIHP # -4153 features observed from the surveyed parcel, but located on these bordering state lands included three small terraces, a cobble and boulder platform, an enclosure, a rock cupboard, a possible canoe landing area, and a depression for ground salt water evaporation.

E. M. Fredericksen and Fredericksen (2000)

From December 1999 through February 2000, Xamanek Researches conducted an AIS on 2-acre Lot 7-B of Huelo Hui Partition Subdivision located within 400 m of the ocean shore, crossed in the west by Honokala Stream, and bordered north and west by North Honokala Rd (TMK: [2] 2-9-002:005 por.) (E. M. Fredericksen and Fredericksen 2000). Two historic properties are reported: SIHP # 50-50-06-4084, a pre-Contact wetland agricultural site, and SIHP # -4816, a leveled area associated with post-Contact ranching or agriculture.

Bushnell and Hammatt (2001)

On 29 March 2001, CSH conducted an AIS for a proposed Kahui Pono L.L.C. Roadway Access Easement and 15-acre parcel (TMKs: [2] 2-9-02:017, 021, and 035) in coastal Ho'olawa, bounded to the north by the Pacific Ocean, bordered east by Honokala Stream, and partially bordered on the west by Waikakulu Gulch (Bushnell and Hammatt 2001). During this pedestrian survey, no cultural resources were observed.

Perzinski et al. (2002)

On 22 February 2002, CSH conducted an AIS of a proposed approximate 800 foot easement and 1-acre lot in West Hanawana (TMKs: [2] 2-9-011:004 and 005) (Perzinski et al. 2002). The survey identified an agricultural complex consisting of fifteen terraces (SIHP # 50-50-06-5206), and an *auwai* (SIHP # 50-50-06-5205) supplying the complex of *lo'i*. Several of the terraced *lo'i* still support feral taro plants; two large stands of *'awa* were also observed in the area. Remnants of a recent squatters' sheds were also present on the property. A 14C date of AD 990-1220 was obtained from sediments underlying a terrace retaining wall.

Dega (2003)

On 4 April 2003, Scientific Consultant Services, Inc. (SCS) conducted a surface survey for 5 acres at Ho'olawa Point (TMKs: [2] 2-9-001:071, 072, and 074) (Dega 2003). No cultural materials were observed; therefore, the report was submitted as an archaeological assessment.

Beck and Dega (2003)

On 6-7 April 2003, SCS conducted an AIS of approximately 3.5 acres in coastal Ho'olawa with Waikakulu Gulch and Stream transecting the east end of the property (TMK: [2] 2-9-002:016) (Beck and Dega 2003). The AIS consisted of pedestrian survey and two shovel test probes. No significant findings were reported.

O'Rourke and Monahan (2003)

Between 7 May and 11 June 2003, SCS conducted an AIS of approximately 0.75 acres of land located in coastal Ho'olawa (TMK: [2] 2-9-002:042), which consisted of pedestrian survey and subsurface testing (O'Rourke and Monahan 2003). The study describes two historic properties: SIHP # 50-50-06-5459, a human burial, and SIHP # 50-50-06-5460, a lithic reduction center.

Conte (2003)

On 8 July 2002, CRM Solutions Hawai'i, Inc, conducted an AIS of a designated access easement corridor through the Huelo Hui Partition on 0.371 acres at coastal Honopou Ahupua'a,

(TMKs: [2] 2-9-001:004, 018 and 019) (Conte 2003). No cultural materials were observed during this pedestrian survey.

D. L. Fredericksen and Fredericksen (2003)

In 2002, Xamanek Researches carried out Phase 2 of an AIS of 3.094 acres in Hanawana Gulch in Hanawana Ahupua'a (TMK: [2] 2-9-011:018), consisting of pedestrian survey and five manual test excavations (D. L. Fredericksen and Fredericksen 2003). Phase I had been limited to a northwestern terraced area, in which two features and a few pre-Contact artifacts were identified as being constituents of agricultural complex SIHP # -4153 (E. Fredericksen 2000). During Phase 2, 52 previously unreported features were documented as part of SIHP # -4153: a leveled area, pavement, a cupboard, an alignment, 47 terraces, and a possible terrace remnant. A polishing stone and lithic debitage were found on the surface. Numerous artifacts were encountered during subsurface testing, including polished basalt flakes, utilized basalt flakes, a basalt hammerstone/chopper, a worked urchin spine tip, a utilized volcanic glass flake, an adze fragment, and Lead printer's type. Mammal and fish bone, *kukui* nut shell, charcoal, lithic debitage, unworked coral pieces, waterworn pebbles, fire-cracked rocks, metal pieces, coal and a lead fishing weight were also documented cultural materials. Five charcoal samples (Samples 1-2; 4-6) returned the following radiocarbon dates (calendrical date \pm 2 Sigma 95%): AD 1520 to 1590, AD 1620 to 1680 and AD 1730 to 1810 (Sample 1), AD 1640 to 1960 (Sample 2), AD 1460 to 1640 (Sample 4), AD 1670 to 1950 (Sample 5), and AD 1420 to 1520 and AD 1580 to 1630 (Sample 6).

Conte (2004)

On 4 September 2004, CRM Solutions Hawai'i conducted an AIS for the 2.541-acre Souza Property (TMK: [2] 2-9-001:009) at coastal Honopou Point, bisected by Honopou Stream in Honopou Ahupua'a (Conte 2004). The AIS consisted of pedestrian survey and the backhoe excavation of three test trenches. No cultural materials were encountered during subsurface testing. During pedestrian survey, three features were observed above the east side of Honopou Stream. These features were reported as one site, SIHP # 50-50-06-5638, which included two terraces (Features A and C) and an alignment (Feature B), collectively interpreted as a *māla'ai*. A passive preservation plan was submitted as part of this study.

Conte (2005b)

On 15 and 18 July 2005, CRM Solutions Hawai'i, Inc. (Conte 2005b) carried out an AIS of a 1.095 acre parcel located a half a mile from Ho'olawa Bay bordered north by Ho'olawa Stream (TMK: [2] 2-9-001:075). During this pedestrian survey, five *lo'i* terrace remnants (Features A-E) comprising SIHP # 50-50-04-5720 were observed along the northern slope of the property.

(Conte 2005a)

Intermittently between July and October 2005, CRM Solutions Hawai'i, Inc. conducted an AIS of the Bolles Property (TMK: [2] 2-9-007:052), a 20-acre parcel located on the coast between Waipi'o Bay and Huelo Point (Conte 2005a). Six SIHPs were identified during this survey: a double linear terrace (SIHP # 50-50-06-5746), a walled terrace with lower terraces (SIHP # -5747), a walled terrace with lower terraces and possible trail alignment (SIHP # -5748),

a remnant wall (SIHP # -5749), a small, historic-era terrace (SIHP # -5750), and a discontinuous rock wall (SIHP # -5751).

Pestana and Dega (2005)

In June 2005, SCS conducted an AIS for 11.15 acres of land near Waipi'o Bay (TMK: [2] 2-9-005:023), consisting of a pedestrian surface survey and mechanical and manual subsurface testing (Pestana and Dega 2005). No cultural materials were observed; therefore, this study was deemed an archaeological assessment.

Chun and Dillon (2008)

On 18 February 2008, Affordable Cultural & Ecological Services, LLC (ACES) carried out an AIS for a 5.128 acres in Ha'iku, Ho'olawa (TMK: [2] 2-9-003:028) (Chun and Dillon 2008). During this 100% pedestrian survey, one historic property was documented: SIHP # 50-50-06-6438, a stacked rock wall on the west and east sides of a stream interpreted as remnants of an *'auwai*.

Madeus and Fredericksen (2008)

In October 2007, Xamanek Researches, LLC conducted an AIS for a 3.136-acre parcel near the coast in Hanawana Valley bordered by Hanawana Stream, in Hanawana Ahupua'a, (TMK: [2] 2-9-011:017), consisting of pedestrian survey and the excavation of five shovel test units (Madeus and Fredericksen 2008). One historic property was reported: SIHP # 50-50-06-6362, a pre-Contact agricultural complex with 19 component features consisting of stepped agricultural terraces.

Chun and Dillon (2009)

In December 2008 and January 2009, ACES conducted an AIS for a 2.0-acre lot located approximately 650 m from the shore in Honokalā (TMK: [2] 2-9-002:041) (Chun and Dillon 2009). The surveyed parcel is bound by N. Honokalā Road to the west and contains a stream gully from Honokalā Stream oriented from south to north through the western third portion of the property. Fieldwork consisted of a pedestrian survey and subsurface testing, including six shovel test probes, four test units, one shovel excavated stratigraphic trench, and five backhoe trenches. Eight features, comprising a portion of previously identified SIHP # 50-50-06-4084, a pre-Contact agricultural complex, were documented in this AIS: a remnant *lo'i* (Feature 1), a 11.5 m by 7.6 m rectangular *lo'i* (Feature 2), a 7.6 m by 6.6 m *lo'i* (Feature 3), an 11.8 m by 8.4 m *lo'i* (Feature 4), a 12.2 m by 5-8 m *lo'i* (Feature 5), a terrace measuring approximately 12 m by 5 m (Feature 6), a narrow terrace at least 30 m long (Feature 7), and a terrace at least 4 m long retained by a 4 m long wall (Feature 8). SIHP # -6627, an historic trash pit, was also identified during this study. The only historic cultural materials encountered during subsurface testing were metal, glass, and porcelain associated with SIHP # -6627.

McCurdy and Hammatt (2010)

On 23 and 24 February 2010, CSH conducted an AIS of 4.0 acres located approximately 430 m southwest of the Waikamoi Ridge trailhead for the Kolea Reservoir Decommissioning Project (TMK: [2] 1-1-001:050) (McCurdy and Hammatt 2010). The project is located within the northeast portion of the Huelo License Area of the current project. One historic property was

identified during this survey: SIHP # 50-50-13-6682, a plantation-era reservoir/water control system constructed in 1901 with six associated features. These features include the spillway (Feature A), reservoir (Feature B), a catwalk (Feature C), the dam (Feature D), the reservoir outlet (Feature E), and a water diversion structure (Feature F).

Chun and Dillon (2010)

On 14 and 19 March and 19 April 2010, ACES carried out an AIS for a 3.75-acre lot in Ha'iku approximately 1.8 km *makai* of Hāna Highway on a Ho'olawa Road easement (TMK: [2] 2-9-002:011), consisting of a pedestrian survey and three backhoe excavated test trenches (Chun and Dillon 2010). During the surface survey, SIHP # 50-50-06-5460, a lithic reduction center previously documented by O'Rourke and Monahan (2003) was observed with a few associated basalt flakes and a hammerstone. Light scatters of waterworn cobble manuports were encountered in the first stratum of all three test excavations.

Chun and Dillon (2014)

During four days in June 2014, ACES conducted an archaeological assessment for a 3.65-acre lot in Ha'iku on an easement off Ho'olawa Road along the western bank of Honokala Stream (TMK: [2] 2-9-002:020), which included a 100% pedestrian survey and nine backhoe excavated trenches (Chun and Dillon 2014). No cultural materials were encountered during surface survey nor within any of the test excavations.

Lyman and Dega (2015)

In March 2015, SCS conducted an AIS of a Rohr Family access road at Honokalā Point in Honopou Ahupua'a (TMK: [2] 2-9-002:019 por.) (Lyman and Dega 2015). During this 100% pedestrian survey, two new sites were reported: SIHP # 50-50-06-8254, a terrace retaining wall for slope stabilization, and SIHP # -8255, a pre-Contact to historic ditch for *'auwai*.

4.4.4 Honomanū License Area Archaeological Studies

Previous archaeological studies conducted in the vicinity of the Honomanū License Area have been addressed elsewhere in this report, since the studies associated with this license area either occurred near all license areas (S. D. M. Freeman et al. 2004; Madeus and Hammatt 2017; McCurdy et al. 2014) or were located closer to adjacent license areas (Group 70 International et al. 1995; A. Haun and Henry 2003; Hill et al. 2008; Kennedy 1990; McCurdy and Hammatt 2010; Palama 1981; Soehren 1963). The portions of these previous archaeological study areas within the Honomanū License Area are depicted in Figure 45.

4.4.5 Ke'anae License Area Archaeological Studies

Previous archaeological studies conducted within or near the Ke'anae License Area are depicted in Figure 46 and summarized in Table 10.

Soehren (1963)

In 1963, Bernice P. Bishop Museum conducted an archaeological survey of portions of East Maui, which included Ke'anae and Wailua (Soehren 1963). Two *heiau*, Kukuiaupun Heiau and Makehau Heiau, previously documented by Walker (1931a), were located; both *heiau* were densely overgrown with vegetation and in poor condition. Additionally, several coastal

Wailuanui sites were documented including, Pu'ū Olu Pond bordered north by a stone wall, a small house platform overlooking Pu'ū Olu Pond, a house platform near Paepaemoana Point, a possible post-Contact cemetery consisting of a cluster of 14 graves and several scattered probable graves with rough stone outlines (many with sunken centers) in an approximately 3,000 ft² area, remnants of stone walls forming adjoining enclosures interpreted as either a house site or shrine, and a stone wall enclosure with a doorway and associated nearby possible grave and collapsed stone wall.

Palama (1981)

On 27 October 1981, Stephen Palama (1981), Pacific Association of Professional Archaeologists member, conducted a field inspection of State Land, Wailua, Hāna, Maui (TMK: [2] 1-1-005:001). His results were reported in a short letter dated 28 October 1981 to Mr. Elden K. Liu, in which no archaeological sites were documented on the inspected parcel, though some stone alignments were noted outside the property boundaries.

Kennedy (1986)

During two days in early June 1986, Archaeological Consultants of Hawaii, Inc. conducted an archaeological land inspection for proposed East and West Wailuaiki Hydroelectric Project, consisting of pedestrian survey along a Civilian Conservation Corps (CCC) trail constructed in the 1930s (TMKs: [2] 1-1-002:001 and 002; 1-2-004:003, 005, 006, 009, and 010; 1-2-001:002) (Kennedy 1986). No archaeological sites were encountered during the survey. However, the entire License Area grounds were not surveyed due to dense vegetation causing limited visibility. As a result, consultations with local residents supplemented the investigation. Informants provided mixed accounts regarding the presence or absence of cultural sites in the area. While some residents said that no archaeological sites existed on the project lands, others disagreed.

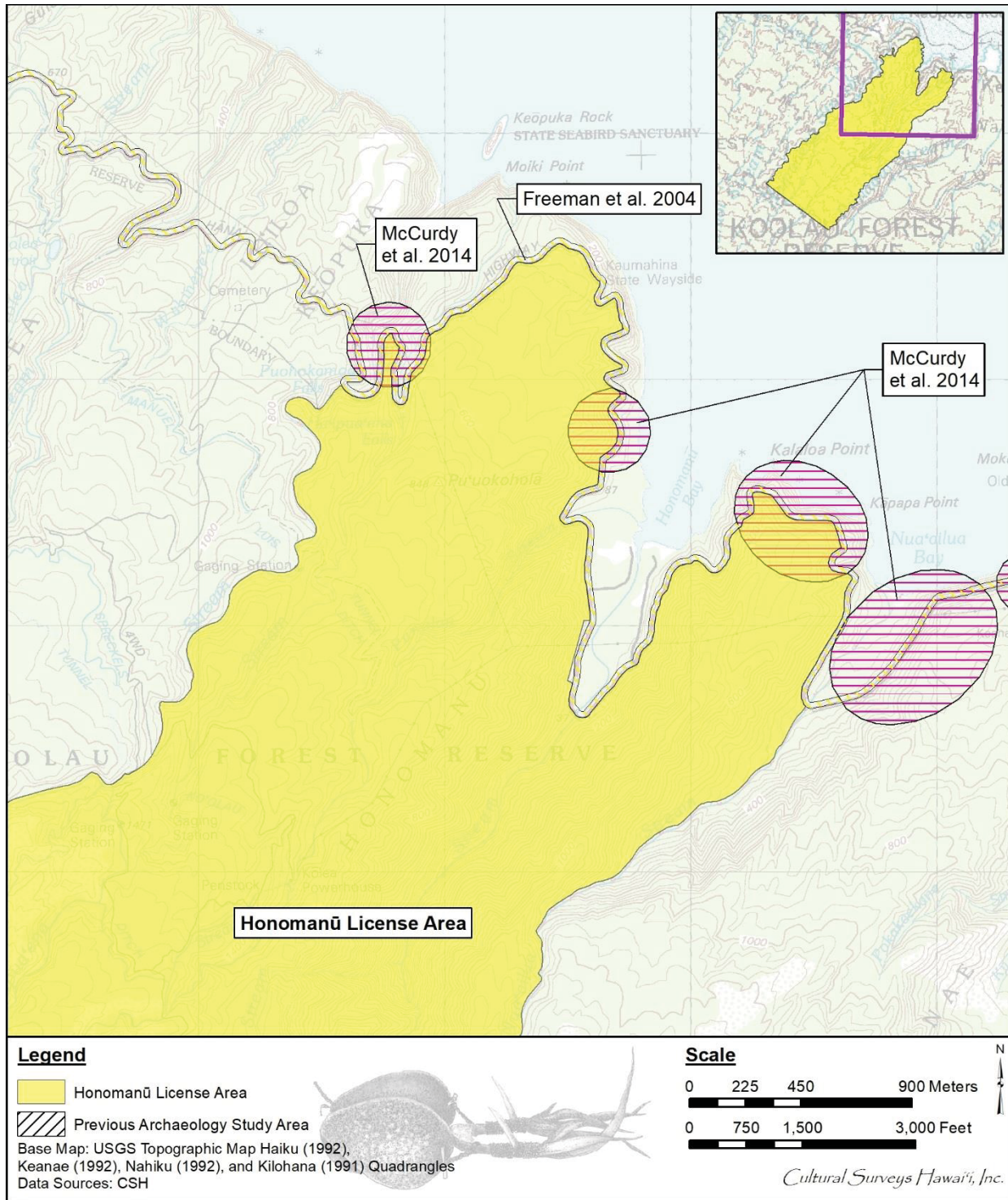


Figure 45. Previous archaeological studies within or near the Honomanū License Area (U.S. Geological Survey 1991, 1992a, c, d)

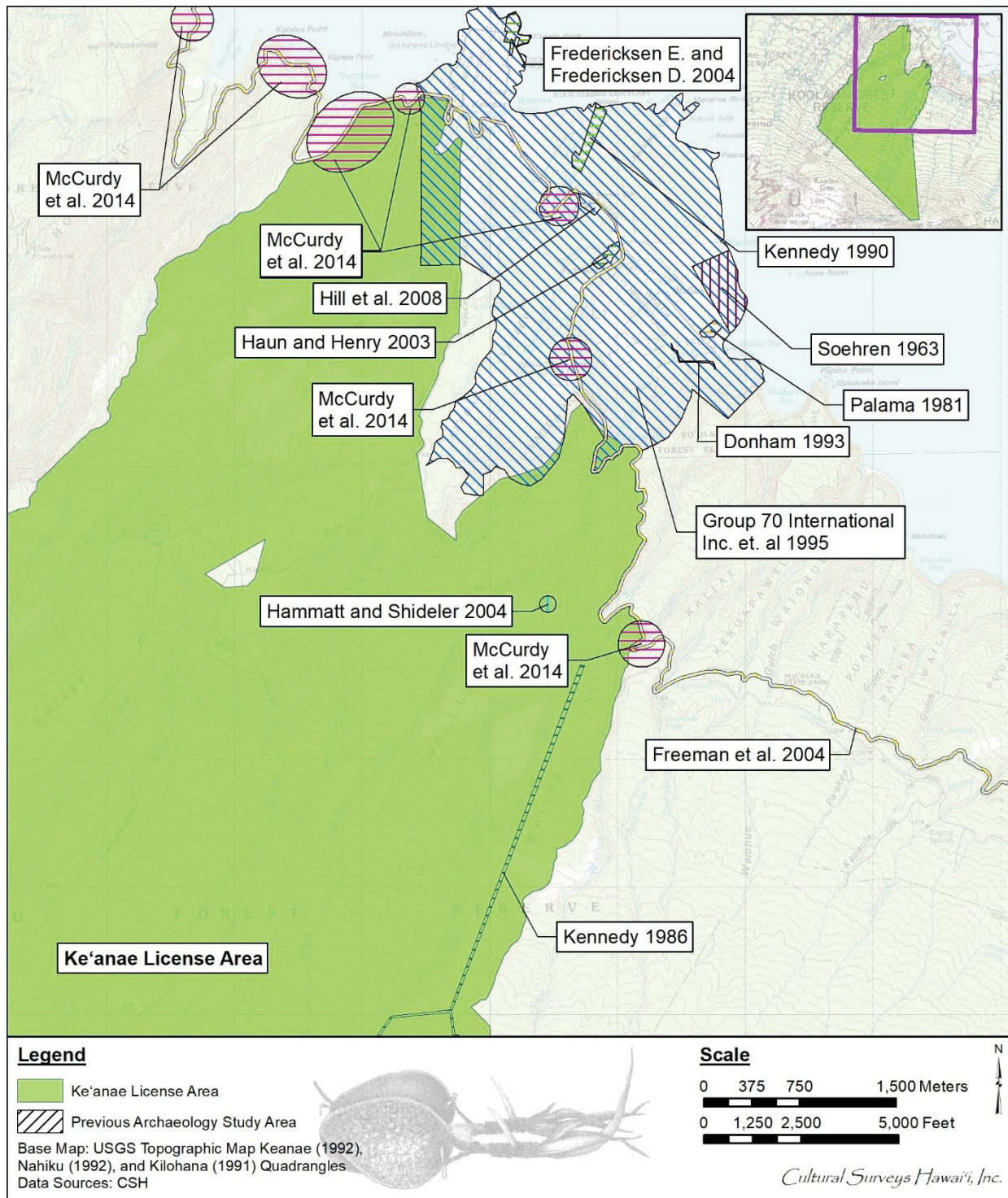


Figure 46. Previous archaeological studies within or near the Ke'anae License Area (U.S. Geological Survey 1991, 1992a, c, d)

Table 10. Previous archaeological studies within the Ke'anae License Area

Reference	Type of Study	Location	Results
Soehren (1963)	Archaeological survey	Portions of east Maui, including Ke'anae and Wailua	Documented Pu'u Olu Pond bordered north by a stone wall, a small house platform overlooking Pu'u Olu Pond, a house platform near Paepaemoana Point, a possible post-Contact cemetery consisting of a cluster of 14 graves and several scattered probable rough stone outlined graves, remnants of stone walls forming adjoining enclosures (either house or shrine site), and a stone wall enclosure with a doorway and associated nearby possible grave and collapsed stone wall; confirmed Kukuiaupun Heiau and Makehau Heiau
Palama (1981)	Archaeological field inspection	Parcel of Wailua State Land (TMK: [2] 1-1-005:001)	No significant findings on inspected parcel; noted stone alignments outside the property boundaries
Kennedy (1986)	Archaeological land inspection	Land along a 1930s Civilian Conservation Corps (CCC) trail in East and West Wailuaiki (TMKs: [2] 1-1-002:001 and 002; 1-2-004:003, 005, 006, 009, and 010; 1-2-001:002)	No archaeological sites observed during survey; possible sites reported from interviews with locals include two contemporary hunting or gathering sites, a shrine near West Wailuaiki Stream destroyed in a 1975 flood, a shrine in a nonspecific location where <i>wauke</i> and <i>Olona</i> grow, and a canoe builders shrine where a <i>koa</i> tree was removed to construct a Hawaiian canoe in the 1950s; one resident also reported the nearby presence of a cave containing a feathered cloak, but another local informant provided a contrary location near Haleakala Volcano summit for the cave
Kennedy (1990)	Archeological reconnaissance	Parcel near Kainalimu Bay (TMK: [2] 1-3-007:016)	Identified Site 79, Kauleiula Heiau, previously documented by Walker (1931a)

Reference	Type of Study	Location	Results
Donham (1993)	Field inspection	Revised route for a road easement beginning at Makehau Road and partially oriented along Wailuanui Stream (TMKs: [2] 1-1-006:071 and 1-1-008:001)	Documented structural remnants of an old wooden slaughterhouse with a likely associated well or cistern; rock terraces; an old roadbed with retaining wall (SIHP # 50-50-07-43); part of terrace complex SIHP # -2942; a ditch-like feature; an agricultural terrace wall (SIHP # -2945); and a terraced-walled late 19th/early 20th century habitation site with associated cultural materials
Group 70 International et al. (1995)	Cultural landscape study that included an archaeological field survey	Ke'anae and Wailuanui	Documented SIHP # -3940, a habitation complex in Kilo consisting of terraces and an enclosure; eight taro complexes (SIHP #s -3932 thru -3938, and -3941), and SIHP # -3943, Ke'anae Quarry with associated machinery, World War II gun emplacement, and possible stone platformed grave of a former quarry; confirmed Kukuioipuni Heiau (SIHP # -0096); Makehau Heiau (SIHP # -0097); Pu'u Olu Pond, a fishpond with an associated house platforms (SIHP # -0538); Wailua Stone Church Ruins (SIHP # -1513); and Ke'anae Landing (SHIP # -2957)
A. Haun and Henry (2003)	AIS	4.0-acres bordered north by Hanau Stream in the Pauwalu area of Hāna District (TMKs: [2] 1-1-008:015 and 023)	Documented two features from SIHP # -5237: a pre-Contact temporary habitation shelter (Feature A) and a 63.0-m trail section; reported a charcoal sample with a C14 date range from AD 1420 to 1650
E. M. Fredericksen and Fredericksen (2004)	Archaeological monitoring	Ke'anae Park restrooms (TMK: [2] 1-1-003:001)	Documented SIHP # 50-50-07-5534, a late pre-Contact agricultural site with associated subsurface deposits; reported a charcoal sample with 14C date ranges of AD 1410 to 1530 and AD 1560 to 1630; noted a possible 'auwai at northwestern edge of SIHP # -5534

Reference	Type of Study	Location	Results
Hammatt and Shideler (2004)	Archaeological assessment	Along Wailuaiki Stream, about 1 km west of 1923 Wailuaiki Bridge on the East Maui Irrigation access road (TMK: [2] 1-1-02:001 por.)	No significant findings
Hill et al. (2008)	Archaeological monitoring	Ke'anae Elementary School grounds (TMK: [2] 1-1-008:020)	No significant findings during monitoring; noted Ke'anae Elementary School was previously designated SIHP # 50-50-07-1630 and National Register of Historic Places Building # -00000665; observed SIHP # -0096, Kukui o Puni Heiau, located within approximately 450 feet from monitored land

Possible cultural sites reported by residents included two contemporary hunting or gathering sites, a shrine near West Wailuaiki Stream that was destroyed in a 1975 flood, a shrine in a nonspecific location where *wauke* (*Broussonetia papyrifera*) and *Olona* (*Touchardia latifolia*) grow, and a canoe builders shrine. Additionally, one resident reported the nearby presence of a cave containing a feathered cloak, but another local informant provided a contrary location of near Haleakala Volcano summit for the cave. Two residents agreed that the canoe builders shrine referred to the site where a *koa* tree was removed to build a Hawaiian canoe in the mid-1950s. Archaeological monitoring was recommended for the License Area.

Kennedy (1990)

In a letter dated 7 March 1990, Joseph Kennedy (1990) discusses an archaeological reconnaissance of a land parcel located near Kainalimu Bay (TMK: [2] 1-3-007:016). Only one site was identified, Site 79 (Kauleiula Heiau) previously documented by Walker (1931a).

Donham (1993)

On 9 December 1992 and 6 January 1993, a field inspection of a revised route for a road easement beginning at Makehau Road and partially oriented along Wailuanui Stream (TMKs: [2] 1-1-006:071 and 1-1-008:001) was conducted (Donham 1993). Twenty meters from Makehau Street near a standing wooden shed, a fallen wooden structure was observed, which appeared to be an old slaughterhouse. Structural remnants included intact beams, corrugated metal roofing, meal cooking pans, glass, and wooden shelving. Age of the site was indeterminate, but observed artifacts were modern. An abandoned well or cistern constructed from dry-laid stones and covered with corrugated metal roofing was located nearby (50 m from Makehau St.) and is probably associated with the wooden structure since water pipes were observed between the two features. The route's closest point to Makehau Heiau is 19 m east from centerline and small terraces were observed within 9 m of centerline between the route and Makehau Heiau. Further along the route, rock terraces attributed to the terrace complex SIHP # 50-50-07-2942, were observed. Along the southern section of the route, three SIHPs were observed: an intact retaining wall for an old roadbed (SIHP # -0043), and two terrace walls (SIHP #s -2944 and -2945). SIHP # -2944, comprised of natural outcrop boulders and stacked cobbles and small boulders, is interpreted as a possible late nineteenth/early twentieth century habitation site due to the associated cultural materials encountered at the site, which include 'opihi shells, *kukui* nuts, dark-brown bottle glass, clear glass, whiteware bowl sherds (some hand-painted), three sizes of clear bottles with applied glass manufacturer stamps, embossed proprietary panel bottles, dark-brown bottles with kick-up bases, gallon-size glass jugs, English transfer print whiteware plate sherds, and impressed yellowware bowl sherds. SIHP # -2945 is interpreted as an agricultural terrace wall. A ditch-like feature, which may have derived naturally, was also observed along the southern portion of the route.

Group 70 International et al. (1995)

In May 1995, Group 70 International, Inc., Dr. Davianna McGregor, and CSH prepared a multidisciplinary cultural landscape study of Ke'anae and Wailuanui, reporting information obtained from literature and document searches, field surveys, and personal interviews (Group 70 International et al. 1995). Archaeological field surveys were conducted during September and October 1994, which also included interviewing local residents and mapping and describing taro

cultivation areas. In total, 41 sites are discussed in this study including 14 *heiau*, a shrine, eight taro complexes, two habitation complexes, three rock terrace sites, an old roadbed wall, a fishpond, and 11 post-Contact historic places. The 14 *heiau* (SIHP #s 50-50-07-82 thru -84, -88, -90 through -97, Kanekauo Lono Heiau, and Paliuli Heiau) and the shrine (Leleiwi) were previously documented by Walker (1931a), and of these, only two, Kukuioipuni Heiau (SIHP # -96) and Makehau Heiau (SIHP # -97), were investigated during the study. Both confirmed *heiau* were noted as being densely overgrown and in conditions similar to previous reports. Pu'u Olu Pond, a fishpond with an associated small house platform overlooking the pond and a historic to modern foundation platform of grass house near Paepaemoana point (SIHP # -538), was another previously recorded site confirmed during the study. Nine complexes were first documented during this study: SIHP #s 50-50-07-3932, -3933, -3934, -3935, -3936, -3937, -3938, -3940, and -3941. All of these sites are taro complexes with the exception of SIHP # -3940, a habitation complex in Kilo consisting of terraces and an enclosure. The other habitation complex discussed in the study (though not investigated) is previously documented SIHP # -539 (Wailua-nui Complex), which consists of 15 graves, two possible house sites, a wall, a terrace, and three modified outcrops. While noted in the report as being documented in previous studies, none of the terrace sites (SIHP #s -2942, -2944, and -2945) nor the wall for a roadbed (SIHP #s -2943) were confirmed. Although not included as an archaeological site, the traditional Pi'ilani Trail in the Ko'olau region is listed as an important cultural resource (Group 70 International et al. 1995:145). Post-Contact historic places mentioned, but not investigated during this study, include Puohokamo Bridge (SIHP # -1509), Lin Hing Society Building (SIHP # -1510), Lanakila Ihiihi o Iehova Ona Kau/ Lanakila Ihiihi o Iehova Ona Kauwa (Congregational church, SIHP # -1511), St. Gabriel Shrine (SIHP # -1512), Wailua Mormon Church (SIHP # -1514), Ramos House (SIHP # -1515), and Waikani Bridge (SIHP # -1516). Wailua Stone Church Ruins (SIHP # -1513) and Ke'anae Landing (SHIP # -2957) were both confirmed, and SIHP # -3943 (Ke'anae Quarry) was first reported during this study. At the quarry, old machinery, a World War II gun emplacement, and a possible stone platformed grave of a former quarry worker who died in a blasting accident were observed.

A. Haun and Henry (2003)

On 3 August 2002, Haun & Associates conducted an AIS of 4 acres bordered north by Hanau Stream in the Pauwalu area of Hāna District (TMKs: [2] 1-1-008:015 and 023) (A. Haun and Henry 2003). During a surface survey, two features from SIHP # -5237 were documented: a pre-Contact temporary habitation shelter in the form of a linear overhang with an associated exterior narrow, level ledge (Feature A) and a 63 m trail section (Feature B). Only one *'opihi* shell fragment was observed at the surface in Feature A, while five *kukui* nut shells, eight basalt flakes, and 77 charcoal fragments were encountered during subsurface testing at Feature A. A charcoal sample yielded a calibrated (2 sigma, 95% probability) 14C date range from AD 1420 to 1650.

E. M. Fredericksen and Fredericksen (2004)

During January and February 2004, Xamanek Researches, LLC monitored ground disturbing activities for Ke'anae Park restroom improvements (TMK: [2] 1-1-003:001) (E. M. Fredericksen and Fredericksen 2004). While monitoring excavation for the septic leach field, SIHP # 50-50-07-5534, a late pre-Contact agricultural site, was encountered with associated subsurface

deposits, including two bivalve shell fragments (*Isognoman* spp.), charcoal flecks, and pieces of angular and waterworn coral. A charcoal sample returned calibrated (2 sigma, 95% probability) 14C date ranges of AD 1410 to 1530 and AD 1560 to 1630. A possible 'auwai or stream meander was observed at the northwestern edge of SIHP # -5534.

Hammatt and Shideler (2004)

On 2 July 2003, CSH conducted a field inspection (accepted as an archaeological assessment) of the Wailuaiki and Waihe'e proposed stream gage relocation License Areas (TMKs: [2] 1-1-02:001 por. and 3-2-014:001 por.) (Hammatt and Shideler 2004). For purposes related to the current proposed project, only the Wailuaiki License Area inspection (TMK: [2] 1-1-02:001 por.) part of this field study is relevant. The Wailuaiki field inspection occurred on lands located along Wailua-iki Stream approximately one kilometer west of the 1923 Wailuaiki Bridge on the East Maui Irrigation access road. The field check found no archaeological sites or historic preservation concerns, with the exception of the Ko'olau Ditch infrastructure that would not be affected by the proposed undertaking.

Hill et al. (2008)

In June and July 2007, CSH (Hill et al. 2008) monitored the excavation of trenches for cesspool conversion at Ke'anae Elementary School (TMK: [2] 1-1-008:020). The single room classroom at Ke'anae Elementary School was previously designated SIHP # 50-50-07-1630 and National Register of Historic Places Building # -00000665. Within approximately 450 feet and visible from the school campus is Kukui o Puni Heiau. No subsurface cultural deposits were revealed during excavations.

4.4.6 Nāhiku License Area Archaeological Studies

Previous archaeological studies conducted within or near the Nāhiku License Area are depicted in Figure 47 and summarized in Table 11.

W. M. Fredericksen and Fredericksen (1978)

On 14 July 1978, Xamanek Researches (W. M. Fredericksen and Fredericksen 1978) conducted an archaeological survey of six power pole sites in a Conservation District in Upper Nāhiku for East Maui Irrigation Company Kuhiwa Well (TMK: [2] 1-2-004:007). No historic properties or archaeological materials were reported.

W. M. Fredericksen and Fredericksen (1980)

On 6 April 1980, Xamanek Researches conducted the field component of research aimed at determining the degree of prehistoric indigenous Hawaiian activities at Hanawī Stream (TMK: [2] 1-2-001:001) (W. M. Fredericksen and Fredericksen 1980). The stream and adjacent land was surveyed from a horse and/or foot trail that roughly followed "the old Government Road" (W. M. Fredericksen and Fredericksen 1980:3). The study concludes that Hanawī Stream area would not have been a substantial site for prehistoric activities due to its remoteness, surrounding

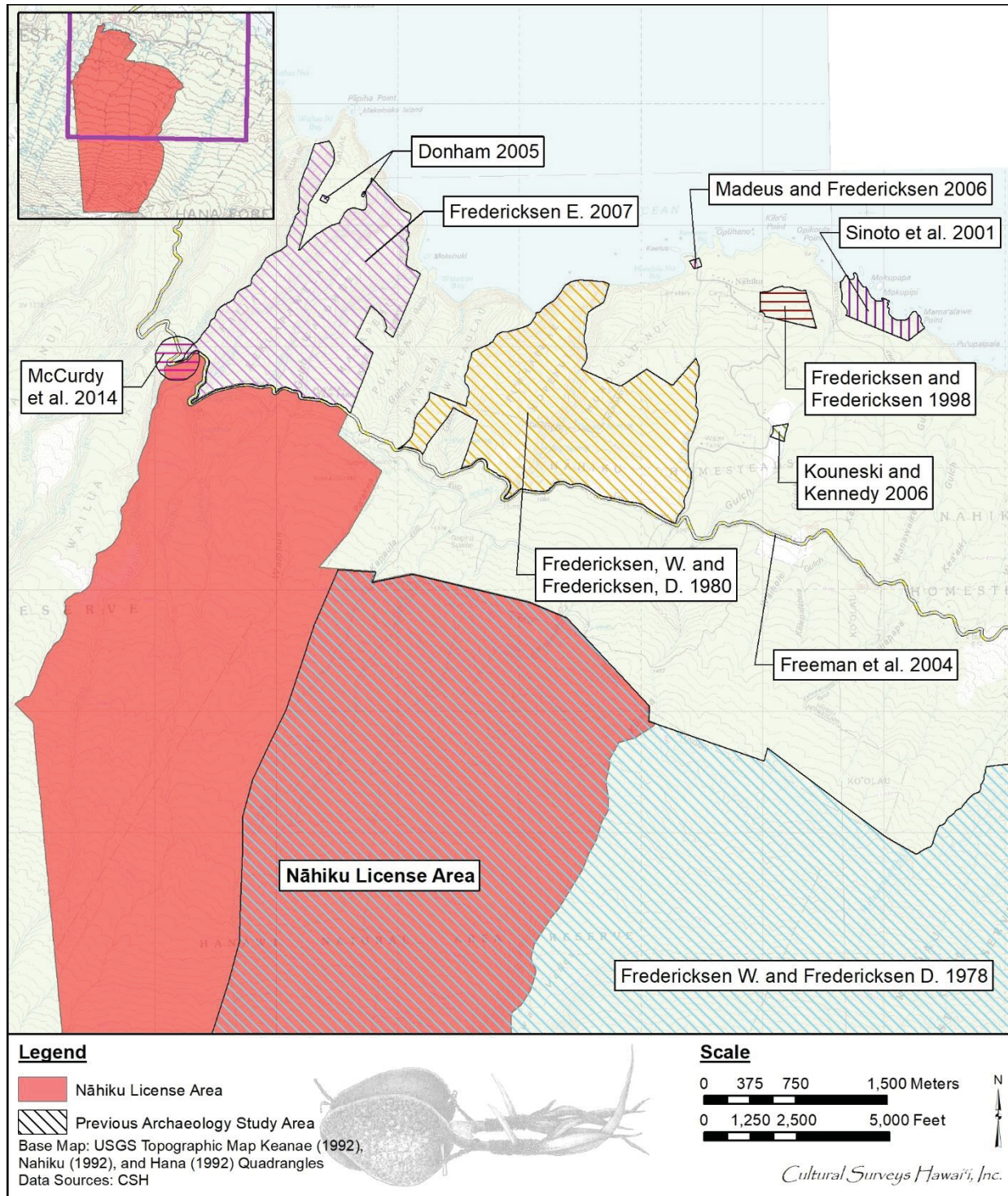


Figure 47. Previous archaeological studies within or near the Nāhiku License Area (U.S. Geological Survey 1991, 1992a, c, d)

Table 11. Previous Archaeological Studies in the Vicinity of the Nāhiku License Area

Reference	Type of Study	Location	Results
W. M. Fredericksen and Fredericksen (1978)	Archaeological survey	Six power pole sites in a Conservation District in Upper Nāhiku for East Maui Irrigation Company Kuhiwa Well (TMK: [2] 1-2-004:007)	No significant findings
W. M. Fredericksen and Fredericksen (1980)	Report of research	Hanawī Stream (TMK: [2] 1-2-001:001)	Concluded an absence of archaeological features but noted a horse or foot trail, a paved area interpreted as a place for modern temporary gatherings and structural-size stones and <i>'ili'ili</i> stones observed along the old Government Road that may or may not have been part of a <i>heiau</i>
E. M. Fredericksen and Fredericksen (1998b)	AIS	26.97 acres in Ko'olau, Hāna District (TMK: [2] 1-2-002:026)	Documented 11 cultural sites including five agriculture and possible habitation sites (SIHP #s 50-50-12-4516 thru -4518, -4522, and -4523); a temporary habitation and agricultural site with burial caves and possible shrine (SIHP # -4514); a site with a boundary wall, burial cave and two probable burial mounds (SIHP # -4515); an agricultural complex with terraces and walls (SIHP # -4519); clear piles (SIHP # -4520); a boundary wall and temporary habitation overhang (SIHP # -4521); and a boundary wall and habitation terraces (SIHP # -4548); confirmed SIHP# 50-50-12-99, Poho'ula Heiau

Reference	Type of Study	Location	Results
Sinoto et al. (2001)	AIS	26-acre ocean front parcel (TMK: [2] 1-2-003:021) located between Kūhiwa Gulch and Kahakapuaa Gulch in Nāhiku	Documented SIHP # 50-50-12-5057, a surface scatter of lithics, and two features of SIHP # -5056: a notched heiau (Feature 1) and a small rectangular depression (Feature 2); reported a possible subsurface pit feature containing rocks, boulders, charcoal flecking, and <i>opihi</i> shell fragments
Donham (2005)	Archaeological assessment	3.2 acres within TMK: [2] 1-2-001:004, located within Ko'olau Forest Reserve	No significant findings
Kouneski and Kennedy (2006)	Archaeological assessment	2.628-acre parcel in Nāhiku Homesteads (TMK: [2] 1-2-002:050)	No significant findings
Madeus and Fredericksen (2006)	AIS	0.84-acre parcel in Nāhiku (TMK: [2] 1-2-001:026)	Documented two features of SIHP # 50-50-12-5961: a small pre-and post-Contact habitation platform (Feature A) and a retaining wall (Feature B)
E. M. Fredericksen (2007)	Archaeological monitoring	Approximately .5 acre at Pua'a Ka'a State Wayside Park (TMK: [2] 1-2-001:003)	No significant findings

rugged terrain, and lack of significant archaeological features observed. Structural-size stones and 'ili'ili stones observed along the old Government Road were the only indication of a possible pre-Contact archaeological site; these stones may or may not have been part of a *heiau* that was reported to exist on the east rise of Hanawī Stream. A small paved area, interpreted as a modern temporary pavement for fishing/gathering parties, was observed east of the mouth of Hanawī Stream. A heavy walled pot and rusty iron grating were associated with this paved area.

E. M. Fredericksen and Fredericksen (1998b)

From January through March 1998, Xamanek Researches conducted an AIS for a 26.967-acre parcel located in Ko'olau (TMK: [2] 1-2-002:026), consisting of pedestrian survey and subsurface testing (E. M. Fredericksen and Fredericksen 1998b). Poho'ula Heiau (SIHP # 50-50-12-0099), previously identified by Walker (1931a), was encountered, and 11 archaeological properties (SIHP #s 50-50-12-4514 through -4523 and -4548) were documented during this AIS. SIHP # -4514 is a pre-Contact agricultural and habitation complex, consisting of 24 features including four rock walls (Features A, D, E, and H), five lava tube caves (Features B, F, G, L, and T), five possible temporary habitation rock overhangs (Features C, M, N, K, and R), a modified outcrop interpreted as a possible agricultural shrine (Feature I), a natural enclosure (Feature J), seven terraces (Features O, P, S, U, V, W, and X), and a retaining wall (Feature Q). Two of the lava tubes (Features G and L) are interpreted as burial caves, since they contain human skeletal remains. Artifacts encountered at SIHP # -4514 include two hand axes or hammerstones, two choppers, volcanic glass debitage, and utilized basalt flakes. SIHP # -4515 has four documented features: boundary wall (Feature A), two probable burial mounds (Features B and C), and a burial cave with visible human remains and a ground stone (Feature D). The burials were first addressed on 2 March 1998, in a letter report (E. M. Fredericksen 1998) noting the discovery of additional human remains located in a 7 m long lava tube in a small gully that also contained two probable post-Contact burials. SIHP # -4516 is interpreted as a pre-Contact agricultural site with five features: a rock wall (Feature A), two terraces (Features B and C), a rock enclosure interpreted as a possible habitation/activity area (Feature D), and a rock alignment (Feature E). Utilized basalt flakes, volcanic glass flakes, and possible quartz flake were encountered at SIHP #- 4516. At SIHP # -4517, three features were documented: large rock enclosure (Feature A), a terrace (Feature B), and a rock mound and small terrace (Feature C). Several artifacts were observed at this site, including basalt flakes, a basalt core, a utilized possible quartz flake, an adze tip fragment, metal pieces, green glass, clear glass, and ceramic sherds. SIHP # -4518 is a small agricultural site with three components: two terraces (Features A and B) and a rock clear pile (Feature C). A basalt core and utilized basalt flakes were observed SIHP # -4518. At SIHP # -4519, a pre-Contact agricultural site, five components were recorded, including two terraces (Features A and B), a pair of parallel rock wall sections (Feature C), a partial rock wall enclosure (Feature D), and a clear pile (Feature E). Two hammerstones, a hand axe, utilized basalt and volcanic glass flakes, an adze fragment, and a pecking stone were encountered at this site. SIHP # -4520 consists of three rock mound agricultural clear piles (Features A through C). SIHP # -4521 is comprised of a historic boundary wall (Feature A) and a rock overhang used as a temporary shelter during pre- and post-Contact times (Feature B). Cultural materials observed at this site include early 20th century bottles and ceramics, two basalt cores, a possible hammerstone, and several *opihi* shells. SIHP # -4522 is a pre-Contact agricultural site also utilized post-Contact that contains three features: a large terrace with

associated retaining wall interpreted as a possible temporary habitation area (Feature A) and two smaller terraces (Features B and C). Artifacts encountered include clear glass, green glass, brown glass, ceramic sherds, a white button fragment, a glass bead, a slate fragment, utilized polished basalt flakes, a retouched adze fragment, and a hammerstone/chopper. SIHP # -4523 is a small agricultural terrace with a poorly constructed retaining wall and associated volcanic glass debitage, unworked basalt flakes, waterworn pebbles; and a waterworn boulder. SIHP # -4548 is comprised of a terrace with a retaining wall interpreted as a pre-Contact habitation area also utilized post-Contact (Feature A) and a likely historic, boundary wall (Feature B). Both pre- and post-Contact artifacts were encountered, including utilized basalt flakes and volcanic glass flakes, three pecking stones, three hammerstones, a ground stone, four adze fragments, polished basalt flakes, four slate fragments, a copper button fragment, and a blue glass bead. An 'ili'ili pavement, a mammal tooth, and shell (*Cellana* sp.) were also encountered subsurface at this site.

Sinoto et al. (2001)

On 6 December and 8 December 2000, Archaeological Services Hawaii, LLC in association with Aki Sinoto Consulting conducted an AIS for a 26 acre ocean front parcel (TMK: [2] 1-2-003:021) located between Kūhiwa Gulch and Kahakapuaa Gulch in Nāhiku 'ili, Ko'olau Moku, Hāna District, which included surface inspection and subsurface testing consisting of seven backhoe trenches (Sinoto et al. 2001). At the surface, two historic properties (SIHP #s 50-50-12-5056 and -5057) were documented, consisting of a notched *heiau* (SIHP # -5056 Feature 1), a small rectangular depression (SIHP # -5056 Feature 2), and a surface scatter of lithics (SIHP # -5057). A possible subsurface pit feature containing rocks, boulders, charcoal flecking, and 'opihi shell fragments was observed in Trench 5.

Donham (2005)

On 24 August 2005, Akahale Archaeology conducted an AIS of two proposed areas totaling 3.2 acres within TMK: [2] 1-2-001:004, located in Ko'olau Forest Reserve (Donham 2005). No historic properties or cultural materials were identified; therefore, the study was termed an archaeological assessment.

Kouneski and Kennedy (2006)

On 25 January 2006, Archaeological Consultants of the Pacific, Inc. carried out an AIS of a 2.628 acre parcel in Nahiku Homesteads (TMK: [2] 1-2-002:050) (Kouneski and Kennedy 2006). No historic properties were identified during this 100% pedestrian survey, so the study was accepted as an archaeological assessment.

Madeus and Fredericksen (2006)

Intermittently from November 2005 through March 2006, Xamanek Researches, LLC conducted an AIS for a 0.84 acre parcel in Nāhiku (TMK: [2] 1-2-001:026), consisting of subsurface testing and 100% surface survey (Madeus and Fredericksen 2006). This AIS documented one historic property (SIHP # 50-50-12-5961), which included a small habitation platform (Feature A) and a retaining wall paralleling an access road to Nahiku Landing (Feature B). During subsurface testing, cultural materials were only encountered in the two test excavations near Feature A. The following pre- and post-Contact materials were observed:

volcanic glass flakes, basalt flakes, a probable hammerstone, 'opihi shell fragments, an unidentified shell, charcoal, pieces of porcelain, clear glass fragments, and a white glass button.

E. M. Fredericksen (2007)

In May 2007, Xamanek Researches, LLC monitored excavations for wastewater improvements on approximately 0.5-acre at Pua'a Ka'a State Wayside Park (TMK: [2] 1-2-001:003) (E. M. Fredericksen 2007). No cultural materials were encountered.

Section 5 Community Consultation

5.1 Introduction

Throughout the course of this assessment, an effort was made to contact and consult with Native Hawaiian Organizations (NHO), agencies, and community members including descendants of the area, in order to identify individuals with cultural expertise/and or knowledge of the *ahupua'a* where the License Area is located. CSH initiated its outreach effort in November 2017 through letters, email, telephone calls, and in-person contact.

5.2 Challenges in Outreach

CSH began the consultation process in late 2017. Some of the challenges that CSH faced during the consultation process included the following:

1. Due to the history and sensitivity of the Proposed Action, cultural researchers encountered community members who were hesitant to talk and/or participate in the process. In a few instances, community members who participated in the interview process later declined approval to be included in the study. During informal conversations, participants shared that they were apprehensive about how their information would be utilized; they questioned “who” it would benefit; and that it was a family or community decision to decline to participate.
2. The cultural researchers who completed the consultation process were primarily located on neighboring islands to Maui and had no prior community connection to East Maui. This created additional challenges for the outreach process, which required additional time and dialogue to develop introductions.

5.3 Community Contact Letter

Letters (Figure 48 and Figure 49) along with a map and an aerial photograph of the License Area were mailed with the following text:

At the request of Wilson Okamoto Corporation, on behalf of Alexander & Baldwin, Inc. (A&B) and East Maui Irrigation Company, Ltd. (EMI), Cultural Surveys Hawai'i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas. The proposed project area includes the following *ahupua'a* (traditional land division spanning from the mountain to the sea): Honopou, Huelo, Mokupapa, Waipioiki, Waipionui, Hanehoi, West Hanawana, East Hanawana, Pu'uomaile, Pāpa'a'ea, West Makaīwa, East Makaīwa, Honomanū, Ke'anae, Wailua Nui, Wailua Iki, Ko'olau, Pa'akea, Nāhiku, and Ko'olau. Districts of Makawao and Hana, Maui Island. Tax Map Keys (TMK): Various. Land area is approximately 33,000 acres.

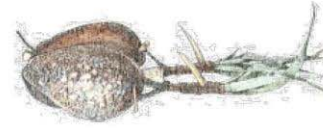
Brief History

For more than a century, a surface-water diversion system has been used to transport water from the wet, northeastern part of Maui, to the drier, central part of the island, mainly for large-scale sugarcane cultivation. The collection system referred to as the "EMI Aqueduct System," spans the Nāhiku, Ke'anae, Honomanū, and Huelo watersheds, and consists of approximately 388 separate intakes, 24 miles of ditches, and 50 miles of tunnels, as well as numerous dams, intakes, pipes, and flumes. The EMI Aqueduct System collects water from approximately 50,000 acres of land. Approximately 33,000 acres are owned by the State of Hawai'i and approximately 17,000 acres are owned by EMI.

Purpose of Project

The proposed project request is the issuance of one long term (30 years) Water Lease from the Board of Land and Natural Resources (BLNR) for continued use of the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas through the existing EMI Aqueduct System which supplies water to domestic and agricultural water users. The Water Lease will enable the lessee to continue to access lands owned by the State in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System, and will allow continued operation of the EMI Aqueduct System to deliver water to the Maui County Department of Water Supply (DWS) in Upcountry Maui and for the Nāhiku community, which draws up to 20,000 gallons of water per day directly from the EMI Aqueduct System. The Water Lease will not allow the lessee to use more water than the amount that will be available for diversion under the Interim Instream Flow Standards (IIFS) issued by the Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM).

Cultural Surveys Hawai'i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President



1860 Main Street

Wailuku, Hawai'i 96793

Ph: (808) 242-9882

Fax: (808) 244-1994

Job code: MAUI 27

emi@culturalsurveys.com

www.culturalsurveys.com

Aloha,

At the request of Wilson Okamoto Corporation, on behalf of Alexander & Baldwin, Inc. (A&B) and East Maui Irrigation Company, Ltd. (EMI), Cultural Surveys Hawai'i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Water Lease for the Nāhiku, Ke'anae, Honomanū, and Huelo License Areas. The proposed project area includes the following *ahupua'a* (traditional land division spanning from the mountain to the sea): Honopou, Huelo, Mokupapa, Waipioiki, Waipionui, Hanehoi, West Hanawana, East Hanawana, Pu'uomaile, Pāpa'a'ea, West Makaīwa, East Makaīwa, Honomanū, Ke'anae, Wailua Nui, Wailua Iki, Ko'olau, Pa'akea, Nāhiku, and Ko'olau. Districts of Makawao and Hana, Maui Island. Tax Map Keys (TMK): Various. Land area is approximately 33,000 acres.

Brief History

For more than a century, a surface-water diversion system has been used to transport water from the wet, northeastern part of Maui, to the drier, central part of the island, mainly for large-scale sugarcane cultivation. The collection system referred to as the "EMI Aqueduct System," spans the Nāhiku, Ke'anae, Honomanū, and Huelo watersheds, and consists of approximately 388 separate intakes, 24 miles of ditches, and 50 miles of tunnels, as well as numerous dams, intakes, pipes, and flumes. The EMI Aqueduct System collects water from approximately 50,000 acres of land. Approximately 33,000 acres are owned by the State of Hawai'i and approximately 17,000 acres are owned by EMI.

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Objectives of the issuance of the proposed Water Lease are:

- Preserve and maintain the EMI Aqueduct System
- Continue to meet domestic and agricultural water demands in Upcountry Maui
- Continue to provide water for diversified agricultural purposes in Central Maui

Figure 48. Page 1 of the community contact letter

 MAUI 27 – CIA for Proposed Water Lease for East Maui

Page 2

- Continue to serve community water demands in Nāhiku

For more information regarding the Proposed Water Lease for the Nāhiku, Keʻanae, Honomanū, and Huelo License Areas, please refer to the Environmental Impact Statement Preparation Notice, which can be found on the Office of Environmental Quality Control's website: http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Maui/2010s/2017-02-08-MA-5E-EISPN-East-Maui-Water-Lease.pdf

The purpose of the CIA is to gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about this area. The research and interviews assist us when assessing potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the planned project. We are seeking your *kōkua* (assistance) and guidance regarding the following aspects of our study:

- **General history and present and past land use of the project area.**
- **Knowledge of cultural sites –for example, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**
- **Cultural associations of the project area, such as legends and traditional uses.**
- **Referrals of *kūpuna* or elders and *kamaʻāina* (Native-born) who might be willing to share their cultural knowledge of the project area and the surrounding *ahupuaʻa* (traditional land division extending from the mountains to the sea) lands.**
- **Any other cultural concerns the community might have related to cultural practices within or in the vicinity of the project area.**

Please contact emi@culturalsurveys.com if you have any questions or would like to participate in the CIA process.

Me ka haʻahaʻa,

Cultural Impact Studies Department
Cultural Surveys Hawai'i

Figure 49. Page 2 of the community contact letter

Objectives of the issuance of the proposed Water Lease are:

- Preserve and maintain the EMI Aqueduct System
- Continue to meet domestic and agricultural water demands in Upcountry Maui
- Continue to provide water for diversified agricultural purposes in Central Maui
- Continue to serve community water demands in Nāhiku

For more information regarding the Proposed Water Lease for the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas, please refer to the Environmental Impact Statement Preparation Notice, which can be found on the Office of Environmental Quality Control’s website: http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Maui/2010s/2017-02-08-MA-5E-EISPN-East-Maui-Water-Lease.pdf

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- Knowledge of cultural sites –for example, historic sites, archaeological sites, and burials.
- Knowledge of traditional gathering practices in the project area, both past and ongoing.
- Cultural associations of the project area, such as legends and traditional uses.
- Referrals of *kūpuna* or elders and *kama‘āina* (Native-born) who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua‘a* (traditional land division extending from the mountains to the sea) lands.
- Any other cultural concerns the community might have related to cultural practices within or in the vicinity of the project area.

5.4 Community Contact Table

Below in Table 12 are names, affiliations, dates of contact, and comments from NHOs, individuals, organizations, and agencies contacted for this project. Results are presented below in alphabetical order.

Table 12. Community Contact Table

Name	Affiliation	Comments
Aarona, Francine	<i>Kama'āina Kupuna</i>	Letter and figures sent via USPS 27 December 2017, returned to CSH 31 December 2017
Ainsworth, Gail	Author and historian	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018, returned to CSH on 10 March 2018
Akoi, Liloa and Waipahe	<i>Kama'āina</i>	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Akuna, Aja	<i>Kama'āina</i> , cultural practitioner Nā Moku Aupuni o Ko'olau Hui	Referred by Mahealani Wendt Letter and figures sent via USPS 22 December 2017, returned to CSH on 28 December 2017 CSH called on 4 February 2019, no answer, voicemail not available CSH called on 5 February 2019, no answer, voicemail not available CSH called on 6 February 2019, no answer, voicemail not available
Akuna, Terrance	<i>Kama'āina</i> , cultural practitioner Nā Moku Aupuni o Ko'olau Hui	CSH called on 5 February 2019, no answer, voicemail not available CSH called on 6 February 2019, no answer, voicemail not available
Alu Like, Inc.	Ke Ola Pono No Nā Kūpuna Program	Letter and figures sent via email 13 June 2018
Ampong, Foster	<i>Kama'āina</i>	Letter and figures sent via USPS 13 June 2018
Antonio, Kapulani	Maui/Lana'i Island Burial Council and History Teacher, Kamehameha Schools	Letter and figures sent via email 2 March 2018
Aquino, Darrell	Maui Invasive Species Committee (MISC), <i>kama'āina</i> , and <i>kalo</i> farmer	Referred by Mahealani Wendt Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2017 CSH called on 8 February 2019, called and left a message

Name	Affiliation	Comments
Arrow One Ranch	Located in Central Maui	Letter and figures sent via USPS 13 June 2018
Barclay, Charles	Nā Moku Aupuni o Ko'olau Hui	<p>CSH called on 7 February 2019, no answer, left a message</p> <p>CSH called on 8 February 2019, no answer, left a message</p> <p>Mr. Barclay called and left a message for CSH on 14 February 2019</p> <p>CSH returned Mr. Barclay's call on 15 February 2019, no answer</p>
Baisa, Gladys	County Council, Central Maui	Letter and figures sent via email 2 March 2018
Bergau, Moses "Moke Boy"	<i>Kama'āina</i> of Nāhiku	<p>Referred to CSH by Mavis Olivera-Medeiros and Dawn Lono</p> <p>CSH met with Moke Boy on 20 February 2019 at Makapīpī Bridge in Nāhiku; briefed him on the CIA process; we walked on the bridge; CSH would follow up later on confirming a date for consultation</p> <p>CSH called on 15 March 2019; no answer, voicemail unavailable; CSH followed up with an email asking if we were still confirmed to meet on Sunday morning (17 March 2019); Moke Boy replied via email on the same day stating that phone lines were down; tentative time of 10AM at the church at the bottom of Nāhiku Road</p> <p>CSH responded to Moke Boy's email on 16 March 2019 confirming the 10AM time</p> <p>Interview with Moke Boy at the bottom of Nāhiku Road on 17 March 2019.</p> <p>CSH sent copies of draft transcription to Moke Boy via USPS on 5 April 2019 with a follow up email</p> <p>CSH followed up with Moke Boy via email on 16 April 2019</p> <p>Moke Boy replied via email to CSH on 18 April 2019 with the following response: <i>I did receive a packet from you and reviewed it</i></p>

Name	Affiliation	Comments
		<p><i>with others feeling very uncomfortable seeing our results as we reviewed it, (you and I) on hard copy, and knowingly the information it contains to be made public, even so. In respect with my ohana wishes I Must decline moving forward with CSH interview, it is a hard decision on my part.(Main concern, to much Detailed information)</i></p> <p><i>I apologize for the inconvenience I have caused.</i></p> <p>CSH responded to Moke Boy via email the same day thanking him for sharing his <i>mana 'o</i> and time</p> <p>Moke Boy declined any further participation in the CIA process. The interview with Moke Boy will not be included in the CIA.</p>
Biga, Marie	Cultural practitioner, Maui Waena Hawaiian Club	<p>Letter and figures sent via email 13 June 2018</p> <p>CSH called Ms. Biga on 10 July 2018, no answer, voicemail not available</p>
Bisgard, Billy and Judy	Former engineer, Hawaiian Commercial Sugar Company (HC&S)	<p>Letter and figures sent via USPS 22 December 2017</p> <p>Second round of letter and figures sent via USPS 2 March 2018</p>
Bissen, Kehau	Hawaiian crafts teacher, resides in Central Maui	<p>CSH called Ms. Bissen on 10 July 2018, said the following day is a better time to be contacted</p> <p>CSH called Ms. Bissen on 11 July 2018; no answer, voicemail unavailable</p>
Broadhurst, Phillip	Former CSH employee, parents are the Wendts	<p>Mr. Broadhurst visited the CSH O'ahu office on 8 March 2018</p> <p>CSH administrative staff emailed CSH CIA staff with contact information for Mr. Broadhurst</p> <p>CSH called Mr. Broadhurst on 9 March 2018 who stated Dr. Hallett Hammatt contacted his mother (Mahealani Wendt) to set up an informal meeting to talk story about the project</p> <p>CSH contacted Mahelani Wendt</p>

Name	Affiliation	Comments
Canto, Doreen	DHHL Homesteader, Central Maui	<p>Letter and figures sent via email 13 June 2018</p> <p>CSH called on 10 July 2018, phone number disconnected</p> <p>CSH called on 8 December 2018 three times; no answer, voicemail box is full</p> <p>CSH called on 15 December 2018; no answer, left a message</p> <p>CSH called Ms. Canto on 17 December 2018; discussed the project and the CIA process; CSH emailed Ms. Canto the consultation package</p> <p>CSH followed up via email with Ms. Canto on 21 December 2018</p> <p>Ms. Canto did not respond</p>
Carmichael, Healoha	Cultural practitioner (fisherman, <i>mālama</i> <i>‘āina</i> , gatherer of aquaculture) Nā Moku Aupuni o Ko‘olau Hui <i>Kama ‘āina</i> of East Maui	<p>Referred by Mahealani Wendt</p> <p>Letter and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Carroll, Robert	County Council Member, East Maui Chair, Land Use Committee	<p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Cho, John	Retired from the College of Tropical Agriculture and Human Resources	<p>Letter and figures sent via email 13 June 2018</p> <p>CSH Called on 10 July 2018 and left a message</p>
Clark, Dan	Nā Moku Aupuni o Ko‘olau Hui	<p>CSH called on 7 February 2019, no answer, left a message</p> <p>CSH called on 8 February 2019, no answer, left a message</p> <p>Mr. Clark returned CSH's call on 8 February 2019 and approved use of his CWRM declaration in this study; see Section 5.6.1</p>
Costa, Joclyn		Letter and figures sent via email 2 March 2018, returned

Name	Affiliation	Comments
Crabbe, Kamana'opono	Ka Pouhana, OHA	<p>Letter and figures sent via USPS on 27 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p> <p>CSH received a letter from OHA on 9 March 2018</p> <p>See Appendix D for response</p>
Crozier, Pomaika'i	Conservation Manager, Pu'u Kukui Watershed Preserve	<p>Letter and figures sent via email 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p> <p>Letter was returned to CSH on 6 March 2018</p> <p>Mr. Crozier called the CSH Maui office on 8 March 2018 stating he wanted to participate in the study</p> <p>CSH contacted Mr. Crozier on 9 March 2018; voice mail was full; CSH called Pu'u Kukui Watershed Preserve office and left a message</p> <p>CSH called Mr. Crozier's cell phone on 19 March 2018; left voice mail</p> <p>Mr. Crozier returned CSH's call on the same day but stated he would be off-island and is still interested in participating; CSH would contact him upon him returning on 10 April 2018</p> <p>CSH called Mr. Crozier on 19 April 2018; he stated he was on the road and to call back in 15 minutes; CSH called Mr. Crozier back and he said he was busy and to call back on 26 April 2018 to coordinate for an interview</p> <p>CSH called Mr. Crozier on 26 April 2018; left a message</p> <p>CSH called Mr. Crozier on 10 July 2018; voice mail full; CSH emailed Mr. Crozier the same day to see if he is still interested in participating; he replied the same day stating he would be on Hawai'i Island and is available to meet</p> <p>CSH emailed Mr. Crozier on 11 July 2018 seeing</p>

Name	Affiliation	Comments
		<p>if he was available on 13 July 2018</p> <p>CSH met with Mr. Crozier at the Naniloa Hotel in Hilo on 13 July 2018; did not conduct interview; CSH got acquainted with Mr. Crozier—his position and background. He stated that he is willing to help put together a group interview for CSH with East Maui residents.</p> <p>CSH followed up with an email to Mr. Crozier on 27 July 2018 for a list of contacts</p> <p>CSH called Mr. Crozier on 9 August 2018; left a message</p> <p>CSH called on 28 September 2018; left a message; Mr. Crozier contacted CSH the same day and set a tentative date for a group interview for 9-11 October 2018</p> <p>CSH called Mr. Crozier on 3 October 2018 and left a message to confirm a date</p> <p>CSH called Mr. Crozier on 4 October 2018; voice mail full; Mr. Crozier called back the same day and cancelled all interviews; tentatively rescheduled for 23-25 October 2018</p> <p>CSH called Mr. Crozier on 19 October 2018; left a message to follow up on the group interviews scheduled for the following week</p> <p>Mr. Crozier did not respond</p>
Cuffe, Susie	Director, Maui County Soil & Water Conservation Districts (SWCD)	<p>Letter and figures sent via email 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Daniels, Ronald	<i>Kama'āina</i> and <i>Lei hulu</i> (feather lei) specialist	<p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Day, Joseph J.	Nā Moku Aupuni o Ko'olau Hui	<p>Referred by Mahealani Wendt</p> <p>Letter and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>

Name	Affiliation	Comments
Day, Virgil	Nā Moku Aupuni o Ko'olau Hui	Letter and figures sent via USPS 21 November 2017; letter returned 27 November 2018 Second letter and figures sent via USPS 2 March 2018 to new address; letter returned 6 March 2018, insufficient address
De Naie, Lucienne	Chairwoman of Hawai'i Chapter, Sierra Club Corporation	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Denecke, Ellen P.	Nā Moku Aupuni o Ko'olau Hui	Letter and figures sent via USPS 21 November 2017; letter returned on 1 December 2017, contact moved Second letter and figures sent via USPS 2 March 2018 to forwarding address; letter returned 10 March 2018
Duey, John V.	President, Hui Nā Wai 'Ehā	Letter and figures sent via USPS 13 June 2018
East Maui Water Study	<i>Hui</i>	Letter and figures sent via email 2 March 2018
Fasi, Paul	Upcountry Maui resident	Letter and figures sent via email 13 June 2018 Mr. Fasi replied to CSH via email on 14 June 2018 stating he was interesting in participating in the discussion CSH replied via email on 19 June 2018 to set up a date and time for consultation CSH called Mr. Fasi on 26 June 2018; no answer, left a voice mail Mr. Fasi did not respond
Finkle, Laura	Maui Program Coordinator, Hawai'i Nature Center	Letter and figures sent via USPS 13 June 2018
Fisher, Scott	Associate Executive Director of Conservation, Hawaiian Islands Land Trust (HILT)	Letter and figures sent via email 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Flamer, Gina	President, Kula Community Association	Letter and figures sent via USPS 13 June 2018

Name	Affiliation	Comments
Franco, Alex	Rancher, Maui Cattle Company	Letter and figures sent via email 22 December 2017 Second letter and figures sent via USPS 2 March 2018 Third letter and figures sent via email 13 June 2018
Garcia Jr., William	Royal Order of Kamehameha I, Office of Ku'auhau Nui	Letter and figures sent via USPS 13 June 2018
Guzman, Don S.	Kahului County Council; Chair, Parks, Recreation, Energy and Legal Affairs Committee	Letter and figures sent via USPS 13 June 2018
Haines, Geoff	Upcountry Maui farmer	Letter and figures sent via email 13 June 2018 CSH called and left a message on 11 July 2018
Haleakalā Ranch Company		Letter and figures sent via USPS 13 June 2018
Haller, Alex		Letter and figures sent via email 2 March 2018
Hau, Skippy	<i>Kama'āina</i> Aquatic Biologist, Division of Aquatic Resources – State of Hawai'i	Letter and figures sent via USPS 22 December 2017 Mr. Hau replied via email on 18 January 2018 with the following: <i>(1-4) Assumption length of “water lease for 30 years.” The proposal does not address the lack of information on the amount of water flowing through the EMI Aqueduct System and the actual amounts collected at each diversion or ditch. Without understanding the future changes in the climate, I'd recommend a five-year lease with constant updates.</i> <i>Is the 20,000 gallons per day for Nahiku and Kula Agricultural Park a minimum?</i> <i>Isn't the interim instream flow suppose to maintain a minimum flow for each stream?</i> <i>(1-6) Will EMI property be clearly identified along with boundaries of State land?</i> <i>Please identify “Settlements” along Hana</i>

Name	Affiliation	Comments
		<p><i>Highway.</i></p> <p><i>(1-7) Please clarify “diversified agricultural uses as is economically feasible.” The term is used but not clearly identified or the need for water.</i></p> <p><i>(1-8) The three DWS water treatment facilities water use should be clearly identified. Please identify actual use not maximum capacity. The reservoir capacities does not clarify actual water use.</i></p> <p><i>(1-9) Please clarify abandoned diversion. Is the diversion and other structures to collect water removed and natural stream restored? Historically, structures including old tractors, drilling rigs, old gates, and rusted pipes have been abandoned throughout East Maui. Although some of these structures are over fifty years old, these debris and abandoned structures, etc. should be completely removed from the land or buried on the mountain.</i></p> <p><i>(Table 1-2) Notes: Planned for full and permanent restoration. This does not mean just the removal of "metal control gates." Concrete walls and control structures should be completely removed and streams restored to their natural conditions.</i></p> <p><i>(3-9) Native gathering rights should be addressed. The gathering of opae, ‘o’opu and hihiwai continues in many of the East Maui Streams being diverted.</i></p> <p><i>(3-16) These State lands should be open to public hunting and gathering. The general pubic should have access to hike up mountains, visit waterfalls, scenic lookouts by streams, shorelines, and beaches.</i></p> <p><i>Not all lands belong to the State so “private lands” should and need to be identified by signs and safe parking areas. Many visitors and tour groups assume most lands belong to the State resulting in illegal trespassing on private property. Many rental cars block the road and</i></p>

Name	Affiliation	Comments
		<p><i>park on Hana Highway blocking traffic.</i></p> <p><i>(3-17) The EMI Aqueduct System requires mapping that shows the 388 separate intakes, ditch, dams, intakes, pipes and flumes used to collect water. Each diversion's location should be identified with accurate GPS coordinates along with elevation. The amount of water moving through the system should be measured and monitored at specific locations in the system.</i></p> <p><i>Stream research has shown diverted streams have impacted aquatic ecosystems. The minimum flow established by interim-instream flows should be strictly enforced. The past hundred years has shown rough estimates on the amount of water being diverted.</i></p> <p><i>Should the 62 miles of roads maintained for the EMI Aqueduct System require a lease for easement on State lands? When was the EMI system consolidated into one lease? The blanket water lease may pertain to the diversion and transport of water. The structures including tunnels, walls, intakes being used should be distinguished from abandoned facilities. Abandoned pipes, tractors, drilling rigs should be removed. A&B and EMI have a responsibility to restore areas that were used in the past.</i></p> <p>CSH interviewed Mr. Hau on 16 February 2018 on Maui</p> <p>CSH attempted to send Mr. Hau his draft transcript and photos on 2 July 2018; file was too big</p> <p>CSH resent a reduced file size of his draft transcript and photos on 3 July 2018 via SharePoint; the same day Mr. Hau replied acknowledging receipt of email and link</p> <p>Mr. Hau replied 4 July 2018 via email with photo captions</p> <p>CSH replied 5 July 2018 acknowledging receipt of photo captions</p>

Name	Affiliation	Comments
		<p>CSH followed up with Mr. Hau 24 July 2018 via email regarding editing his transcript; Mr. Hau replied the same day stating he has been off-island but will work on his edits soon</p> <p>Mr. Hau emailed CSH his transcription edits 26 July 2018 with a presentation, additional photos, and various articles (i.e., water rights, freshwater animals, Wailuku River discharge, and Commission on Water Resources Management [CWRM]); CSH replied the same day acknowledging receipt of email and attachments</p> <p>CSH followed up with Mr. Hau via email 31 July 2018 regarding next steps of consultation process and draft interview summary for review; Mr. Hau replied the same day with edits to his summary; CSH replied the same day acknowledging receipt of edits</p> <p>Mr. Hau forwarded photos via email 15 August 2018</p> <p>CSH emailed Mr. Hau 16 August 2018 asking permission to use his photos for his interview summary</p> <p>Mr. Hau forwarded YouTube links via email 16 September 2018</p> <p>CSH replied to Mr. Hau via email 17 September 2018 acknowledging receipt of email; Mr. Hau replied the same day with captions to photos</p> <p>Mr. Hau's interview summary can be found in Section 5.5.2</p>
Hegele, Paula	President, Maui Wine	Letter and figures sent via USPS 13 June 2018
Hemming, Christina	Ha'ikū/Kuiaha Stream	<p>Letters and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Hew, Garret	<i>Kama'āina</i> , Upcountry Maui farmer, former EMI employee	Letter and figures sent via email 13 June 2018; Mr. Hew contacted CSH the same day expressing interest in participating in the study; CSH shared the process with Mr. Hew and set up a tentative

Name	Affiliation	Comments
		<p>date to be interviewed and visit his farm in Kula</p> <p>CSH interviewed Mr. Hew at his home in Kula, Maui on 26 June 2018</p> <p>Draft transcription sent to Mr. Hew for review 5 November 2018</p> <p>CSH followed up with Mr. Hew via email on the progress of his review of his transcription 27 November 2018; Mr. Hew responded the same day via email that he was still reviewing</p> <p>CSH responded to Mr. Hew via email on 28 November 2019 acknowledging receipt of his email</p> <p>Mr. Hew sent his revised transcription to CSH via email 29 November 2018</p> <p>Mr. Hew followed up via email 2 December 2018 if CSH received his revised transcription</p> <p>CSH responded to Mr. Hew via email 3 December 2018 acknowledging receipt of his revised transcription; Mr. Hew responded the same day thanking CSH for acknowledgment</p> <p>CSH sent Mr. Hew a revised final transcription for review via email 21 December 2018</p> <p>Mr. Hew responded to CSH via email 24 December 2018 approving his revised final transcription</p> <p>CSH sent Mr. Hew a draft interview summary for review via email 5 February 2019</p> <p>Mr. Hew sent a revised interview summary to CSH via email 7 February 2019</p> <p>CSH sent Mr. Hew a final interview summary via email on 11 February 2019 for his review</p> <p>Mr. Hew approved his interview summary via email 12 February 2019</p> <p>Mr. Hew's interview summary can be found in Section 5.5.3</p>
Hew, Jason	Conservation Specialist, SWCD	Letter and figures sent via USPS 13 June 2018

Name	Affiliation	Comments
Hilananda, Nik		<p>Letter and figures sent via email 22 December 2017</p> <p>Second letter and figures sent 2 March 2018 via USPS</p>
Hobdy, Robert	Retired naturalist and forester	<p>Letter and figures sent via email 22 December 2017</p> <p>Mr. Hobdy sent a letter with the following statement on 16 January 2018:</p> <p><i>Aloha,</i></p> <p><i>My name is Robert Hobdy. I am a retired Forester with the State Division of Forestry and Wildlife, DLNR with 37 years of service, 32 years of which have been on Maui. I worked extensively in the subject area and am familiar with the land, resources and people who live in the Hamakualoa, Ko'olau and Hana moku and who farm, hunt and gather resources from these lands.</i></p> <p><i>Much of the information you seek regarding this project is well documented in a 2006 study "A Cultural-Historical Study of East Maui—the uplands of Kaliialinui, and the Lands That Lie Below, Island of Maui" by Kumu Pono Associates LLC authored by Kepa and Onaona Maly. This document includes information on general history, cultural sites, traditional gathering practices and cultural associations. It also includes oral history interviews with a number of kupuna and other kama'aina including myself who have connections to this 'aina. It is a very thorough and informative document and it suffices for my input on these cultural associations.</i></p> <p><i>In addition I would like to say that there should be two more objectives verbalized that need to be added to the four "bullets" shown:</i></p> <p><i>1. Provide adequate stream flow to support diversified agriculture in the Hamakualoa and Ko'olau region.</i></p>

Name	Affiliation	Comments
		<p><i>2. Provide adequate stream flow to support indigenous fish, shrimp and mollusk species in the Hamakualoa and Ko'olau region.</i></p> <p><i>I am not interested in participating in the CIA process beyond this involvement.</i></p>
Hokoana, Lui	President, Central Maui Hawaiian Civic Club	<p>Letter and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Holt-Padilla, Hōkūlani	<i>Kumu Hula</i>	<p>Letter and figures sent via email 2 March 2018</p> <p>Ms. Holt-Padilla emailed CSH on 7 March 2018 stating that this is not her area of expertise</p>
Ho'okano, Steven	Nā Moku Aupuni o Ko'olau Hui	CSH called on 11 February 2019, no answer, voicemail not available
Jacintho, Jonah	Nā Moku Aupuni o Ko'olau Hui	CSH called his sister, Lezley Jacintho, on 8 February 2019; gave approval to use his declaration in this study; see Section 5.6.2
Jacintho, Juliana	Nā Moku Aupuni o Ko'olau Hui	<p>CSH called on 8 February 2019; no answer, left a message</p> <p>CSH called on 11 February 2019; mailbox full, unable to leave a message</p>
Jacintho, Lezley	Nā Moku Aupuni o Ko'olau Hui	CSH called on 8 February 2019 and she approved use of her CWRM declaration in this study; see Section 5.6.3
Ka'auamo, Mary	Nā Moku Aupuni o Ko'olau Hui	Letter and figures sent via USPS 22 December 2017
Ka'auamo, Noelani		Letter and figures sent via USPS 22 December 2017; letter returned to CSH 31 December 2017
Ka'auamo, Solomon	Nā Moku Aupuni o Ko'olau Hui	<p>Referred by Mahealani Wendt</p> <p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Kaho'okele, Dorothy "Aunty Dottie/Kumu Kamalu"	President, Nahiku Community Association	<p>Referred by Mavis Oliveira-Medeiros and Dawn Lono</p> <p>Letters and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March</p>

Name	Affiliation	Comments
		<p>2018</p> <p>Referred by Mavis Oliveira-Medeiros and Dawn Lono at our interview on 19 February 2019</p> <p>Spoke to Aunty Dottie on 20 February 2019 via phone; explained the project and the CIA process; said she is interested in participating but can only be interviewed on the weekend</p> <p>Phone call to Aunty Dottie on 15 March 2019 to confirm interview; confirmed and will call when en route to Nāhiku</p> <p>Called Aunty Dottie on 16 March 2019 en route to Nāhiku; interviewed</p> <p>Aunty Dottie texted on 17 March 2019 thanking us for the interview; CSH thanked Aunty Dottie for her time, <i>'ike</i>, and <i>mana'o</i></p> <p>CSH texted Aunty Dottie on 10 April 2019 giving her an update on her transcription and that it would be sent out soon</p> <p>CSH texted Aunty Dottie on 12 April 2019 asking for confirmation of address; draft transcription sent via USPS</p> <p>Aunty Dottie texted CSH on 15 April 2019 acknowledging she received the draft transcription and would proofread and return</p> <p>CSH followed up with Aunty Dottie on 18 April 2019 via text on the edits of the transcription; she replied she is still working on it</p> <p>CSH followed up with Aunty Dottie on 27 April 2019 via text on the status of her draft transcription edits</p> <p>Aunty Dottie replied via text 28 April 2019 that she would work on it tomorrow; currently sick; Aunty Dottie called CSH on the same day asking about the CIA process (What is the project purpose? Who is it for? Who will it benefit from this?); CSH answered her questions and she decided to withdraw from the consultation process</p>

Name	Affiliation	Comments
Kailila'au, Henry	Nā Moku Aupuni o Ko'olau Hui	<p>Letter and figures sent via USPS 21 November 2017; letter returned to CSH 5 December 2017, contact has moved</p> <p>Second letter and figures sent to forwarding address via USPS 2 March 2018; letter returned to CSH 10 March 2018, wrong address</p>
Kalanikau, Vernon	Kula Moku Representative, Aha Moku o Maui	<p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Kamaunu, Johanna	Wailuku Moku Representative, Maui-Lana'i Island Burial Council	Letter and figures sent via email 2 March 2018
Kamaunu, Kaniloa	Wailuku Moku Representative, Aha Moku o Maui	Letter and figures sent via email 2 March 2018
Kanaka'ole, Kai L.	<p><i>Kumu Hula</i>, Hālau o Kekuhi and Hālau o Nakaulakuhikuhi</p> <p>Member, Edith Kanaka'ole Foundation</p> <p>Cultural Practitioner</p> <p>Nā Moku Aupuni o Ko'olau Hui</p>	<p>Referred by Mahealani Wendt</p> <p>Letter and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p> <p>CSH called on 4 February 2019; number disconnected</p> <p>CSH called on 5 February 2019; Ms. Kanaka'ole approved use of her CWRM declaration in this study and it can be found in Section 5.6.4</p>
Kanoa, Gladys	Nā Moku Aupuni o Ko'olau Hui	<p>Referred by Mahealani Wendt</p> <p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p> <p>CSH called on 4 February 2019; Mr. Kanoa said to call the following day</p> <p>CSH called on 6 February 2019; asked if it was OK to use CWRM declaration even if in public domain; not approved</p>

Name	Affiliation	Comments
Kanoa, Isaac	Nā Moku Aupuni o Ko'olau Hui <i>Kalo</i> Farmer, gatherer, fisherman, diver, <i>mālama 'āina</i> practitioner	Referred by Mahealani Wendt Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018 CSH called on 4 February 2019; approved use of declaration CSH called for Mrs. Kanoa's approval of CWRM declaration on 6 February 2019; Mr. Kanoa rescinded use of his CWRM declaration in this study; not approved
Kapu, Kea'aumoku	CEO, Aha Moku o Maui and Koani Foundation	Letter and figures sent via email 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Kapu, Kekai	Aha Moku o Maui Cultural Director, Maui Ocean Center	Letter and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Kapu, Uilani	Treasurer, Nā 'Aikāne 'o Maui	Letter and figures sent via email 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Kaupalolo, Carl	Royal Order of Kamehameha	Letter and figures sent via email 13 June 2018 CSH called Mr. Kaupalolo on 11 July 2018; wrong number
Kekahuna, Cheryl (Pohe) Ka'ohelani	Nahiku Community Association	Letters and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Kekahuna, Ivan	<i>Kama'āina</i>	Letter and figures sent via USPS 2 March 2018; letter returned to CSH 14 March 2018
Kekahuna, Mapu	<i>Kama'āina</i> , Nahiku Community Association	Letters and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Kapahulehua, Leonard Kimokeo	Founder, Kimokeo Foundation	Letter and figures sent via email 21 November 2018

Name	Affiliation	Comments
		<p>Second letter and figures sent via USPS 2 March 2018</p> <p>Third letter and figures sent via email 13 June 2018</p> <p>Mr. Kapahulehua replied to CSH via email on 14 June 2018 with the following:</p> <p><i>Aloha</i></p> <p><i>I received email, now in London due back on Maui June 21st and will call and make contact</i></p> <p>CSH followed up with Mr. Kapahulehua via email on 19 June 2018 stating we will wait for his call upon his return</p> <p>CSH called Mr. Kapahulehua 6 August 2018; no answer</p> <p>CSH emailed Mr. Kapahulehua on 6 August 2018 asking his dates of availability for an interview</p> <p>Mr. Kapahulehua replied via email on 7 August 2018 with his dates of availability; CSH responded the same day with options and availability</p> <p>Mr. Kapahulehua emailed CSH 8 August 2018 with a tentative interview date of 23 August 2018</p> <p>CSH emailed Mr. Kapahulehua 10 August 2018 confirming the 23 August 2018 for an interview on Maui</p> <p>CSH called and emailed Mr. Kapahulehua on 22 August 2018 and left a voice mail cancelling the interview due to Hurricane Lane</p> <p>Mr. Kapahulehua emailed on 23 August 2018 stating he understood the circumstances</p> <p>CSH emailed Mr. Kapahulehua on 28 August 2018 to reschedule consultation</p> <p>Mr. Kapahulehua stated via email 29 August 2018 that he was in Kona and could meet for consultation; CSH responded the same day confirming consultation for the 30 August 2018</p>

Name	Affiliation	Comments
		<p>in Kona</p> <p>CSH emailed and called Mr. Kapahulehua on 30 August 2018 when a good time to meet would be; CSH met with Mr. Kapahulehua that day to discuss two projects including EMI; CSH was unable to cover EMI with Mr. Kapahulehua and would contact him later to set up another consultation date</p> <p>CSH emailed Mr. Kapahulehua to secure a time and date for consultation 6 September 2018</p> <p>CSH called to follow up with Mr. Kapahulehua 4 October 2018 to schedule an interview; unable to leave message, mailbox full</p> <p>Mr. Kapahulehua did not respond</p>
Kekiwi, James	Nā Moku Aupuni o Ko'olau Hui	<p>CSH called on 8 February 2019; said to call back because he was driving</p> <p>CSH called on 11 February 2019; no answer, voicemail full, unable to leave message</p>
Keyser, Harold	Retired from College of Tropical Agriculture and Human Resources (CTAHR)	Letter and figures sent via email 13 June 2018
Kimoeko, Pualani	Nā Moku Aupuni o Ko'olau Hui	<p>Referred by Mahealani Wendt</p> <p>Letter and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p> <p>CSH called on 4 February 2018; approved CWRM declaration to be in the report; see Section 5.6.5</p>
Kubota, Gaylord	Retired Director/Founder, Alexander & Baldwin Sugar Museum	<p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Kuloloio, Leslie	<i>Kupunakāne</i>	<p>Letter and figures sent via email 27 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>

Name	Affiliation	Comments
Lake-Farm, Sissy	Executive Director, Maui Museum <i>Kumu Hula</i> , Nā Hanona Kūlike 'o Pi'ilani	Letter and figures sent via email 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Lawrence, Tiare	Cultural Practitioner	Letter and figures sent via email 2 March 2018
Lay, Ivan	Chair, Maui County Cultural Resources Commission	Letter and figures sent via USPS 13 June 2018
Lee, Jeeyun	Executive Director, Hawai'i Nature Center	Letter and figures sent via USPS 13 June 2018
Lester, Sean	East Maui resident	Letter and figures sent via USPS 21 November 2017, letter returned to CSH on 31 December 2017
Lightfoot, Roslyn	Director, Alexander & Baldwin Sugar Museum	Letter and figures sent via email 21 November 2017 Ms. Lightfoot responded via email on 28 November 2018 with the following: <i>Aloha,</i> <i>We received your letter about the EMI Project. We would like to participate in the CIA process anyway that we can.</i> <i>Resources that might be helpful:</i> • <i>Our archives hold two maps that might be helpful to your research. The first one is a map of Nahiku Coffee Plantation, and the second map is an irrigation map from Nahiku to Keanae.</i> • <i>Kepa Maly cultural survey for EMI. A copy was donated to the Maui Historical Society and is available for researchers.</i> CSH reviewed these recommended resources as part of the traditional and historic background research conducted for the CIA
Lindsey III, Edwin "Ekolu"	President, Maui Cultural Lands	Letter and figures sent via USPS 13 June 2018
Lutgen, Hannah	Conservation Specialist, Natural Resources Conservation Service	Letter and figures sent via USPS 13 June 2018

Name	Affiliation	Comments
Makena Stables		Letter and figures sent via USPS 13 June 2018
Martin, Koa	Former HC&S Employee	Letter and figures sent via USPS 13 June 2018
Martin, Bob	Central Maui farmer	Letter and figures sent via email 2 March 2018
Maui/Lana'i Island Burial Council		Letter and figures sent via USPS (C/O SHPD) 13 June 2018
Maxwell, Dane	Maui/Lana'i Island Burial Council	Letter and figures sent via USPS 22 December 2017; letter returned to CSH 28 December 2017
Mayer, Dick	Retired Professor, author, and political analyst	Letters and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
McGregor, Davianna P.	Expert testimony; specializes in Hawaiian subsistence, cultural, and religious customs and practices (research); research for East Maui; author Professor, Department of Ethnic Studies – University of Hawai'i at Mānoa	Referred by Mahealani Wendt Letter and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Molitau, Kaponoa'i	Cultural Practitioner, <i>Kumu Hula</i>	Letter and figures sent via USPS 13 June 2018
Nahiku Community Association		Letter and figures sent via email 2 March 2018; returned to CSH the same day
Nakahashi, Ikaika	Cultural Historian, SHPD	Letter and figures sent via email 2 March 2018
Nakanelua, Kyle	<i>Kama'āina</i> , Aha Moku o Maui, and <i>kalo</i> farmer	Letter and figures sent via email 2 March 2018 Mr. Nakanelua emailed CSH on 6 March 2018 with the following: <i>Good Morning to you Cultural Survey Hawai'i, I am very pleased to meet you. You email has found me well, and I wish you the same also. I would like to participate in this survey can you direct me as to what task you need for me to</i>

Name	Affiliation	Comments
		<p><i>accomplish, as well as inform me as to what the time frame is I need to complete these tasks. I look forward to hearing from you. I will call you today.</i></p> <p><i>Mahalo and have a good day.</i></p> <p>CSH responded via email to Mr. Nakanelua 6 March 2018 explaining the CIA process</p> <p>Mr. Nakanelua responded to CSH via email 7 March 2018 with the following:</p> <p><i>Mahalo for getting back to me and letting me know I still have time to contribute. I noticed the bullet statements that are listed below. I am aware of a previous work done by Kepa Maly that addresses</i></p> <ul style="list-style-type: none"> •<i>General history and present and past land use of the project area.</i> •<i>Knowledge of cultural sites (i.e. heiau, burials, historic sites, etc.).</i> •<i>Knowledge of traditional gathering practices (such as fishing, limu picking, la'au lapa'au, etc.).</i> •<i>Mo'olelo (stories)</i> •<i>Referrals</i> <p><i>Also the book sites of Maui has a lot of mo'olelo and diagrams as well. Will those documents be include as well?</i></p> <p><i>When do you think you will be conducting the interview? I will be off Island several time during this month and beginning April.</i></p> <p>CSH responded to Mr. Nakanelua via email 19 March 2019, follow up to see if he is still interested in participating</p> <p>Mr. Nakanelua emailed on 20 March 2018 with the following:</p> <p><i>Aloha Nicole, Yes I am still interested in participating, with certain interest. It is important to me for you to know that I need the</i></p>

Name	Affiliation	Comments
		<p><i>communication regarding the process, to be completely transparent between the two of us. I would like to know how this process is going to be conducted. So what are the next steps that will occur. What are your expectations of me in this interview as well as what will my testimony be used for. I have given testimony before only to have it used against the cause that I support. I am NOT in Favor of any stream diversions from Nahiku to Waikamoi. I am aware that EMI A&B has enough properties and wells to support upcountry water needs as well as any upcoming and planned Agricultural projects. There is also enough water for Mayor Arakawa's plan to take Kihei off of the Wailuku aquifer and replace their water consumption needs with water that use to go to the cane fields out in Pu'unene. I think 10 million gallons a day was the number he spoke of. Also, anything I share regarding the land, it's resources, and the work that I do, I consider Intellectual and Cultural Property of myself and my Ohana. I am halfway through a House painting project. I have time in the morning on April 4th and 11th. If not those Mid-April is better.</i></p> <p><i>Malama pono ia oe kekahi.</i></p> <p>CSH called Mr. Nakanelua on 20 March 2018 then followed up with an email stating:</p> <p><i>Aloha,</i></p> <p><i>Tried to call you (I think it's your number) and left a message. I think it would be easier if we hopped on the phone and talk story a little bit. We can talk about the process and transparency (which I fully believe in when it comes to project details and expectations--for the both of us). I am not ma'a to Maui. I spent some time in Makawao, Kula, and Hana every year when I was a little girl to visit family friends but its been some time. I want to get a better understanding of the landscape, the changes, and how those changes (and the possible changes that may ensue from</i></p>

Name	Affiliation	Comments
		<p><i>this project) will affect you and others.</i></p> <p><i>When you have time, give me a call at the office: (808) 965-6478. I'll be here in the office all day today, Thursday, and Friday. We talk story and we go from there. I want to make sure that everything is pa'a first.</i></p> <p>Mr. Nakanelua emailed CSH on 20 March 2018:</p> <p><i>Aloha Nicole,</i></p> <p><i>I got your call I just got in. I am headed out to the farm tomorrow, and then I have class at night. I will steal some time to call you at least touch base ear to ear.</i></p> <p><i>According to your email it sounds like a good thing for us to do. I will make every effort to call tomorrow.</i></p> <p>CSH responded to Mr. Nakanelua via email 22 March 2018:</p> <p><i>Aloha,</i></p> <p><i>E kala mai, I was in school all day yesterday. I am here in the office today and I'll be in all day tomorrow as well. Give me a call when you're free.</i></p> <p>Mr. Nakanelua called on 27 March 2018 wanting to know the CIA process; CSH let him know about the authorization form, recording, transcripts, approval, public record, etc. and he was fine with it; tentative date to meet is 13 April 2018 at Pauwela Coffee Shop; CSH to email questions to Mr. Nakanelua for him to review prior to interview</p> <p>Mr. Nakanelua called CSH on 11 April 2018 to confirm interview and change location of interview</p> <p>CSH called Mr. Nakanelua on 12 April 2018 to confirm interview and that we would call him when we landed on Maui the following day</p> <p>CSH interviewed Mr. Nakanelua on 13 April</p>

Name	Affiliation	Comments
		<p>2018 at Starbucks Kahului</p> <p>CSH sent a follow up email on 16 April 2018 thanking Mr. Nakanelua for sharing his <i>'ike</i> and <i>mana 'o</i></p> <p>CSH emailed Mr. Nakanelua his draft transcription for review 20 June 2018</p> <p>Mr. Nakanelua emailed edits in text 25 June 2018; CSH responded the same day via email to Mr. Nakanelua to give options to go through the transcript together by phone or if he would like to provide a write up</p> <p>CSH followed up with Mr. Nakanelua via phone 4 September 2018 on transcription edits</p> <p>Mr. Nakanelua emailed 5 September 2018 stating that he is available for a call today; CSH called, no answer</p> <p>CSH called Mr. Nakanelua 6 September 2018, no answer; Mr. Nakanelua emailed that he received the message and is available the following day</p> <p>CSH called and emailed a follow up 11 September 2018 stating we would contact him the following day</p> <p>Mr. Nakanelua emailed CSH 12 September 2018 stating he would wait for our call that day; CSH called later in the afternoon; edits made and approved to transcript</p> <p>Draft summary sent via email for review 8 October 2018</p> <p>Follow up on draft summary via email 5 November 2018</p> <p>Mr. Nakanelua emailed CSH 10 November 2018 stating he had apprehensions about participating in the study and felt that his words could be taken out of context</p> <p>CSH emailed Mr. Nakanelua 13 November 2018; followed up with a phone call</p> <p>Mr. Nakanelua sent an email 14 November 2018</p>

Name	Affiliation	Comments
		<p>with edits; CSH called multiple times the say day, Mr. Nakanelua called back; CSH will make the corrections to his summary</p> <p>CSH sent edited summary for review via email 19 November 2018</p> <p>Mr. Nakanelua emailed CSH his corrections to his summary 28 November 2018</p> <p>CSH emailed Mr. Nakanelua his edits 9 January 2019</p> <p>Mr. Nakanelua emailed CSH 10 January 2019 relating that he would get back to us tomorrow</p> <p>Mr. Nakanelua emailed CSH 11 January 2019 stating that we “have represented the voice, thoughts, and concerns well.”</p> <p>Mr. Nakanelua’s summary can be found in Section 5.5.1</p>
Neal, Patricia J.	Nā Moku Aupuni o Ko‘olau Hui	<p>Letter and figure sent via USPS 21 November 2017; letter returned to CSH 27 November 2017</p> <p>Second letter and figures sent via USPS to forward address 2 March 2018; letter returned to CSH 6 March 2018</p>
Nelson, Linda	President, Native Hawaiian Plant Society	Letter and figures sent via USPS 13 June 2018
Nemet, Cody	<i>Kama‘āina</i> , Cultural Practitioner	Letter and figures sent via email 2 March 2018
Newbold, Robin	Chair, Maui Nui Resource Council	<p>Letter and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Nishiyama, Patty	Member, Nā Kūpuna o Maui	<p>Letter and figures sent via USPS 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Noho‘ana Farm		Letter and figures sent via USPS 13 June 2018

Name	Affiliation	Comments
Oliveira, Roy Kalani	President, Waiehu Kou Phase 3 Association	Letter and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Oliveira-Medeiros, Mavis	<i>Kama'āina</i>	Letters and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Ornellas, Daniel L.	Vice President, Waiehu Kou Phase 3 Association	Letter and figures sent via email 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Pahukoa 'Ohana	<i>Kama'āina</i> , Cultural Practitioners	Letter and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Pang, Dr. Lorrin		Letters and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018
Pasco Jr., Michael D.	<i>Kama'āina</i> , Cultural Practitioner	Letter and figures sent via email 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Pastula, Dana and Michael	Owners, Café O Lei	Letter and figures sent via USPS 13 June 2018
Pelligrino, Hokuao	<i>Kama'āina</i> , <i>kalo</i> farmer, descendant of Bailey Family	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Pua'a, Mikiala and Ka'u	<i>Kalo</i> Farmers	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Pyle, Bill	Former HC&S employee	Letter and figures sent via email 2 March 2018

Name	Affiliation	Comments
Raymond, Ki'ope	Hawaiian Studies Teacher, University of Hawai'i – Maui College	Letter and figures sent via USPS 27 December 2017 Second letter and figures sent via USPS 2 March 2018
Reilly, Rose		Letter and figures sent via email 2 March 2018, returned
Roback, William	Royal Order of Kamehameha	Letter and figures sent via email 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Sakugawa, Jerry	Upcountry Maui Farmer	CSH called 11 July 2018; left a voice message Mr. Sakugawa returned CSH's call 12 July 2018; CSH explained the project and the CIA process; Mr. Sakugawa stated that he does not use that much water but he is interested in seeing what the study is about; CSH emailed Mr. Sakugawa the consultation letter and figures the same day Mr. Sakugawa did not respond
Schattenburg- Raymond, Lisa	Horticulturalist/Former Executive Director, Maui Nui Botanical Gardens Humanities Teacher, Univeristy of Hawai'i Maui College	Letter and figures sent via email 2 March 2018
Scott, Lurlyn	Nā Moku Aupuni o Ko'olau Hui	CSH called on 4 February 2019; left a message Ms. Scott returned CSH's call on 5 February 2019; CSH asked if it was OK for us to use her CWRM declaration in the study; Ms. Scott said OK but she wanted to see her declaration first CSH emailed Ms. Scott her declaration for review on 6 February 2019 Ms. Scott approved use of her CWRM declaration in this study via email on 7 February 2019; see Section 5.6.7

Name	Affiliation	Comments
Shishido, Jamie	Upcountry Maui Farmer	<p>Letter and figures sent via email 13 June 2018</p> <p>CSH called Mr. Shishido 11 July 2018; said to call back the following day at 9AM</p> <p>CSH called Mr. Shishido 12 July 2018 and left a voice message; Mr. Shishido returned CSH's call later that afternoon; CSH discussed the project and the CIA process and encouraged him to read the letter and review the figures, if he wishes to participate or has questions he can contact CSH</p> <p>Mr. Shishido did not respond</p>
Smith, Annette	Director, SWCD	<p>Letter and figures sent via email 22 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Smith, Earl	Nā Moku Aupuni o Ko'olau Hui	CSH called on 7 February 2019; Mr. Smith approved use of his declaration in this study; see Section 5.6.8
Smith, Jade Alohalani	Representative, Moku o Kaupo	<p>Letter and figures sent via email 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Solamillo, Stanley	Former Cultural Resources Expert, County Planning Department Architectural Historian	<p>Letter and figures sent via USPS 27 December 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Sterling, Donna	Aha Moku Representative	<p>Letter and figures sent via email 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Stoner, Kawika	<i>Kama'āina</i>	<p>Letters and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>
Stoner, Maluhia	<i>Kama'āina</i>	<p>Letters and figures sent via USPS 21 November 2017</p> <p>Second letter and figures sent via USPS 2 March 2018</p>

Name	Affiliation	Comments
Takeshita, Sandy	Upcountry Maui Nursery	<p>Letter and figures sent via email 13 June 2018</p> <p>Ms. Takeshita replied via email 14 June 2018 requesting for more information on author of the email (sent from a general email handle); CSH replied the same day with information of Cultural Researcher who authored email; Ms. Takeshita replied the same day thanking CSH</p> <p>CSH called 11 July 2018 discussing the project and the CIA process; Ms. Takeshita stated that she is on County water and not on EMI water, and therefore not interested in participation in the CIA</p>
Tanahy, Dalani	<i>Kapa</i> maker	Letter and figures sent via email 2 March 2018
Tavares, William	Chairman, Committee for More Equitable Taxes	Letter and figures sent via USPS 2 March 2018
Tengan, Ty	Professor, University of Hawai'i at Mānoa	<p>CSH called on 8 February 2019; left a message</p> <p>CSH called on 11 February 2019; left a message</p> <p>Mr. Tengan called CSH on 12 February 2019; left a message for CSH</p> <p>CSH returned Mr. Tengan's call on 15 February 2019; Mr. Tengan approved use of his CWRM declaration in this study; see Section 5.6.9</p>
Texeira, Justin	Upcountry Maui Farmer	<p>Letter and figures sent via email 13 June 2018</p> <p>CSH called 10 July 2018; unable to leave a voicemail</p>
Ulupalukua Ranch Inc.		Letter and figures sent via USPS 13 June 2018
Vicens, Chubby	<i>Kama'āina</i>	Letter and figures sent via email 13 June 2018
Watanabe, Heidi	Upcountry Maui Farmer	<p>Letter and figures sent via email 13 June 2018</p> <p>CSH called 10 July 2018; left voice message</p>
Watanabe, Noelani	Vice Chair, Native Hawaiian Historic Preservation Council for Maui	Letter and figures sent via email 2 March 2018; returned
Watanabe, Warren	Maui County Farm Bureau	Letter and figures sent via email 13 June 2018

Name	Affiliation	Comments
Wendt, Carl	Nā Moku Aupuni o Ko'olau Hui Cultural Practitioner (<i>kalo</i> farmer, gatherer, fisherman)	Referred by Mahealani Wendt Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018 CSH called on 11 February 2019; no answer, left a message
Wendt, Edward	Nā Moku Aupuni o Ko'olau Hui	Referred by Mahealani Wendt Letter and figures sent 21 November 2017 Second letter and figures sent via USPS 2 March 2018 CSH called on 5 February 2019; no answer, left a message CSH called on 6 February 2019; no answer, left a message Returned CSH's call on 11 February 2019; CSH called the same day, no answer, left a message
Wendt, Emily	<i>Kama'āina</i> , family of <i>kalo</i> farmers	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018
Wendt, Mahealani	Nā Moku Aupuni o Ko'olau Hui	Letters and figures sent via USPS 21 November 2017 Second letter and figures sent via USPS 2 March 2018 Mrs. Wendt called the CSH Maui office on 8 March 2018, no voice mail CSH called Mrs. Wendt on 9 March 2018; no answer, no voice mail available CSH received an email from Mrs. Wendt on 26 March 2018: <i>Aloha,</i> <i>I spoke informally with Mr. Hammatt by telephone earlier this month and he told me the deadline on your letter dated February 2018 is a soft deadline, and that you would continue to</i>

Name	Affiliation	Comments
		<p><i>accept input past the February 23, 2018 deadline indicated in your letter.</i></p> <p><i>I am writing to ask for confirmation that this is also the understanding of the Maui office.</i></p> <p><i>I am also writing to confirm that you have received declarations submitted as part of contested case and court proceedings of our community members. These declarations, forwarded early in this process to your office on our behalf by attorneys at the Native Hawaiian Legal Corporation, set out the traditional practices of our community members and how those practices would be impacted by the continuing water diversions of A&B / EMI. A list of those declarations is attached for your information.</i></p> <p><i>Our community non-profit organization, Na Moku Aupuni o Ko`olau Hui, is in the process of encouraging its members to update their statements if they feel it necessary. We are also encouraging those who have not submitted statements to do so.</i></p> <p>Mrs. Wendt called the Maui Office and left a message on 27 March 2018</p> <p>CSH responded to Mrs. Wendt's email on 27 March 2018:</p> <p><i>Mahealani,</i></p> <p><i>Mahalo for getting in touch with CSH and taking time out of your schedule to visit the O'ahu office to follow up on the project.</i></p> <p><i>Yes, the February 2018 date was a soft deadline. Confirming that we are still accepting testimonies and are in the process of setting up interviews with interested parties. Mahalo for pointing out the date, I will need to take that out since we are now entering April 2018.</i></p> <p><i>Confirming that we have received <u>some</u> testimonies from the parties listed. I need to do more research through our files to</i></p>

Name	Affiliation	Comments
		<p><i>locate the remainder. For instance, I don't recall seeing testimony provided by Ty Tengan or Paul Reppun. The document I read was a compilation of testimonies, mostly from the hui, but it has been a while since I read through it so maybe it was there but I just cannot recall? So let me check what we have on file and get back to you on this.</i></p> <p><i>I have reached out to quite a bit of people listed in the List of Declarations, but others I do not have contact information for. I am having our Administrative Assistant try to locate contact information for those we do not have information for so we can send out consultation letters and maps to them. Mahalo for the list!</i></p> <p><i>Yes, please encourage the hui to update and submit testimony. Also, if anyone is interested (including yourself) in having a sit down interview for the cultural impact assessment, we can schedule something. Myself or one of our researchers will fly over and we can have a talk story session. Let me know if you or anyone you know is interested in participating or has questions about the process.</i></p> <p><i>Mrs. Wendt replied to CSH via email on 28 March 2018 with the following:</i></p> <p><i>Thank you for your reply. I will keep you informed of our progress in obtaining these statements and as our community has been through the wringer of legal process, it will probably not be necessary for you to be here in person. There's a lot of "interview" fatigue here after decades of dealing with the justice system. I will let our folks know of your offer, though, and thank you very much. We may indeed need your assistance at a later time.</i></p> <p><i>Let me know if you need for me to send any statements you are missing that were on my list.</i></p>

Name	Affiliation	Comments
Young, Joseph “Jojo” and Edwin	<i>Kama‘āina</i> Cultural Practitioner (gatherer, <i>mālama</i> <i>‘āina</i>)	Letter and figures sent via USPS 22 December 2017 Second letter and figures sent via USPS 2 March 2018 CSH called on 8 February 2019; no answer, left a message

5.5 *Kama‘āina* Interviews

The authors and researchers of this report extend our deep appreciation to everyone who took time to speak and share their *mana‘o* (thoughts) and *‘ike* (knowledge) with CSH whether in interviews or brief consultations. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and in no way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

Interviews were conducted in accordance with Federal and State laws and guidelines with individuals knowledgeable of the general history, present and past land use, traditional gathering practices (both past and ongoing), and cultural sites of the License Area and the encompassing *ahupua‘a*. The following analysis of *kama‘āina* interviews is intended to facilitate the identification of potential impacts to cultural resources, ongoing cultural practices, and/or cultural sites within the License Area or its immediate vicinity.

5.5.1 Interview Summary for Kyle Nakanelua

Disclaimer from Kyle Nakanelua: *“It is critical to me that my testimony will not be used to support other diversions. I request that if my interview is used in future documents, my words are reproduced accurately and in no way altered. If large excerpts are used, those that are using my statements obtain my express written consent.”*

CSH interviewed Kyle Nakanelua on 13 April 2018 at Kahului Starbucks. Kyle Nakanelua was born on 10 September 1959 to Paul Hanai Nakanelua, Jr. and Barbara Jean Rodrigues in Honolulu. Mr. Nakanelua has an older and a younger sister. He was raised in Honolulu and lived there for 17 years. He spent four years in the military before moving to Wailuku in 1982. He worked for the Department of Transportation – Airports Division as a fireman for 30 years before retiring.

Mr. Nakanelua’s connection to Maui is that his maternal grandfather is from Kokomo and his father was born and raised in Wailua Village, the greater area known as Wailua Nui. He has traced his *mo‘okuauhau* (genealogy) prior to Kamehameha and has spent many summers and winter breaks with his grandparents, sister, and older cousin. He recalls spending time with his *kūpuna* (elders) as well as working in the *kalo* (taro; *Colocasia esculenta*) fields. Mr. Nakanelua describes working in the *lo‘i* (irrigated terrace) not as work, but as a “way of life.” Mr. Nakanelua elaborates what a typical day with his grandparents would entail:

Yeah, get up, clean up, house chores, and then...yard chores or farm chores. The farm was away so it's either weeding in the taro patch, cutting the grass, pulling the taro, helping clean up all the—you know when you harvest the taro there's always left-over work, right? There's--you got to move the roots, you got to move the cut *huli* [taro top], just all of these...just farming tasks. Yeah. So, we would participate in. Everything is manual labor. Nothing was machines. So, there was always work to do.

Although there are many varieties of *kalo*, Mr. Nakanelua points out that the two varieties that his grandparents cultivated were Lehua and Moi.

When he returned to his family property in 1989, he consistently worked on cleaning the taro patches at least three times a week and there were some challenges including invasive species and insufficient water flow.

Invasive species such as apple snails and feral hogs are an obstacle that Mr. Nakanelua faces in *kalo* farming. He is currently on a comeback after a two-year hiatus after feral hogs wiped out an entire acre of taro. He points out that these are not normal pigs as they are cross-bred with Russian boar so they're much more aggressive—eating baby goats, avocado trees, and *pohole* (fiddlehead fern).

In terms of the water flow, Mr. Nakanelua points out that as a child he recalls all the streams being full of water. Honomanū never flowed unless there was torrential rains. However, he points out that since the release order¹, Honomanū and several other streams have been flowing nicely, including Puohokamoa and Waikamoi. He adds that it's not always the amount of water that matters, but the velocity behind it:

So it's not that its 6 feet wide of water and 4 feet deep. Its X amount wide and X amount deep but there's a really crisp and vigorous flow to it. You know, and that's what's important. That's what keeps everything stimulated and alive - that I've seen. If you talk about a healthy stream flow, that was a healthy stream.

Because Mr. Nakanelua is a taro farmer, having water that is cold and constantly running is a vital component of farming wet land *kalo*.

Besides tending to their *lo'i*, they were also responsible for gathering food products from the rivers and streams such as *ōpae* (general name for shrimp), *ōpihi* (general name for limpets), *ō'opu* (general name for fishes included in the families *Eleotridae*, *Gobiidae*, and *Blennidae*), and *hīhīwai* (endemic grainy snail; *Neritina graposa*). They also gathered *pohole*.

¹ Although CSH is not certain what release order Mr. Nakanelua was referring to, we note that EMI ceased all diversions within the Waiokamilo hydrologic unit after the BLNR ruled in March 2007 that EMI should release 6 mgd from Waiokamilo Stream. In July 2016, the CWRM issued an Order re Interim Restoration of Stream Flow, and ordered that the following streams, on which diversions had stopped, were to remain undiverted until further order by CWRM: Waiokamilo Stream, East and West Wailuanui, Makapipi, Hanawi, Waiohue, East Wailuaiki, West Wailuaiki, Waikamoi, Kapiliula, and Puakaa

'*O'opu* it used to be more prolific in this area...but not as much as it used to be. And I've seen it. As a young child, '*o'opu* was like prevalent in the streams....and now it ain't. I believe they're still there but I used to see them before I don't see them anymore.

When Mr. Nakanelua was a child, he recalls '*ōpae* being prevalent in the streams that flow through their property named Lakini. When he began to clean the family property on a regular basis, he points out that there was "some" because his grandmother would still catch '*ōpae* to use and eat. Today there is no '*ōpae*, but there are prawns. When posed the question if perhaps '*ōpae* was being over picked by others, he responds with "no" because "we were the only one there." Mr. Nakanelua does not think that the prawns are to blame for the decline of the '*ōpae* population, but instead believes "that the flow of water is impactful" and has seen the water decline since 1989.

In addition to freshwater species, his grandmother fished and gathered for food items *makai* (towards the ocean). He explains:

They fished for the little fish, the '*ōhua* [young fish] . . . They fished for little eels the way they did it. How they put the *palu* [fish bait made of fish head or stomach, also used for chumming] in the hand and then the small eels would come in and they would grab them and stuff like that. We participated in the picking '*opihī*...And certain types of *limu*.

'*Opihī* was eaten raw, while *hīhīwai* was used for soup. '*O'opu* was steamed. *Limu* was a side dish and used as a condiment to dishes. Typically, all marine life was taken home, cleaned, and then eaten for dinner. Any leftovers were eaten for lunch the following day.

The area of Ha'aluea is a *wahi pana* (storied place). Ha'aluea is a *papa* (reef) that extends just off the shoreline. Mr. Nakanelua shared with us that it was the '*awe'awe* or tentacle of the great squid named Ha'aluea. The *mo'olelo* behind it is that 'Ai'ai cut off the tentacle, which later became petrified. The *mo'olelo* stems from "Ku'ula from Hāna." It is said that Ku'ula and Hina were called upon for assistance in Wailuanui. A *leho* (general name for cowry shell) was removed from a gourd that was given to 'Ai'ai, son of Ku'ula. He attached the *leho* to a line and lowered it into the sea where it emitted rich, beautiful colors that attracted Ha'aluea. The large *he'e* (general term for octopus) came out of its hole and appeared on the surface of the water. Men on canoes surrounded Ha'aluea were frightened by his size. Ha'aluea had every intention of killing the men on the canoes but instead 'Ai'ai's friend shoved a stone into the head of the *he'e* and an arm was cut off, which now makes up the *papa* today (Thrum 1901:117-118).

Ha'aluea also serves as a fish breeding ground due to the lay of the land. Because it's a reef and the *muliwai* (rivermouth) empties into this area, Mr. Nakanelua points out that this is where fish spawn. The *papa* serves as a home for fish of all sizes as well as '*opihī*. Residents regularly fish in this area and have caught *kole* (surgeonfish; *Ctenochaetus strigosus*), '*ō'io* (ladyfish; *Albula Vulpes*), *akule* (big eyed scad fish; *Trachurops crumenophthalmus*), and pelagics such as '*ahi* (Hawaiian tuna fishes) and *aku* (bonito, skipjack; *Katsuwonus pelamis*). Mr. Nakanelua recalls his grandmother making *lomi* (knead, massage) '*ō'io* by cutting open the fish, scraping out the soft meat of the fish, then picking out the small bones with her fingers. She would add

'inamona (relished made of *kukui* [candlenut; *Aleurites moluccana*]) and *limu koku*. Another favored option was to dry fish in a dry box.

Mr. Nakanelua shared a few *mo'olelo* that focus on the water of East Maui:

So there are various ponds that are dedicated to the *mo'o* and there are various streams that are dedicated to *puhi*. And there's one stream that's named after a *mo'o* and that stream or that area—stream rivulet is called Waiakakamilo, so “the water of Kamilo.” There's another stream in the area of Waianu, I believe. It's a big one. It's a main tributary and it's called Waiakuna or “the waters of Kuna” and that was a big *puhi* of that place, at that time.

Mr. Nakanelua continues that below the waters of Waiakuna is a pond commonly known as Ching's Pond. That is where he swam growing up or ponds that was on his grandmother's *'āina* (land).

Another point of interest that Mr. Nakanelua shares is his knowledge of a *heiau* (pre-Christian place of worship) complex called Pākanaloa. The site consists of a couple platforms, but in recent years it has been choked by *hau* (beach hibiscus; *Hibiscus tillaceus*) and trash. The Redo family resides near the *heiau* where they operate a watercress farm. On their property is a spring known as 'Ōhi'a. Mr. Nakanelua shares the *mo'olelo* of these two sites:

Because it was founded and formed by Kāne and Kanaloa. And I'm not talking about those magical, mystical gods. I'm talking about two real guys that actually existed, you know? And for me and my educational base their ancestors that are upon us, ancestors that were so great and from such a time, so long ago, that we have commemorated them to various landscapes across, you know, across this *pae moku* [group of islands]. But definitely on Maui that is one of their places that they have established. And if you think about establishing a spring - the establishment of a spring - it's drinking water. Fresh, pure drinking water that is necessary for people to live. And so if you look at it, there's a spring there, and then above the spring there's a temple complex or let's call it a church complex. Why do you need a church? You need a church because you have people. And people require [loud sigh] spiritual sustenance, you know, as well as food sustenance. So, there was an established ancient village there of where that was the central focal point. And if you look at the societies of the world - and everywhere - the center of society is the religious institution for a lack of a better phrase at this moment in time. So, the temple complex is called Pākanaloa or “the enclosure of Kanaloa” and it oversees and is connected to the well spring called 'Ōhi'a that was established by Kāne and Kanaloa who are notable ancestors that are always paired together. So, I think yeah if that ain't an archaeological site I don't know what is.

When CSH posed the question if he knows other people in the area who perform any other cultural practices, Mr. Nakanelua discusses the “buzz phrase” and how it was just how you lived in his grandparent’s time:

It was way of life. So, I learned stuff like that but is was way of life, it wasn’t one cultural practice. You never practice anything, you just did the work. So, I would virtually say yeah there are—everyone in that valley is a cultural practitioner....I think if you asked them a lot of them would scratch their heads and go ‘what you talking about’ [laughing]. And a lot of people don’t understand that because the academic world is really large right now, especially in Hawaiian traditions. And the majority of the cultural practitioners that exist, yeah, that have taken on the title, they do not live that kind of life...And I’m not discrediting them, yeah, I want to be clear. I’m not discrediting the life that they live here. But it’s definitely nothing like the life that country people live. So, for me...there’s insiders and there’s outsiders. And there’s an outside life and the way people live and there’s an inside life and the way people live.

He gives an example of diving, fishing, and gathering ‘*opihi* of someone who lives in the country. He explains that a person from the country will simply put on old clothes and bring a bag and a spear—no fins. That person will walk up current, dive in, and follow the current, which is what eliminates the need for fins. That person will spear just enough fish for himself and his ‘*ohana* (family). Then they would walk the shore to pick ‘*opihi* and maybe the stream to gather *hīhīwai*. Mr. Nakanelua states: “It’s so bloody sensible.” In comparison to those who have made a tradition into a novelty, which in turn has become a sport. He continues:

So, yeah so are there cultural practitioners? I will say...every one of those people that live in there [East Maui] are cultural practitioners. If you’re planting food, if you’re gathering food, if you do these things that is what is classified now a days as a cultural practice...Yeah.

Mr. Nakanelua is concerned with the act of diverting water, he explicitly states that “when those places dry up that adversely impacts the way of life, the cultural practice if you will” and it “adversely impacts the people’s way of life that live there.”

Now Mayor Alan Arakawa told me, his mouth to my ear, said they want to take Kīhei’s consumption off of the Wailuku aquifer and supplement that with 10 million gallons a day from the Ko‘olau water system. You know the whole problem with this is for the past 150 years they’ve been circumventing the law. They’ve been violating the law. And the administrators have allowed it to occur.

His recommendations for this project was simply “Follow the law! Support the law! File for your permit. There’s a policy and there’s procedures. Adhere to the policy and follow the

procedures. And stop trying to circumvent it [the law] because you smart. You know, just be honest, be transparent.”

Closing statement from Mr. Nakanelua: “In closing, I would like to express my gratitude to those that called for this EIS. It has afforded an opportunity for an old voice to be heard and hopefully heeded. The voice of the Mo‘o-Kūpuna (Elders that have passed) through Mo‘o-lelo (oral tradition) about the Mo‘o-‘āina (tangible and intangible life of the land) and Mo‘owai (life giving force of water) and the many Mo‘o-mahi (eco-system) that make up this environment of ours.

He ali‘i ka ‘āina, He kānaka ke kaula.

The land has authority, the human is the steward that is to care for it.”

5.5.2 Interview Summary for Skippy Hau

On Friday, 16 February 2018, CSH interviewed Skippy Hau and accompanied him on a *huaka‘i* (journey,trip) to historic water diversions and irrigation ditches within the EMI Aqueduct System. Born to Arthur Mann Yau Hau and Rose Sin Heong, Mr. Hau was born and raised in Kāne‘ohe, O‘ahu and moved to Wailuku, Maui in 1985. From that time, he has held his position as an Aquatic Biologist for Maui’s Department of Land and Natural Resources. He has also given presentations for the Marine Option Program at Maui Community College.

His work as an Aquatic Biologist has introduced him to many different aquatic species, mainly the *‘ōpae* (Figure 50 and Figure 51), *‘o‘opu* (Figure 52), and *hīhīwai* (Figure 53), all of which he has done extensive research on. His studies have taken him into the streams most deeply impacted by years of water diversion for the purpose of sugarcane production on Maui. To truly understand the negative impacts of water diversion or even the negative impacts of private ownership of water, one must first understand the *positive* impacts of properly managed, natural stream flow, which Mr. Hau has advocated for years. The importance of water to the Hawaiian people speaks volumes when one looks deeper into the meaning Hawaiian meaning and use of the term *wai*, water. As Carol Wilcox notes:

The difference between Western and Polynesian concepts of water was fundamental. Take, for example, the languages that drove the two cultures. While in English the word “water” means “a transparent, odorless, tasteless liquid, a compound of hydrogen and oxygen,” in Hawaiian the word “wai” has many meanings: water and blood and passion and life. Hawaiians were fully aware of the power and wealth bestowed on those who controlled *wai*. After all, this word is the root word for wealth, *waiwai*, and law, *kanawai*. [Wilcox 1996:24-25]

Mrs. Emma Nakuina, a Hawaiian scholar, wrote an article on “Ancient Hawaiian Water Rights” and all the different parts that attributed to its success in ancient Hawai‘i. Mrs. Nakuina notes:

Water rights were primarily for *lois* [irrigated terraces], that is, for *kalo* [taro] culture-potato patches, bananas or sugar cane had no recognized claim on a water right in the rotation. The cultivation of these, regarded as dry land crops, were invariably during the rainy season except in the *Koolau* or wet districts. Sugar cane and bananas were almost always planted on *loi* banks (*kuauna’s*) so as to

ensure a sufficiency of moisture from the seepage or ooze between them.
[Nakuina 1893:83]

In her description of ancient Hawaiian water rights, Mrs. Nakuina makes a clear point that water was used primarily for the cultivation of *kalo*, the main staple of the Hawaiian people. So it came with no surprise that the amount of water required for sugar cane production would have profound effects on the families of East Maui and the population of aquatic species Mr. Hau is so familiar with.

On the way to our first stop at the Honopou stream diversion (Figure 54 and Figure 55), Mr. Hau spoke of a *kūpuna* who lived in this area by the name of Beatrice Kekahuna. In 2001, she, along with Marjorie Walette and Elizabeth Lapenia, members of *Nā Moku 'Aupuni o Ko'olau Hui* (a non-profit corporation organized by the Hawaiian community of East Maui) petitioned the Commission on Water Resources Management (CWRM) to amend the Interim Instream Flow Standard (IIFS) for 27 Streams in East Maui (State of Hawaii 2008:130). The details of the case is described as follows:

On May 24, 2001, Nā Moku (a nonprofit corporation organized by native Hawaiian residents of East Maui ahupua'a), Beatrice Kekahuna, Marjorie Walle, and Elizabeth Lehua Lapenia filed petitions to amend the IIFS for twenty-seven East Maui streams. On May 25, 2010, the Commission held an open meeting to reach a decision on IIFS amendment for nineteen of the streams. The Commission restored flow to six streams (two on an annual basis and four on a seasonal basis) and decided that the IIFS for the remaining thirteen streams would remain unamended. Before the end of the May 25, 2010 Commission meeting, Nā Moku's counsel orally requested a contested case hearing to challenge the decision, and on June 4, 2010, Nā Moku filed a written Petition for a Contested Case Hearing Before the Commission on Water Resource Management (Petition for Hearing) pursuant to the Commission's administrative rules. [...] The petitioners in that case testified that their native Hawaiian members "live, work, and play" in the areas of the streams at issues, and they claimed the Commission's decision to restore a limited amount of water to the streams adversely affected their native Hawaiian rights and their ability to engage in traditional and customary gathering practices. [...] ...community members who owned or resided on land in the area of the East Maui streams submitted testimony to the Commission about similar interests in gathering hīhīwai, limu, o'opu, and ōpae from the streams... [State of Hawai'i Court of Appeals 2012:1-2 and 5-7]

An interim order was issued in 2007 by the Board of Land and Natural Resources (BLNR) ordering "A&B/EMI [Alexander & Baldwin/East Maui Irrigation] be immediately ordered to decrease current diversions on Waiokamilo Stream such that the water flow can be measured [...] at the rate of 6,000,000 gallons per day based on a monthly moving average on an annual basis" (State of Hawaii 2008:131). Though this figure seems rather large, it is still not an adequate amount for those who have petitioned for the release of more water. At the Honopou diversion, Mr. Hau pointed out that modifications were made to allow more water to flow downstream, however, much of the water is still being diverted by EMI.

Continuing on our *huaka‘i*, we approached Honomanū where Mr. Hau recalled seeing residents gather ferns in this area. This fern, known on other islands as *hō‘i‘o* is called *pohole* by Maui residents and is particularly large and coarser (Pukui and Elbert 1986) (Figure 56). In one particular account by a Mr. James Hū‘eu Jr., he states that *pohole* grows only in the mountainous areas of Maui while *hō‘i‘o* can be found at different elevations on other islands (Maly and Maly 2001:46). Regarding Honomanū Stream, Mr. Hau published a report in 2007 that was featured in Bishop Museum’s Bulletin, *Biology of Hawaiian Streams and Estuaries*. This published work really encompasses Mr. Hau’s work as an Aquatic Biologist. A section of the report’s abstract briefly describes the effects of stream diversion and, likewise, stream restoration on *hīhīwai*:

Juvenile *hīhīwai* (*Neritina granosa*), endemic freshwater snails of Hawai‘i, were collected from ‘Īao and Honomanū Streams on the island of Maui. Each stream has two or three diversions at various elevations which removes most of the stream flow before reaching the ocean. The lack of flow restricts *hīhīwai* to the estuary. [...] The persistence of juvenile *hīhīwai* recruitment confirms the possibility for restoring native stream population if “natural flow” is restored. Stream restoration should be based on the needs of the slowest migrating animal such as *hīhīwai*. A slow-migrating species like *hīhīwai* may be a good indicator of the adequacy of stream flow during stream restoration programs. [Hau 2007:171]

Mr. Hau expands on the importance of proper water level and flow on the *hīhīwai* population:

The streams occasionally experience heavy rains and flash flooding which temporarily establishes *mauka-makai* connection (from the mountain to the ocean) that is vitally important for amphidromous animals migrating between the ocean and fresh water. The connection is maintained intermittently after storms with flows that exceed diversion capacities. [...]

Hīhīwai still attempt to migrate into ‘Īao and Honomanū estuaries even though both streams have been diverted for more than 100 years. Water collected by diversions is transported to agricultural lands by a comprehensive system of irrigation ditches and reservoirs (Wilcox, 1996). These diversions may also be carrying *hīhīwai* larvae away from the ocean. [...]

For diverted streams, the requirement for two or more flows are often overlooked and are needed to allow post larvae *hīhīwai* and other stream animals sufficient space and time to migrate upstream. Depending on the duration of the rainy season, these later flows may need to exceed diversion capacities and be able to break open a natural berm built up by large winter swells (>10) generated from the North Pacific. Substrate, which naturally moves downstream, blocks the stream from flowing into the ocean. On the other hand, with consistent rainfall, there is a sufficient flow to prevent this build up and a continuous stream connection to the ocean is maintained. [...]

‘Īao and Honomanū Streams represent many other streams in Hawai‘i that have been diverted. Restricted stream flows have resulted in smaller estuaries and prevented *hīhīwai* from migrating to higher elevations. Unless the animals reach adequate freshwater stream habitats, they are unable to grow into healthy

reproducing populations. In Honomanū and 'Īao Streams, the diversion of over 90% of the stream flow results in intermittent stream conditions, which limit the average growth of *hīhīwai* to less than 10 mm. The recruitment of *hīhīwai* and other amphidromous species requires consistent stream flows. [Hau 2007:177, 180]

Mr. Hau's research on *hīhīwai* presents clear statistics that a certain level of stream flow is required to ensure healthy migration and population of this species and also of 'o'opu and 'ōpae. In a memo to the CWRM from the Division of Aquatic Resources (DAR), the same points were made regarding restoration efforts in East Maui Streams, some of the points mentioned below are in regard to stream diversion and native aquatic animals and entrainment of native animals in stream diversions:

- The removal of stream diversions and the complete restoration of stream flow would be the best possible condition for native aquatic animals. DAR understands that management of the resource is a balance between the needs of the animals and the needs of people thus supports some use of water from East Maui Streams.
- In no case are additional diversions of stream water recommended, although current levels of stream flow diversion may be appropriate on some streams. Flow restoration is only recommended on 8 of the 19 streams under consideration [Waikamoi, Puohokamoa, Haipua'ena, West Wailua Iki, East Wailua Iki, Kopiliula, Waiohue, and Hanawī].
- Co-mingling of stream and ditch flows should be avoided where at all possible to limit the potential spread of invasive aquatic species.
- As newly recruiting animals move upstream to adult habitats, they follow the available path of water in the stream. Thus release of water from sluice gates in the immediate vicinity of diversion intakes serves to funnel animals to the intake and results in high rates of entrainment (and ultimately death) of animals migrating upstream. Therefore, water releases should provide a pathway as far away as possible from the point of diversion to minimize entrainment of upstream migrating animals. [Nishimoto 2010:3-4]

We continued on our *huaka'i* and passed Pi'ina'au and Palauhulu Streams. Mr. Hau talked about a woman who lived near these streams that joined at the rear of her home, Auntie Sarah Ka'auamo. These two streams join above Waialohe Pond where Mr. Hau has done surveys collecting post larvae 'o'opu, 'ōpae, and *hīhīwai*. Another study Mr. Hau participated in again mentioned the negative effect of water diversion on native stream fauna:

There is contact pressure in Hawai'i to utilize freshwater resources for urban, resort, and agricultural purposes. This had resulted in increased concern for the future of the indigenous freshwater stream fauna... [...] The fishes and aquatic invertebrates have an amphidromous life cycle. [...] This life cycle requires streams which flow continuously. Thus, the endemic Hawaiian stream fauna is

particularly sensitive to any anthropogenic perturbations which disrupt stream flows for extended periods. [Way et. al 1998:54]

Mr. Hau mentioned that back in the 1920s and 30s, those who lived near the streams would catch *'ōhua*, which is the young stage of the *manini* (*Acanthurus triostegus*) (Figure 57). At this stage, the *'ōhua* has not yet gotten its stripes so easily identified when it matures to a *manini*. The *'ōhua* would be gathered well before sunrise, where they'd be prepared and put in the dry box and then "eaten like candy", as Mr. Hau described. *Hinana* (young *'o'opu* fish) would be prepared and eaten the same way. This information from old time residents of East Maui helped Mr. Hau in figuring out the pattern of population of those species and also the constant decline once the negative impacts of diverted water became more severe. The *kama 'āina* would see large populations of fish when they were kids but now in their older years, it is rare to find the same species in these streams. The stories of gathering fish and the availability of certain species give a glimpse into the health and decline of their stream habitat. *'Ōpae* were once caught in lower streams whereas today they are only caught in the mountain areas where water remains cool. Though the population still thrives, they have adapted in some way to inconsistent stream flow caused by water diversions.

Another negative impact brought up by Mr. Hau in regard to EMI's presence in East Maui is the abandonment of equipment and structures. Dilapidated structures and inoperable equipment are almost completely overgrown with vegetation and left at several diversion sites (Figure 58 and Figure 59). Some specific concerns presented by Mr. Hau require clarifications that he is unable to obtain from the CWRM. These concerns include:

1. Exactly how much water is being diverted and when will it be released to residents?
2. Of the water being diverted, what exactly will it be used for?
3. With the absence of sugar cane plantations, what is the reason for continued diversions?

There has also been some speculation that the continued diverted water will be used for cattle ranching. If this is true, Mr. Hau expresses concern that cattle ranching, similar to sugar cane cultivation, requires large amounts of water, land, and ample maintenance. He feels that the community is being excluded in any issue regarding the release of water or the use of diverted water and that families are still not receiving the appropriate amount of water to maintain their *lo'i*. Through his work as an Aquatic Biologist, Mr. Hau is an advocate for healthy stream ecosystems that rely on natural streamflow for the success of aquatic populations. Without the proper level of natural streamflow, native aquatic populations are at risk of decline.



Figure 50. 'Ōpae kala 'ole; opae kuahiwi (*Atyoida bisulcata*) in bucket (CSH 2018)



Figure 51. 'Ōpae oe ha 'a (*Macrobrachium grandimanus*); native prawn (CSH 2018)



Figure 52. 'O'opu nopili (*Sicyopterus stimpsoni*) (CSH 2018)



Figure 53. Hihīwai (*Neritina granosa*) from Honomanū Stream (CSH 2018)



Figure 54. Honopou Stream diversion by Ha'ikū Ditch (CSH 2018)



Figure 55. Control gate (Ha'ikū Ditch by Honopou Stream) (CSH 2018)



Figure 56. Skippy Hau at lower Honomanū Stream, *pohole* ferns line the left bank (CSH 2018)



Figure 57. Estuary photo of 'ōhua (*manini*) (*Acanthurus triostegus*) (Skippy Hau 2018)



Figure 58. Abandoned, dilapidated structure (Skippy Hau 2018)



Figure 59. Abandoned equipment (Skippy Hau 2018)



Figure 60. West Wailua Iki Stream, Skippy Hau with 'ōpae net (CSH 2018)



Figure 61. Dam across West Wailua Iki Stream (CSH 2018)



Figure 62. View of West Wailua Iki Stream waterfall from access road (CSH 2018)

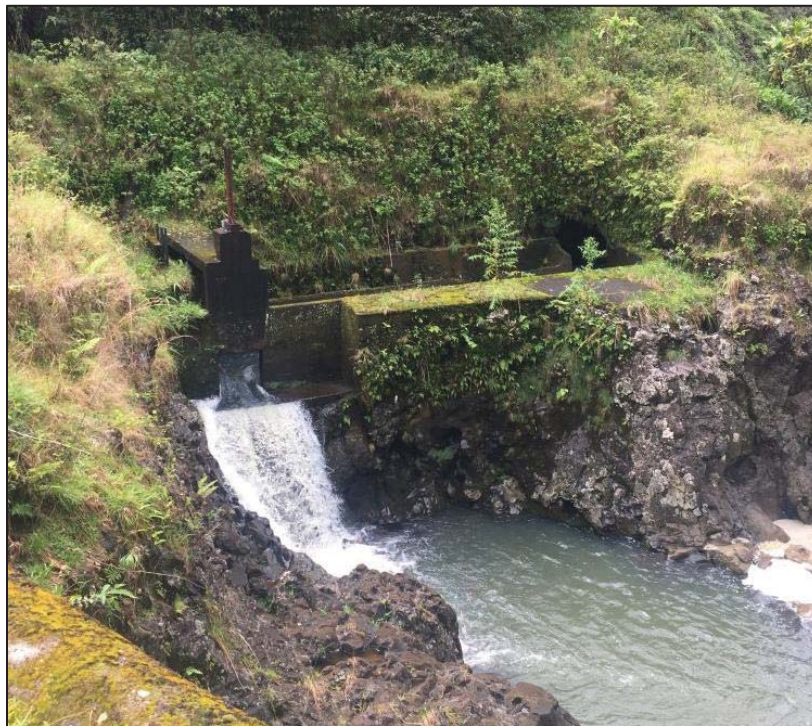


Figure 63. Control gate to release diverted water on West Wailua Iki Stream (CSH 2018)



Figure 64. Irrigation ditch, Waiohue Stream (CSH 2018)



Figure 65. Flume above Waiohue Stream (CSH 2018)



Figure 66. Waiohue control gate removed; intake blocked on other side (CSH 2018)



Figure 67. Lower Honomanū Stream (*makai* of Hāna Highway) (CSH 2018)

5.5.3 Interview Summary for Garrett Hew

On 26 June 2018, CSH met with Mr. Garret Hew, a retired EMI manager, at his home in Kula, Maui. Mr. Hew was born to Harry Hew and Nellie Shim in Pu'unēnē, Maui and later raised in Kula. His father was from Maui and his mother from Kōhala, on Hawai'i Island. Although they met on O'ahu, they eventually made Maui their home with their five children including Mr. Hew. Now on Maui, his dad became a farmer and grew Kula onions, tomatoes, and a variety of other crops. His grandmother and great-grandmother were also farmers making Mr. Hew a 4th generation farmer in his family.

Growing up on a farm meant alot of chores but also alot of memories. Mr. Hew and his siblings grew up with the motto, "If you wanna eat, you better work" and this carried on into his adult life. Mr. Hew explains that growing up, it was a hard life but very rewarding to be outside and learn how to farm and ranch. It has become a family tradition and even his grandchildren love participating in the chores of ranching. Today, Mr. Hew does both cattle ranching and farming.

After graduating from high school, Mr. Hew attended Pacific University in Forest Grove, Oregon. It took him some time to find his true interest. In 1978, Mr. Hew graduated from Oregon State University with a degree in Horticulture and some background in Business. Soon after graduating, he returned home and took over the family farm when his father retired. He continued to raise Kula onions, tomatoes, and other vegetables but was met with issues outside of his control such as weather and bug issues. After five years of trying his hand at farming, he decided to get a job and was hired at Hawaiian Commercial & Sugar Company (HC&S) in December of 1983 in the Irrigation Department.

Under HC&S, Mr. Hew had the title of Ditch Supervisor whose primary responsibility was regulating water. Two years later he was transferred to East Maui Irrigation Co. Ltd. (EMI) where he was put in charge of administrative functions. Mr. Hew can recall his start at EMI and how he had a brusque introduction of being out in the field. He recalls training being tough but it was obvious to his superiors that he could handle the outside elements and physical qualifications of the job. This included hiking several miles and doing tunnel inspections.

In one specific case, Mr. Hew remembers doing a tunnel inspection with two supervisors: Robert Pu'u and Steven Cabral. He recalls how they would clear the tunnel floors from fallen rocks:

We blow air into the tube and strap a piece of plywood on top. So what you do is, you jump on the plyboard and float down [the tunnel], and when you see rocks on the tunnel floor you stop and put it on the plyboard. And if you have plenty rocks, you turn the tire upside down where the plywood is under water [...] And you throw rocks in it and then you float them down.

These routine cleanings were done whenever there was 40 millions gallons of water or less flowing through the main Koolau/Wailoa ditch tunnels because any more would make it hard to stand up to perform maintenance work. Mr. Hew's determination and hard work during training really spotlighted his work ethic and he earned a lot of respect from his supervisors and co-workers. He learned a lot from them and from working in the ditch system.

While working for EMI, Mr. Hew also received his explosives license which allowed the clearing of rocks and roads. Today, machines are used to clear obstructions but in his day, things were cleared by using explosives. He maintained his position in Administration for EMI throughout his entire employment but when the opportunity presented itself for him to learn more in other positions and departments within the company, Mr. Hew learned as much as he could.

Mr. Hew was eventually promoted to Manager in 2000 and named President in 2005. He oversaw the entire operations of EMI until his retirement in 2017. Through his years with the company, he learned many things from past supervisors and members of the community. He learned that in the past, Ke'anae and Wailua were cultivated in rice. In the late 1800s, Chinese immigrants were brought to Hawai'i to work in the sugar plantations and intermarried with Native Hawaiians who resided in Ke'anae and Wailua. Eventually *lo'i* (irrigated terrace) were converted to rice paddies. These days, many of the paddies have returned back to *lo'i kalo* (taro patch). His old supervisor mentioned Maggie Alu who had a *poi* (made from cooked taro corms, pounded, and thinned with water) shop in Kūpau Valley but eventually when it became difficult to make a living off of *poi*, many people in the valley looked for work with the County and in other parts of Maui. It became routine for EMI to hire people who lived in East Maui, which allowed them the opportunity to support their family while still being relatively close to home.

Being a farmer himself, water diversion was a personal concern for Mr. Hew as well. One day while out in the field with Supervisor Robert Pu'u, he questioned how *lo'i* situated below diversions were still receiving water. He saw for himself that below each diversion and ditch system were springs that would feed into the taro patches. Even through the controversy of the water diversions, EMI offered assistance with clearing out *'auwai* (ditch, canal) but were rejected by the community. As a local, he understood the anger caused by the diversions but as a family man, he also understood the need of working to support and provide for your family. In his perspective, it wasn't that he was choosing to do harm to the families by diverting water but that he was simply fulfilling his position with EMI. He says "You just have to let it go in one ear and out the other. We just do our thing. If anyone like make humbug with you, just walk away."

Mr. Hew also mentioned how natural disasters, like heavy rain, landslides, and earthquakes have also interrupted the natural flow of water. He was told stories by locals of Hāna that an earthquake caused the Mokulehua Stream water to sink into the ground instead of flow down to the ocean. In another instance, heavy rains and big floods have washed away ponds, like Makapīpī, where he once took his kids swimming. Heavy rains caused a landslide that completely took out the pond adjacent to the Hana Highway and although a pond stands there today, it is now 200 feet below from where it originally was.

Mr. Hew explained how folks traveled to Hāna before the highway was built:

[...] they used to use the EMI ditch trail to access going to Hāna. So, you either catch the boat from Kahului, go all the way to Hana, which is real rough ride. Or you go horse and mule and you catch our ditch trail at Pāpa'a'ea and go up the road, come all the way across, and either come down Pi'ina'au Road or over across to Kopiliua Stream.

According to Mr. Hew, Jimmy Hueu, the former overseer in Ke'anae, explained that the Hāna Highway was built in sections. The section from Pāpa'a'ea to Pi'ina'au was built from 1923 to 1925. The next section, from Pi'ina'au to Kopiliula, was built between 1925 and 1927. Prior to construction of this road, the trails used to reach beyond Pāpa'a'ea were ditch access roads. There were no established trails or roads except for old hunting trails.

Regarding his knowledge of archaeological sites, Mr. Hew can recall a few in Honomanū, including a small Chinese graveyard and a few more along Pi'ina'au Road. He was told there was a ditchman who lived with his family in that area whose *kuleana* (responsibility) was to maintain the ditch and regulate the water. According to Mr. Hew, there were eight ditchman houses set up near sections of the ditch that needed routine maintenance. He is closely familiar with the ditchman homes nearest Pi'ina'au Road.

In regard to gathering practices, Mr. Hew explained that people would gather near the streams but drew closer to the ditches when water levels were extremely low, making it easy to catch 'ōpae (general name for shrimp). Mr. Hew would also take his children to gather 'ōpae. After gathering enough, they'd fry the 'ōpae and eat it with *poi*. *Hihīwai* was also a favored dish. Mr. Hew also caught Tahitian prawns (*Macrobrachium lar*) which have slowly become a threat to the native 'ōpae population. Regarding native stream life, Mr. Hew has taught his children and friends to gather only what you need and doing so maintains a healthy balance and ensures an ongoing supply of natural stream resources. Aside from stream life, Mr. Hew has also gone hunting. He was a member of the Kaupō Gun Club and would hunt around the South side of Maui. The east side of Maui was known for pig hunting and the Kaupō area for goats and axis deer. With the axis deer, Mr. Hew takes the meat and makes it *teriyaki* (marinade of soy sauce, mirin, and sugar) style. When he caught pig, he usually gave it away to his friends who make smoked sausage.

These days, Mr. Hew enjoys spending time with his family and in his yard growing fruits and vegetables. He has adopted a bartering system with friends where he'll trade harvested items for other food like *pastele* (a Puerto Rican dish made with grated green banana) and fish. He refuses to sell anything he harvests and any excess is given to friends or donated to the Maui Food Bank. Mr. Hew served on the Food Bank board for seven years and was the Vice Chair and Chair in the last several years.

When asked what was the coolest thing he experienced while employed with EMI, his reply was the construction and locations of the ditches. The EMI ditch system was an architectural feat that he believes could not be replicated today even with the use of modern technology. Mr. Hew made it clear that his time with EMI and HC&S was a blessing. He was able to provide for his family and learned many different things. He ultimately supports the decision of releasing water back into the streams but believes there still needs to be peace and understanding with the community and in situations where EMI would still need to utilize water, the community should be compliant



Figure 68. View of Maui from Mr. Hew's house



Figure 69. Picture of banana and tangerine trees on Mr. Hew's property



Figure 70. Picture of *kalo*



Figure 71. Mr. Garret Hew and his *kalo*

5.6 Commission on Water Resource Management (CWRM) Declarations

In 2001, the Native Hawaiian Legal Corporation (NHLC), on behalf of Nā Moku Aupuni o Ko'olau Hui, petitioned the Commission on Water Resource Management (CWRM) to amend the Interim Instream Flow Standards (IIFS) for 27 East Maui streams. Declarations provided as a part of that proceeding from the community were first filed in the same year to increase the IIFS and are in the public domain (see <http://files.hawaii.gov/dlnr/cwr/cch/cchma1301/CCHMA1301-20141230-NHLC-DE.pdf>). Below are declarations made by cultural practitioners, an expert witness, and Nā Moku Aupuni o Ko'olau, a community of taro farmers, fishermen, and hunters. As a courtesy, CSH attempted to contact each individual to obtain approval to include these declarations in the CIA. These declarations were submitted to CWRM before CWRM issued its Findings of Fact, Conclusions of Law, and Decision and Order on June 20, 2018, setting forth the approved IIFS.

5.6.1 Dan Clark

DECLARATION OF DAN CLARK

I, Dan Clark, declare that:

1. The statements below are based upon my personal knowledge.
2. I am a member of Nā Moku Aupuni O Ko'olau Hui.
3. My family has an interest in property in proximity to Piinaau Stream.
4. I am a taro farmer. My family grows kalo on 0.129 acres of property located in Ke'anae and irrigated by Piinaau and Palauhulu. I am farming this land based on my leases with various property owners on the Ke'anae peninsula.
5. I have been kalo farming in Ke'anae for 15 years.
6. The Wailuanui-Ke'anae ahupua'a comprise one of the most beautiful spots on the earth. Once my work is accomplished, I take time to enjoy the beauty of the natural landscape.
7. The fact that the fishing resource is in the process of being restored is a consolation to the hard work required to keep the ecosystem alive. When you can gather, the resource (food) will be there.
8. Currently, my family and I clean both our section of the ditch and above our area at Piinaau and Palauhulu in an effort to mālama the land and streams.
9. The lack of stream flow is a problem for me and my 'ohana because I need cool, fast running water to feed my lo'i for the best production of kalo. The low stream flow has caused a decrease in my kalo production and an increase in disease to my kalo.
10. If there was enough water in the streams, I would be able to harvest a much healthier kalo crop at Piinaau and Palauhulu. Additionally, it would restore the entire ecosystem, which would benefit everyone.

11. If stream flow was restored, my family and I would continue to clean Piinaau and Palauhulu, the streams that water our lo'i.

12. For me, recreation is enjoying the surroundings and gathering around a healthy ecosystem. If the water was to flow again, I would definitely enjoy seeing the Piinaau and Palauhulu areas restored and in good health again. There are songs and legends associated with the spots we go to. It is a spiritual feeling.

13. If water was returned, I would appreciate viewing the beauty of Ke'anae's restored natural ecosystem.

14. Please return the stream flows.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Keanae, Maui, Hawai'i, September [28], 2014.

[Dan Clark]

DAN CLARK

5.6.2 Jonah Jacintho

DECLARATION OF JONAH JACINTHO

I, Jonah Jacintho, declare that:

1. The statements below are based upon my personal knowledge.
2. I am Hawaiian.
3. My family has an interest in property near Honopou. We grow kalo on that property, which is about two acres. I have my own lo'i as do my aunt and sister.
4. I am farming this land based on my family history and the practices passed down to me.
5. I learned how to farm taro from Aunty Beatrice Kepani Kekahuna and Lurlyn Scott.
6. Traditionally, my 'ohana gathered pohole, fish for enenu, 'o'opu, watercress, hihiwai, prawns, banana, limu, bamboo, and ulu in and around Honopou.
7. Traditionally, my 'ohana fished for moi, enenu, aholehole, 'opihi, kumu, tako or he'e, moanakali, kole, ulua, honu, mullet, omilu, pāpio, uhu, paanau, menpachi, and aweoweo in or near the mouth of Honopou.
8. My 'ohana also engaged in mālama 'āina and mālama kahawai at Honopou by cleaning the 'auwai to our family lo'i, pruning, and cleaning the buildup on the stones in the ponds. My family also fished and planted according to moon phases.
9. My mother, Juliana Jacintho, was baptized in Honopou.
10. I currently gather kalo, pohole, fruit, 'ulu, and watercress in and around Honopou.
11. I fish for enenu, ulua, uhu, 'opihi, haukiuki, poopaa, omilu, aholehole, lae, aweoweo, paananui in or near the mouth of Honopou.
12. I gather and fish to feed my family and myself.
13. My family engages in mālama 'āina and mālama kahawai by fishing and gathering by moon phases. We also clean Honopou for good consistent flow, which keeps the water cooler for planting.
14. I also swim, relax, and get together with my family along Honopou. I learned to swim there.
15. I appreciate the natural beauty of Honopou. I like listening to the stream flow as well as smelling the flowers and fresh flowing water. I love hearing the birds singing and the sound of the wind blowing through the trees. I enjoy the feeling of following what my grandfather did with kalo fanning. I feel him with me.

16. The lack of stream flow is a problem because we cannot fish as much. We have to take only a small amount of fish, and much time is needed before the fish replenish. We have lost large amounts of ocean fish due to wanner waters and the fact that less nutrients get into ocean from the land.

17. If there was enough water in the streams, I would farm more kalo because the flow would be sufficient. I would fish more too, because the water would bring back the abundance of fish.

18. More water would also help meet our needs for home use and gardening.

19. If there was more water in the streams, I would fish for ulua, omilu, pāpio, moi, aholehole, uhu, paananu, enenu, he'e, and aweoweo in Honopou.

20. If water was put back in the streams, I would clean Honopou for kalo farming.

21. If water was restored, the streams would flow faster and at cooler temperatures that are ideal for growing taro.

22. More water in the streams would bring back fish, 'o'opu, prawns, and 'ōpae, which my family members rely on. Old ways of life would be more feasible.

23. If there was more water in the streams, I would continue swimming, family picnics, and prawning at Honopou.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Honopou, Maui, Hawai'i, December 13, 2014.

[Jonah Jacintho]

JONAH JACINTHO

5.6.3 Lezley Jacintho

DECLARATION OF LEZLEY JACINTHO

I, Lezley Jacintho, declare that:

1. The statements below are based upon my personal knowledge.
2. I am Hawaiian.
3. I am a taro farmer. I have been growing kalo in Honopou for about six years now on approximately two acres of land.
4. I am farming this land based on my family history and talking with kupuna about practices their parents had done to farm lo'i long before we did.
5. I learned how to farm taro from Beatrice Kepani Kekahuna and Lurlyn Scott.
6. My 'ohana has lived in Honopou for many generations.
7. Traditionally, my 'ohana gathered 'ulu, kalo, uala, moi, aholehole, banana, 'o'opu, pūpū, kala, hau, native crayfish, hihiwai, 'opihi, limu, pohole, mango, 'awapuhi, tī leaf, lū'au, guava, watercress, oranges, and medicinal plants in and around Honopou.
8. Traditionally, my 'ohana fished for aholehole, honu, moi, mullet, poopaa, puhi, ulua, lobster, pāpio, 'ō'io, lae, uhu, menpachi, kole, black crab, haukiuki, kupipi, and opihi in or near the mouth of Honopou, Punalau/Kolea, Honomanu, Hanawi, and Makapipi. They also gathered limu in those areas.
9. My 'ohana also engaged in mālama 'āina and mālama kahawai. They were aware of spawning times, they cleaned the 'auwai, gathered only what was needed, gathered and fished with the moon cycle, rebuilt walls, and cleaned Honopou.
10. Currently, my 'ohana and I gather pohole, banana, avocados, 'ulu, mango, orange, puakenikeni, and lū'au in and around Honopou and Honomanu. We also pull kalo if it is not rotten.
11. My family and I fish for pāpio, enenu, moi, prawns, lobster, haukiuki, 'opihi, and kupipi in or near the mouth of Honopou and Honomanu.
12. I gather and fish to feed my family, teach my kids to feed themselves, and live as our grandparents did.
13. My family engages in mālama 'āina and mālama kahawai by cleaning Honopou and nearby ponds, planting kalo, cleaning, and working together to grow food.
14. We also swim in the ponds, teach our kids how to swim, catch prawns, fish, and play games in and around Honopou.

15. I appreciate the natural beauty of Honopou, including the birds and dragon flies. I love the smells of 'awapuhi and other flowers. I enjoy looking around, taking in the beauty and the greenery, and hearing rushing water while sitting on Lynn's deck next to the pond.

16. Water is used to irrigate my lo'i as well as other lo'i. The level of water barely can feed those lo'i. More water is needed as we continue to open more lo'i. Around these lo'i the water also feeds homes that have been established from generations.

17. The lack of stream flow affects our taro. We have lost taro due to root rot and other diseases.

18. Because the streamflow connects to the ocean, improper flow restricts spawning of different species of fish. Thus, the lack of stream flow affects our gathering rights as Hawaiians to feed our 'ohana as was once possible. Native species like 'o'opu cannot travel back up stream due to lack of water, which compromises their reproduction. Our families who live in this area cannot gather enough resources from the ocean and streams because there is not enough fish, hihiwai, 'ōpae, and 'o'opu. The low stream flow has also caused people to move away to provide better for their family.

19. Additionally, swimming in the ponds is what we all enjoy and should continue to be enjoyed, not compromised by improper flow which can cause stagnate water, bringing leptospirosis and other bacteria.

20. If there was enough water in the streams, I go back to traditional gathering practices, being more self-sustainable as a valley. Everything in Honopou would be in abundance.

21. If there were more water in the streams, I would fish for what was traditionally fished for in Honopou. Aholehole would come back as well as other species like moi, nohu, and menpachi.

22. If water were put back in the streams, I would mālama the streams the same way as my kupuna did. We would open more lo'i and continue to monitor fishing practices in and around Honopou.

23. If there was more water in the streams, I would make even more use of the ponds, teach our kids to fish and gather to make traditional tools and implements. I would also appreciate the beauty of the strong flow of water, the additional greenery at Honopou because everything would flourish.

24. Spiritually, we are connected to the water. Water is life. Without water we will not be.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Honopou, Maui, Hawai'i, December 13, 2014.

[Lezley Jacintho]

LEZLEY JACINTHO

5.6.4 Kauai L. Kanakaole

DECLARATION OF KAUI L. KANAKAOLE

I, Kauai L. Kanakaole, declare that:

1. The statements below are based on my personal knowledge and upon research that I have conducted.
2. I reside at 4195 Hana Highway, Hana, Hawaii 96713. I was born in Hilo on Hawaii Island, but moved with my family to Hana, Maui at age 4 and grew up in Hana until graduating from Hana High School.
3. Attached to my declaration as Exhibit "1" is a true and accurate copy of my resume.
4. I received my Bachelors of Arts in English and my Teaching Certificate in Secondary Education from University of Hawaii at Hilo. I started my professional career in teaching at Hilo High School then moved on to Ke Ana Laahana Pubic Charter School before returning home to my alma mater at Hana High and Elementary School. All of my teaching experiences have put me in the middle of high Native Hawaiian populations, from Keaukaha to Hana, public education was an important vehicle for me to reach the native "underprivileged" community and give back what I had gained from my own upbringing in these types of communities.
5. I served as Department Head at Hana High School, trying to rally the school population around reading and raising our students' reading test scores, which came to fruition in 2011 when we scored the highest in Maui County.
6. My hula career started as an 8 year old child in Hana with Namahana Kalama-Panui, learning about the stories and songs of the place I grew up in. Hula had me hiking through the mountains gathering kinolau (body forms of the gods) of the gods we danced about and this practice became my first introduction to the water diversions of East Maui.
7. We were curious about the flumes, waterways, and water pumps that cut through our sacred forest so our kumu and aunties told us about the sugar plantations on the other

- side of the island needing water and even as a young child I remember feeling angry and confused.
8. My hula career continued on in Hilo with renowned Halau o Kekuhi, which is also my family's halau on my father's side.
 9. Hula comes from Edith Kanakaole, my father's mother, and was passed down matrilineal and continues in that vein today.
 10. I was a dancer in the PBS broadcast of "Great Performances: Holo Mai Pele" (2000), went on tour for the hula drama "Kamehameha: Na Hoailona" (1999) and "Hanau Ka Moku" (2002).
 11. Being an olapa dancer in Halau o Kekuhi has afforded me many cultural learning experiences and opportunities however the added responsibility of being of familial descent from this hula lineage gave this experience deeper meaning.
 12. Hula has taught me about the many facets of our culture, from menial work to ritualistic prayer, from the bloom of a leaf-bud to the cycle of water in the forest, from obeying the request of an older sibling to embracing the transformation into your god-self.
 13. Hula has given me an education that cannot be translated into any degree at a university, and my family has solidified those teachings and anchored me spiritually and it is this inherited DNA that I pass on to my two children.
 14. In 2007, I participated in Halau o Kekuhi's Aha Ailolo Puaalohelohe, which is a rigorous rite of passage from olapa to kumu, and I was granted the right to teach the traditions of hula Aihaa and hula Pele that have been taught to me.
 15. In 2009 I started my own hula halau and continue today with children and adult classes for Halau o Nakaulakuhikuhi.
 16. I am a member of the Edith Kanakaole Foundation, which was started in 1990 by my father and his siblings in order to maintain and perpetuate the teachings, beliefs, practices, philosophies and traditions of their parents, the late Luka and Edith Kanakaole.

17. I am currently contracted by Ala Kukui Retreat Center to conduct research on water in East Maui looking at it from a cultural perspective.
18. My research is entitled “Ke Ala Huli i Waihanau” and I use Papaku Makawalu to understand the cycles and significances of water in the Koolau, Hana, Kipahulu and Kaupo districts of Maui.
19. My ties to East Maui are from my mother’s side, whose great grandmother, Kahele was a native of Kipahulu and married a Japanese stow-away immigrant by the name of Ishii.
20. My mother remembers her grandmother telling her stories of watching her mother Kahele down at the muliwai (estuary) feed the shark at Maulili. She was of pure Hawaiian descent and although not much was said about Kahele, this little piece of information has been passed down. From this we know that the shark is an aumakua (family deity) of our family and because of that we honor these ocean beings through chant and dance and have an affinity for the muliwai there at Maulili and the flow of fresh water from mauka to makai.
21. These combinatorial experiences, influences, lineages have given me the intimate connection and cultural prowess to understand this land that I live on and the natural cycles it goes through and especially our human role in those natural cycles.
22. East Maui, which is comprised of the four moku (land district) of Koolau, Hana, Kipahulu and Kaupo, is historically significant and is extolled in the chants and stories for time immemorial. In the epic saga of Pele and Hiiaka, when Hiiaka journeys up the island chain from Hawaii to fetch her older sister’s lover on Kauai she lands first at Kauiki in Hana and chants about the majestic Kauiki hill, the outcrop of Mokuhano in the sea and the fresh water spring of Punahoa that brings life to the area.
23. Through stories we know that the gods Kane and Kanaloa have traversed the region thrusting their staff into the ground at various places and fresh water bubbled up. People of the area worshipped these gods because of the abundance of water as in the

story of Kalemakuakaimano who was a man who lived in the Pauwalu area where the watercress patches are today.

24. When he lived there, there was no spring, just the water from the river that would flow when there was a lot of rain, however because he constantly importuned Kane and Kanaloa as his gods, grew and ate the kinolau of these gods, they visited him one day. At that visit he prepared a feast and chewed the awa for his gods and served them. In return Kane and Kanaloa thrust their staff and springs erupted out of the ground with a loud rumble that continued so one of the springs was closed up and the one that was flowing quietly was left.
25. There are countless stories and chants that communicate the importance of water in this East Maui region. It is this abundance that made and continues to make this particular land waiwai (valuable) to its inhabitants.
26. This high value was not taken for granted or misused at any cost but met with severe punishment if ever abused, punishment of death. There are a few stories about misuse or greed of the water resource in this area that were met with the death penalty because without water there would be significant repercussions. Found in the Hawaiian language newspaper Ka Nupepa Kuokoa was a story about "Na Akua" Kane and Kanaloa.

Ka Moolelo o Na Akua

... na laua ka wai o Kou ma Kaupo, na laua i hoomake kahuna oia o Koino ma Kikoo i Kipahulu, a na laua i hoomake ka moopuna a Waianu ma no ka hoohaumia i ka wai, a na laua i wahi i ka pohaku a puai mai ka wai.

The Story of The Gods

... the water of Kou at Kaupo belongs to them (Kane and Kanaloa), they were the ones who killed the priest Koino who was from Kikoo at Kipahulu, and they were also the ones who killed the grandchild of Waianu folks because of his defiling of the water there, and it was the gods who split the rock and water bubbled forth.

27. Tampering with a natural resource to the point where it prohibited the untainted continuance of the natural cycle was met with strict consequences and this was a pervasive understanding. It's an innate thought process for native people to think

this way, which is why as a little girl I was angry and confused about the water diversions in the forest even without any preconceived notions of the sugar industry's effect on Hawaii.

28. It's fundamental to the psyche of the native Hawaiian that we understand the cycles of our natural world and find our fit, as humans, in it all. My Hawaiian ancestors categorized their world into a system of knowledge known as Papaku Makawalu, whose origin can be found in the Kumulipo (Hawaiian Creation chant).
29. Papaku Makawalu is a Hawai'i ontological knowledge system that assigns the Hawaiian universe to three Papa or houses of knowledge. The first of the three is Papahulihonua, which includes all of the earthly elements such as the ocean, volcanic processes, and the water cycle. Kane (and Kanaloa for that matter) is a vital component of Papahulihonua in his occupation as water, Kane is the entity in and of Papahulihonua that mingles continuously with elements of Papahulilani (the second Papa).
30. Papahulilani is the atmospheric elements including the sun, weather, stars, planets, heavenly strata, and seasonality.
31. The third Papa is Papahanaumoku. This papa is comprised of the living components with the biological intelligence of procreation. Those who belong to the house of Papahanaumoku are the direct beneficiaries of Kane. These individuals include everything from plants, to birds, to coral, to fish, to mea kolo (creepers), and kanaka (man). The house of Papahanaumoku also includes the activities that kanaka engage in, including things like hula and caring for land. Kanaka functions including consciousness and inner conscious are also in the house of Papahanaumoku.
32. Water is one of the few elements that easily traverse all three Papa. It is the nature of the water cycle that make it a part of Papahulihonua when it is on the earth in the form of streams, springs, aquifers or even a puddle. Kane and

Kanaloa preside over these waters as in the chant “Ka Wai a Kane”:

E ui aku ana au ia oe,
 One question I put to you,
Aia i hea ka wai a Kane?
 Where is the water of Kane?
Aia i ke kuahiwi, i ke kualono,
 Yonder on mountain peak, on the ridges steep
Ike awawa, i ke kahawai;
 In the valleys deep, where the rivers sweep
Aia i laila ka wai a Kane.
 There is the water of Kane.

33. Then Laka presides over the evaporation/transpiration process, it gets taken up into the atmosphere, which is the realm of Papahulilani and falls to earth in the form of rain, mist, or snow.

34. The role of Laka is illustrated in this chant:

A ke kuahiwi, i ke kualono
 From the mountain tops, to the highland ridges
Ku ana o Laka i ka mauna
 Laka presides over the forest
Noho ana o Laka i ke po 'o o ka ohu
 Laka is at the pinnacle of the gathering of the mist
O Laka kumu hula
 Laka the source of movement

35. As water accumulates it is the beneficiary of Papahanaumoku that ingest and rely on this element for life. The kanaka (man), the plants and animals, crawlers and winged creatures are the ones who are either made up of water and/or rely on it for survival.
36. Papaku Makawalu gives us a framework to understand the movement of water throughout the different papa (foundations) and this framework can be applied to our own localities to understand peculiarities about the cycles we experience everyday. In looking at the moku of Koolau for example, the water cycle there is a microcosm for what is happening in other moku in East Maui, Maui, Hawaii and the world.
37. Starting with Oopuola stream and continuing on to the end of the Koolau moku at Makapipi stream, each water source was given a name by our ancestors. These names tell us information about that particular source, which we can use to better

acquaint ourselves with the land, elemental sources and cycles that occurred.

38. Kaaiea stream, for example, was named for the Aiea tree that grew abundantly in the area. The species of this endemic Hawaiian genus *Nothocestrum* consisted of soft-wooded shrubs and trees with oblong leaves, yellowish flowers and white/red berries, which grew from 1500-5000 feet elevation. The aiea tree acted as a causative in the water cycle and it helped to accumulate water in the forest.
39. Ohia stream and spring was named such not for the ohia tree; ohia also means “tabooed, as food patches during famine”. A native of the area, Henry Kahaleulaokekua Kamali, who has long passed, was born in 1886 at Pauwalu close to Ohia stream and grew up in the area. In his 1970 interview with Clinton Kanahale, which was conducted in Hawaiian and later translated and transcribed he described the water as such:

“Ohia, That is the waters of Kanaloa and Kane. The water gushes forth from inside from a spring. Yes, that is healing water for coughs and all kinds of sicknesses. There the sick were taken. When you have your illness you go into there to bathe. Healed.”
40. The native people in the area understood that this water was special, sacred, kapu (taboo) and only to be used in unique circumstances.
41. A wind of the Wailua area is named Kialeale, meaning stirring, moving, undulating, and rippling with force. This wind is also characteristic of the land because the water sources of Koolau moku (district) are powerful, full of energy and maintain a strong presence over the other elemental forces of nature.
42. The Kialeale wind occupies Papahulilani and is a manifestation of the god Lono and through its stirring force, clouds accumulate in the uplands and that is when the god Kane releases the rains that penetrate the earth and amass in the kuahiwi (hill) and kualono (mountain ridge), in the awawa (valley) of Honomanu, Waiohue, Wailua, and Makaiwa.
43. It is in this realm of Papahuihonua that we kanaka (man) have most intimate dealings with this water. It is the kanaka (man) of Koolau who give praise to the god Lono who initiated the Kialeale wind that brought this precious resource to the

earth where he is able to utilize its gifts, while still allowing the cycle to continue. It would be requisite of the kanaka to deny this resource its due diligence.

44. Kialeale is of Koolau moku only, it serves this area and it would be wrong to take the product (water) of its service elsewhere because that creates a void, a break in the cycle that is distinctly Koolau.
45. The unique natural cycles that occur in each locality belong to that particular place, the mana (spiritual power) that is created as a result of these cycles belongs to that particular place and the displacement or gross manipulation of that element whether it be water, earth, lava, wind or sun is counter to everything that the kanaka Hawaii believe. And this is illustrated for us in the simple act of naming everything in their world.
46. The wind in Koolau moku is not known as just "Wind" but "Stirring, Moving, Undulating Wind".
47. The spring in Pauwalu is not named "Spring" but "Tabooed, as a food garden during famine Spring".
48. There is a reciprocity of energy that occurs between element and kanaka and it is imperative that these relationships are nurtured and continued so that the our island world lives and prospers.

The people of Koolau were not just called "Wailua-ans" or "Keanae-ans" but "Koolau Hauwalaau". It is a poetic saying, which means "Koolau of the Loud Voices" because inhabitants of the area were said to be loud of voice. And it is this hauwalaau that must be heeded, that must be reckoned with, that must be regarded because they are the mouthpiece of the land of which they occupy.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Hana, Maui, Hawai'i, [December 17th], 2014.

[Kaui L. Kanakaole]

KAUI L. KANAKAOLE

5.6.5 Pualani Kimokeo

DECLARATION OF PUALANI KIMOKEO

I, Pualani Kimokeo, declare that:

1. The statements below are based upon my personal knowledge.
2. I am Hawaiian.
3. I am a member of Nā Moku Aupuni o Ko'olau Hui.
4. My father Henry Ben Kaauamo was from Wahinepee. My mother Sarah Ahkuna Hueu was from Ke'anae.
5. I grew up in Wailua/Ke'anae.
6. When I was growing up, my mother had different leases from the state. She had about fifty patches. My mother worked the patches until I was in high school. She continued farming most of them until the 90s and stopped when she was 70 years old. My father worked as a taro farmer until he was 80-something. He refused to give up. My dad was also a garbage collector for the County. He also did a lot of hunting for pigs in these mountains as well.
7. I too am a taro farmer. I grow kalo on about one acre of property in Keanae that is irrigated by Palauhulu and another water source that may be connected to Piinaau.
8. I have an interest in the land I farm based on my connection to Kalilimoku, on my mother's side.
9. Before times, the fathers worked the taro patches. Mothers fought to get stream flow and worked on the traditional gathering.
10. I learned traditional and customary gathering practices from my grandmother Ellen. She and my mother taught us about what to look for, how to know when big water is coming, how to respect the seasons. We would pull kalo, pick 'opihi, and gather 'ōpae all in the same day.
11. Traditionally, my 'ohana gathered 'ōpae, watercress, lū'au, haha, pepeiao, hihiwai, pupulo'i and guava in Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaka, Kapaula, Hanawi, Makapipi, and Waiohue.
12. Traditionally, my 'ohana fished for 'o'opu, aholehole, uau, and pāpio in or near the mouths of Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaka, Kapaula, Hanawi, Makapipi, and Waiohue.
13. My 'ohana also engaged in mālama 'āina and mālama kahawai at Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East

Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue by respecting the seasons. They didn't have problems that required the same kind of cleaning because there was more flow.

14. Currently, my 'ohana and I gather 'ōpae, and limu in or near the mouths of Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue. I also gather 'opihi in those same areas.

15. I farm, gather, and fish to feed my family.

16. I taught my kids what I know about farming, gathering, and fishing. My kids also started hunting when they were three. They learned from Doug Chong. They are now teaching their own children our practices.

17. I engage in mālama 'āina and mālama kahawai by cleaning the ditches with a sickle. That allows better flow to my lo'i, which are the last lo'i to get fed by the streams.

18. We also enjoy Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue recreationally.

19. I thank Ke Akua for everything before our eyes, everything he gives us. My mom was a strong woman. I learned a lot from her. I love that she tried to teach us. I try to instill all of that into our children. To me, Ke'anae will always be what I envision from when my mom instilled these lessons in me. To me, that's the biggest gift from Ke Akua.

20. The lack of stream flow is a problem for my family because we cannot grow kalo how we would like to. The taro gets diseased and damage. We get pocket rot and what we call "guava seed," or growths on the taro that affects the quality. We have apple snails, which like the warm water. Also, farmers in Ke'anae have to compete for water. It's not like before – we used to share and it wasn't a problem.

21. If there was more water in the stream, I would worry less about my kalo. I would expect more cool water to reach my lo'i.

22. If there were more water in the streams, my 'ohana would gather 'ōpae, limu, and opihi in or near the mouths of Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue. I also gather 'opihi in those same areas.

23. If water were put back in the streams, I would continue to mālama the streams and cleaning the ditches.

24. If there was more water in the streams, I would appreciate the natural scenery. It would be nice to see the streams of Ke'anae the way I knew them when I learned how to farm and gather from my mother.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Keanae, Maui, Hawai'i, [11/01/2014], 2014.

[Pualani Kimokeo]

PUALANI KIMOKEO

5.6.6 Davianna McGregor, PhD

**Note, only Exhibit "A" is included in this report.*

DECLARATION OF DAVIANNA MCGREGOR, PhD

1. I am submitting this expert testimony in support of the petitions filed by Na Moku Aupuni O Ko'olau Hui to amend interim instream flow standards for various East Maui streams located on the Ko'olaupoko, Maui coastline.
2. Attached as Exhibit "A" is a true and correct copy of PETITIONERS' DIRECT EXPERT TESTIMONY OF DAVIANNA POMAIKAI MCGREGOR, Ph.D, filed in the contested case hearing docket DLNR File No. 01-05-MA. [
3. Exhibit A is testimony I prepared for and presented to the Board of Land and Natural Resources in 2005 in the contested case proceeding involving Na Moku Aupuni O Ko'olau Hui's challenge to the request of Alexander and Baldwin/Hawaiian Commercial and Sugar/East Maui Irrigation Company for a 30-year lease of the four East Maui water license areas.
4. Attached as Exhibit "B" is a true and correct copy of my most current curriculum vitae.
5. I recognize that in 2008 the CWRM voted to partially restore 5 of 8 streams then under consideration by amending the IIFS for Wailuanui, Waiokamilo, Pi'ina'au, Hanehoi, and Honopou Streams, in order to respond to the claims of active taro farmers depending on those streams for the irrigation of taro crops in Wailuanui, Ke'anae, Hanehoi, and Honopou valleys.
6. However, I further understand that EMI's compliance with those amended IIFS continues to be an outstanding issue before the CWRM in this contested case hearing.
7. Accordingly, I affirm that the substance of the testimony I presented to the BLNR in 2005 is still applicable and material to the current IIFS contested case hearing before the CWRM and I now offer it for consideration in this proceeding.

8. I have reviewed the Declarations of Na Moku Members submitted in 2001 in support of the stream flow petitions, attached as Exhibit "C" hereto that were provided to me by the Native Hawaiian Legal Corporation.
9. I have reviewed the Declarations contained in Exhibit "D" which were provided to me by the Native Hawaiian Legal Corporation and submitted in 2010 during the CWRM's 90-Day factfinding process.
10. I have reviewed the Witness Statements for CCH-MA-13-01 of Emily Akiona Wendt, Aja Akuna, Terrance D.K. Akuna, Darrell Aquino, Charles Barclay, Leonora (Smith) Barclay, Danny Carmichael, Healoha Carmichael, Dan Clark, Harry Hueu, Sandy Hueu, Jonah Jacintha, Juliana Jacintha, Lezley Jacintha, Kames F. "Kimo" Kaaa, Gladys Kanoa, Sanford Kekahuna, Jerome K. Kekiwi, Jr., Pualani Kimokeo, Norman "Bush" Martin, Jr., Lurlyn "Lyn" Scott, Edward Wendt, and Joseph "Jojo" Young.
11. Based on my prior research, it is my opinion that the 2001 Statements, the 2009 submissions, and the 2014 Witness Statements referenced above, describing the areas of use for traditional and customary practices of gathering in streams ranging from Makapipi to Honomanu are consistent with my prior research as presented in the Ke'anae-Wailuanui Cultural Landscape study of July 1995. The statements are also consistent with my prior testimony provided in Exhibit A, in which I reported that community members from the Keanae-Wailuanui region engage in traditional and customary gathering activities throughout the traditional practices region (Makapipi to Honomanu) including in unoccupied areas in order to maintain the resources.

DATED: Honolulu, HI, December 23, 2014.

[Davianna P. McGregor]

Davianna Pomaikai McGregor, Ph.D

EXHIBIT A

PETITIONERS' DIRECT EXPERT TESTIMONY OF
DAVIANNA POMAIKAI MCGREGOR, Ph.D.

Q. Please state your name for the record.

A. DAVIANNA POMAIKAI MCGREGOR.

Q. Where do you live?

A. I live in Kaiwiula, Kapalma, O'ahu and Ho'olehua, Moloka'i.

Q. Where do you work and what is your title?

A. I am a Professor of Ethnic Studies at the University of Hawaii, Manoa.

Q. What is your educational background and training?

A. I graduated from the University of Hawaii with a Bachelor of Education degree in Secondary Education in 1972 and a Bachelor of Arts degree in Asian/Pacific History in 1973. I did my graduate work at the UH, where I obtained a Master of Arts degree in Pacific Islands Studies in 1979. I also earned a PhD in Hawaiian and Pacific History from the University of Hawai'i in 1989.

Q. What was your doctoral dissertation topic?

A. The title of my doctoral dissertation is "Kupa'a I Ka 'Aina: Persistence On The Land." It examines the conditions of Hawaiians from 1898 to 1930, the first 32 years of direct U.S. rule over Hawai'i. It compared the conditions of Hawaiians in urban O'ahu with that of Hawaiians in rural Hawaiian communities on the island of Moloka'i, the moku of Hana, Maui and the ahupua'a of Waipi'o, Hawai'i.

Q. Did you prepare a *curriculum vitae* to reflect your education and training?

A. As part of my testimony, I have submitted my *curriculum vitae* which contains information on my academic training, my teaching, my research, and my publications.

Q. Have you previously been qualified to testify as an expert witness?

A. I have served as an expert witness regarding traditional Hawaiian subsistence, cultural, and religious customs and practices in the following Civil Cases: *Kelly v. 1250 Oceanside Partners*, Civ. No. 00-1-0192K (Haw. 3rd Cir.); *Office of Hawaiian Affairs, et al vs. Housing and Community Development Corporation of Hawaii, et al*, Civil No. 94-4207-11 SSM, 1994 - 2001; *Kamaka v. Department of Defense*; *Pele Defense Fund v. Paty*, Civ. No. 89-089 (Haw. 3rd Cir.); *Pele Defense Fund v. Campbell Estate*, Civ. No. 89-089 (Haw. 3rd Cir.); and *Hanakeawe v. Nansay Hawaii, Inc.*, Civ. No. 90-316 (Haw. 3rd Cir.). I have also testified as a cultural expert in the following criminal trespass cases. *State of Hawai'i v. Spalding* (Haw. 3rd Cir.); *State of Hawai'i v. Naeole* (Haw. 3rd Cir.); *State of Hawai'i v. Kaleo Patterson* (Haw. 3rd Cir.); *State of Hawai'i v. Keli 'ikoa* (Haw. 3rd Cir.).

Q. Have you ever been qualified before administrative bodies to testify as an expert?

A. I appeared as an expert before the State of Hawai'i Water Commission in the Waiahole Water Case, Docket No. CCH-0A95-1, and *In re Waiola O Molokai*, Docket No. CCH-MO96-1; before the Public Utilities Commission in Docket # 7259 Relating to Hawaiian Electric Light Company, Regarding Integrated Resource Planning, 1993; and before the Public Utilities Commission in Docket # 6617 To Require Energy Utilities in Hawai'i to Implement Integrated Resource Planning, 1990.

Q. Have you had the opportunity to study the nature and extent of cultural, religious, and subsistence activity in which the Native Hawaiians have engaged to support themselves?

A. Yes. I first studied rural Hawaiian communities where Native Hawaiians comprised the majority of the population and continued to support their extended 'ohana through traditional Hawaiian subsistence farming, fishing, hunting, and gathering customs and practices when I wrote my PhD dissertation. Subsequently, I conducted a number of studies of the traditional and customary practices of Native Hawaiians, which mirror long-held cultural practices of ancient Hawaiians in several rural communities throughout the state. While all have unique features associated with those communities, these traditions and

customs I've recorded are resilient and persistent. In many instances, the continuation of these cultural practices is financially necessary for many families. These studies have taken me to East Maui, where I conducted extensive and expanded research, as well as Moloka'i and the Island of Hawai'i.

Q. What prompted your expanded research for East Maui?

A. In June 1993, the Hawai'i State Legislature approved what later became Act 156 to implement a preexisting statutory mandate requiring planning for the state's physical environment and for socio-cultural enhancement, which recognizes the significance of the state's "cultural landscapes." Accordingly, it established a task force to examine Hawaiian cultural landscapes. This task force was responsible for developing designation criteria, specifying activities and uses consistent with cultural landscape districts, developing procedures for definition of cultural landscape districts and their boundaries, and reporting their findings to the legislature.

Q. What happened as a result of this effort?

A. In January 1994, the DLNR Cultural Landscape Task Force reported back to the Legislature on the importance of landscape preservation within a vital daily living context. The Task Force defined cultural landscapes as geographic areas, which exhibit monolithic characteristics of an ethnic, economic or cultural nature. They reflect the interaction of cultural, economic, and natural forces on the environment. They are a definable area, which clearly defines the settlement or use of the land, water, and/or living systems (plants and animals) over a long period of time, as well as cultural values, norms, and attitudes toward the land, water and/or living systems. These geographic areas possess a significant concentration, linkage or continuity of landscape components (i.e., vegetation, buildings and structures, archaeological sites, roads and trails, waterways, religious and natural features and resources), which are united by human use and past events and/or aesthetically by plans or physical development. Typically, these landscapes could involve abandoned villages or agricultural systems, taro-producing areas, sugar lands, ranches, fishing areas, traditional gathering areas, and entire islands.

Q. What were the recommendations of the Task Force?

A. The Task Force supported a model project focusing on the Ke'anae-Wailuanui area on Maui, because it recognized that this community is a taro-growing area with long continuity of use and with local support for preservation.

Q. What was the purpose of this model project?

A. The project involved a cultural landscape study to inventory and assess the resources of the Ke'anae-Wailuanui communities. The Maui County General Plan of 1990, on which the Hana Community Plan is based, has themes, one of which under "land use" is:

To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in accordance with the individual character of the various communities and regions of the County.

Maui County adopted the Hana Community Plan as part of its adoption of County General Plan in July 1994, under Section 2.80.050 of the Maui County Code. To implement the Hana Community Plan, the Maui County Planning Department initiated the resulting Ke'anae-Wailuanui Cultural Landscape study. The Hana Community Plan calls for county government to "compile special plans and studies necessary to implement the recommendations of the Community Plan." It also establishes the following goals, policies and implementing actions:

Land Use: Preservation and enhancement of the current land use patterns which establish and enrich the Hāna Community Plan region's unique and diverse qualities.

- Identify and inventory exceptional open space resources and viewsheds. Explore protective management measures such as covenants, easements, and other planning tools.
- Explore alternative land use and overlay zoning designations that recognize and preserve the unique natural and cultural characteristics of each community within the Hana region.
- Encourage the availability of agriculturally suitable lands to provide opportunities for small diversified agricultural activities with residential tenancy for farmers.

Q. What was the specific goal of the Ke‘anae-Wailuanui Cultural Landscape study of July 1995?

A. The goal was to describe and quantify conditions and traditions which have shaped the land and which still affect the patterns of land use. Land use management policies based on a broad foundation of knowledge of resources will better enable the community and its representatives in county and state government to make effective decisions appropriate to this and other rural and agricultural areas.

Q. What were the specific tasks of the study?

A. There were three major tasks: (1) identify the historic context of the landscape, through archaeological research to determine the depth of wetland taro cultivation and a literature search, including a summary of Land Commission Awards for the Ke‘anae and Wailuanui ahupua‘a, focused on agricultural or other uses of the claims; (2) identification of cultural landscape components, including farm land, crops, vegetation types, water control, gathering, hunting, home sites, ocean-related activities, and lands associated with Hawaiian legends; and (3) preliminary mapping using historical maps, aerial photographs, and detailed land classification maps to identify existing land use areas and the boundaries of the cultural landscape.

Q. What was the methodology for conducting this study and who was the team responsible for conducting the work?

A. The methodology is described on pp. 13-17 of the report. Basically, (1) Cultural Surveys Hawaii, Inc. conducted a literature search, including a review of aerial photographs, (2) Cultural Surveys Hawaii, Inc. and Group 70 conducted field surveys, including mapping of taro lo‘i; and (3) I conducted personal interviews, relying heavily on kupuna (9 of 13 interviewees) from Ke‘anae and Wailuanui.

Q. How reliable are the sources of oral history, as related by those Hawaiians you interviewed?

A. The oral history interviews were consistent with each other and were cross validated with the information gathered through the literature search and the field surveys.

Q. What are the cultural landscape area boundaries?

A. The team identified the Keanae-Wailuanui core Cultural Landscape area boundaries in Figure 3 of the report. The area encompasses the Ke'anae peninsula and runs southeast along the coast to the southeast ridge of Wailuanui Valley. On the west, it is bounded by the Ke'anae YMCA, Ke'anae Arboretum and the Palauhulu stream. Inland it extends 600 feet mauka of the Hana Highway, stretching from the YMCA camp to the ridge on the east side of Waikani Falls. The informants also identified a wider traditional cultural practices region shown in Figure 4 of the report, for fishing, hunting and gathering. This extends from Makapipi Stream and forest access road in the east, to Honomanu and the Kaumahina ridge on the west and mauka to Pohaku Palaha on the northern rim of the Haleakala Crater.

Q. In summary, what did these sources of information show?

A. The literature search documented the cultural and natural setting of the cultural landscape area, which has a rich and long history of supporting Hawaiians who tilled the land, grew taro and other food crops, and fished the nearshore ocean seas as far as 11 miles offshore. In the various land commission testimonies, maka'ainana from the Ke'anae-Wailuanui community described their agricultural pursuits in the 1840's. The field surveys, combined with the literature search, yielded information that enabled the team to map the cultural landscape - historic locations of buildings, taro lo'i, 'auwai, and other cultural features of the communities that settled the area. The interviews helped me link current uses of land and streams by residents to their historic uses and verified those practices that continued to be followed along the traditions of their ancestors. The relative isolation of this cultural landscape enabled it and its residents to avoid or resist intensive modern land developments and retain many of the ancient traditions passed down through the generations of Hawaiians who resided in this area.

Q. Why was the Ke'anae-Wailuanui area selected for this cultural landscape study?

A. Aside from the land use planning angle I've previously mentioned, it was particularly appropriate because it is associated with a deep and long tradition of growing taro, the staple crop of Native Hawaiians for generations. The earliest Polynesian voyagers to Hawai'i brought taro with them. It has been linked mythologically to the origins of Hawaiians as a people. The plant itself has attributes which are embedded in the notion of the family and kinship relations. All parts of the taro plant are used for food. Much of the traditions surrounding the cultivation and use of taro have persisted in Ke'anae-Wailuanui to a much greater extent than most other parts of Hawai'i. With such an intimate association with the people and culture of Hawai'i, Ke'anae-Wailuanui was a prime candidate for designation as a cultural landscape. Today, large-scale taro cultivation is confined to isolated areas in Hawai'i – Hanalei/Waioli, Hanapepe and Waimea on Kaua'i, Waikane/Waiahole on O'ahu, Onokohau, Waihe'e, Ke'anae-Wailuanui on Maui, and Waipi'o Valley on the island of Hawai'i. The taro landscape of Ke'anae-Wailurumi is a viable traditional economy which has maintained historic and cultural integrity, traditional lifestyles, and social continuity to an equal or greater extent than any of the other taro growing landscapes in Hawai'i.

Q. What physical attributes of Ke'anae-Wailuanui did your study examine?

A. The 1995 study identified 12 components for examination. They are listed on page 44 of the report. Among them are taro cultivation, the Ko'olau Ditch built and maintained by EMI, and cultural resources and use areas.

Q. What did you learn about the taro cultivation in Ke'anae-Wailuanui?

A. Wetland taro cultivation is the most important single component of the cultural landscape of Ke'anae-Wailuanui. Wetland taro cultivation requires a precisely defined, stable field system with a continuous and reliable source of water. The system must be designed so that cool, fresh water can be delivered constantly to every field. In this sense, a taro landscape is designed as a single system with interrelated elements (fields, streams and 'auwai). Alteration of any of these elements could affect the entire system. The ancient Hawaiians who designed this landscape were limited in the degree to which they could alter the natural topography. They dealt

with this constraint by flexibility of design. Seen as a whole, the taro landscape appears as a simple network of inter-connected rectangles defined by banks, which hold in water. Upon closer inspection, it is apparent that field design, water flow, and water delivery are a response to subtle variations in the natural landscape. A taro landscape is extremely complex in its internal workings.

Q. What areas of taro cultivation exist in Ke'anae-Wailuanui?

A. There are five major locations of active taro cultivation – Ke'anae peninsula, Wailuanui, Ke'anae Arboretum, Waianu Valley, and Lakini. An additional small area of cultivation exists at Waiokamilo Stream just makai of its crossing of Wailuanui Road. There are small lo'i on both sides of the stream. In addition, throughout the district old taro terraces can be found and taro still grows in the wild in the valleys, along streams. Informants speak of going out and gathering lu'au leaves from the wild taro because it has a good flavor, distinct from the cultivated varieties. Some of the areas for the gathering of wild lu'au include Pi'ina'au, Nua'ailua, Kupa'u, Waipio, Awiowio, Pohole and Paho.

Q. Please describe the Wailuanui taro area.

A. This is the largest taro system of the cultural landscape, with 339 lo'i, that Cultural Surveys plotted off a 1982 aerial photograph in Figure 15. They lie mainly west of Wailuanui Stream and to the north and east below Hana highway. It is an area of mixed cultivation and uncultivated areas. There is also a smaller set of lo'i above Hana Highway in the area known as Lakini. See, Figure 21.

The essence of Wailuanui is water (wai = water). Wailuanui is best viewed looking mauka. The taro lo'i as seen from makai, are framed by the steep green slopes of the valley with Waikani Falls to the east and Waiokamilo Stream waters entering from the center and west. The lo'i themselves, as they ascend the slopes, decrease in size to accommodate the requirements of water control. Nowhere else in Hawai'i are such miniature fields still cultivated in this kind of topography with such integrity. See, p. 126.

Q. Please describe the Wailuanui 'auwai system.

A. It is evident that at Wailuanui Valley, the 'auwai and lo'i systems were constructed first and subsequent residences and circulation networks accommodated the already established systems. The pattern of cultivated lo'i at Wailuanui is likely close to what existed at the time of the Mahele, but for the time when rice was cultivated just prior to and after the dawn of the 20th century.

Cultural Surveys was able to produce a schematic of the 'auwai as it takes water from Waiokamilo Stream and passes through Lakini. Figure 21. The water flows past these lo'i, partially returning back to Waiokamilo Stream, but mainly flowing under the existing Hana Highway to irrigate the valley lo'i below that point.

There is another major diversion of Waiokamilo Stream below Hana Highway that irrigates the extreme western end of the valley. See, Figure 22.

Cultural Surveys approximated the direction of flow in the 'auwai system servicing the valley, as the system was complex and our team did not have the time or resources to make a definitive map of all aspects of it.

Q. Did you discover any major changes in the use of the valley for taro cultivation since the time of the Mahele?

A. Our team did not find any historic map of the valley. Taro cultivation is well documented for the entire area in the 1850's Land Commission Award documents. In Appendix A of the report, the various claims for Land Commission Awards in Ke'anae-Wailuanui are rendered in a table. The table illustrates the extent to which taro was grown on the claimed parcels. The table summarizes the testimonies submitted in support of the requests for Land Commission Awards and reflects the presence of taro cultivation at the time of the Mahele for these parcels. While it indicates what was happening on those parcels at that time, it does not indicate which of the pieces claimed were actually awarded by the Land Commission. Nevertheless, the table gives an accurate indication of the extent to which active taro cultivation existed and on which parcels in the valley. This

activity also indicates where irrigation water from the streams was being applied in pursuit of this activity at the time of the Mahele.

Q. Did you discover any other evidence of the extent of taro growing in the valley during different times in history following the Mahele?

A. Apparently, as an 1896 map (Figure 9) of the lower section of the valley reveals, by then there was a sizable area devoted to rice cultivation, although much of the southeastern portion along Wailuanui Stream remained in taro. This pattern apparently persisted through 1903, according to a similar map of the area (Figure 10). Some of the residents I interviewed indicated that rice was preferred at that period because water temperature was not the crucial consideration as it is for taro cultivation, reflecting a diminished water supply to the valley for irrigation. Chinese farmers grew rice in significant parts of the valley between 1880 and 1927, when the market collapsed because of the competition from California.

A 1936 photograph (Figure 16) shows that a majority of the valley was under taro cultivation, with considerably less tree and bush vegetation than was present in 1994 when I conducted my field research. By 1966, in contrast, while all cultivated areas appeared to be in taro, there is a dramatic increase in forest growth along the periphery of the valley, compared to 1936, as Figures 17 and 18 reveal. Contrasted with current conditions, as depicted in the photographs taken in 2004 and this year in June, it appears that there is now substantially different, as well as fewer, areas of taro lo'i than was being actively cultivated in 1966.

This evidence shows there was apparently a period of decline in taro cultivation in the valley between 1936 and 1966, as well as between 1966 and 1994. However, while to varying degrees, the Wailuanui valley residents, especially Hawaiians, continued a tradition of taro cultivation that continues through the present. This cultural landscape is distinctive in terms of this long tradition, and continues on to this day, reflecting how critical taro production is to this community.

Q. Do you have an opinion as to whether the current taro cultivation reasonably approximates the amount of water used to cultivate taro at the time of the Mahele?

A. Yes.

Q. And what is that opinion?

A. While the rice cultivation earlier last century may have altered some of the pattern of lo'i in the valley, the broad pattern remains since both crops are wetland agricultural products and the irrigation system plays a critical role in their cultivation. The mechanics of irrigation systems must follow gravity. Residences are found on slightly elevated areas at the edges of the fields, not in the center of the lo'i, which would be the low spot and subject to periodic flooding. The roadway network serving these residences skirt the cultivated areas and does not cut into the system of lo'i. This pattern involves frequent tending and fits the horticultural character of Hawaiian agriculture where the cultivated fields are relatively small and are within walking distance of residences. It is a pattern developed before automobiles and mechanized agriculture. The field was central, not the residence. This pattern is found even in areas where residences are not nearby. See, p. 126.

There was far more taro cultivation in the valley in the 1800's than presently. There is also far less water flowing naturally into the valley as a result of the major EMI diversion into the Ko'olau Ditch mauka of Kupau and Akeke Spring. This reduction in taro production is significant compared to historic levels.

Q. On what basis do you make this conclusion?

A. During the fieldwork for this study, which included field trips as well as interviews, it became apparent that the Ke'anae-Wailuanui communities have a long history of small commercial ventures associated with processing and marketing of local taro. Besides the People's Store, which once stood at Ke'anae landing, there were six separate poi mills, each in operation over a different span of time. Each sold local taro processed into poi to the community itself and also exported taro. Taro was exported in two separate directions: to

Hana and to Ha'iku/Kahulu/Wailuku. The Alama Poi Shop operated from the 1920's to the 1950's. The Ching Poi Mill operated in the 1930's through the 1950s, exporting poi to Kahului and Hana. The Ng family operated a mill that exported poi to Hana. The Alu family ran the Kupa'u Mill from the late 1930's to the early 1950's. The Lum Hoy Poi Mill exported poi to Wailuku from the 1930's through the 1940s. The last mill, Ke'anae-Wailua Poi Mill was started in 1975 by Mr. Ed Wendt and operated through 1984. The current level of taro production contrasts sharply with what historic records show.

Q. Do you have an opinion, based on your training, research, and expertise, whether the land uses of Wailuanui residents are linked to Hawaiian cultural mores and practices?

A. Yes.

Q. What is your opinion?

A. The land use patterns of the Ke'anae-Wailuanui region have been shaped by Hawaiian cultural mores and practices. The 'ohana values and practices of the community stress the conservation of natural resources for the benefit of present and future generations. Rules of behavior are based on respect of the 'aina, the virtue of sharing, and a holistic perspective of organisms and ecosystems that emphasize balance and coexistence. The Hawaiian outlook which shapes these customs and practices is lokahi or maintaining spiritual, cultural, and physical balance with nature. In the course of their travels through the various 'ili of the traditional cultural practices region, practitioners of Ke'anae and Wailuanui are able to renew their knowledge and understanding of the landscape, the place names, names of the winds and the rains, traditional legends, wahi pana, historical cultural sites, and the location of various native plants and animals. The region is thus experienced as a part of their 'ohana, necessitating the same care as would a member of their family.

Q. Do you have an opinion, based on your training, expertise, and research, on how important traditional and customary gathering of 'o'opu, 'opae, and hihiwai is to the Hawaiians of Wailuanui?

A. Yes.

Q. What is that opinion?

A. Ke'anae-Wailuanui is one of the few remaining areas in the Hawaiian Islands where 'opae can be gathered. Virtually every stream has 'opae at some time during the year. However, it is easier to gather 'opae in the tunnels of the EMI ditch system. The irrigation ditch itself is an excellent breeding area for the 'opae because it has flowing water year round. Some streams below the ditch, however, don't have enough flowing water to sustain the 'opae year round when the water is diverted into the ditch system. Commercial sale of 'opae is prohibited under a state law that went into effect in 1993. 'Opae is still a popular delicacy among the families in the district. They also gather 'opae to share with family and friends outside and on different islands. 'Opae, the 'a'aniu net used to gather it, and the methods of preparing it will continue to be a distinctive aspect of the cultural lifestyle for which Ke'anae-Wailuanui is known and distinguished.

'O'opu and hihiwai are becoming increasingly scarce in the Hawaiian Islands. Certain species of 'o'opu are endangered and others are rare. They require pristine and flowing stream waters to exist. Ke'anae-Wailuanui is one of the few areas where they still can be found in sufficient size to be occasionally caught for subsistence food.

The gathering of hihiwai is also carefully managed. The location of the hihiwai is knowledge that has been passed down from generation to the next for their protection and proper management. It is not information that is made available to the general public.

Q. What is the geographic range of this gathering activity?

A. Family members of all ages engage in some level of gathering activity in the Ke'anae-Wailuanui district. Kupuna like Helen Nakanelua still go out and gathers 'opae with her homemade 'a'aniu net in the 'auwai that runs through her property at Lakini. Waiokamilo Stream still has 'opae which is accessible to the kupuna. The Ka'auamo family is best known for their traditional and customary gathering activities. Awapuhi Ka'auamo Carmichael still goes out gathering for 'opae, hihiwai, and 'opihi from Kailua and over through Kuhiwa. Awapuhi Carmichael identified some of the area which she regularly accessed for gathering of 'opae, hihiwai, and 'o'opu:

We have our own names. Kapa'ula, gather 'opae. We use Puaakaa, we call it Kaunoa. Above the road, the ditch above the road, we use that stream, and then it branches off. Even Makapipi, we use Makapipi stream. We use all the way to the tunnel. We use it. Kuhiwa gulch is used by our family. Kuhiwa gulch we use also. Makapipi is just mauka. Kuhiwa is mauka.

Gathering from a variety of places is important in order to maintain the resources. The choice of place to gather is determined by the weather and other natural signs. Awapuhi Carmichael described the factors which affected her decision as to where to gather on a particular expedition:

It depends on what we're getting, and how we feel ... We never go to the same place. You know how the Hawaiians used to do, they don't go back to the same place, so can restore. It depends on the weather, and then we go by the moon, the stars. If use one place, then go to another place, depends on the moon and the stars. We go up far ... We all go to the same places, although each of us have our favorite hole, places, where we go for opae, you know. All mauka for 'opae. And then below have the 'o'opu and the prawns, they introduced the prawns, and hihiwai. Above the road is more the 'opae. Above the road is where all the opae are. Above the main highway. And then below the road has hihiwai, 'o'opu, you know.

Within the traditional cultural landscape area for Ke'anae-Wailuanui unoccupied areas with flowing pristine streams and the forested areas are integral to the livelihoods of the families in the district. For example, nobody lives in the area from Wailuaiki to Kopili'ula and over to Hanawi but there are many gulches and streams flourishing with hihiwai and 'o'opu.

Q. What was the importance of subsistence gathering to the health of Hawaiian gatherers who engaged in this traditional activity – historically and in current times?

A. Through subsistence, families attain essential resources to compensate for low incomes. They can also obtain food items, especially seafood, that may be prohibitively costly under a strict cash economy. If families on fixed incomes were required to purchase these items, they would probably opt for cheaper, less healthy foods that would predispose them to health problems. In this respect, subsistence not only provides food, it also ensures a healthy diet.

Subsistence generally requires a great amount of physical exertion (e.g., fishing, diving, hunting) that is a valuable form of exercise and stress reduction and contributes to good physical and mental health. It is also a form of recreation that the whole family can share in. Family

members of all ages contribute at different phases of subsistence, be it active hunting, fishing or gathering or cleaning and preparing the food for eating. Older family members teach the younger family members how to engage in subsistence and prepare the food, thus passing on ancestral knowledge, experience and skill.

Q. What was the pattern of these subsistence activities amongst those traditional and customary gatherers of Ke‘anae-Wailuanui you interviewed?

A. Subsistence gathering, hunting and fishing is an integral part of the lives of the residents of Ke‘anae-Wailuanui. There is general agreement among the informants that their traditional cultural practices region extends from Honomanu in the west to Makapipi in the east and mauka from Pohaku Palaha on the rim of the Haleakala crater makai to the shoreline, and into the ocean as far as the buoy 11 miles offshore. Additional areas are used by residents of Ke‘anae-Wailuanui depending on where their family ancestors originated and established subsistence practices. For example, some families fish and gather as far as Kaupo or as far west as Honopou and mauka to Waikamoi. The location and distribution of water is the primary determinant of the distribution of natural resources. Traditional land use boundaries were defined in relation to the amount and location of water. The change of season from wet to dry does affect the distribution and availability of subsistence resources. When there is a lot of rain, the resources are more abundant and spread out over a larger area. During the dry period, the amount of resources shrink and they are distributed near to water sources.

Most subsistence areas can only be accessed by land through a trail or a dirt road. The Pi‘ilani Trail affords an important route of access between ‘ili along the coastline. The Ke‘anae-Wailuanui residents also use an extensive network of mauka to makai trails to carry out their subsistence activities. Hunters say that one can readily catch a decent sized pig without venturing far up the mountain. However, the network of trails allows access to upper regions where the larger animals roam. Fishing resources vary by ocean depth. Along the rocky shoreline fishermen gather crab, ‘opihi, ha‘uke‘uke, and other shellfish. In the reef, residents gather limu and catch squid, lobster, and reef fish such as ‘uhu, kala, and manini. At greater depths bottom fish are caught such as weke, elm, ‘opakapaka and uku. In the bays, nets are used to surround ‘akule. ‘Aholehole, ‘ama‘ama and uouoa are also caught with gill nets. In the deep ocean and out

to the buoy the fishermen troll for ono, aku, 'ahi, marlin, and mahimahi. Ocean resources are accessed by land through mauka-to-makai trails and along the Pi'ilani Highway. Boats are also used for ocean subsistence activities. The launching areas are Honomanu Bay, Ke'anae Landing, Wailuanui Bay and Hana Harbor.

Resource gathering patterns are also influenced by ho'ailona or spiritual signs in natural phenomena. Ke'anae-Wailuanui residents stay alert to the direction and patterns of clouds, winds, rain, the flight of birds, rainfall and all natural elements to inform them about where the ideal place is to gather on any given day. They also keep track of the moon phases and the effect on the shifts in the tides. Ancestral knowledge of the interpretation of place names in the district also informs Hawaiians about the special features or qualities of that particular area for subsistence and cultural use.

Q. Is this a traditional pattern of subsistence activity?

A. Traditional factors shape the pattern, nature and purpose of the ongoing subsistence fishing, gathering, farming and hunting activities. These include family and ancestral connections to particular features of the landscape; the distribution of water; access; the type of resource to be obtained; the life cycle of that resource; the diet and feeding habits of fauna; the weather and seasonal changes; and ho'ailona. The subsistence activities are also guided by traditional values and customs which include but are not limited to the following:

1. Only take what is needed.
2. Don't waste natural resources.
3. Gather according to the life cycle of the resources. Allow the resources to reproduce. Don't fish during their spawning seasons.
4. Alternate areas to gather, fish and hunt. Don't keep going back to the same place. Allow the resource to replenish itself.
5. If an area has a declining resource, observe a kapu on harvesting until it comes back. Replant if appropriate.
6. Resources are always abundant and accessible to those who possess the knowledge about their location and have the skill to obtain them. There is no need to overuse a more accessible area.

7. Respect and protect the knowledge which has been passed down intergenerationally, from one generation to the next. Do not carelessly give it away to outsiders.
8. Respect each other's areas. Families in Ke'anae-Wailuanui usually fish, hunt, and gather in the areas traditionally used by their ancestors. If they go into an area outside their own for some specific purpose, they usually go with people from that area.
9. Throughout the expedition keep focused on the purpose and goal for which you set out to fish, hunt, or gather.
10. Be aware of the natural elements and stay alert to natural signs, e.g. falling boulders as a sign of flash flooding.
11. Share what is gathered with family and neighbors.
12. Take care of the kupuna who passed on the knowledge and experience of what to do and are now too old to go out on their own.
13. Don't talk openly about plans for going out to subsistence hunt, gather, or fish
14. Respect the resources. Respect the spirits of the land, forest, ocean. Don't get loud and boisterous.
15. Respect family 'aumakua. Don't gather the resources sacred to them.

Q. To what extent, if any, does taro cultivation relate to the traditional and customary gathering of 'o'opu, 'opae, and hihiwai?

A. These native aquatic marine species and taro rely upon pristine, clear, cold, free running streams that flow year round. All of the great historical taro growing areas of Hawai'i rely on pristine streams where native aquatic species thrive – Ke'anae-Wailuanui, Kahakuloa on Maui; Hanalei on Kaua'i; Waipi'o on Hawai'i, the windward valleys of Moloka'i. 'O'opu, 'opae and hihiwai have been a part of the traditional diet of taro farmers in these areas.

Q. Were you able to determine the degree to which traditional and customary gathering of 'o'opu, 'opae, and hihiwai in Wailuanui has changed since the 1890's?

A. Aunty Helen Nakanelua who was 83 in 1994 was born in 1911 and described how she used to go out and gather 'opae with her grandmother who would have been born and learned how to gather 'opae before the 1890's:

And I used to go along with my grandma, with a five gallon can, you know those tall ones, and I pack some wood, and I pack salt, so that whenever my grandma goes with the upena net, do you have an idea what the upena net looks like and they have a little bag there? Some of the bags are small, but she used to have these long bags, and then she cleans that where I am, she takes that out, we clean it and we cook it in this can. Salt it and cook it there, the wood that I take we cook it. And after it's cooked, I begin spreading it on a table oil cloth and a mat I used to pack along and then she leaves me there I attend that opae while it's drying. By the time she comes back here, it's partly dried, I gather that 'opae again, and separate it in another bag, because that's partly dried, and we continue on, she gets another bag to do the same thing, cook, so that by the time she ends up her day, most of the opae, except the last one she has is partly half dried already. Do you know how the upena look like? I show you, cause I have made some for me, because I use it.

Although Aunty Helen continues to gather 'opae, it is not as plentiful as it had been in her youth. An indicator of the decline of 'opae is the passage of a state law in 1993 which prohibits its commercial sale due to its scarcity.

Q. Do you have an opinion as to the importance of the Ke'anae-Wailuanui region to Hawaiian cultural history?

A. Yes.

Q. What is that opinion?

A. The most distinctive historic association of the Ke'anae-Wailuanui landscape is its unbroken relationship to the foundations of Hawaiian culture through the traditional cultivation of taro, the major component of the cultural landscape. The traditional cultural practices region is also significant as a surviving enclave of Hawaiian subsistence, cultural, and spiritual beliefs, customs, and practices. Rural Hawaiian communities like Ke'anae-Wailuanui are cultural kipuka - places where Hawaiians have maintained a close relationship to the land through their livelihoods and customs - that play a vital role in the survival of Hawaiian culture as a whole. There is a growing recognition that protection of the natural resources and the integrity of the lifestyle and livelihoods within rural districts is essential for the perpetuation of Hawaiian culture. However, the survival of these cultural kipuka and the traditions and customs related thereto are continually eroded by an ever increasing lack of water.

Q. Do you have an opinion on how significant the Ke'anae-Wailuanui region is as judged against federal criteria for cultural significance?

A. Yes.

Q. What is that opinion?

A. The Ke'anae and Wailuanui cultural landscape is significant under the four National Register criteria of significance and an additional Hawai'i state criterion. Under Criterion A, Ke'anae-Wailuanui is associated with significant events affecting broad patterns of history. The evolution of Hawaiian culture and society in the Hawaiian Islands over the past 1500 years was sustained by highly developed and well-managed systems of wetland taro cultivation. Ke'anae-Wailuanui is an extraordinary example of a highly developed historic Hawaiian wetland irrigation system which sustained the complex social organization and sophisticated customs and practices of the Native Hawaiian culture. The cultural landscape also includes the historic network of irrigation ditches and tunnels which were developed in the late nineteenth and early twentieth centuries. The last completed segment of the Hana Belt Road is also in this cultural landscape.

Under Criterion B, Ke'anae-Wailuanui is associated with events which involved famous people such as the landing of Umi-a-Liloa's war canoes during his 14th century battle over Hana against Ho'olae-Makua and the staging of the battles between Kalaniopu'u and Kahekili in the 18th century.

Under Criterion C, Ke'anae-Wailuanui epitomizes the quality and integrity of a historic landscape centered around the historic wetland cultivation of taro. In addition, the 2 churches, its public school facility and the Waikani Bridge are also excellent examples of each of these types of historic architecture.

Under Criterion D, Ke'anae-Wailuanui provides excellent potential to yield information important in the prehistory and history on the origins, chronology and

development of Hawaiian taro cultivation, as well as the complex social structures which both sustained and perpetuated by this kind of agricultural technology.

Q. To what extent are those that now gather and attempt to farm taro in the valley genealogically linked to the Hawaiians that lived in the valley during the 1800's?

A. The informants that I interviewed said that they lived and farmed lands that their ancestors had lived on and farmed in the 1800's.

Q. Do you have any opinion based on your training and education of whether there is any correlation historically between the amount of traditional gathering from the streams and the amount of fish and limu that could be taken from the coastal areas of the valley and the sea for subsistence purposes?

A. Yes.

Q. What is that opinion?

A. The abundance of aquatic and marine resources are dependent upon the pristine, clean, free flowing year round streams flowing into the ocean. The bays where the fresh water mixes into the ocean water are important spawning grounds for the fish. Moki Day, a Hawaiian fisherman from the area, described how the bays are important breeding grounds which deserve protection:

You can consider all the shoreline area between here and Kaupo as breeding grounds for all these shoreline species of fish. They come into our rivers here because we have the fresh water, and they come in here and breed here and lay their eggs here.

According to the late Uncle Harry Mitchell, who had been a long-time resident of the area, the streams and the ocean together provided the breeding ground for 'o'opu. He described the lifecycle of the 'o'opu as follows:

The first heavy rains usually arrived in August or September, carrying the 'o'opu to the ocean where they spawned. Once they laid their eggs, the mother 'o'opu died. The baby 'o'opu, called hinano, would hatch and develop in the salt water from August/September through November. The salt water made them strong

enough to climb up the stream where they would mature. About November, the hinano began to make their way up stream to the large fresh water pools in the mountains. Their migration upstream coincided with the arrival of the migratory birds from the north which fed upon the hinano as they made their perilous journey to the uplands.

Q. Do you have an opinion on how significant the diversion of stream water from Wailuanui Valley by EMI has been on the ability of its residents to continue their tradition of taro growing and gathering from the streams and coastal areas?

A. Yes.

Q. What is that opinion?

A. The diversion of steams in the Ko'olau watershed, via the East Maui Irrigation (EMI) Company system, has reduced the surface water flow in the region mauka of the cultural landscape. The system currently provides most of the irrigation water for central Maui's large-scale agriculture and is the main source for county water supplies to upcountry Maui residents and farmers.

While the degree of reduction has not been quantified, the volumes of water carried by the ditch are significant and impact on the stream ecology in Ke'anae-Wailuanui is probable. Native endemic and indigenous species such as 'o'opu and 'opae and hihiwai are likely to have been affected within the last few generations, with consequent impact on the traditional gathering practices that are part of the local lifestyle. During interviews for the study, some residents expressed concern over the impact of the diversion of water by EMI Co. on the ecology of the region. They also questioned the effects that the EMI diversion may have on the temperature and consistent flow of stream water to taro lands.

Q. Do you have an opinion on what positive steps should be taken to promote the perpetuation of the cultural landscape of Ke'anae-Wailuanui?

A. Yes.

Q. What is that opinion?

A. Provide incentives for taro growing, such as tax relief for parcels used for taro farming. Provide support to the community to maintain the water sources and the 'auwai, such as state and county support to clean and maintain the agricultural irrigation systems. Maintain the Pi'ilani Trail along the shoreline as well as the trails and unimproved roads running makai from the highway to the beach, and the trails and unimproved roads running mauka into the forest reserve should be maintained and their significance in the cultural landscape assessed. The watershed's forest should be protected. Access for cultural, subsistence, and spiritual customs and practices should be afforded to those residents of the community who will maintain traditions of respect and stewardship of the land and water resources. Develop the Ke'anae Arboretum to offer interpretation and education, with emphasis on practical and hands-on experience. Improve lookout points with better paving, approach signage, interpretive signage, landscaping and benches. Preserve and maintain the 2 large heiau and other cultural sites. Document and protect historic taro terraces. Perpetuate significant aspects of the cultural landscape without hampering changes beneficial to the community and its residents.

Q. Are you familiar with crucial definitions of traditional land divisions used by Hawaiians?

A. Yes.

Q. What are the land divisions that were common in delineating the various land uses made by Hawaiians?

A. The traditional Hawaiian land divisions according to Malo (1951:16-18) consist of the following district, subdistricts, land divisions and land parcels:

- island: *Moku-puni* (cut off surrounded).
- Large District: *Apana* (pieces) or *Moku-o-loko* (interior division), e.g. Hana.
- Sections: *'Okana* or *Kalana*, e.g. Honua'ula. [*'Okana* is also a district or sub-district and usually comprising several *ahupua'a*; *Kalana* is smaller than a district (Pukui & Elbert 1971: 113, 258).]
- Subsection within *'Okana*: *Poko*. [Dividing a District, or *ahupua'a* into two or more sections, e.g.: Hamakua Poko; Hamakua Loa]

- *Ahupua'a*. (running *mauka-makai*, from the mountains to the sea) [a sub-district land division, some contain a few hundred acres, others 10,000 acres, or more]
- *'Ili-'aina* [*'Ili-'aina*, a sub-division of an *ahupua'a*; *'ili lele*, a discontinuous *'ili-'aina*, consisting of two or more parcels of land in the same *ahupua'a* and having the same name]
- *Mo'o-'aina* [*mo'o-'aina* is a cultivated garden within an *'ili-'aina* or *'ili-lele*]
- *Pauku-'aina* (joints of lands) [*pauku-'aina* is a land section smaller than a *mo'o-'aina*]
- *Kihapai* (patches or farms) [dry land garden]
- *Ko'ele* [*ko'ele*, a cultivated garden, the produce of which went to the *ali'i* of the district or island]
- *Hakuone* (land cultivated by 'ohana with crops going to *konohiki*) [produce of which went to chief of the *ahupua'a*]
- *Kuakua* (broad *kuauna* or *kuaauna*, an embankment) [embankments between wet taro gardens, usually cultivated] (Malo 1951: 16-18). Information in brackets [] added.

Harry Mitchell, April 22, 1988.

5.6.7 Lurlyn Scott

DECLARATION OF LURLYN SCOTT

Declaration of Lurlyn Scott

I, Lurlyn Scott, hereby declare that:

1. I am Hawaiian by birth.
2. I am the daughter of the late Marjorie Wallett, and the niece of the late Beatrice Kekahuna, both of whom were original petitioners to amend the interim instream flow standard (IIFS) for Honopou Stream before this Commission in May 2001.
3. I was born on July 2, 1959 in California after my mother left the U.S. Air Force to begin a family.
4. My mother, Marjorie Wallett, was the daughter of Maria Kaehukai Kepani and John Kalia Kaleialoha.
5. The name listed on the current tax map of this area of Honopou, tax map zone 2, section 9, plat 1 is "Elizabeth Kepani."
6. Elizabeth Kepani's husband, Jerry Kepani, is my mother's first cousin.
7. My extended 'ohana has lived in Honopou for many generations and after returning to Maui from California as a young girl, I grew up along Honopou Stream.
8. As a young girl growing up, I both played in Honopou Stream and enjoyed the scenic beauty of the stretches of stream where I swam and played.
9. During my lifetime, my 'ohana gathered 'ōpae, 'o'opu, hihiwai, watercress, medicinal plants, and crayfish from Honopou Stream to supplement our diet.
10. My 'ohana also traditionally gathered rocks for the imu in and around Honopou Stream.

11. Traditionally, my 'ohana fished for āholehole, enenuē, po'opa'a, moi, weke, moana, kole, 'opihi, uhu, and honu in or near the stream mouths of Honopou, Punalau/Kolea, Honomanu, Hanawi, and Makapipi.

12. They also gathered limu in and along those coastal areas.

13. My 'ohana would mālama Honopou by cleaning out the hau, only taking what they needed, cleaning limu off rocks, and being aware of the spawning cycle of fish and other creatures.

14. My family also used the stream to wash clothes and soak hau to make rope.

15. I also helped my 'ohana raise kalo in lo'i tended to by my mother and other members of my family and located on the properties designated as TMK 2-9-1-14, being portions of Grant 1082 and 3101:2. LCA 5595E-1, and Grant 1918:1.

16. My mother passed away on April 3, 2010.

17. After her passing, I continued to farm kalo in the Honopou lo'i.

18. My cousins Sanford Kekahuna, Richie and Leilani English, Maudrey English, and various youth groups like Kukulu Kumuhana, Mormon Young Women's Group and the Royal Hawaiian Guard help me work the Honopou lo'i. My cousins Kainani Kaleialoha, Lezley Jacintho and Jonah Jacintho have their own lo'i in the system and have their friends come to work with them.

19. My daughter, Wyonette and her children, and Kainani Kaleialoha and her ohana all reside in homes location on these parcels.

20. My family and I currently gather 'o'opu, crayfish, hihiwai, rocks for the imu, pohole, and ferns for lei making in and around Honopou, Honomanu, Hanawi, and Makapipi Streams.

21. We fish for lobster, enenuē, po'opa'a, āholehole, uhu, mullet, and ulua in or near the mouths of Honopou, Honomanu, Hanawi, and Makapipi streams.

22. I gather and fish to perpetuate my cultural food and traditions so my grandchildren will be able to live off the land like our kūpuna did.
23. My family would mālama Honopou by cutting back the hau, trying to regulate shoreline fishing, and breaking apart dams built by other people.
24. We also swim, cliff dive, and enjoy the tranquility at Honopou, Honomanu, Hanawi, and Makapipi after a hard day at work.
25. Our children and grandchildren learned to swim at Honopou.
26. I like hearing and seeing the natural flowing streams at Honopou, Honomanu, Nuailua, Pi'ina'au, Palauhulu, Waiokamilo, Hanawi, and Makapipi.
27. Attached as Exhibit "A-149" is a schematic drawing of the various kalo lo'i that my 'ohana has collectively tended over the decades I have witnessed kalo farming on these properties (hereafter, "Honopou lo'i").
28. Included on Exhibit "A-149" are arrows which depict the direction of water flow passing through the various designated lo'i.
29. I certify that the layout of the Honopou lo'i, albeit not to scale, and direction of water flow is truly and accurately depicted in Exhibit "A-149".
30. I estimate that the land area covered by the Honopou lo'i is about one acre.
31. On September 25, 2008, the Commission on Water Resources Management voted to amend the IIFS for Honopou by establishing a flow of 2.0 cubic feet per second (cfs) at Station A.
32. Station A is located about a half mile below the lowest EMI dam on Honopou Stream, known as "Haiku Dam."
33. Attached as Exhibit "A-151" is an aerial photograph of the Honopou drainage basin, which truly and accurately reflects the location of Station A, which is where the

amended IIFS for Honopou stream is measured, and the USGS metering locations that once measured flow and temperature readings of water flow into and out of the Honopou lo'i.

34. When the CWRM amended the IIFS for Honopou Stream to 2.0 cfs at Station A in Exhibit "A-151" in September 2008, I elected not to appeal the decision, although I had reservations about whether this amount of flow would be sufficient to support the kalo cultivation on the Honopou lo'i, the gathering of o'opu, opae, and hihiwai, and fishing along the mouth of the stream at the coastline.

35. After consulting with attorneys for my mother and aunt, we decided not to appeal the September 2008 CWRM decision because it specifically incorporated an Adaptive Management Strategy (AMS).

36. As a result of the amended IIFS, I looked forward to monitoring the work of EMI workers who installed modifications to the Haiku Dam to supposedly allow more water to pass over that dam to meet the amended IIFS.

37. With great optimism, in 2009-12, I witnessed CWRM and USGS staff periodically install, and download raw data from, instruments at Stations A and B on Honopou Stream in what appeared to be a sustained effort to monitor and enforce stream flow compliance with the amended IIFS established in 2008.

38. I also witnessed USGS staff from Maui separately installed metering in and around the Honopou lo'i at strategic spots to monitor the temperature and flow of the water we diverted from, and later returned to, Honopou Stream.

39. The metering of water temperature and flow *in real time*, apparently through a satellite upload to the USGS website, was especially useful.

40. Access to this metering data, especially the real time information, provided valuable objective information on whether my 'ohana was getting adequate water to irrigate our kalo.

41. In March 2009, I witnessed EMI workers cooperating with CWRM staff to install modifications to the Haiku Dam at Honopou Stream to allow more water to bypass the diversions at that dam.

42. One of the major modifications included a metal bypass flume installed on top of the cement grate feature of the Ha'iku Dam to allow a limited amount of additional stream water to pass over this diversion structure.

43. Attached as Exhibit "A-146" is a photograph taken on March 23, 2009, which I took the day EMI workers installed that metal flume over the Haiku Dam.

44. Despite the collection of stream flow data since the IIFS for Honopou was amended in 2008, I have been supplied with flow measurements for Honopou only sporadically when my attorneys asked CWRM staff for them.

45. The CWRM has not provided me regular or reliable access to flow measurements, either online or by other means of communication.

46. I learned of flow measurements only through my attorneys at NHL.

47. I have only recently been made aware that the CWRM staff presented its flow data to the CWRM.

48. Attached as Exhibit "A-145" is a true and correct copy of September 24, 2009 update, which I downloaded from the CWRM website.

49. As shown in Exhibit "A-145", the AMS adopted by the CWRM appeared to protect my interests in restoring flow to Honopou Stream, and I looked forward to "[c]ollaborat[ing] with agency staff and registered diversion owners to determine appropriate actions," as stated on page 12 of Exhibit "A-145."

50. In addition, as the graphic on page 11 of Exhibit "A-145" indicates, the AMS process allowed for continuous adjustments based on the CWRM staff's ongoing monitoring

and evaluation, enabling the CWRM to revise the IIFS to address the needs of kalo farmers, cultural gatherers and people who fish.

51. I sincerely believed and relied on CWRM's pledge that the AMS was the key to restoring stream flow where conditions and needs required it and that the CWRM would finally and timely meet the needs of kalo farmers, cultural gatherers, and fishermen.

52. As indicated on page 16 of Exhibit "A-145," EMI diverts water from Honopou Stream at 4 elevation levels with the Wailoa, New Hamakua, Lowrie and Haiku ditches.

53. As shown on page 20 of Exhibit "A-145," EMI failed to abide by the amended IIFS (2.0 cfs @ Station A) for all of the field measurements recorded between October 2008 and July 2009 during the initial implementation phase.

54. Despite the stream channel modifications installed after the 2008 IIFS amendment, I experienced low flows to the Honopou lo'i cultivated by my 'ohana.

55. Since the 2008 IIFS amendments for Honopou Stream, I have not been able to cultivate all 30 lo'i shown in Exhibit "A-149", because there is inadequate stream flow in Honopou to support all the kalo I and my 'ohana could otherwise plant and grow successfully without experiencing harm to our kalo crop from the lack of stream flow.

56. Without adequate stream flow we could otherwise tap to irrigate more kalo, we were forced to reduce the amount of kalo planted in the Honopou lo'i and the dry cracked lo'i that I saw in the summer of 2009, as depicted in Exhibit "A-147".

57. Unfortunately, apparent funding shortages began to affect my ability to access the real time metering by the USGS in and around the Honopou lo'i after I have begun downloading important objective evidence of the shortage of irrigation water negatively affecting by kalo.

58. Ultimately, when the USGS staff removed gauging stations that it had previously installed at strategic points on or near the Honopou lo'i due to lack of funding, I

lost access to important flow and temperature data being recording in real time at the intake to the Honopou lo'i and the outflow from that lo'i system.

59. Before the removal of these meters, working with my attorneys, I was able to download various graphs depicting the water flow and temperature into, and the outflow from, the Honopou lo'i at various times between November 2008 and 2010, all of which is attached as Exhibit "A-150".

60. Attached as Exhibit "A-148" is a video which truly and accurately depicts the amount of water that flows past the Haiku Dam, as a result of the modifications undertaken in 2010 to meet the 2008 IIFS amendments for Honopou Stream, and the amount of water that continues to fall into the diversion ditch at that point.

61. The Haiku Ditch transports those diverted water to points northwest to irrigate Hawaiian Commercial and Sugar fields in Central Maui.

62. As shown in Exhibit "A-148," I estimate that, in 2014, despite the Haiku Dam modifications, EMI still diverts over 80% of the Honopou stream flow at Haiku dam.

63. The restoration of natural flow to Honopou Stream would enhance kalo cultivation in the Honopou lo'i, the gathering of o'opu, opae, and hihiwai in Honopou Stream, and fishing along the mouth of the stream at the coastline.

64. Also, during summer months, we have stagnant, smelly water that is not useable for domestic use.

65. In addition, from 2009 through 2014, although i repeatedly reported to the CWRM staff members that I was not receiving sufficient flow to irrigate the Honopou lo'i, I did not see the staff attempt to increase stream flow as a remedy to my problems.

66. If there was enough water in the streams, I would grow more kalo, raise watercress, gather 'o'opu, crayfish, hihiwai, rocks for the imu, pohole, and ferns for lei making in Honopou, and fish for lobster, enenu, po'opa'a, aholehole, uhu, mullet, and ulua in or near the mouths of Honopou, Honomanu, and Makapipi.

67. If water were put back in the streams, I would mālama the streams the same way I do now.

68. I would also clean the muliwai, move rocks for better flow, and observe ancient fishing practices at Honopou.

69. If there was more water in the streams, I could swim and enjoy Honopou recreationally all year round.

70. I would also get to enjoy watching the ulua go upstream, smelling the clean breeze, hearing the water flowing, and watching for 'o'opu.

71. If there was more natural flow restored to Honopou Stream, I would be better able to teach the opio of my 'ohana and others in my community how to mālama the kahawai, perpetuate the traditions and customs of my ancestors and enhance our food security for future generations.

DATED: Honopou, Maui, HI, December [16], 2014.

[Lurlyn Scott]

Lurlyn Scott

5.6.8 Earl Smith, Sr.DECLARATION OF EARL SMITH, SR.

I, Earl Smith, Sr., declare that:

1. The statements below are based upon my personal knowledge.
2. I am Hawaiian.
3. I live in Kaupō.
4. My family has about four to five acres of on property irrigated by Waiokamilo Stream. Not all of our lo'i are open because there is not enough water.
5. Traditionally, my family gathered 'ōpae, 'o'opu, and hihiwai from Hanawi, Makapipi, and One'o streams.
6. My family also traditionally fished along the East Maui shoreline near the mouth of Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue.
7. Traditionally, my family engaged in mālama 'āina and mālama kahawai in the above streams by only taking what they needed for their 'ohana and to share with family and neighbors.
8. Currently, my 'ohana gathers 'ōpae, hihiwai, and 'o'opu in Hanawi. It's the only place where I can find these living things. The other streams are dead.
9. Currently, my 'ohana fishes for moi, aholehole, manini, and eneneue along the East Maui shoreline near the mouth of Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West

Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue. There has been a depletion of fish. Eneue used to be there by the schools but now there are less. Only the strong survive.

10. My family also practices mālama 'āina/mālama kahawai in and around the above streams by only taking what we need, not to sell. I work with marine biologists so the scientists can survey/research environmental impacts and depletion of resources from Hana to Keanae. I also plant native plants.

11. I gather and fish for home consumption and to share if I have more than enough. I also gather and fish to teach my kids and grandkids how to live off the land and sea (fishing, gathering, hunting) to survive after I'm gone.

12. In the past, my family used to wash clothes and swim in the stream.

13. When I go to the streams, I take in the beauty. I don't alter what's there, what's beautiful. The way it was, that's the way I leave it.

14. The lack of stream flow is a problem for me because my grandkids don't have the experience or resources to gather what they need from the land and water. The lack of water has caused too much pilikia. When nobody cares, nobody understands our practices and our need to harvest. It pains me. It's very emotional.

I declare under penalty of perjury that the foregoing is true and correct.

EARL SMITH, SR.

5.6.9 Ty Kāwika Tengan, PhD

DECLARATION OF TY KĀWIKĀ TENGAN, PhD

1. I am competent to testify to the matters herein, and unless otherwise indicated, I make this declaration based upon my personal knowledge, skill, experience, training and education.
2. I am a Native Hawaiian, born into a family with strong genealogical ties to our Hawaiian ancestors. Native Hawaiian custom and religion was and is an integral part of my family's daily life.
3. Today, I am a practitioner and a scholar of Native Hawaiian cultural and religious practices. I speak the Hawaiian language fluently.
4. In 2003, I received a PhD from the Department of Anthropology at the University of Hawai'i at Mānoa.
5. Currently, I am the Chair and Associate Professor of the Department of Ethnic Studies and also Associate Professor of the Department of Anthropology at the University of Hawai'i at Mānoa.
6. Through practice, community service, the writing of books, journal articles, and reports, I have dedicated my academic career to the study of Native Hawaiian culture and religion. Attached hereto as Exhibit A is a copy of my recent curriculum vitae.
7. My opinions in this Declaration are based upon my personal knowledge, skill, experience, training, and education.
8. Further some of my opinions in this Report are based upon the following source material: Alexander, W.D. *A Brief History of Land Titles in Hawai'i* (1882); Handy, E.S. Craighill, *Hawaiian Planter* (1940); Handy, Handy, & Pukui, *Native Planters* (1972); and Maly, Kepa, VOLUME I *Wai O Ke Ola: He Wahi Mo'olelo No Maui Hikina. A Collection of Native Traditions and Historical Accounts of the Lands of Hāmākua Poko, Hāmākua Loa and Ko'olau, Maui Hikina (East Maui), Island of Maui* (2001).

9. I have reviewed the witness statements of Edward Wendt, Lezley Jacintho, and Terrance P. Akuna provided to me by the Native Hawaiian Legal Corporation.
10. I do not have a personal or familial relationship with any of the named Petitioners in this case.
11. Petitioners have neither paid me nor promised any compensation for my opinions or testimony in this matter.
12. On or about December 4, 2007, I testified as an expert witness at a State of Hawai'i administrative hearing before the Commission on Water Resource Management for the State of Hawai'i in "RE Iao Ground Water Management Area High-Level Source Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe'e, Waiehu, Iao, & Waikapu Streams Contested Case Hearing," Case No. CCH-MA-06-01.
13. In general, Native Hawaiian spiritual tenets and beliefs are expressed and perpetuated in their relationship to each other and to their *kulāiwi* (native land). The naming of winds, rains, landmarks, and waters perpetuate the traditional knowledge that the inhabitants developed of these areas and their resources over centuries of cultivation and habitation.
14. The first inhabitants of the islands were remembered as akua "gods" for their capacity to endow nature with cultural features and "create" society.
15. Kāne and Kanaloa were two of the four primary akua in the Hawaiian pantheon; Kāne was associated with fresh water and taro, and Kanaloa with the ocean and fishing. Wai, fresh water, is an important element in Hawaiian spirituality and fundamental to the exercise of traditional and customary practices. Fresh spring water is presented as ho'okupu to the akua (gods). Kāne and Kanaloa are known to have introduced the ritual, social, and medicinal use of drinking 'awa (kava), a drink that requires the waters of Kane.
16. Handy, Handy, and Pukui (1972) described the correlation between water and life in Hawai'i:

...The life of taro was dependent upon water. In his role as life-giver, Kane the procreator was addressed as Kane-of-the-water-of-life (Kane-ka-wai-ola). Water (*wai*) was so associated with

the idea of bounty that the word for wealth was *waiwai*. And water rights were the basic form of law, the Hawaiian word for which was *ka-na-wai*, meaning “relative to water...” [1972:19] [cited in in Maly (2001:21)].

17. East Maui was historically divided into 8 moku or districts, all meeting at a large rock on the northeast brink of the crater of Haleakalā, called Palaha. Alexander (1882:175-76).
18. The 27 streams from Honopou to Makapipi fall into the moku of Hāmākualoa and Ko‘olau. The two moku are both included in the larger region known as known as Maui Hikina, East Maui, each having unique characteristics. Lyons (1875) and Coulter (1935) as cited in Maly (2001:7).

HĀMĀKUALOA

19. Hāmākualoa is characterized by numerous minute ahupua‘a which indicate a dense population once settled there. Handy (1940: 109).
20. J. Waiamanu, recounts the story of Kāne and Kanaloa (or Kāneloa, in this version) in *Ka Ho‘omana Kahiko*, Ka Nupepa Kū‘oko‘a, January 19, 1865 in which Kāne and Kanaloa sailed to Maui and drank ‘awa in Hāmākua. Because there was no water, they caused fresh water to flow which was called “ka wai a Kaneloa” (the water of Kāneloa). The actual location of this spring, Kaneloa, is unknown today. Maly (2001:21).
21. Hāmākua loa is described as follows by firsthand accounts during the 1930s-1950s after the water diversions were in place:

Two kama‘aina at Ke‘anae said that there were small lo‘i developments watered by Ho‘olawa, Waipi‘o, Hanehoi, Hoalua, Kailua, and Na‘ili‘ilihaele Streams, all of which flow in deep gulches. Stream taro was probably planted along the watercourses well up into the higher kula land and forest taro throughout the lower forest zone. The number of very narrow ahupua‘a thus utilized along the whole of the Hamakua coast indicates there must have been a very considerable population. This would be despite the fact that it is an area of only moderate precipitation because of being too low to draw rain out of trade winds flowing down the coast from the rugged and wet northeast Ko‘olau area that lies beyond. It was probably a favorable region for breadfruit, banana, sugar cane, arrowroot; and for yams and ‘awa in the interior. The

slopes between gulches were covered with good soil, excellent for sweet potato planting. The low coast is indented by a number of small bays offering good opportunity for fishing. The Alaloe, or "Long-road," that went around Maui passed through Hamakua close to the shore, crossing streams where the gulches opened to the sea.[Handy et. al. 1972:502] [as cited in Maly (2001:8) (emphases in Maly)].

22. Native testimony indicates "there are many lo'i [in Honopou]." *Ibid.* at 120-21, 125, 129, 194, 201. *See also ibid.* at 104, 106, 127, 130, 135, 203, 205-06, 208-10, 212, 214, 220, 225-26.
23. The famous Alaloe or Alanui that circled the island was created by the high chief Kiha-a-Pi'ilani (or Kihapi'ilani) after securing his rule over Maui. In *Ka Nupepa Kuokoa*, August 23, 1884, Moses Manu related that after paving sections of the trail in different parts of the island, Kihapi'ilani "began the paving in the forest of 'O'opuloa [i.e., 'O'opuola], at Ko'olau, extending from Kawahinepe'e to Kaloa, then on to Pāpa'a'ea, and on to Ka'ohekanu at Hāmākua Loa" (translation and emphasis by Maly (2001:27). Abraham Fornander (1996:206) also noted that Kihapi'ilani "kept peace and order in the country, encouraged agriculture, and improved and caused to be paved the difficult and often dangerous roads over the Palis of Kaupo, Hana, and Koolau—a stupendous work for those times, the remains of which may still be seen in many places, and are pointed out as the "Kipapa of Kihapiilani" (cited in Maly (2001:28)). The trail was significant because it created an interconnected cultural and historical landscape where customary practices of gathering, farming, exchange, and travel could be conducted from Hāmākua Loa to Ko'olau and beyond.

KO'OLAU

24. The Ko'olau region of Maui has been described as the "wettest coastal region in all the islands." Handy, Handy, & Pukui (1972:498) as cited in Maly (2001:8).
25. "Oopuola Gulch marked the northwestern boundary of Ko'olau. Its stream, and likewise Waikamoi, Puohokamoa, and Haipuaena streams watered small patches." Handy (1940:109).
26. Handy, Handy, and Pukui (1972:272) reported that "On the northeast flank of the great volcanic dome of Haleakala...the two adjacent areas of Ke'anae and

Wailua-nui comprise the fourth of the main Maui centers and the chief center on this rugged eastern coast. It supported intensive and extensive wet-taro cultivation. Further eastward and southward along this windward coast line is the district of Hana, the fifth great center[.]” As cited in Maly (2001:7).

27. For generations following initial settlement, communities were clustered along the watered, windward (ko‘olau) shores of the Hawaiian Islands. Along the ko‘olau slopes, streams flowed and rainfall was abundant, and agricultural production became established. The ko‘olau region also offered sheltered bays from which deep sea fisheries could be easily accessed, and near shore fisheries, enriched by nutrients carried in the fresh water, could be maintained in fishponds and coastal fisheries. It was around these bays that clusters of houses where families lived, could be found, and in these early times, the residents generally engaged in subsistence practices in the forms of agriculture and fishing. Handy, Handy, and Pukui (1972:287) cited in Maly (2001:6).
28. Waikamoi, Puohokamoa, and Haipuaena watered small lo‘i areas. *Ibid* at 9.
29. “Honomanu, a large stream with a broad deep valley at its seaward end and a good beach for fishing canoes and gear, facing its broad bay. Anciently Honomanu supported a large population. Old terraces run back into the valley as far as the level land goes[.]” *Ibid*.
30. Just beyond Honomanu is Nu‘uailua [Nu‘a‘ailua], flat bottomed like Honomanu but smaller. Terraces cover the flatlands and much taro was formerly raised, watered by an ample stream; but the valley has long been uninhabited.” *Ibid*.
31. Ke‘anae “is a unique wet-taro growing ahupua‘a.” *Ibid*. at 9. “It is on the broad flat peninsula of lava extending for about a half a mile into the sea from the western line of the valley that Ke‘anae’s famed taro patches are spread out -- striking evidence of old Hawaii’s ingenuity.” *Ibid*.; *see also ibid*. at 137, 139-40, 145-46, 251, 254, 271, 273, 281-86, 288, 289.
32. In *Ka Nupepa Kuokoa*, dated October 4, 1923, Mrs. Annie Kalau related a visit to Maui Hikina wherein her hosts took her to Waianu at ‘Ōhi‘a and told her a story of how Kane and Kanaloa used their spears to cause fresh water to flow for their ‘awa; these waters irrigated lo‘i in this valley at the time of her visit.

33. Beyond Ke‘anae “is a sizable bay formed by erosion where three streams flow into the ocean....About half the gently sloping land seaward of the cliff was terraced with lo‘i which were watered by Wailuanui (Big Wailua) Stream, the larger of the three that flow into the bay....And on high ground there was a war temple” Maly (2001:0). “Wailua has been notable for its continued occupancy and cultivation by Hawaiian families.” *Ibid.*; see also *ibid.* at 137, 142-44, 150- 52, 154-56, 241-44, 246-51, 257, 277-79, 283, 291.
34. Beyond Wailuanui “there are a succession of small deep gulches, each one having a few lo‘i: East Wailuaiki and West Wailuaiki (Little Wailua), Kapili‘ula [Kopili‘ula], Waiohue, Pa‘akea, Kapa‘ula, Hanawi. Then comes Nahiku, a settlement spread over gently rising ground above the shore, with a number of groups of lo‘i watered from Makapipi Stream.” *Ibid.*
35. In his 1861 story of the pig god Kamapua‘a, published in *Ka Hae Hawaii*, G.W. Kahiolo noted that Wailuaiki was the home of the goddess Kapoma‘ilele, the sister of Pele who distracted Kamapua‘a with her flying genitals, luring him to Maui. *Ibid* at 23.
36. The legendary story of Laukaieie as told by Moses Manu in *Nupepa Ka Oiaio* (1894-1895) provides an abundance of rich cultural information about the Ko‘olau-Hāmākua region and its traditional and customary practices. Some activities include (starting in Nāhiku and going to Ho‘olawa, adjacent to Honopou): harvesting lū‘au of the god at Nāhiku; seeing the kalo that grew on the cliffs of Hanawī and watching a man carry a large taro there; walking on a path at Waiohue; passing the point of Kamokupeu which is a hula'ana (trail that crosses the water between two points of land); watching noio birds, finding a kū‘ula i‘a (fishing shrine) at ‘Ohea cliff; seeing the famed kala fish outside of the point of Mokumana at Pauwalu; passing Kaliae and its renowned winds; traveling to Wailuaiki famed in song where one can see women going to the shore of Kapilikaunoa; gathering awa and ‘anae fish at Wailuaiki from a fishpond made by Kāne; seeing the stone body of the supernatural octopus Hā‘alua off the landing of Wailuanui;

arriving at the muliwai of Wai'ōlohe at Ke'anae; finding a nearby cave that ran to the uplands of Kūō; visiting a pond mauka of Puhipinao where the prophet shark Hi'u was born; glimpsing Kahekili's leaping place of Pu'ukanohua; entering a cave at Kawahinepe'e that led to Waikamō'i stream and 'O'opuola, where slept the supernatural 'o'opu Ka'o'opili; viewing a carved stone in a cave flanked by ti plants at Maka'iwa; reaching Hawini to gaze at the cove of Holawa (Ho'olawa). Maly (2001 :34-36). What emerges from this journey is the significance of pathways, those on land or sea, through caves or streams, for connecting the gods, land, and people in an integrated cultural landscape. At the core of this, free flowing water is central for creating abundance, life, and growth in the region.

37. Today the importance of water to the perpetuation of Hawaiian culture and tradition is echoed in the following witness statements: "Without the water, my whole way of life would be lost," Edward Wendt, par. 20, "Spiritually, we are connected to the water. Water is life. Without water we will not be." Lezeley Jacintho, par. 24, and "If there is no water, there is no life." Terrance P. Akuna, par. 18.
38. Fresh water is essential to the perpetuation of Native Hawaiian traditional customary practices. The return of streamflows will support the regeneration of the land and people.

I declare under penalty of perjury that the foregoing is true and correct, to the best of my knowledge, information, and belief.

[Ty Kāwika Tengan]

TY KĀWIKĀ TENGAN, PhD.

5.6.10 Edward Wendt

DECLARATION OF EDWARD WENDT

I, Edward Wendt, declare that:

1. The statements below are based upon my personal knowledge.
2. I am Hawaiian.
3. I am the president of Nā Moku Aupuni O Ko'olau Hui.
4. I am a taro farmer. I farm kalo on more than one acre of land irrigated by Waiokamilo, Kualani, and Wailua.
5. My family has been in Wailuanui for six generations. I still farm on lands that trace back to the Māhele on my mother's side (Kaiha'a-Waila'ahia-Lu'ukia). I farm the same taro patches, 'auwai, and rivers in the same traditional and customary manner. That knowledge was passed on to me through the generations.
6. My ancestors are buried in Lakini and at St. Gabriel's Church located in Wailuanui.
7. Traditionally, my family gathered 'ōpae, 'o'opu, and hihiwai from Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue.
8. My family also traditionally fished for uhu, u'u, kole, ulua, 'uku, kumu, moi, honu, and anae in or near the mouth of Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ohi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puakaa, Paakea, Waiaaka, Kapaula, Hanawi, Makapipi, and Waiohue.
9. Traditionally, my family engaged in mālama 'āina and mālama kahawai by being careful not to overharvest the stream animals as well as clearing the vegetation or rubbish blocking stream flow in and around Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, Waiokamilo, Kualani, Wailua, Waikani

(Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puakaa, Paakea, Waiaka, Kapaula, Hanawi, Makapipi, and Waiohue.

10. Currently, I gather 'o'opu and hihiwai in Honomanu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puakaa, Hanawi, Makapipi, and Waiohue. I also fish for moi, enenu, manini, uaouao, ulua, and anae in or near the mouth of Honomanu, Nuaailua, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puakaa, Hanawi, Makapipi, and Waiohue.

11. I also engage in mālama 'āina and mālama kahawai by clearing stream banks of vegetation and rubbish that otherwise block stream flow in and along Honomanu, Piinaau, Palauhulu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Hanawi, and Waiohue.

12. For me, gathering and fishing from the streams enables me to provide a protein source to my 'ohana and neighbors, including kupuna, who may be unable to gather and catch their own fish. I also aim to teach the 'ōpio the traditional practices to mālama streams and gather and fish from the streams and coast lines.

13. I appreciate viewing and visiting Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, and East Wailuaiki. Every morning, my wife and I walk up to Waikani (Wailuanui) waterfall to enjoy the view and experience the beauty of this area.

14. Dewatering the streams prevented my generation from teaching 'ōpio how to mālama streams and use techniques wisely to gather from streams and fish along coastline near the muliwai.

15. The diminished stream flow has negatively affected the muliwai and the coastal fisheries, including a fish sanctuary in Hana that depends on the water. Much of my kalo could not survive the emptying of these streams, so it has made farming more difficult. The lack of stream flow has also allowed vegetation along the stream banks to block the stream beds, and has permitted invasive snail species and African tulips to take over the taro crop. Additionally, some of my neighbors have abandoned kalo farming because the streams had stopped flowing. Ultimately, the loss of stream water has changed the whole way of life

in Wailuanui-Ke'anae. It takes more time to find the resources to gather, which robs me of my time for recreation and time with my 'ohana.

16. If there was enough water in the streams, I would gather and fish as my family before me did. I would gather 'ōpae, 'o'ōpū, and hihiwai from Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puakaa, Paakea, Waiaka, Kapaula, Hanawi, Makapipi, and Waiohue. My family would fish for uhu, uu, kole, ulua, 'uku, kumu, moi, and honu (if it were legal, of course) in or near the mouths of Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puakaa, Hanawi, and Waiohue.

17. If there was more water in the streams, I would continue to clear stream banks of the vegetation and rubbish that would otherwise block stream flow.

18. If water was returned to the streams, I would appreciate viewing and visiting Waikamoi, Alo, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuailua, Piinaau, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puakaa, Paakea, Waiaka, Kapaula, Hanawi, Makapipi, and Waiohue.

19. Many original members of Nā Moku have died since we first petitioned for the return of water to these streams. It makes me sad and lose hope. They never lived to see the water return to the lo'i in 2008. I am afraid I will not live to see the return of the water we are now fighting for.

20. Without the water, my whole way of life would be lost. Corporations last forever. Traditional people do not. Crown lands should be set aside for the benefit of the people.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Honolulu, Hawai'i, HI, September [10], 2014.

[Edward Wendt]

EDWARD WENDT

5.6.11 Emily Wendt

DECLARATION OF EMILY WENDT

I, Emily Wendt, declare that:

1. The statements below are based upon my personal knowledge.
2. I am Hawaiian.
3. I was born April 7, 1925 in Hana.
4. My parents were James Akiona and Ellen Higgins.
5. My family consisted of my parents, five brothers and three sisters.
6. I was the fourth born of the family.
7. Until 15 years old, from 1925 through 1940, I lived in a house in Keanae peninsula.
8. Thereafter, my family sent me to Maunaolu Seminary, where I boarded and received my education until the 10th grade.
9. While going to school, I visited Wailuanui periodically to visit and stay in touch with my 'ohana.
10. I got married to Donald Wendt and raised my family of five children in Kahului, where I still reside.
11. During the years I was raising my children, my husband and I visited Wailuanui-Keanae as frequently as weekly.
12. My grandmother, Helena Akiona, who used to live at Lakini, is still buried at St. Gabriel's Church located in Wailuanui.
13. My father died when I was nine years old.
14. When I was between the ages of 10-13, I and my older cousin, Dorothea Lum Ho, who taught me how to gather, would gather 'ō pae, 'o'opu, and hihiwai from Palauhulu, Waiokamilo, Kualani, Hanawi, Wailuanui Streams.
15. My family also traditionally fished for popa'a, hinale'a, and kupipi from the shoreline near the mouths of West Wailuaiki and Wailuanui Streams.

16. My brother Jimmy, who was my senior by six years, would bring me by canoe to the shoreline near the muliwai of Wailuanui, Kopiliula, and Waiohue Streams to swim and pick opihi. He taught me the most about how to fish and gather.

17. My father, uncle, brothers and cousins also shared and supplied the family with u'u, enenu, kole, ulua, kumu, moi, honu, aholehole and anae, which they fished in or near the mouth of Wailuanui and West Wailuaiki.

18. My family raised pigs, chicken, and cattle while I was growing up in Keanae.

19. My brother Jimmy and I helped raise and brand pipi in our back yard

20. For me, gathering and fishing from the streams and coastlines near streams was a very important food source to my 'ohana. In fact, most of the food we ate came from what my 'ohana fished, gathered or raised.

21. I recall my relatives, the Akinas, Nakaneluas, and Ka'auamos, as well as my neighbors, all raising taro in Wailuanui and Keanae valleys as the staple for our diets.

22. Many of these families pounded their own poi, as I was taught to do when I was old enough.

23. When my father typically went shopping for food, he only purchased a few items, like sugar, cream, rice, and cookies.

24. The rest of our diet came from what we raised, fished and gathered.

25. As a youth in Wailuanui-Keanae, my 'ohana lived a very basic life living off the land and sea.

26. As I was growing up in Wailuanui-Keanae, I was not aware of any complaints against East Maui Irrigation Company about how much water was available in the lo'i and auwai of the valleys.

27. To this day, my nephew Norman Akiona and son Ed catch fish like papio, enenu, pala, manini, and kole from the Wailuanui-Keanae area for me to eat.

28. It makes me sad and lose hope when I see so many original members of Nā Moku who have died since we first petitioned for the return of all water to these streams; water that would support more taro growing, gathering, and fishing along the mouths of those streams.

29. I do not understand why Nā Moku members who started in 2001 have had to wait so long for the return of the water.

30. I think the priority should be to leave water in East Maui streams so the people who used it traditionally can continue to survive like my 'ohana used to be able to do.

31. To me, I don't know why Hawaiian Commercial and Sugar insists on diverting water that is so important to Hawaiian traditions and customs.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: Kahului, Maui, Hawai'i, December 17, 2014.

[Emily Wendt]

EMILY WENDT

Section 6 Traditional Cultural Practices

Timothy R. Pauketat succinctly describes the importance of traditions, especially in regard to the active manifestation of one's culture or aspects thereof. According to Pauketat,

People have always had traditions, practiced traditions, resisted traditions, or created traditions . . . Power, plurality, and human agency are all a part of how traditions come about. Traditions do not simply exist without people and their struggles involved every step of the way. [Pauketat 2001:1]

It is understood that traditional practices are developed within the group, in this case, within the Hawaiian culture. These traditions are meant to mark or represent aspects of Hawaiian culture that have been practiced since ancient times. As with most human constructs, traditions are evolving and prone to change resulting from multiple influences, including modernization as well as contact with other cultures. It is well known that within Hawai'i, a "broader 'local' multicultural perspective exists" (Kawelu 2015:3) While this "local" culture is deservedly celebrated, it must be noted that it has often come into contact with "traditional Hawaiian culture." This contact between cultures and traditions has undoubtedly resulted in numerous cultural entanglements. These cultural entanglements have prompted questions regarding the legitimacy of newly evolved traditional practices. The influences of "local" culture are well noted throughout this section and understood to represent survival or "the active sense of presence, the continuance of native stories, not a mere reaction, or a survivable name. Native survivance stories are renunciations of dominance, tragedy and victimry" (Vizenor 1999:vii). Acknowledgement of these "local" influences helps to inform nuanced understandings of entanglement and of a "living [Hawaiian] contemporary culture" (Kawelu 2015:3). This section strives to articulate traditional Hawaiian cultural practices practiced within the *ahupua'a* in ancient times, and the aspects of these traditional practices that continue to be practiced today; however, this section also challenges "tropes of authenticity" (Cipolla 2013) and acknowledges the multicultural influences and entanglements that may "change" or "create" a tradition.

This section integrates information from Section 1.4 and Sections 3-5 in examining cultural resources and practices identified within or in proximity of the License Area in the broader context of the encompassing East Maui landscape. Excerpts from interviews and declarations that were given in 2014 as part of the contested case on the Petition for IIFS are incorporated throughout this section where applicable.

The following subsections are also supported by a qualitative and quantitative analysis, as depicted in Table 13 and Table 14. The following analyses provide a tabulation of cultural resources, practices, and beliefs that were discussed via approved interviews and the declarations that are part of the public record in the CWRM proceedings.

Table 13. Tabulation of Cultural Practices Via Approved Interviews and Declarations

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
Farming/Gardening			
Farming, generally	Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue)	More water would improve ability to better garden and farm, follow traditional lifestyles	14
Kalo farming (wet land)	Wailuanui, Ke'anae, Honopou, Waianu Valley, Lakini, Waiokamilo	Water level/flow/velocity, invasive pests (apple snails, feral pigs), temperature all decrease yield and increase rot and disease (e.g., "guava seed"); 'auwai can become clogged affecting the above; families unable to continue selling <i>poi</i> must find other work; more flow requires less cleaning; competition between farmers; more water, less worry; from an O'ahu based community member who has conducted research in East Maui: "Ke'anae-Wailuanui is a viable traditional economy"	14

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
		which has maintained historic and cultural integrity, traditional lifestyles, and social continuity to an equal or greater extent than any of the other taro growing landscapes in Hawai'i"; alteration of any interrelated element (field, stream, 'auwai) can affect entire system—extremely complex' incentives should be provided for taro farming (e.g., tax relief, support for community ditch maintenance	
Farming, gardening misc. crops	(Kula, misc. garden veggies); (Honopou, misc.); (East Maui community member - "native crops"); (O'ahu based community member via historical documentation - 'awa, yams, kō, arrowroot, breadfruit, banana)	N/A	4
Growing watercress	East Maui	N/A	2
Raising livestock (pigs, chicken, cattle)	Ke'anae	N/A	1
Gathering			
Gathering, generally	Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu,	From an O'ahu based community member who has conducted research in East Maui: "Gathering from a variety of places is important in order to maintain the resources. The choice of place to	12

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili‘ula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue, Ke‘anae	gather is determined by the weather and other natural signs... Within the traditional cultural landscape area for Ke‘anae-Wailuanui unoccupied areas with flowing pristine streams and the forested areas are integral to the livelihoods of the families in the district” “Through subsistence, families attain essential resources to compensate for low incomes... subsistence not only provides food, it also ensures a healthy diet... is a valuable form of exercise and stress reduction and contributes to good physical and mental health. It is also a form of recreation that the whole family can share in.” Provide food for those who cannot gather on their own (<i>kūpuna</i> , etc.)	
Gathering rocks for <i>imu</i>	Honopou	N/A	1
Gathered Plants			
Gathering <i>pohole</i>	Honomanū, Honopou, Hanawī, and Makapīpī	Different type only found in mountainous areas of Maui	5
Gathering <i>limu</i>	Honopou, Punala‘u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Wahinepe‘e, Puohokamoa,	N/A	6

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/ Mentions
	Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering watercress	Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	4
Gathering tī leaf	Honopou	N/A	1
Gathering lū'au	Honopou, Honomanū, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea,	Wild taro growing in abandoned <i>lo'i</i> along streams has distinct flavor	2

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/ Mentions
	Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili‘ula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>‘awapuhi</i>	Honopou	N/A	1
Gathering <i>puakenikeni</i>	Honopou, Honomanū	N/A	1
Gathering <i>pepeiao</i>	Honopou, Wahinepe‘e, Puohokamoā, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili‘ula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue	N/A	1
Gathering <i>hāhā</i>	Honopou, Wahinepe‘e, Puohokamoā, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū,	N/A	1

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering ferns for <i>lei</i>	Honopou, Honomanū, Hanawī, and Makapīpī	N/A	1
Gathering medicinal plants	Honopou	N/A	2
Gathering <i>'uala</i>	Honopou	N/A	1
Gathering banana	Honopou	N/A	2
Gathering bamboo	Honopou	N/A	1
Gathering <i>ulu</i>	Honopou, Honomanū	N/A	2
Gathering <i>kalo</i>	Honopou, Honomanū	N/A	3
Gathering fruit (e.g., mango, guava, oranges, avocados)	Honopou, Honomanū, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/ Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea,	N/A	3

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>hau</i>	Honopou	N/A	1
Gathering medicinal plants	Honopou	N/A	2
Gathered Proteins			
Gathering <i>hihiwai</i>	Honomanū, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/ Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue, One'o	Lack of flow restricts the snails to the estuary; diversions may carry snail larvae away from ocean; smaller estuaries prevent up migration; "slowest migrating animal" good indicator of the adequacy of stream flow; from an O'ahu based community member who has conducted research in East Maui: "The gathering of hihiwai is also carefully managed. The location of the <i>hihiwai</i> is knowledge that has been passed down from generation to the next for their protection and proper management. It is not information that is made available to the general public"	11
Gathering <i>ōpae</i>	Wailuanui, mountain areas, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/ Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo,	Few left nowadays; caught now only in mountain areas where water is cool and less diverted; from an O'ahu based community member who has conducted research in East Maui: "Ke'anae-Wailuanui is one of the few remaining areas in	9

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue, Ke'anae, One'o	the Hawaiian Islands where 'ōpae can be gathered. Virtually every stream has 'ōpae at some time during the year. However, it is easier to gather 'ōpae in the tunnels of the EMI ditch system. The irrigation ditch itself is an excellent breeding area for the 'ōpae because it has flowing water year-round. Some streams below the ditch, however, don't have enough flowing water to sustain the 'ōpae year round when the water is diverted into the ditch system", 'a'aniu net used to gather it	
Gathering prawns	Honopou, Honomanū	(though these are invasive and may be a threat to 'ōpae, people still gather for food)	3
Gathering native crayfish	Honopou	N/A	2
Gathering 'opihi	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani	N/A	7

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	(Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>haukiuki</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	3
Gathering <i>pūpūlo 'i</i>	Honopou, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	1
Gathering <i>pūpū</i>	Honopou	N/A	1
Gathering <i>kūpipi</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī, Wailuaiki and Wailuanui	N/A	2
Catching crab	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	2
Catching lobster	Honopou,	N/A	3

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī		
Fishing			
Fishing, generally	Wailuanui, Ke'anae, Honopou, Honomanū, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	Process of restoration/keeping ecosystem alive; loss of fishing opportunity translates to less opportunity to teach kids how to make traditional tools and implements; "Through subsistence, families attain essential resources to compensate for low incomes ... subsistence not only provides food, it also ensures a healthy diet... is a valuable form of exercise and stress reduction and contributes to good physical and mental health... It is also a form of recreation that the whole family can share in."; "The <i>ko'olau</i> region also offered sheltered bays from which deep sea fisheries could be easily accessed, and near shore fisheries, enriched by nutrients canied in the fresh water, could be maintained in fishponds and coastal fisheries. It was around these bays that clusters of houses where families lived, could be found, and in these early times, the residents generally	11

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
		engaged in subsistence practices in the forms of agriculture and fishing”	
Fishing for <i>‘o‘opu</i>	Wailuanui, Honopou, Honopou, Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili‘ula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue, Ke‘anae, One‘o	“Certain species of <i>‘o‘opu</i> are endangered and others are rare. They require pristine and flowing stream waters to exist. Ke‘anae-Wailuanui is one of the few areas where they still can be found in sufficient size to be occasionally caught for subsistence food.”	9
Fishing for <i>kole</i>	Honopou, Punala‘u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu Waiokamilo, Kualani, Wailua, Waikani	N/A	6

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	(Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue.		
Fishing for 'ō'io	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	2
Fishing for <i>akule</i>		N/A	2
Fishing for <i>manini</i>	Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue.	N/A	3
Fishing for <i>moi</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa,	N/A	6

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>kala</i>	Honopou	N/A	2
Fishing for <i>pala</i>	Wailuanui-Ke'anae	N/A	1
Fishing for <i>weke</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	2
Fishing for <i>aholehole</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula,	N/A	7

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Hanawī, Makapīpī, and Waiohue		
Fishing for <i>moanakali</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	2
Fishing for <i>uluu</i>	Honopou, Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	5
Fishing for <i>honu</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu	N/A	5

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for mullet	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	3
Fishing for <i>omilu</i>	Honopou	N/A	1
Fishing for <i>pāpio</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī, Honopou, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	4
Fishing for <i>uhu</i>	Honopou, Punala'u/Kōlea, Honomanū, Hanawī, and Makapīpī,	N/A	5

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/ Mentions
	Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>uau</i>	Honopou, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	1
Fishing for <i>paananui</i>	Honopou	N/A	1
Fishing for	Honopou,	N/A	2

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
<i>‘ū‘ū/menpachi</i>	Punala‘u/Kōlea, Honomanū, Hanawī, and Makapīpī		
Fishing for <i>aweoweo</i>	Honopou	N/A	1
Fishing for <i>lai</i>	Honopou, Punala‘u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	2
Fishing for <i>po‘opa‘a</i>	Honopou, Punala‘u/Kōlea, Honomanū, Hanawī, and Makapīpī, Wailuaiki and Wailuanui	N/A	3
Fishing for <i>kumu</i>	Honopou, Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili‘ula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Fishing for <i>hinale‘a</i>	Wailuaiki and Wailuanui	N/A	1
Fishing for <i>tako/he‘e</i>	Honopou	N/A	1
Fishing for <i>puhi</i>	Honopou, Punala‘u/Kōlea, Honomanū, Hanawī, and Makapīpī	N/A	1

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/ Mentions
Fishing for pelagics (<i>ahi, aku</i>)		N/A	2
Fishing for <i>ono</i>		N/A	1
Fishing for marlin		N/A	1
Fishing for <i>mahimahi</i>		N/A	1
Fishing for <i>enenuē</i>	Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	5
Fishing for <i>u'u</i>	Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West	N/A	2

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/ Mentions
	Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>'uku</i>	Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	2
Fishing for <i>anae</i> (specific type of mullet)	Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West	N/A	2

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>'ama'ama</i>		N/A	1
Fishing for <i>uouoa</i>		N/A	1
Fishing for elm		N/A	1
Fishing for <i>'opakapaka</i>		N/A	1
Catch squid		N/A	1
Hunting			
Hunting, generally		"Through subsistence, families attain essential resources to compensate for low incomes...subsistence not only provides food, it also ensures a healthy diet... is a valuable form of exercise and stress reduction and contributes to good physical and mental health. It is also a form of recreation that the whole family can share in."	4
Pig hunting	East Maui (generally, and Ke'anae-Wailuanui)	N/A	3
Axis deer hunting	Kaupō (South Maui)	N/A	1
Environment			
Healthy streams / <i>wai / Mālama kahawai</i>	Honopou, Honopou, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu,	Anthropogenic disruption to continuously flowing streams can decimate endemic stream fauna/overall ecosystem (including loss of fish and other food resources in streams and at ocean)	13

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopili'ula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	(some families break apart dams built others); sugar and cattle too water intensive; can also be impacted by natural disasters (EQs, landslides, etc); families must work to clear their sections of ditches and streams of rocks and debris; loss of ability to follow local traditional life styles; affect on spiritual connection to wai; more flow requires less cleaning; competition between farmers; AMS metering of water flows seen as very important, but this data is not consistently collected or provided to public—no funding, some meters were removed; don't overharvest stream resources; less water allows vegetation (including invasives like African tulip) to establish along stream banks	
<i>Mālama 'Āina / He ali 'i ka 'āina, He kauwā ke kanaka</i>	Honopou, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani	Families must work to clear their sections of ditches and streams of rocks and debris; holistic; resources are shared	10

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	(Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Use of <i>mauka-makai</i> trails		N/A	2
Culture			
Holistic Hawaiian culture / "cultural kīpuka" / cultural viability (passing down of traditions, continued survival)	Ke'anae-Wailuanui	"Enclave of Hawaiian subsistence, cultural, and spiritual beliefs, customs, and practices;" represents cultural survival; eroded by increasing lack of water; "The lack of water has caused too much <i>pilikia</i> . When nobody cares, nobody understands our practices and our need to harvest. It pains me. It's very emotional." "Water is life; everything connected to water"; lack of water decreases opportunity to pass down traditions; less water means more times spent finding resources to gather, less time for recreation and 'ohana; "when those places dry up that adversely impacts the way of life, the cultural practice if you will"	11
Recreation (can include spiritual feeling of a place, connection to ancestors)	Wailuanui, Ke'anae, Honopou, Honopou, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea,	When ecosystems are impacted and in bad health, spiritual feeling is lost; ability to enjoy healthy/beautiful surroundings lost;	9

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue	tranquility of sounds and sights naturally flowing water; can get sick swimming in stagnant waters (i.e., leptospirosis, etc.)	
Cultural sites-traditional	Pākanaloa Heiau and ‘Ōhi‘a Spring; two <i>heiau</i> ; war temple	Damage from invasives, littering	2
Cultural sites-historic	Chinese graveyard in Honomanū and other sites along Pi‘ina‘au Rd including old ditchmen homes; EMI ditch system itself; historic taro terraces (partly mapped by CSH); “Kipapa of Kihapiilani” (early belt road/trail); St. Gabriel’s church	Ditch system features not always seen as a positive (some discussion from a community member as a positive; also discussion from a community member as negative—overgrown and abandoned; another community member added that it is negative because it cuts through sacred forest)	2
<i>‘Aumakua</i>	Maulili(shark) at estuary; general in terms of honoring while collecting resources	N/A	2
<i>Mo‘olelo</i>	Ku‘ula and Hina and Ha‘alaea at Wailuanui (1); Kane, Kanaloa (3) -springs; Papaku Makawalu (1); Wailuaiki was the home of the	Health of reef; abundance of water is what makes this land valuable to its inhabitants; water traverses all three <i>papa</i> ; “story of Laukaieie as told by Moses Manu in	4

Cultural Practice	Area / Location	Declarant/Interviewee Comments	Tally of People/ Mentions
	goddess Kapoma'ilele, the sister of Pele who distracted Kamapua'a with her flying genitals, luring him to Maui (1); story of Laukaieie (1)	Nupepa Ka Oiaio (1894- 1895) provides an abundance of rich cultural information about the Ko'olau-Hāmākua region and its traditional and customary practices.... At the core of this, free flowing water is central for creating abundance, life, and growth in the region."	
Stream baptism	Honopou	N/A	1
Making of traditional tools and implements	Honopou Honomanū	N/A	1
<i>Hula</i> /gathering <i>kinolau</i> in mountains	N/A	N/A	1
Washing clothes in streams	N/A	N/A	2
Soak <i>hau</i> for rope	N/A	N/A	1
' <i>Ohana</i> burial	Located at St Gabriels (2);	N/A	2

Table 14. Tabulation of Cultural Practices Via Declarations (Anonymous Tally)

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
Farming/Gardening			
Farming, generally	Waiokamilo and Kualani, Kukuipuka Gulch, Ke`anae, Wailua, Waianu & Pahoa, Hamau Stream, Palauhulu Stream, Honopou	Farming to feed family; traditional way requires no commercial fertilizers; agricultural homesteads described in numerous native testimonies for LCAs and LGs	17
Kalo farming (wet land)	Honopou, Waikamoi, Alo, Wahinepe`e, Puohokamoā, Ha`ipua`ena, Punala`u/Kōlea, Honomanū, Nua`ailua, Pi`ina`au, Palauhulu, `Ōhi`a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka`a, Pa`akea, Waia`aka, Kapā`ula, Hanawī, Makapīpī, and Waiohue; [Ka`alaea Valley, Waihe`e Valley and Waiahole (O`ahu)]	“The lack of stream flow is a problem for my family because we cannot grow kalo or gather how our kupuna used to. We are unable to open up new taro patches. We have also lost taro due to the lack of water.... Families cannot support themselves and have to leave the area to make money”; “I want my kids to learn — that’s the most important to me. But they can’t without the water. My granddaughter asks me, ‘Papa, when we going to open up the farm again?’”; “The lack of water has caused financial setbacks, and it has reduced the quality and quantity of taro. Additionally, not all of the lo`i on my property are opened up. Abandoned lo`i above our patches requires more work and maintenance to get water to our loi.” People having to farm	17

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
		areas off their own family land because not enough water. Native testimonies describing <i>lo'i</i> .	
Gathering			
Gathering, generally	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	"However, we can't get the same amount of these resources as my 'ohana used to be able to. We also need to go further to gather"; "I gather and fish to feed my family and kupuna who cannot go and get food themselves." Each 'ohana has its own traditions. "I gather maybe two or three times a year in order to supply food for 'ohana gatherings on special occasions"; "If there was enough water in the streams, my 'ohana would gather as my kupuna did."	16
Gathered Plants			
Gathering <i>pohole</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula	N/A	8

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>limu</i>	Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Gathering <i>pīlali</i>	N/A	N/A	1
Gathering watercress	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	8
Gathering <i>lū'au</i>	Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au,	N/A	4

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>pepeiao</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	7
Gathering <i>hāhā</i>	Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani	N/A	5

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	(Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>hāpu'u</i>	Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	1
Gathering <i>olena</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	1
Gathering <i>wauke</i>	Honopou, Waikamoi, Alo, Wahinepe'e,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering banana	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	5
Gathering bamboo	Pi'ina'au, Palauhulu, 'Ōhi'a, and Kopiliula	N/A	3
Gathering <i>ulu</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū,	N/A	2

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>kalo</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Gathering fruit (e.g., mango, guava, oranges, avocados, papaya)	Honomanū, Wailua, Waikani (Wailuanui), and East Wailuaiki	N/A	3
Gathering mountain apple	N/A	N/A	2
Gathered Proteins			
Gathering <i>hīhīwai</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena,	“We have to go high in the mountains to find the ‘Opae and hihawai” “There’s not that much	15

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	hihiwai"	
Gathering 'ōpae	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	"We have to go farther, higher in the mountains than we used to to find the 'opae. We also used to go to Honomanū but it's dirty now"; "The water problem combined with the prawns that eat the 'opae really changed the population"; "It takes about four hours to walk to where you can gather ['opae]. Before you could just get out of the car and you would see them. These days there is sometimes nothing and you need to turn around empty-handed"; "I gather 'opae in Piinaau and Palauhulu only. The other streams do not have enough water to support my gathering. I gather maybe two or three times a year in order to supply food for 'ohana gatherings on special	16

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
		occasions”; “Currently, my ‘ohana gathers ‘opae above the diversions in Wailua, West Wailuaiki, East Wailuaiki, Hanawī, Makapīpī, and Waiohue. We have to go above because there is no ‘opae below.”	
Gathering prawns	Honomanū, Pi‘ina‘au, Palauhulu, Waiokamilo, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka‘a, Hanawī, and Makapīpī; Honopou, Kualani, Wailua, and Makapīpī	N/A	4
Gathering <i>‘opihi</i>	Honopou, Waikamoi, Alo, Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue	N/A	11
Gathering <i>haukiuki</i>	Honopou, Waikamoi, Alo, Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Punala‘u/Kōlea,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>pūpūlo‘i</i>	Wahinepe‘e, Puohokamoā, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Gathering <i>wana</i>	Honopou, Waikamoi, Alo, Wahinepe‘e, Puohokamoā, Ha‘ipua‘ena, Punala‘u/Kōlea, Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Gathering <i>pipi</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	2
Gathering <i>kupe'e pu'u</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Hanawī, Makapīpī, and Waiohue		
Gathering frogs	Pi'ina'au, Palauhulu, 'Ōhi'a, and Kopiliula	N/A	2
Gathering goldfish	Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Catching crab	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u/Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	3

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
Catching lobster	Kailua, Nua'ailua, Pi'ina'au, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, and Hanawī; Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu,, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Fishing/Diving			
Fishing, generally	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	“However, we can't get the same amount of these resources as my 'ohana used to be able to. We also need to go further to gather”; “I gather and fish to feed my family and kupuna who cannot go and get food themselves”; “There also is not as much fish to eat”; “We would mālama our own ko'a's to make sure that we could keep the population going”; “Back then, fish were big and plentiful. We could catch more fish going a shorter distance by canoe”; “the fish are now scarce so we	16

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
		don't catch very many"; "We catch the same kind of fish as our kupuna, just less of them. We have to go further. We also use newer tools than before time."	
Fishing/gathering for 'o'opu	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue; Waiolohi, Ching's Pond	"There is no 'o'opu for us to gather."	14
Fishing for kole	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea,	N/A	8

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>'ō'io</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	6
Fishing for <i>akule</i>	Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a /Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	6
Fishing for <i>manini</i>	Kailua, Nua'ailua, Pi'ina'au, Wailua, Waikani (Wailuanui),	N/A	2

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TMKS: Various

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, and Hanawī		
Fishing for <i>moi</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	13
Fishing for <i>kala</i>	N/A	N/A	2
Fishing for <i>pala</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
Fishing for <i>weke</i>	Puohokamoa, Ha'ipua'ena, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Wailua, and West Wailuaiki, Honopou	N/A	2
Fishing for <i>aholehole</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	13
Fishing for <i>ulua</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula	N/A	3

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TMKS: Various

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>honu</i>	N/A	N/A	3
Fishing for mullet	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	
Fishing for <i>pāpio</i>	Kailua, Nua'ailua, Pi'ina'au, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, and Hanawī. Palauhulu; Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua,	N/A	5

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>uhu</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	7
Fishing for <i>uau</i>	Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>'ū'ū/menpachi</i>	Pi'ina'au and Palauhulu	N/A	3
Fishing for <i>aweoweo</i>	Kailua, Nua'ailua, Pi'ina'au, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, and Hanawī; Honopou, Hanehoi/Puolua, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	3
Fishing for <i>lai</i>	Honopou, Wailua, Waikani (Wailuanui), West Wailuaiki, and East Wailuaiki	N/A	1
Fishing for <i>po'opa'a</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā,	N/A	6

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>kumu</i>	Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	5
Fishing for <i>hinale'a</i>	Honopou, Wailua, Waikani (Wailuanui), West Wailuaiki, and East Wailuaiki	N/A	1
Fishing for <i>tako/he'e</i>	Honopou, Wailua, Waikani (Wailuanui), West Wailuaiki, and East Wailuaiki	N/A	2

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
Fishing for <i>puhi</i>	Pi'ina'au, Palauhulu, and 'Ōhi'a	N/A	1
Fishing for pelagics (<i>ahi, aku</i>)	Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	2
Fishing for "deep seven bottom fish" (<i>onaga, ehu, 'opakapaka, kalekale, lehi, gindai, and hapuupuu</i>)	Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nua'ailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	1
Fishing for <i>mahimahi</i>	Waikamoi, Alo, Wahinepe'e,	N/A	1

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TMKS: Various

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>enenue</i>	Puohokamoa, Ha'ipua'ena, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Wailua, and West Wailuaiki; Honopou, Wailua, Waikani (Wailuanui), West Wailuaiki, and East Wailuaiki	N/A	10
Fishing for <i>u'u</i>	Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, and Waiohue	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
Fishing for <i>anae</i> (specific type of mullet)	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	7
Fishing for <i>uouoa</i>	N/A	N/A	1
Fishing for <i>awa</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	2
Fishing for <i>pakaawa</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Ha'ipua'ena, Punala'u /Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>palani</i>	Kailua, Nuaailua, Pi'ina'au, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka'a, and Hanawī; Punala'u / Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	N/A	2
Fishing for <i>pakeawa</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena,	N/A	1

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Punala‘u /Kōlea, Honomanū, Nuaailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue		
Fishing for <i>noho</i>	Kailua, Nuaailua, Pi‘ina‘au, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula, Puaka‘a, and Hanawī	N/A	1
Fishing for <i>kūpipipi</i>	Honopou, Wailua, Waikani (Wailuanui), West Wailuaiki, and East Wailuaiki	N/A	1
Hunting			
Hunting, generally	Honopou, Waikamoi, Alo, Wahinepe‘e, Puohokamoā, Ha‘ipua‘ena, Punala‘u / Kōlea, Honomanū, Nuaailua, Pi‘ina‘au, Palauhulu, ‘Ōhi‘a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West	“I hunt in most of the areas the streams flow, and I notice there is not as much water in the streams.”	7

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Pig hunting	Puohokamoā, Ha'ipua'ena, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Wailua, and West Wailuaiki	"When my family would hunt wild pig, we would try and let go the pregnant sows and babies to preserve for the future"	3
Environment			
Healthy streams / <i>wai</i> / <i>Malama kahawai</i>	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoā, Ha'ipua'ena, Punala'u / Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue	"Cleaning the above-named streams to help the water flow all the way to the ocean and support the ecosystem we rely on to farm, fish, hunt, and gather"; "Gathering according to the moon and not always going to the same places so we Didn't overharvest the stream"; "The lack of stream flow is a problem for me as a Hawaiian. It hurts me to see the 'āina and its resources suffering"; "My family and I had to leave the area because there was not enough water and that made it harder to continue fanning and gathering"; "Always throwing the small fish back into the ocean"; "also sometimes have to spend money to	16

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
		<p>provide substitute foods for meals and special occasions, though there really is no substitute for the 'opae I get myself'; "We knew not to overharvest, were mindful of seasonal spawning, and respected the cycle of life"; "Now, we have to go longer distances to catch more fish because of the lack of stream water flowing to the ocean"; "[Traditionally] they didn't have problems that required the same kind of cleaning because there was more flow"; "there has been fighting amongst community members over water needs. This shouldn't be happening"; "If there was enough water in the streams, I would live at home and live off the land we were raised on"</p>	
<p>Mālama 'Āina / <i>He ali 'i ka 'āina, He kauwā ke kanaka</i></p>	<p>Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u / Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani (Wailuanui), West</p>	<p>N/A</p>	<p>14</p>

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue		
Culture			
Holistic Hawaiian culture / "cultural kipuka" / cultural viability (passing down of traditions, continued survival)	N/A	"Families cannot support themselves and have to leave the area to make money"; "The lack of stream flow is a problem for me because we need water so future generations can continue our traditions"; "Because of the lack of stream flow, we are losing our cultural practices"; "If water was returned to the streams, I would appreciate seeing mother nature working as intended"; "also like teaching my son what I learned growing up"; "I don't want my kids eating out of a tin can. I want them to eat natural food."	14
Recreation (can include spiritual feeling of a place, connection to ancestors); swimming, enjoying scenery, camping, etc.	Honopou, Waikamoi, Alo, Wahinepe'e, Puohokamoa, Ha'ipua'ena, Punala'u / Kōlea, Honomanū, Nuaailua, Pi'ina'au, Palauhulu, 'Ōhi'a/Waianu, Waiokamilo, Kualani, Wailua, Waikani	"In some places the water is dirty and just sits because there's not enough flow. I got a staph infection four times just swimming in the water"; "Being up in the mountains feels free... There is something spiritual about being around the streams"; "To me, more water means	14

Cultural Practice	Area/Location	Declarant/Interviewee Comments	Tally of People/Mentions
	(Wailuanui), West Wailuaiki, East Wailuaiki, Kopiliula Puaka'a, Pa'akea, Waia'aka, Kapā'ula, Hanawī, Makapīpī, and Waiohue; Ching's Pond	more beauty.”	
Washing dishes in streams	N/A	N/A	1
Bathing in streams	N/A	N/A	1

6.1 Agriculture and Subsistence

The License Area covers four licensed areas: Huelo, Honomanū, Ke‘anae, and Nāhiku. With multiple streams flowing through each license area, it is easy to determine the placement of *lo‘i* near these streams for proper irrigation. The wet areas of East Maui provided the perfect environment to cultivate *kalo*. Numerous streams in this region ensured proper filtration and adequate water levels for *kalo* to thrive. Three separate field systems encouraged by community cooperation were evident in the regions of Ke‘anae and Wailua Nui. Wet patches were found at lower elevations while dryland *kalo* were planted higher up.

Dry-zone agriculture on the slopes of Haleakalā was utilized where streams were not available and non-existent. These slopes were most suitable for cultivating sweet potato and dryland taro. In this region, both wetland and dryland techniques were used to maximize food diversity and harvests.

In Ke‘anae, the peninsula was once a barren lava field. The chief at the time, pressured by growing populations, ordered the people to bring soil from the valley out to the peninsula. This is how Ke‘anae is lush and thriving today.

Evidence show that Hāna once produced dryland sweet potato, dryland *kalo*, yams, sugarcane, and breadfruit. The variety of produce can attest to the large population in that region and also the mixture of knowledge required to cultivate the different plants. Hawaiians did take into account the different moon phases and its effect on cultivation and fishing. Plants were known to grow better when planted in certain moon phases and some nights were better than others for fishing.

Nāhiku was intensely cultivated and in addition to *kalo* and sweet potato, the upper region was forested with native trees such as *koa*, *‘ōhi‘a lehua*, and sandalwood. Weapons and canoes were made of *koa* because of its strength and durability and sandalwood became a large export during the time of Kamehameha I. According to Handy et al. (1991), Nāhiku was also a very fertile *ahupua‘a*. Wetland taro were planted next to streams while dryland taro was planted near house sites. Throughout east Maui, even areas considered too arid for *lo‘i* cultivation would be utilized for small scale cultivation.

Mr. Kyle Nakanelua, whose family is from Wailua, remembers not only tending to the family *lo‘i* but also gathering from the rivers and streams. An important concept brought up by Mr. Nakanelua to ensure the longevity of food resources in the area is the act of gathering just enough to feed your family. This follows the traditional Hawaiian saying of “*E ‘ai i ka mea loa‘a*” (Pukui 1986:31), which translates to being satisfied with what you have and taking only what you need. Another saying, “*He ali‘i ka ‘āina, He kauwā ke kanaka*” (Pukui 1986:62), could be understood as putting the land and its resources before man and his wants.

Mr. Dan Clark from Ke‘anae has been farming *kalo* for 15 years. His property is fed by both Pi‘ina‘au and Palauhlulu Stream and he says that the best production of *kalo* requires “cool, fast running water”. He also says that low stream flow results in an increase in disease to his *kalo* which ultimately decreases production.

Ms. Lezley Jacintho and her brother Jonah, both native Hawaiian *kalo* farmers from Honopou remember gathering and fishing with her family according to the different moon phases. A

popular calendar taken from old traditions and put together by the Prince Kūhiō Hawaiian Civic Club focuses on fishing and farming practices observed in east Maui. According to *kūpuna* who observed these phases, some nights were good for fishing and farming (Akua, Kaloakukahi) and other nights were not ideal. These nights were spent in prayer until the rise of the next moon when fishing and farming were fair.

6.2 Aquaculture

Numerous streams flow from the backside of Haleakalā to the ocean providing not only an abundant supply of fresh water, but an ecosystem for aquatic life, which was and continues to be an important food source for Native Hawaiians (McGregor 2007:109). Over two dozen streams can be found within the License Area, including areas within Huelo, Honomanū, Ke'anae, and Nāhiku.

Mo'olelo, wahi pana, 'ōlelo no'eau, and oli all attest to the abundance of water, aquaculture, and traditional Native Hawaiian lifestyles dependence of these vital resources. Habitation along the coastal areas of East Maui are estimated at AD 1200 (Haun et al. 2004). This is also where Native Hawaiians depended heavily on access to ocean resources. Native Hawaiian author and historian Samuel Kamakau relates that the people of Ko'olau worshipped sharks “in order to be saved from being eaten by a shark when they went fishing” (Kamakau 1991:78). In the book *Ka 'Oihana Lawai'a: Hawaiian Fishing Tradition* by Daniel Kahā'ulelio (2006), the preferred method of fishing was an open ocean style in deep waters off the coast of East Maui. The *kākā* and *kūkaula* methods were favored. The *kākā* method required a hook and line, but no weight was needed. This method was also used at a depth of 200 fathoms. The *kūkaula* method also used hook and line, but was employed at a depth of 50+ fathoms. Land Commission Awards also indicate that claims were made for fresh water and off-shore fisheries. Claims include the sea shore, ocean, streams, *'ōpae* and *'o'opu* fishing grounds.

Community participant Kyle Nakanelua spent many summers and winter breaks with his sister and older cousin at his grandparent's home in Wailua Nui. He recalls spending time with his *kūpuna*; working in their *kalo* fields; and gathering food products from the rivers and streams such as *'ōpae, 'opihi, 'o'opu, and hīhīwai*. When Mr. Nakanelua was a child, he recalls *'ōpae* being prevalent in the streams that flow through their property named Lakini. As Mr. Nakanelua began to clean the family property on a regular basis from 1989, he points out that there was some *'ōpae* because his grandmother would catch and eat. Today there are no *'ōpae*, but instead prawns. When posed the question if perhaps *'ōpae* was being over picked by others, he responds with “no” because “we were the only one there.” He also does not believe that prawns are to blame for the decline of the *'ōpae* population, but instead believes that the flow of water has been impactful. He adds that the *muliwai*, the rivermouth, is an important area as this is where fish spawn.

In addition to freshwater species, Mr. Nakanelua's grandmother fished and gathered for food items *makai*. She fished for *'ōhua* or young fish. She also gathered baby eels by putting “*palu* in the hand and then the small eels would come in” and grab the bait. The *papa* at Ha'alua served as a fish breeding ground. The reef served as a home to fish of all species and sizes including *'opihi*. Fish usually caught in this area include *kole, 'ō'io, akule, and pelagics such as 'ahi and aku*.

In terms of preparation, *'opihi* was eaten raw and *hīhīwai* was used for soup. *'O'opu* was steamed. *Limu* was a side dish and used as a condiment. Mr. Nakanelua's grandmother would make *lomi 'ō'io*. The fish was cut open, the soft meat was scraped, and any small bones were picked out by hand. *Inamona* and *limu kohu* were added then kneaded to create the raw dish. Another favored option to dry fish in a dry box. All marine life was taken home, cleaned, then eaten for dinner. Leftovers were eaten for lunch the next day.

Skippy Hau, Aquatic Biologist, has worked extensively with freshwater species including *'ōpae*, *'o'opu*, and *hīhīwai*. His research has taken him into the streams of Maui that have been directly impacted by years of water being diverted. He is an advocate for the positive impacts of properly managed, natural stream flows. In a report written by Mr. Hau, he states, "The lack of flow restricts *hīhīwai* to the stuary...The persistence of juvenile *hīhīwai* recruitment confirms the possibility for restoring native stream population if 'natural flow' is restored. Stream restoration should be based on the needs of the slowest migrating animal such as *hīhīwai*" (Hau 2007:171). He also states that diversions may also be carrying *hīhīwai* larvae away from the ocean. Mr. Hau's research presents statistics that a certain level of stream flow is required to ensure healthy migration and population for *hīhīwai*, *'o'opu*, and *'ōpae*.

Mr. Hau shared that in the 1920s and 1930s, residents who lived near streams would catch *'ōhua*, which he relates as the young stage of the *manini* which has not gotten its stripes yet. The *'ōhua* would be gathered before sunrise, prepared for the dry box, dried, then "eaten like candy" as Mr. Hau described. *Hinana* or the young *'o'opu* would be prepared and eaten the same way. This information from *kūpuna* and older residents of East Maui helped Mr. Hau in figuring out population patterns. He also shared that *'ōpae* could be caught in lower streams, whereas today they are only caught in the mountain areas where the water is much cooler. Although there is still a reasonable population of *'ōpae*, they have adapted to the inconsistent stream flow caused by the water diversions.

Mr. Earl Smith Sr. from Kaupō can recall traditionally gathering *'ōpae*, *hīhīwai*, and *'o'opu* from Hanawī, Makapīpī, and One'o Streams. Today, he can only find them in Hanawī. Near the coast, Mr. Smith would fish for *moi*, *aholehole*, *manini*, and *enenu* but has noticed a depletion of fish. There was once schools of *enenu* at the coast but Mr. Smith has noticed a considerable decrease which could be connected to the lack of stream flow that empties into the ocean.

Mrs. Emily Wendt recalls going to the shoreline by canoe with her older brother to pick *'opihi*. They would typically go near the stream mouths of Wailuanui, Kopiliula, and Waiohue Stream to gather. Mrs. Wendt says gathering from the streams and fishing near the shore was the primary source of her family's diet, as was the pattern in the old days where living off the land was the true meaning of survival.

6.3 Habitation

In the story, *Ka Mo'olelo o Hi'iakaikapoliopole*, the young goddess stops at Maui whilst on her quest to retrieve Lohiau. Upon arriving in Wailua Iki, they came across a group of people celebrating *hula* in a *hālau* filled with men, women, and children. This shows the concentration of people in Wailua Iki and also the extent and popularity of *hula*. Hi'iaka first learned how to dance *hula* by her beloved friend Hōpoe in Kea'au, Hawai'i.

The great chief of Maui, Pi'ilani, created an extensive, hand-fitted, basalt block road which extended about 60 ft connecting Wailuku to Hāna. After his death, his son Kihapi'ilani, continued construction extending the road through Kaupō and across Haleakalā. It was called the Alaloa (Long Road) of Kihapi'ilani. The road provided not only an ease of access around the island but a means of trade, commerce, and war time protection for the people of Maui. It allowed the people them to send word of invading forces approaching the island.

During the construction of the Alaloa, it was also believed that Kihapi'ilani constructed Pi'ilanihale Heiau in Hāna. This *heiau* is considered the tallest in the entire archipelago. The size of the *heiau* would suggest a large population in East Maui capable of completing such a great structure. The Alaloa may have been an access way for all able-bodied men of Maui to commute and participate in its construction. The amount of men required for this construction also suggests a large amount of food needed to sustain them.

In addition, Land Commission Awards demonstrate a high concentration of residents along the coast in Huelo and Ke'anae. Residents of East Maui, Mr. Earl Smith (from Kaupō) and Ms. Lyn Scott (from Honopou), remembers a time when they would wash their clothes in the stream. One can assume that washing clothes in the stream not only meant a constant flow of water but, most importantly, clean water. Ms. Lyn Scott also remembers soaking *hau* in the stream in preparation for making cordage. Though she does not go into detail, *hau* is usually soaked in water to remove slime from the bark and to separate the layers of bark. When the bark is dried, it can be twisted to the desired ply.

Mr. Garret Hew mentioned how natural disasters in east Maui had a negative effect on the environment and interrupted the natural flow of water. He spoke with residents of Hāna who shared that an earthquake caused the Mokulehua Stream water to seep into the ground rather than flow down to the ocean. Heavy rains and consequent floods have washed away ponds and in one particular instance, caused a landslide that completely took out a pond adjacent to Hāna Highway. These natural disasters could be clear evidence of habitation patterns in east Maui and areas where residents would avoid due to the possibility of floods or landslides.

Ms. Davianna McGregor has done extensive doctoral research on the condition of Hawaiians in the first 32 years of direct U.S. rule over Hawai'i. She compared the conditions of Hawaiians who lived in urban O'ahu with Hawaiians living in rural communities as on Moloka'i, the area of Hāna, and Waipi'o on Hawai'i Island. Her studies focused primarily on traditional subsistence farming, fishing, hunting, and gathering practices in these rural communities. The practices observed by Ms. McGregor closely mirrored the customs and practices of ancient Hawaiians and though they are location specific, she found those practices to be "resilient and persistent."

6.4 *Mo'olelo and Wahi Pana*

Many of the *mo'olelo* and *wahi pana* reflect the abundance of aquaculture in East Maui and the importance of water. In the tale "Hi'u of Ko'olau" the story involves two families in Ke'anae who used to exchange food. The couple who lived *makai* would trade fish to the couple who resided in the *mauka* region for produce and vice versa. One day the woman from the shore gave her sister-in-law a fishtail in exchange for bananas and sweet potatoes. Instead of complaining about the meager trade, the woman took the fishtail home and put it into a calabash. Overnight

the couple dreamed about a shark and when they awoke they found a shark in the calabash. The couple freed the shark in an upland pool and during a heavy rain the shark was washed downstream. Today the shark lives in a cave near Ke'anae wharf (Lueras 1983:92).

In the legend of "Springs of Kāne," the demi-gods Kāne and Kanaloa are in search for water to accompany their appetite for *'awa*. One of the first places they are known to have traveled on Maui is to the mountains of Ke'anae. Kāne inserted his wood staff into the ground and a spring appeared. Author Martha Beckwith places these springs across from 'Ōhi'a Gulch beyond Ke'anae (Beckwith 1970:65). The pair continue to travel east forming springs and fishponds in Luala'ilua, Kaupō, Kīpahulu, Waihe'e, and Kahakuloa.

Mr. Kyle Nakanelua also shares his take on the *mo'olelo* of Kāne and Kanaloa. He refers to the spring as 'Ōhi'a and places it near Pākanaloa Heiau. The *heiau* consists of a couple platforms, but in recent years the area has been choked by *hau*.

Because it was founded and formed by Kāne and Kanaloa. And I'm not talking about those magical, mystical gods. I'm talking about two real guys that actually existed, you know? And for me and my educational base their ancestors that are upon us, ancestors that were so great and from such a time, so long ago, that we have commemorated them to various landscapes across, you know, across this *pae moku*. But definitely on Maui that is one of their places that they have established. And if you think about establishing a spring—the establishment of a spring—it's drinking water. Fresh, pure drinking water that is necessary for people to live. And so if you look at it, there's a spring there, and then above the spring there's a temple complex or let's call it a church complex. Why do you need a church? You need a *ō*church because you have people. And people require [loud sigh] spiritual sustenance, you know, as well as food sustenance. So, there was an established ancient village there of where that was the central focal point. And if you look at the societies of the world—and everyplace—the center of society is the religious institution for a lack of a better phrase at this moment in time. So, the temple complex is called Pākanaloa or "the enclosure of Kanaloa" and it oversees and is connected to the well spring called 'Ōhi'a that was established by Kāne and Kanaloa who are notable ancestors that are always paired together.

Author Martha Beckwith adds that Pākanaloa Heiau was erected in a place where violent thunderstorms occur and that this was a form of the god, Kāne-hekili. It is said that Kāne-hekili's human form had one side of his body black and the other side white. Kahekili, the last ruling chief of Maui, was tattooed black on one entire side of his body to show that he belonged to the same family (Kirch 2012:248; Maly and Maly 2001:13).

Mr. Nakanelua also relates the *wahi pana* known as Ha'aluea, a *papa* that extends just off the shoreline of Wailuanui. The reef was the *'awe'awe* or tentacle of the great squid known as Ha'aluea. The *mo'olelo* behind it is that 'Ai'ai had cut off the tentacle, which later became petrified. The story stems from "Ku'ula from Hāna." It is said that Ku'ula and Hina were called upon for assistance in Wailuanui. A *leho* was removed from a gourd that was given to 'Ai'ai, son of Ku'ula. The *leho* was attached to a line then lowered into the ocean where it emitted rich,

beautiful colors that attracted Ha'alua. The large squid came out of its hole and appeared at the surface of the water where men in canoes surrounded Ha'alua. The men were frightened by the size of the squid and Ha'alua had every intention of killing everyone, but instead 'Ai'ai's friend shoved a stone into Ha'alua's head and cut off his arm, which now makes the *papa* today.

Mr. Nakanelua also pointed out that various ponds are dedicated to *mo'o* (lizard, water spirit) and there are ponds specific to *puhi* or eels. He relates:

And there's one stream that's named after a *mo'o* and that stream or that area—stream rivulet is called Waiakakamilo, so “the water of Kamilo.” There's another stream in the area of Waianu, I believe. It's a big one. It's a main tributary and it's called Waiakuna or “the waters of Kuna” and that was a big *puhi* of that place, at that time.

Ms. Kauai Kanaka'ole, an *'olapa* (dancer) of Hālau o Kekuhi spoke of her passion of hula and the role it has played in her life as a mother, teacher, and *kumu hula* (hula teacher) . She says:

Hula has taught me about the many facets of our culture, from menial work to ritualistic prayer, from the bloom of a leaf-bud to the cycle of water in the forest, from obeying the request of an older sibling to embracing the transformation into your god-self. Hula has given me an education that cannot be translated into any degree at a university and my family has solidified those teaching and anchored me spiritually and it is this inherited DNA that I pass on to my two children.

Ms. Kanaka'ole mentions the saga of Pele and Hi'iaka, when Hi'iaka arrives at Kauiki in Hāna and chants about the Kauiki hill, Mokuhanu and the freshwater spring of Punahoa. Ms. Kanaka'ole also mentioned stories of the gods Kane and Kanaloa and how they journeyed through east Maui “thrusting their staff” into the ground thus resulting in pools of freshwater across the region. Due to the abundance of freshwater, many people of the area admired and worshipped these gods. She tells the story of Kalemakuakaimano, a man who lived in Pauwalu:

When he lived there, there was no spring, just the water from the river that would flow when there was a lot of rain, however, because he constantly importuned Kane and Kanaloa as his gods, grew and ate the kinolau of these gods, they visited him one day. At that visit he prepared a feast and chewed the awa for his gods and served them. In return Kane and Kanaloa thrust their staff and springs erupted out of the ground with a loud rumble that continued so one of the spring was closed up and the one that was flowing quietly was left.

The countless stories that mention water in the east Maui region show how invaluable it is for the environment and the people who reside there. Ms. Kanaka'ole explains the concept of Papaku Makawalu and how water is present in each level of the Hawaiian universe:

Papaku Makawalu is a Hawai'i ontological knowledge system that assigns the Hawaiian universe to three Papa or houses of knowledge. The first of the three is Papahulihonua, which includes all of the earthly elements such as the ocean, volcanic processes, and the water cycle. Kane (and Kanaloa for that matter) is a vital component of Papahulihonua in his occupation as water, Kane is the entity in and of Papahulihonua that mingles continuously with elements of Papahulilani

(the second Papa). Papahulilani is the atmospheric elements including the sun, weather, stars, planets, heavenly strata, and seasonality. The third Papa is Papahanaumoku. This papa is comprised of the living components with the biological intelligence of procreation. Those who belong to the house of Papahanaumoku are the direct beneficiaries of Kane. These individuals include everything from plants, to birds, to coral, to fish, to mea kolo (creepers), and kanaka (man). The house of Papahanaumoku also includes the activities that kanaka engage in, including things like hula and caring for the land. Kanaka functions including consciousness and inner conscious are also in the house of Papahanaumoku. Water is one of the few elements that easily traverse all three Papa. It is the nature of the water cycle that make it a part of Papahulihonua when it is on earth in the form of streams, springs, aquifers or even a puddle.

In closing, Ms. Kanaka'ole says the close relationship and dependent energy between element and *kanaka* must be maintained and nurtured so that "our island world lives and prospers."

Section 7 Summary and Recommendations

CSH undertook this CIA at the request of Wilson Okamoto Corporation. The research broadly covered the entire licensing areas of Huelo, Honomanū, Keʻanae, and Nāhiku.

7.1 Results of Background Research

Background research for this study yielded the following results, in approximate chronological order:

1. The License Area encompass the following *ahupuaʻa*: Honopou, Mokupapa, Waipiʻoiki, Waipiʻonui, Hanehoi, West Hanawana, East Hanawana, Puʻuomālie, Pāpaʻaʻea, West Makaīwa, East Makaīwa, Honomanū, Keʻanae, Wailuanui, Wailuaiki, Koʻolau, and Paʻakea.
2. Makapipi, Hanawī, and Kapāʻula in the Nāhiku License Area; Waiaʻaka, Paʻakea, Puakea, Waiohue, Kopiliʻula, Puaʻakaʻa Tributary, East Wailuāiku, West Wailuāiki, Wailuānui (Waikani Waterfall), Kualani (or Hāmau), Waiokamilo, ʻŌhiʻa (or Waianu), Palauhulu (Hauoli Wahine and Kano Tributaries), Piʻinaʻau in the Keʻanae License Area; Nuaʻailua, Honomanū, Punaluʻu (Kōlea and Ulunui Tributaries), Haʻipuaʻena in the Honomanū License Area; and Puohokamoā, Wahinepeʻe, Waikamoi (Alo Tributary), Kōlea, Punaluʻu, Kaʻaiea, ʻOʻopuola (Makanali Tributary), Puehu, Nāʻiliʻilihale, Kailua, Hanahana (Ohanui Tributary or Hanawana or Hanauna), Hoalua, Hanehoi, Huelo (Puolua Tributary), Waipiʻo, Mokupapa, Hoʻolawa (Hoʻolawa ili and Hoʻolawa nui Tributaries), and Honopou (Puniawa Tributary) in the Huelo License Area.
3. According to *moʻolelo*, in “The Epic Tale of Hiʻiakaikapoliopole,” retold by Hoʻoulumāhiehie, Hiʻiaka and her friend Wahineʻōmaʻo sail to Maui and travel to the windward side of the island. They stop in Wailua Iki Ahupuaʻa where they encounter a group of people celebrating the hula. The *hālau* was filled with men, women, and children (Hoʻoulumāhiehie 2008:199). Hiʻiaka sees her cousin Kapokūlani (Kapo) in hopes of being invited in to eat and rest. Hiʻiaka offers a chant and this is when Kapo notices her *ʻohana*. It should be noted that Kapo is a goddess of sorcery on Maui where she acts as an *akua noho*.
4. Kihapiʻilani is the son of the *aliʻi nui* Piʻilani. Kihapiʻilani is known for his *lelekawa* skills and for building a stone paved road around the island of Maui (Beckwith 1970). According to legend, Kihapiʻilani fled from his brother and took up residence in Makawao but kept his identity a secret. He left Makawao after he was accused of being lazy and stayed in Kaluaʻama in Haʻikū to obtain sweet potato growing skills. He later took his skill set to Kalaniwai and Wailuku.
5. In the legend of Kāne and Kanaloa, the two demi-gods are in search for water to accompany their appetite for *ʻawa*. One of the first places the pair travel to is in the mountains of Keʻanae where Kāne thrusts his *kauila* wood staff into the ground and a spring appears. According to author, Martha Beckwith, two holes can be seen across from ʻŌhia Gulch (1970:65).

6. 'Ai'ai, son of Ku'ula the Fish God, instructed his friends to venture into the deep waters off of Wailua Nui Ahupua'a and kill the giant *he'e* that lived there. Canoes were drawn and people came down ready. 'Ai'ai brought the *hokeo* and *leho* that his father gave him. The canoes and people sailed out. It was here that Ku'ula and Hina were called upon for their assistance and the *hokeo* and *leho* were taken out and lowered into the ocean. The *he'e* was attracted by the radiance the *leho* brought out but due to its overwhelming size, scared the people. 'Ai'ai's friend brought a stone with him and at the right time, shoved the stone into the head of the squid. The weight of the stone sunk the *he'e* and one of the men cut off one of the tentacles of the squid. When the *he'e* died it turned into stone and a formation resembling a squid can be seen just outside of Wailua Nui (Thrum 1907:234-235).
7. Of the 230 structures that Walker (1931) surveyed on Maui, 39 of the recorded *heiau* (Walker Sites 64 through 102) were documented in this portion of East Maui. Of the 39 documented *heiau* sites, only one lies within the License Area. This *heiau* is named Pu'u o Koholā and was presumed to be located within the current Honomanū License Area. Pu'u o Koholā was listed as "destroyed/not found" by Walker (1931).
8. The Alaloa (Long Road) of Kihapiilani or the Kihapiilani Highway, was constructed during the sixteenth century during the reign of Kihapi'ilani. The chief is credited with completed the paved road from Hāna to Wailuku, which was initiated by his father, Pi'ilani (Fleming 1933). The road provided a means of trade, commerce, and war time protection.
9. Honomanū Valley was once the site of a large Hawaiian community. The residents of this area utilized the bay for canoe fishing and the uplands for agricultural terracing and house sites (Handy and Handy 1978). Another account states that many burials can be found in the upper reaches of the valley (Sterling 1998:109).
10. Ke'anae Peninsula is a lava plain that extends a mile into the ocean from Ke'anae Valley. This area is known for *lo'i* cultivation and still continues to celebrate a traditional Native Hawaiian lifestyle today (Handy 1940).
11. The earliest estimation of occupation along the coastal region of East Maui is approximately AD 1200 (Haun et al. 2004). The abundance of traditional land divisions and place names between Hāmākua Loa and Hāna suggest habitation was extensive after initial establishment.
12. Documentation regarding Native Hawaiian tenancy reveal that ocean resources were just as important as products of the land for sustenance. The preferred method of fishing was open ocean fishing for the people who lived along the coast of East Maui. In waters of ten or more fathoms deep, the favored technique was *kākā* or *kūkaula*.
13. It has been noted that there was some rivalry between the *ahupua'a* of Ke'anae and neighboring Wailua Nui. This rivalry gave way to larger political battles concerning rule of Maui Island between the sons of Pi'ilani (Kamakau 1992:22-29) and later the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International Inc. et al. 1995).

14. In 1778, after Captain James Cook's ships returned from their North American explorations, the crew stopped in Hāna and encountered Hawaiians for the first time on board their ships (Cordy 2000:294).
15. Prior to the establishment of the Hāna protestant mission in 1837, missionaries would visit East Maui once or twice a year. Hāna was considered to be "one of the most isolated places in these islands, remote and difficult to access" (Bishop 1861). The journey was made by horseback to Ke'anae then traveled by canoe for the remainder of the trip.
16. Māhele documentation exhibits that occupancy was dense in East Maui, especially in the Honopou, Mokuapapa, and Ke'anae regions. According to records, the land was used for traditional crops including *lo'i kalo*, *kula*, potato growing, *olonā*, 'ie, *wauke*, *koa*, 'ulu, and 'ōhi'a. In addition, many streams, 'auwai, and *loko i'a* were claimed as well. A unique trait to this area was that specific areas including the sea shore, *pali*, government roads, and streams that contained 'ōpae and 'o'opu were also claimed.
17. The Māhele of 1848 set the precedence of private land ownership across the entire Hawaiian Island chain and Maui was no exception to the age of Western development. The Māhele enabled foreigners and foreign nationals to acquire land for the establishment of ranching and plantation operations, including any infrastructure projects that were to support these land intensive industries.
18. With the decline of the whaling industry in the mid- to late-1800s, the Hawaiian Islands attracted a new generation of entrepreneurs. Samuel T. Alexander and Henry Perrine Baldwin were prominent in this movement. Alexander was credited with using irrigation for improving sugar cane and banana yields (Dean 1950), while Baldwin's father had been granted 2,675-acres of land in northwest Maui.
19. In 1867, S.T. Alexander proposed a massive construction project to bring mountain water from the streams of East Maui to the Central Maui isthmus, where many sugar crops were experiencing drought (Kuykendall 1967:64). This would later be known as the East Maui Irrigation Company (EMI) ditch system (the EMI Aqueduct System).
20. The digging of the irrigation ditch from East Maui to Central Maui was a great feat. Hundreds of men were employed at a time with food, shelter, and tools supplied to them. The work required brute strength as heavy timber for flumes would need to be transported from the main road to the upper reaches of the forest (Thrum 1877:39-42). The crew dealt with torrential rains and landslides. Sometimes workers hacked their way through the thick forests and were required to descend sheer cliffs by way of rope.
21. In July of 1877, the first water began to flow through the ditch and reached Haiku Plantation 24 hours later. Approximately 60 million gallons of water per day ran through the ditch system. The system cost \$80,000, which was paid for by Castle & Cooke.
22. The EMI Aqueduct System has been in use for over 140? years and continues to collect water today for private and municipal entities. The EMI Aqueduct System contains 50 miles of tunnels, 24 miles of open ditches, inverted siphons and flumes, 388 intakes, eight reservoirs, and a solar powered radio telemetry system to monitor ditch flow. The

catchment begins at roughly 1,300 ft elevation and delivers water to Central Maui at an elevation of 1,150 ft, covering 18 miles from its western to eastern extent (ASCE 2001).

7.2 Results of Community Consultation

CSH attempted to contact NHOs, agencies, and community members. Below is a list of individuals who shared their *mana'o* and *'ike* about the proposed Water Lease and the License Area :

1. Dr. Kamana'opono Crabbe, Ka Pouhana – OHA
2. Pomaika'i Crozier. Conservation Manager – Pu'u Kukui Watershed Preserve
3. Skippy Hau, *Kama'āina* (native born) and Aquatic Biologist – Division of Aquatic Resources – State of Hawai'i
4. Garrett Hew, *Kama'āina*, Upcountry Maui farmer, and former East Maui Irrigation (EMI) employee
5. Robert Hobdy, Retired naturalist and forester
6. Roslyn Lightfoot, Director – Alexander & Baldwin Sugar Museum
7. Kyle Nakanelua, *Kama'āina*, Aha Moku o Maui, and *kalo* (taro; *Colocasia esculenta*) farmer
8. Jerry Sakugawa, Upcountry Maui farmer
9. Sandy Takeshita, Upcountry Maui farmer
10. Mahealani Wendt, Nā Moku Aupuni o Ko'olau Hui

In addition, CSH asked permission to use declarations that were made by certain members of the community and members of Nā Moku Aupuni o Ko'olau in connection with the contested case hearing held by CWRM on the Petition for Interim Instream Flow Standards. The declarations were given to CWRM in December 2014, several years prior to CWRM's issuance of its final Findings of Fact, Conclusions of Law and Decision and Order issued on June 20, 2018, which established the current IIFS. Although the declarations are part of the public domain, CSH attempted to contact each individual to obtain approval to include their declarations in the CIA. Below is a list of individuals who approved use of their declaration:

1. Dan Clark
2. Jonah Jacintho
3. Lezley Jacintho
4. Kau L. Kanaka'ole
5. Pualani Kimokeo
6. Davianna McGregor, Ph.D
7. Lurlyn Scott
8. Earl Smith, Sr.
9. Ty Kāwika Tengan

Tabulated results of approved declarations that relay traditional cultural practices, which includes fishing, gathering, hunting, sites, traditional knowledge, and values can be found in Table 13. Tabulated results of declarations that were not approved are arranged anonymously and can be found in Table 14.

7.3 Non-Cultural Community Concerns and Recommendations

Based on information gathered from the community consultation, participants voiced the following concerns not related to the cultural context.

Community participant Skippy Hau noted that “not all lands belong to the State” and recommends that private lands should and need to be identified by signs and safe parking areas. In addition, many visitors and tour groups assume that most lands belong to the State resulting in illegal trespassing. Also noted that rental cars regularly block Hana Highway creating and blocking traffic.

1. Mr. Hau states that the EMI Aqueduct System requires mapping that shows the 388 intakes, ditches, dams, pipes, and flumes. Each diversion should be located and identified accurately with GPS coordinates. Elevations should also be recorded. The amount of water moving through the system should be measured at specific locations within the EMI Aqueduct System as well.
2. Other questions and clarifications Mr. Hau had include the following (please note that these questions were asked prior to CWRM's June 2018 decision on the East Maui Interim Instream Flow Standards):
 - a. Is the 20,000 gallons per day for Nahiku and Kula Agricultural Park a minimum?
 - b. Isn't the interim instream flow supposed to maintain a minimum flow for each stream?
 - c. Will EMI property be clearly identified along the boundaries of State land?
 - d. Please identify “settlements” along Hana Highway.
 - e. Please clarify “diversified agricultural uses as it economically feasible.” The term is used but not clearly identified or the need for water.
 - f. The three Department of Water Supply treatment facilities water use should be clearly identified. Please identify actual use, not maximum capacity. The reservoir capacities does not clarify actual water use.
 - g. Please clarify abandoned diversion. Is the diversion and other structures to collect water removed and natural stream restored? Mr. Hau noted that historically structures and associated materials have been abandoned throughout East Maui. He recommends that debris and abandoned structures should be completely removed and/or buried.
 - h. Mr. Hau recommends that concrete walls and control structures that are planned for full and permanent restoration should be completely removed and streams restored to their natural conditions.
3. In addition, Mr. Hau relayed via email that he recommends a five-year lease with constant updates due to the fact that the project description lacks information on the amount of water flowing through the EMI Aqueduct System and the actual amount of water collected at each diversion and/or ditch without the factor of climate change accounted for.
4. Participant Kyle Nakanelua's recommendations for this project was simply, “Follow the law! Support the law! File for your permit. There's a policy and there's procedures. Adhere to the policy and follow the procedures. And stop trying to circumvent it [the law] because you smart. You know, just be honest, be transparent.”

7.4 Cultural Community Concerns and Recommendations

Based on information gathered from the community consultation, participants voiced and framed their concerns in a cultural context.

1. Mr. Hau states that native gathering rights should be addressed. The gathering of '*ōpae* (general name for shrimp), '*o'opu* (general name for fishes included in the families *Eleotridae*, *Gobiidae*, and *Blennidae*), and *hīhīwai* (endemic grainy snail; *Neritina graposa*) continue throughout East Maui streams that are being diverted.
2. Mr. Hau adds that State lands should be open to the public for hunting and gathering. The general public should have access for recreational activities such as hiking, scenic viewing, and swimming at waterfalls.
3. Mr. Robert Hobdy voiced his concerns, which include that the EIS study should:
 - a. Provide adequate stream flow to support diversified agriculture in the Hamakualoa and Ko'olau region.
 - b. Provide adequate stream flow to support indigenous fish, shrimp, and mollusk species in the Hamakualoa and Ko'olau region.
4. Participant Kyle Nakanelua is concerned with the act of diverting water. He explicitly states that "when those places dry up that adversely impacts the way of life, the cultural practice if you will" and it "adversely impacts the people's way of life that live there."
 - c. To support this claim, Mr. Nakanelua states that '*ōpae* was once prevalent in the streams that flowed through their family property named Lakini. He relates that when he began to regularly clean the property his grandmother would still catch '*ōpae*. He adds that today there is no '*ōpae* but there are prawns. When CSH asked if '*ōpae* was being overpicked, he replied "no" because "we were the only one there." He also does not think the introduction of prawns are to blame but believes "that the flow of water is impactful" and has seen the water decline since 1989.
5. A 2014 declaration provided by Dan Clark from Ke'anae stated he needs cool, fast running water for optimal *kalo* production. Due to low stream flow results, there has been an increase in disease to his *kalo*, which decreases production.
6. Jonah Jacintho states in his 2014 declaration that due to a lack of stream flow, fish populations have decreased therefore he cannot fish as much. To increase the population of ocean fish, fresh water is integral for spawning and nutrients. He also added that more water in stream beds would also increase '*o'opu*, prawn, and *hīhīwai* populations.
7. In Lezley Jacintho's 2014 declaration, she states that due to lack of stream flows, her *kalo* production has declined due to root rot and other diseases. She adds that stream flow output is also important in the spawning of different species of fish. The lack of stream flow affects her gathering rights as a Native Hawaiian and her '*ohana* (family). Native species such as '*o'opu* needs fresh water to travel back upstream, which compromises their reproduction. Fish, *hīhīwai*, '*ōpae*, and '*o'opu* populations are also scarce and many families cannot gather these resources causing them to move away. Another concern Ms. Jacintho voiced is stagnate water, which causes leptospirosis and other bacteria.

8. Kau‘i Kanaka‘ole voices in her 2014 declaration the Papaku Makawalu framework, which incorporates traditional Hawaiian knowledge and *mo‘olelo* (stories) and connects it with *wahi* (place). Papaku Makawalu consists of three Papa or houses of knowledge (earth, atmospheric, and the living). In this case, Ms. Kanaka‘ole points out that without water, all three Papa could not exist. She shares *mo‘olelo* on O‘opuola Stream, Makapīpī Stream, Ka‘aiea Stream, and ‘Ōhia Stream. She points out that ‘Ōhia Stream was known for its healing powers and that the people of this area understood that this water was “special, sacred, kapu (taboo) and only to be used in unique circumstances.”
9. Pualani Kimokeo states in her 2014 declaration that due to a lack of stream flow there is an increase in pocket rot and “guava seed,” which she describes as a growth on the taro. There are also apple snails in her *lo‘i kalo*, which she states like the warm water. She points out that farmers in Ke‘anae have to compete for water.
10. In Earl Smith, Sr.’s 2014 declaration, he states that he recalls gathering ‘*ōpae*, *hīhīwai*, and ‘*o‘opu* from Hanawī, Makapīpī, and One‘o Streams. He can only find these species in Hanawī Stream. Near the coast, he would fish for *moi* (threadfish; *Polydactylus sexfilis*), *aholehole* (Hawaiian flagtail; *Kuhlia sandvicensis*), *manini* (reef surgeonfish; *Acanthurus triostegus*), and *enenue* (chub; *Kyphosus bigibbus*) but has noticed a depletion of fish. He attributes this to a lack of stream flow that empties in the ocean.
11. In Edward Wendt’s 2014 declaration, he states that he gathers and fishes in the streams to provide a protein source for his family, neighbors, and *kūpuna* (elders) who may be unable to gather for themselves. He also enjoys teaching traditional fishing practices and values to students. However, due to the lack of adequate stream flow, Mr. Wendt is unable to teach students how to *mālama* (to take care of) streams, fish, and gather. The diminished stream flow has negatively impacted the *muliwai*, fisheries, and his *lo‘i kalo*. Invasive species such as the apple snail and African tulip tree have infringed his *lo‘i kalo*.

7.5 Ka Pa‘akai Analysis

The Proposed Action consists of the issuance of a long-term (30 years) Water Lease from the BLNR for the continued use of water from the Huelo, Honomanū, Ke‘anae, and Nāhiku License Area through the existing EMI Aqueduct System, which supplies water to domestic and agricultural water users. The Water Lease will enable the lessee to continue to go on lands owned by the State in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System. It will allow continued operation of the EMI Aqueduct System to deliver water to the County of Maui DWS for domestic and agricultural water needs in Upcountry Maui, including agricultural users at the Kula Agricultural Park, and the 262-acre expansion of the Kula Ag Park, and the Nāhiku community. It will also allow for the continued provision of water to approximately 30,000 acres of agricultural lands (formerly in sugarcane) in Central Maui to supply irrigation water for diversified agriculture.

Article XII, section 7 of the Hawai‘i Constitution obligates the State and its agencies “to protect reasonable exercise of customarily and traditionally exercised rights of native Hawaiians to the extent feasible when granting a petition for reclassification of district boundaries” (*Ka Pa‘akai O Ka‘Āina v Land Use Commission*, 94 Hawai‘i 31, 7 P.3d 1068 [2000]). Under Article XII, section 7, the State shall protect all rights, customarily and traditionally exercised for subsistence, cultural, and religious purposes and possessed by *ahupua‘a* tenants who are

descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights. In *Ka Pa‘akai*, the Hawai‘i Supreme Court set forth the framework for the State to protect these rights, requiring agencies to, when making decisions that may impact cultural, historical, or natural resources or native Hawaiian traditional and customary practices, at a minimum, make specific findings and conclusions on:

1. The identity and scope of valued cultural, historical, or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area;
2. The extent to which those resources—including traditional and customary native Hawaiian rights—will be affected or impaired by the proposed action; and
3. The feasible action, if any, to be taken by the [agency] to reasonably protect native Hawaiian rights if they are found to exist.

Based on information gathered from the cultural and historical background, and the community consultation, significant cultural resources were identified within the License Areas well as outside of the License Area. It should be acknowledged that although some of the impacted cultural resources exist outside of the License Area, what takes place within the License Area directly affects these cultural practices and resources. At present, there is documentation and testimony indicating traditional and customary Native Hawaiian rights are currently being exercised within the License Area. . Cultural resources, practices, and beliefs were identified as currently existing within the License Area. In addition, East Maui, which includes the License Area and beyond the License Area, maintains a rich subsistence and cultural history.

The earliest initial occupation in East Maui is estimated at AD 1200 (Haun et al. 2004). The abundance of traditional land divisions and *wahi pana* spanning from Hāmākua Loa to Hāna suggest that habitation continued to increase after initial establishment. Xamanek Researches conducted an AIS in 2000 of a parcel near the *muliwai* of Hanawana Stream. A charcoal sample from the study yielded a radiocarbon date of AD 1425 to 1665. In conjunction with *mo‘olelo* and *ka‘ao*, such material evidence indexes the importance of East Maui and its natural resources in supporting early inhabitants and traditional practices. Throughout this analysis, an effort is made to ground physical evidence within traditional cultural frameworks or knowledge systems. That is, understandings of East Maui’s ecological processes and anthropogenic activities have been informed by various traditional sources, including *mo‘olelo*, *mele*, or *oli*. As pointed out by anthropologist Laura Nader and reiterated by Dr. Kathleen Kawelu, “science is not free of culture; rather, it is full of it” (Kawelu 2015:6; Nader 1996: xiii). Several *mo‘olelo*, unique to East Maui, do indeed provide key insights into the socio-cultural and socio-economic realities of pre-Contact life. *Ka Mo‘olelo o Hi‘iakaikapoliopole* relates how Hi‘iaka stopped in Wailua Iki and stumbled upon a crowd celebrating *hula* in a *hālau* filled with men, women, and children. This *mo‘olelo* exhibits the popularity of *hula* in this area as well as a burgeoning population in East Maui.

Pi‘ilani, *Mō‘ī* of Maui, ordered to have a hand-fitted, basalt block road constructed, which connected Wailuku to Hāna. This road served as a trail for residents and was also accessed during times of war. During the last half of the eighteenth century, war occurred frequently. The road, along with canoe landings and inhabited places, were common sites for robbery and death

for *maka'āinana*. After Pi'ilani's death, his son Kihapi'ilani continued the construction of the road, extending through Kaupō and across Haleakalā. It was called the Alaloa of Kihapi'ilani, also known as the King's Road. The amount of labor that went into the Alaloa suggests that there was a large population of able-bodied men to complete the trail. The caloric demands of such a workforce would have no doubt been significant, suggesting that a large amount of food also was available to sustain the workers.

East Maui was and still is an ideal place to cultivate *kalo* based on the rich soils and the amount of rain that occurs per year. The License Area contains various tributaries. Wet patches were and still exist in the *makai* regions, while dryland *kalo* was planted in the *mauka* areas. Ke'anae and Wailua Nui continue to be thriving regions within the License Area that still practice traditional taro farming.

Ōlelo no'eau, mele, and oli all attest to the abundance of water, in addition to the resources available from the ocean and uplands. However, documents such as Land Commission Awards (LCA) and associated maps exhibit the expansive population of East Maui during The Māhele. Although most of the LCAs are outside of the License Area, it is important to point out that the water that runs through the License Area leads to these *kuleana* parcels, many of which are still *kuleana* properties held by the same families today. Land use was inventoried during The Māhele. Common uses and *kuleana* include residence, farming (*lo'i, kula, kīhāpai, pō'alima*, specific patches for *olonā* and *hala*), associated farm structures (pig pens), water ways (*'auwai*, fishponds, streams, beaches, and the sea), forests, and infrastructure (government road, trails, foot paths). Land use records indicate that almost every property had at least one *lo'i kalo* with some of the highest concentrations in the Huelo and Ke'anae License Areas, the latter still being an active community that continues the practice. Although quantity of water matters for the community, it is also about velocity. Mr. Kyle Nakanelua relates the importance of having “a really crisp and vigorous flow” to the water because “that's what keeps everything stimulated and alive” which contributes to having a healthy stream and flow. Having water that is cold and constantly running are vital components of farming wet land *kalo*.

In addition to *kalo, pohole* or the fiddlehead fern is also a staple in the diet for residents of East Maui along with watercress, *'ulu, bananas, lū'au, etc.* Traditional subsistence is important to those who live in this remote area of East Maui as it not only is a reliable food source but ensures a healthy diet. Plants such as *pohole* and watercress are aquatic plants, which need an abundant amount of fresh, running water for optimal growth. *Pohole* is a wild plant that needs to be foraged and is widespread throughout the License Area. *Pohole* that is growing in or adjacent to tributaries that have limited and/or diverted water are most likely impacted gathering grounds.

The water source for the East Maui streams came from the backside of Haleakalā, which supplies the streams with fresh water, providing an ecosystem for aquatic life. Fresh, brackish, and ocean resources were and continue to be an important food source for Native Hawaiians (McGregor 2007:109). Habitation patterns model settlement near the ocean, which alludes that Native Hawaiians settled close to their food sources such as the ocean and in areas that were viable for *kalo* growth. Native Hawaiian author and historian Samuel Kamakau relates that the people of Ko'olau worshipped sharks “in order to be saved from being eaten by a shark when they went fishing” (Kamakau 1991:78). The favored method of fishing off of East Maui was the *kākā* and *kūkaula* methods. The *kākā* method required a hook and line and was utilized at a depth

of 200 fathoms. The *kūkaula* method also used hook and line but was employed at 50+ fathoms. Through interviews, informal discussions with community members, and CWRM declarations, it is evident that residents within and in the vicinity of the License Area rely heavily on fresh and salt water resources as a food source.

Many community members stated that they formerly utilized stream fauna as a food source, however, due to the stream water being limited and/or diverted in conjunction with invasive species, it is now deemed an unreliable food source. 'O'opu, 'ōpae, and *hīhīwai* were staples to East Maui resident's diets. *Kūpuna* who lived near the streams in the 1920s and 1930s also caught and ate 'ōhua and *hinana*, which were prevalent in tributaries. East Maui residents and those who intimately know the *mauka* regions of East Maui know where to gather these limited aquaculture resources. For example, State of Hawai'i Aquatic Biologist, Skippy Hau, shared that at one time 'ōpae could be found in streams spanning from *mauka* to *makai*. Today 'ōpae can be found only in the mountain areas where stream water is cooler but have mostly adapted to inconsistent stream flows. Mr. Hau also shared that *hīhīwai*, one of the slowest migrating animals, utilize heavy rains and flash flooding to transport larvae into the ocean, so they can migrate upstream again over a period of time. However, fresh water is also needed to assist in this process. Although, "the natural environment has a built-in capacity to respond and adapt to traumas and shocks (system resilience)," this is not infinite (Minerbi 1975:8). Diverted streams, whereby the *mauka-makai* connection is severed, strain the resiliency of the stream's ecosystem by inhibiting reproduction rates of freshwater animals as well as growth patterns.

In addition, salt water resources are also being compromised by limited fresh water being emptied into the ocean, which is a vital component for propagation. Mr. Earl Smith, Sr. would fish for *moi*, *aholehole*, *manini*, and *enenue* but has since observed a considerable decline in populations and relates this to the lack of fresh water entering the ocean. Mr. Jonah Jacintho also related that a lack of stream flow inhibits nutrients from *mauka* traveling *makai*, which creates warmer waters and an unfavorable ecosystem for fish, mollusks, and other ocean life to replenish. Although the License Area is not adjacent to the ocean, the ocean is directly affected because the fresh water that runs throughout the License Area is limited and/or being diverted. Modifications to flow, such as diversion, invariably result in a dramatic decline in ocean life by restricting nutrients that are carried via tributaries and emptied into the ocean, which are needed for healthy conditions and growth patterns.

Based on the cultural and historical background presented above, in conjunction with archaeological evidence, oral histories, declarations, and interviews throughout East Maui, it is the finding of the current analysis that there are specific valued natural and cultural resources within the License Area. There is evidence of identified traditional and customary cultural practices associated with natural and cultural resources that are regularly exercised within the License Area, which includes the following activities and resources:

1. Foraging, traditional, and generational gathering of freshwater species for personal consumption. These species include but are not limited to 'ōpae, 'o'opu, *pūpūlo'i* (also known as *pūpū Pākē* or Chinese snail), crayfish, prawns, and *hīhīwai*.
2. Foraging, traditional, and generational gathering of plants that may be in or adjacent to tributaries for personal consumption. These species include but are not limited to *pohole* and watercress.

3. Traditional and generational gathering of introduced plants that can be cultivated or foraged. These species include but are not limited to *'ulu*, bananas, wild *kalo*, wild *lū'au*, guava, *'uala*, *'awapuhi*, *tī*, oranges, *hāhā*, avocado, *puakenikenī*, and medicinal plants for *lā'au lapa'au*.
4. Traditional and generational gathering of plants that can only be foraged. This includes but is not limited to *pepeiao*, various types of ferns (ornamental), and *hau*.
5. Traditional and generational gathering of rocks that are used for traditional food preparation. These activities include but are not limited to *imu* and the production of stone tools for traditional food preparation (i.e., *pōhaku ku'i 'ai*).
6. Traditional and generational fishing and gathering methods utilized for the shoreline and offshore. Species gathered include but are not limited to *limu* (seaweed), *'opihi* (limpets), lobster, *enenue*, *kole*, *ulua*, *moi*, *aholehole*, *'anae*, *kumu*, *tako*, *moanakali*, *'ōmilu*, *'ū'ū/menpachi* (soldierfish; Holocentridae), *'āweoweo* (Bulleye; *Priacanthus meeki*), *pāpio*, *pa'ananu*, *'ō'io*, *uhu*, *lae*, *kala*, black crab, *hā'uke'uke*, and *kūpipi*.

These activities and resources are further inventoried in Tables 13 and Tables 14.

7.6 Impacts and Recommendations

Once the valued cultural, archaeological, and historical resources within the License Area are identified (discussed above in Section 6, including Tables 13 and 14, and Section 7), the second and third prongs of the *Ka Pa'akai* analysis require the agency to determine how any of the resources may be impacted by the proposed action, and what, if any, feasible measures can be taken to protect the resources.

Proposed Action

The Proposed Action constitutes the issuance of a long term (30 years) Water Lease from the BLNR for the continued “right, privilege, and authority to enter and go upon” the License Area for the “purpose of developing, diverting, transporting, and using government owned waters” via the existing EMI Aqueduct System which supplies water to domestic and agricultural water users. The Water Lease will enable the lessee to continue to go on lands owned by the State in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System, and will allow continued operation of the EMI Aqueduct System to deliver water to the County of Maui DWS for domestic and agricultural water needs in Upcountry Maui, including the agricultural users at the Kula Agricultural Park (KAP), as well as for the Nāhiku community. It will also allow the continued provision of water to approximately 30,000 acres of agricultural lands in Central Maui. The proposed action is subject to the terms of the Interim Instream Flow Standard (IIFS) established by the CWRM.

Based on information gathered from the cultural and historical background, and the community consultation, CSH identified potential impacts and made the following recommendations:

1. **Impact:** Participants expressed interest in getting clarification on stream flow, water diversion, and climate statistics with the following questions:
 - How much water is being diverted at each location of intakes, ditches, dams, pipes, and flumes?

- How much water is being diverted from East Maui to Central Maui?
- Is climate change accounted for?

Recommendation: It is recommended that these questions be addressed by qualified professionals who possess an understanding of stream flow mechanics, water diversion, and climate statistics within the License Area.

2. **Impact:** Several community participants voiced their concern regarding indigenous freshwater species that may be impacted by the act of diverting water. These species include but are not limited to *‘ōpae*, *‘o‘opu*, *pūpūlo‘i* (also known as *pūpū Pākē*, or Chinese snail), crayfish, prawns, and *hīhīwai* (endemic grainy snail; *Neritina graposa*), which are still gathered regularly by residents for personal consumption. Furthermore, community participants shared their concern of water not exiting stream beds and flowing into the ocean. This estuary environment creates an ecosystem where freshwater and saltwater species spawn and travel back upstream (such as *‘o‘opu*) or continue to grow in the ocean. Specific streams mentioned by community participants where this impact is identified include: Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Honopou (Puniawa Tributary), Punala‘u (Kōlea and Ulunui Tributaries), Honomanū, Nua‘ailua, Pi‘ina‘au, Waiokamilo, Wailuānui (Waikani Waterfall), Kopili‘ula, Pa‘akea, Kapā‘ula, Hanawī, Makapīpī, Waiohue, Waikamoi (Alo Tributary), Hanehoi, Palauhulu (Hauoli Wahine and Kano Tributaries), ‘Ōhi‘a (or Waianu), Kualani (or Hāmau), East Wailuāiki, West Wailuāiki, Pua‘aka‘a Tributary, and Waia‘aka. It is understood that these streams were subject to the Interim Instream Flow Standards (IIFS) decision.

Recommendation: It is recommended that a biologist or similar qualified professional provide an assessment of the impacts of water diversion to indigenous freshwater species (*‘ōpae*, *‘o‘opu*, and *hīhīwai*) within the License Area. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact. Nine of the streams mentioned by community participants where this impact is identified have been fully restored in accordance with the IIFS. These include Honopou (Puniawa Tributary), Pi‘ina‘au, Waiokamilo, Wailuānui (Waikani Waterfall), Makapīpī, Waiohue, Hanehoi, Palauhulu (Hauoli Wahine and Kano Tributaries), and West Wailuāiki Streams.

3. **Impact:** A majority of participants who are taro farmers voiced their concern of the lack of water needed to maintain a healthy and productive *lo‘i kalo* or taro patch. A cold, vigorous flow of water is needed for the production of *kalo*. Without an ample amount of water continuously flowing, many taro crops have been subject to invasive species such as the apple snail, root rot, and growths. Many taro farmers are unable to continue their traditional and generational cultural practice. Specific streams mentioned by community participants where this impact is identified include: Honopou (Puniawa Tributary), Waikamoi (Alo Tributary), Wahinepe‘e, Puohokamoa, Ha‘ipua‘ena, Punala‘u (Kōlea and Ulunui Tributaries), Honomanū, Nua‘ailua, Pi‘ina‘au, Palauhulu (Hauoli Wahine and Kano Tributaries), ‘Ōhi‘a (or Waianu), Waiokamilo, Kualani (or Hāmau), Wailuānui (Waikani Waterfall), West Wailuāiki, East Wailuāiki, Kopili‘ula, Pua‘aka‘a, Pa‘akea, Waia‘aka, Kapā‘ula, Hanawī, Makapīpī, and Waiohue. It is understood that these streams were subject to the IIFS decision.

Recommendation: It is recommended that a botanist, ethnobotanist, or similar qualified professional provide an assessment of the ideal conditions of water flow and water temperature needed for *kalo* growth in comparison to the current water flow and water temperature of impacted areas in order to understand and address the stated impact. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact. Eight of the streams mentioned by community participants where this impact is identified have been fully restored in accordance with the IIFS. Honopou (Puniawa Tributary), Pi'ina'au, Palauhulu (Hauoli Wahine and Kano Tributaries), Waiokamilo, Wailuānui (Waikani Waterfall), West Wailuāiki, Makapīpī, and Waiohue.

4. Impact: While no human burials have been identified by previous archaeological studies within or immediately adjacent to the License Area, historical research indicates that Honomanū Valley and other areas throughout East Maui once held a sizable population. LCA documentation indicates that there were settlements along the coast, however, a pedestrian survey was also conducted where there was evidence of habitation in the higher reaches of the valley (E. M. Fredericksen and Fredericksen 1998b).

Recommendation: It is recommended that any personnel involved in access, maintenance, or any other related activities within the License Area be informed of the possibility of inadvertent cultural finds, including human remains. In the event that any potential historic properties are inadvertently discovered within the License Area, these discoveries should be reported immediately to the State Historic Preservation Division (SHPD). In the event that *iwi kūpuna* and/or cultural finds are encountered, consultation with lineal and cultural descendants of the area is also recommended.

No Action Alternative

The No Action alternative is understood as the termination or non-issuance of the subject Water Lease. Under this alternative, A&B would be permitted to 30% of the water from the larger 50,000-acre Collection Area based on previous agreements.

The No Action alternative includes permission to divert 30% of the water from the larger 50,000-acre Collection Area and therefore, impacts related to the diversion of water may apply, but to a lesser extent than the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include: interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive *lo'i kalo* or taro patch in areas where water may continue to be diverted.

Recommended mitigation for the No Action alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate cultural impacts of the No Action alternative as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.

Water Sources Alternative

The Water Sources alternative is understood as the decision to obtain water from new sources other than from the diversion of East Maui streams into the existing EMI Aqueduct System. These sources could include new wells, desalinization facilities, and reservoirs located on Maui Island.

The Water Sources alternative has the potential for cultural impacts to the areas where new sources of water are obtained. Potential cultural impacts could be wide-ranging as these new facilities would likely require ground disturbance, land clearing, and/or changes to coastal environments on Maui Island. Impacts related to the diversion of water, as discussed in relation to the Proposed Action would not apply to the Water Sources Alternative, however with the potential of project-related ground disturbance, there is the possibility of impacts to *iwi kūpuna*.

Recommended mitigation for the Water Sources alternative would include a cultural impact study for the specific location or region of Maui Island in which this new infrastructure is installed. Additionally, in the event that any potential historic properties are inadvertently discovered within the Water Sources alternative locations, these discoveries should be reported immediately to the State Historic Preservation Division (SHPD). In the event that *iwi kūpuna* and/or cultural finds are encountered, consultation with lineal and cultural descendants of the area is also recommended

Water Lease Volume Alternative

The Water Lease Volume alternative is understood as a modification (reduction) to the volume of water that is diverted from East Maui streams.

The Water Lease Volume alternative has the potential for cultural impacts related to the diversion of water that may apply to a lesser extent than the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include: interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive *lo'i kalo* or taro patch in areas where water may continue to be diverted.

Recommended mitigation for the Water Lease Volume alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.

Lease Terms Alternative

The Lease Terms alternative is understood as a modification to the length of the proposed lease term for the “*right, privilege, and authority to enter and go upon*” the Nāhiku, Ke‘anae, Honomanū, and Huelo License Areas for the “*purpose of developing, diverting, transporting, and using government owned waters* through the existing EMI Aqueduct System. The Proposed

Action constitutes the issuance of one long term (30 years) Water Lease, and this alternative considers either a shorter or longer lease term.

The Lease Terms alternative has the potential for cultural impacts related to the diversion of water that may apply to an equal extent as the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include: interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive *lo'i kalo* or taro patch in areas where water may continue to be diverted.

Recommended mitigation for the Lease Terms alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.

Management Alternative

The Management alternative is understood as a change of the entity that manages the diversion of water from East Maui streams.

The Management alternative has the potential for cultural impacts related to the diversion of water that may apply to an equal extent as the Proposed Action. These impacts, as discussed in detail in relation to the Proposed Action, include interest in getting clarification on stream flow, water diversion, and climate statistics; concern regarding indigenous freshwater species that may be impacted by the act of diverting water; concern of water not exiting stream beds and flowing into the ocean; and concern of the lack of water needed to maintain a healthy and productive *lo'i kalo* or taro patch in areas where water may continue to be diverted.

Recommended mitigation for the Management alternative is equal to that of the Proposed Action and would require assessment by qualified professionals who possess an understanding of stream flow mechanics, water diversion, climate statistics, biology, botany, and/or ethnobotany as specified under the recommendation of the Proposed Action. The application of the IIFS decision has the potential to reduce or eliminate this cultural impact as many of the streams that are currently in use by community participants where these impacts are identified have been fully restored in accordance with the IIFS.

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Appendix A Kyle Nakanelua Transcription

Cultural Impact Assessment, East Maui Irrigation Water Lease renewal Project, Cultural Surveys Hawai'i (CSH) interview with Kyle Nakanelua (KN), at the Kahului Starbucks, on 13 April 2018

CSH: CSH Researcher

KN: Kyle Nakanelua

CSH: Alright, I got it starting. Hope it doesn't pick up too much of this outside stuff. Okay so, let's start with your name.

KN: Kyle Nakanelua. Kyle K. Nakanelua.

CSH: Ok. And your birth date?

KN: Tenth September, 1959.

CSH: And where were you born and raised?

KN: Born and raised Honolulu, Hawai'i. Seventeen years. Four years military service. 1982 moved to Maui.

CSH: What part of Maui?

KN: Wailuku.

CSH: Ok.

KN: And yeah, been here ever since.

CSH: Can you tell me a little bit about your parents? Your mom, your dad?

KN: My mom is Barbara Jean Rodrigues born and raised on O'ahu. Her father is from Kokomo, Maui. Her mother was born in Portugal and came over on the boat and was raised in Maui. And my father is Paul Hanai Nakanelua, Jr. Born and raised Wailua Village on Maui. The greater area called Wailua Nui.

CSH: Ok, alright do you have siblings?

KN: I have an older sister and I have a younger sister.

CSH: Oh ok, right smack dab in the middle. Surrounded by women.

KN: Yeah. Only boy, black sheep, the whole deal.

CSH: Ok you were saying you're a...ok let's back up a little bit. So, you went to military and after the military you went to like a fire academy or something?

KN: No, I got a job. I was in the fire academy in the military. And then I got a job here on Maui for DOT - Airports Division as a fireman. Did 30 years and retired.

CSH: Nice. Ok...so tell me about your connections to this area.

KN: To this area. Ok.

CSH: ...Or to the project area.

KN: So, the moku, so the project area or the moku which is an ancient land division, so there are 12 on Maui, 12 moku. And one of those moku is Ko'olau and it is that whole project area falls within this land division called Ko'olau. And within the Ko'olau there are all these ahupua'a and then one of which is the Wailua-Keanae land division, from mauka to makai. Um, my connection to this place is through my dad, through his mother, through her ancestors. And we go back to, going through my notes...before the Kamehameha dynasty, we lived in that area. I spent summers and winter breaks with my grandparents and my sister and my older cousin. Spending time with the old people, working in the taro fields.

CSH: Oh, so grandma and grandpa put you to work?

KN: Oh yeah [laughing].

CSH: Wow.

KN: Well it wasn't work, it was a way of life! For them it was. So, working the taro fields...going, gathering...gathering food products from the...from all the rivers and streams 'ōpae, 'opihi, hīhīwai.

CSH: Oh, you guys have hīhīwai?!

KN: Oh yeah.

CSH: I'm jealous! Yummy.

KN: Yeah. Pohole just all the natural food products that exist out there. We gathered and that was a way of life.

CSH: You guys caught 'o'opu too?

KN: Caught 'o'opu.

CSH: Ate that too?

KN: 'O'opu it used to be more prolific in this area,,but not as much as it used to be. And I've seen it. As a young child, 'o'opu was like prevalent in the streams

CSH: Yeah.

KN: And now it ain't. I believe there still their there but I used to see them before I don't see them anymore.

CSH: Sad. So, what was the typical day like when you were with grandma and grandpa? You guys wake-up . . .

KN: Yeah, get up, clean up, house chores, and then...yard chores or farm chores. The farm was away so it's either weeding the taro patch, cutting the grass, pulling the taro, helping clean up all the – you know when you harvest the taro there's always left-over work, right? There's - you got to move the roots, you got to move the cut huli, just all of these...just farming tasks. Yeah. So, we would participate in. Everything is manual labor. Nothing was machines. So, there was always [laughing] work to do.

CSH: Do you know what varieties of kalo?

KN: Basically, we knew the two major varieties of Lehua and Moi.

CSH: Ok.

KN: There's many other varieties that I can name but those - I mean, when we were growing up - those were pretty much the varieties we had.

CSH: And then, did you guys go fishing? Makai?

KN: Yeah, so the fishing that we went to was my grandmother and them did the fishing. We weren't fishers.

CSH: Ok.

KN: They fished for the little fish, the 'ōhua.

CSH: Oh, ok. Yeah, yeah, yeah.

KN: They fished for little eels the way they did it. How they put the palu in the hand and then the small eels would come in and they would grab them and stuff like that. We participated in picking 'opihi.

CSH: Ok.

KN: And certain types of limu.

CSH: How would you guys, like if you...would you eat it for lunch or dinner?

KN: Yeah, take it home clean it and then have it for dinner and then what was ever leftover we would have it for lunch the next day.

CSH: How would you guys prepare it? Would you guys fry it?

KN: 'Opihi was raw. Hīhīwai was soup.

CSH: Oh.

KN: Um, the fish was dried or fried. 'O'opu was steamed, yeah.

CSH: Interesting. What about the limu? For poke?

KN: Just on the side. Just as a condiment. You just add them in.

CSH: Cool. Do you know of any mo'olelo of the area - like myths, legends?

KN: There's a lot of them. So there are various ponds that are dedicated to the mo'ō and there are various streams that are dedicated to puhi. And there's one stream that's named after a mo'ō and that stream or that area--stream rivulet is called Waiakakamilo, so "the water of Kamilo." There's another stream in the area of Waianu, I believe. It's a big one. It's a main tributary and it's called Waiakuna or "the waters of Kuna" and that was a big puhi of that place, at that time.

CSH: Did you guys ever swim in those or was it like, kapu? Because...

KN: No, below the waters of Waiakuna is a pond called Lala'au, AKA Ching's Pond. We swam in that one. But we didn't swim too much in the ponds because the land that we take care of, my grandmother's ancestral lands, there's little ponds in there so we just swam in those.

CSH: Nice, nice. Yeah, yeah. Ok. Any trails in the area?

KN: So, there's the muliwai, which is the water that is left over at the bottom - that whole area is called the muliwai. It's at the end of the village road and from that place to Wailua Iki which is that little harbor on the opposite...right around the corner from the muliwai there is a trail called Kamapua'a out there. Also there's another mo'olelo about big papa or reef area that exists just off of the shore line, outside of Sammy Akina's place. It's called Ha'aluea and that was the 'awe'awe or the tentacle of the great squid called Ha'aluea and it was cut off and then became petrified by 'Ai'ai. And that is associated to the mo'olelo called "Ku'ula from Hāna"

CSH: Ok. Yeah. Did you guys...

KN: And that is Ha'aluea is...it's a.... traditionally, we call it a papa, but it's a big shelf. It's a reef and it looks like a big arm

CSH: Yeah.

KN: It's a fish breeding ground - that's what it is. It's because it's a reef system you got little fish, and bigger fish, and bigger fish, and 'opihi and everything is out there. And it's like...

CSH: Is there like an outlet from the stream that goes out there? Or springs?

KN: Well, the muliwai is here so it feeds this area with that fresh brackish water.

CSH: Ok, so it is a....

KN: And then Ha'aluea is outside of that so the thing is just one big feeding ground and it's where they breed, its where they spawn...it's where -they just grow. You know and when the growth gets so big then they move on to the next. Yeah and they just keep moving on.

CSH: Nobody fishes over there though?

KN: All the people over there fish over there.

CSH: They do fish over there?

KN: Yeah.

CSH: Ok.

KN: They take their zoris out and yeah pretty much. But the people that go there, they're the ones that go there. Nobody...I don't go there [laughing].

CSH: Yeah, yeah. Got you. Alright. Ummm. Let's see, what about any archaeological sites or cultural, or historic sites, burial sites?

KN: I think the major archeological site is the heiaus that are behind the school and the name of that heiau complex- it is actually a complex, yeah - there are couple of platforms but it's called Pākanaloa and it oversees - if you clear all the hau and all that rubbish out there, it will oversee this little gulch like where the Hāna road passes through and it's the Redo property. The Redos' live there now. They have a watercress farm, but on that farm, they have the spring called 'Ōhi'a and that spring is, I would say it's an archaeological site as well - you know - that's [inaudible] generations old. Because it was founded and formed by Kāne and Kanaloa. And I'm not talking

about those magical, mystical gods. I'm talking about two real guys that actually existed, you know? And for me and my educational base they're ancestors that are upon us, ancestors that were so great and from such a time, so long ago, that we have commemorated them to various landscapes across, you know, across this pae moku. But definitely on Maui that is one of their places that they have established. And if you think about establishing a spring - the establishment of a spring - it's drinking water. Fresh, pure drinking water that is necessary for people to live. And so if you look at it, there's a spring there, and then above the spring there's a temple complex or let's call it a church complex. Why do you need a church? You need a church because you have people. And people require [loud sigh] spiritual sustenance, you know, as well as food sustenance. So, there was an established ancient village there of where that was the central focal point. And if you look at the societies of the world - and everywhere - the center of society is the religious institution for a lack of a better phrase at this moment in time. So, the temple complex is called Pākanaloa or "the enclosure of Kanaloa" and it oversees and is connected to the well spring called 'Ōhi'a that was established by Kāne and Kanaloa who are notable ancestors that are always paired together. So, I think yeah if that ain't an archaeological I don't know what is [laughing].

CSH: Do people still go up there or it's choked with hau?

KN: It's choked with hau there's - it's on what they call hui land there are numerous family owners of which my grandmother was one of them...um...and the place does still exist. It was cleaned maybe about 10-15 years ago. There was this guy from Kīhei rounded up a bunch of people - I don't know if they were hooked up with the Sierra Club or anything- they went inside, they cleaned everything up. I helped cleanup a couple of times and it opened it up pretty good. I don't know the state that it is in now but it's just you know you have to go through the school, State of Hawai'i Department of Education school property you got to go into everybody else's property, you know.

CSH: Oh, ok, ok. So, there's no easement or anything? It's just. . .

KN: Well the easement is as it always was, right? Well I mean everyone had access to these kinds of areas and you were careful about how you entered and how you exited.

CSH: Yeah.

KN: You were careful about what you did when you were there. You know, trying to get - in this system of things we live in now in order to go in places you gotta get permits, you gotta get insurance. Who the hell can afford insurance?

CSH: Yeah.

KN: You know, this liability stuff because if they get hurt no one like be liable and all this stuff so the system is setup to not support the re-institution of these kinds of cultural treasures.

CSH: Yeah.

KN: Yeah.

CSH: Do you know if those people who cleaned up the complex mapped it or anything?

KN: I believe it was mapped by Walker them. You know in that book "Sites of Maui" and stuff. It's all mapped out inside there.

CSH: Ok...umm...let's see. So, we talked a little bit about gathering. Mauka, makai. Um. I'm trying to think...what about hunting or surfing?

KN: I gathered shrimp, 'ōpae in the streams. There used to be a lot of 'ōpae in the streams that flow through our property and that's all but declined. It's all but gone.

CSH: When did you see that decline?

KN: When I was a kid, when we used to go there as kid, there was always 'ōpae in the streams. Always. We used to get 'ōpae for eat dinner. I definitely, there was...when I came back in '89 and started to clean the area there was some...still yet, cause my grandmother would go into the bush and she would get 'ōpae for use to eat and...there isn't any now.

CSH: None?

KN: None, none. There's some prawns.

CSH: Those big ones?

KN: Big ones. There's prawns now but I - there's no 'ōpae. There's no small 'ōpae.

CSH: So, do you think the decline is because of over picking or overusing?

KN: Nah. No, there's no way you could over pick that place. No way. We were the only ones there.

CSH: [Laughing] Or the prawns? Do you think it was the introduction of the prawns or...?

KN: I mean, I heard people say that. I heard people say that, you know that possibly. But I don't know who tested that and...there was so much 'ōpae. I don't think those - you know when we talk about prawns how many was in this pond that I saw today that's this big right here? Five. So those five prawns ate all that 'ōpae...

CSH: Yeah.

KN: I don't think so. You know? I do know that the flow of water is impactful on there and I have seen the flow of water decline from when I started in 1989 till today, I have seen it decline.

CSH: In grandma's patch or just all over?

KN: Well. All over, yeah? I mean coming as kids, all the streams were always full of water. But when I came back in '89 I noticed that maybe two flowed. When I started working in '89 in the - going back to the patches, consistently, at least three times a week - Honomanū, never flowed. You know I thought that was pretty unusual but it never flowed unless it was like torrential rains.

CSH: Torrential rains?

KN: You know. That's the only time I saw it flow.

CSH: Wow.

KN: But now ever since the release order, it's been flowing regularly.

CSH: Ok.

KN: There's been a nice flow so several other streams have been flowing nicely ever since the release order. Puohokamoa I know is one, um, Waikamoi is another one. Our place...maybe a little bit more than when I first went out there. But I'll tell ya, I remember going out there in '89. It was definitely less than when I was a kid.

CSH: Yeah.

KN: And then I started to see it go down even more after that, and then I don't know I guess it's kind of reasonable now.

CSH: Yeah.

KN: But it's not like it was when I was a kid and at those particular points. And I came here in the summer.

CSH: Yeah. Oh yeah?

KN: No rain...

CSH: No rain?

KN: ...and in the winter! And I spent more summer time here and that water was always flowing in the summer. It was a significant flow, yeah? So, it's not about, it's not about the kahawai being 6 feet wide and 4 feet deep and there's water in it. It's about the water in it has a velocity behind it.

CSH: Yeah/

KN: So it's not that its 6 feet wide of water and 4 feet deep. Its X amount wide and X amount deep but there's a really crisp and vigorous flow to it. You know, and that's what's important. That's what keeps everything stimulated and alive - that I've seen. If you talk about a healthy stream flow, that was a healthy stream.

CSH: Well that's also vital for the farming of lo'i kalo.

KN: Yeah, absolutely.

CSH: So, you guys need that too, right?

KN: Absolutely.

CSH: Did you guys do dry land?

KN: No, I just do wet land.

CSH: Why, because you guys have the water right? [Laughing] It only makes sense.

KN: [Laughing] Or even beyond that, that is what was handed to me. They gave it to me and said here. Tag, you're it. So ok.

CSH: So, you still mālama that place?

KN: Oh yeah.

CSH: And your 'ohana comes with you? Your sisters go out there? Your cousins?

KN: No mostly it's me. Once in a while - so my daughters in school on O'ahu, my son is trying to develop a life for himself out here. Once in a while they come back and you know we go and we do the work - continue the work.

CSH: Yeah. Do you have mo'opuna too?

KN: No, no.

CSH: Not yet [laughing]. But eventually if you do they'll make their way there too.

KN: If - you know it's definitely their prerogative. I think, I think their parents will have in a say in their going to have to [CSH laughing].

CSH: Yeah.

KN: I think so. And who wouldn't?

CSH: Yeah.

KN: Especially in this day and age. Maybe in my time when I was growing up it was like who would want to. But nowadays there's a whole different value system on those kinds of things. There is actually a desire to go out there and do those things.

CSH: Yeah, absolutely.

KN: In my time the last thing you wanted to do was go work on a farm. You know.

CSH: Yeah. So, no one lives at the house and stuff over there?

KN: So...so the property where the farm is at there used to be a house on it. That was my grandmothers'- grandmothers' house - or grandparents' house. When she got older she bought another property below in the village and that property belongs to my cousin.

CSH: Oh, okay.

KN: And they do not live there, so I basically take care of the old family homestead.

CSH: Yeah. So, you still get your kalo from there and you pound poi or. . .

KN: No, I use grinder.

CSH: Oh, ok, ok, ok.

KN: [Laughing] Use grinder.

CSH: So, you make poi and pa'i 'ai?

KN: Yeah I, um...Aloha Poi is my taro outlet where I send all my taro to. Whenever I have it.

CSH: Ok.

KN: I am looking for...I have used other sources. I've been on a two year ...it's been a two-year non-production of taro because I have been inundated with feral hogs.

CSH: Ohhhh. Wow.

KN: Wiped out the whole place. Everything, everything. One acre of all taro, all gone.

CSH: [Gasps] Oh my gosh.

KN: For two years, so I'm just making a comeback. I have a crop that's...that I'm going to harvest within about a month or two. But the rest is just growing back. Yeah, they destroyed everything. So, I had to fence off the whole property.

CSH: You have neighbors?

KN: No.

CSH: No? Ok, ok.

KN: So – we - this property is at a place that the inside people know. The name of the property is called Lakini and its our family homestead. And it's on the ridge of Wailua. Above the village yeah? About what, I don't know--what is that about 300 feet, 400 feet above the village?

CSH: I'm sure other people must have the same issue with the pigs though?

KN: Oh yeah, they're all in the village right now.

CSH: Oh ok.

KN: They're eating peoples whatever they're growing down there. They're eating the baby goats. They attack baby goats yeah? And they'll eat them.

CSH: I didn't know that.

KN: Avocados, trees, the - yeah, it's bad.

CSH: So, is that also affecting like the pōhole as well?

KN: Well yeah, they'll run right through the pōhole. You know? And these, these feral hogs have been inseminated with Russian boar...um, what would you call it – they've cross-breed. People brought Russian boar out there and they've cross breed all these pigs.

CSH: What?!

KN: So, they're more aggressive now, they're bigger. They got big heads, they got big jaws. They're really aggressive.

CSH: Like it was just in somebodies like somebody domesticated them and. . .

KN: Well the hunters I guess they needed one bigger charge, ah? They needed more wild animals for - you know that's the mo'olelo.

CSH: Yeah.

KN: That's the stories that's going around that people know how did they get here. I don't know, how did the mongoose get here? [Laughing] How did that happen, right? But it happened.

CSH: Yeah.

KN: How did those wallabies get loose in Kalihi, right [laughing]? So, somebody brought them in and it done and okay too late now. Apple snails.

CSH: I know.

KN: Same shit.

CSH: Do you guys have that at your – well...

KN: Down at the bottom they have. We no more on the top. We had.

CSH: How did you get rid of it?

KN: Ducks. Ducks.

CSH: Oh ok, good.

KN: Someone went above me and somehow it got loose up there and it flowed into my patch and it just started getting on. So, we put the ducks in - the Cayugas - they ate them all. Took about three years and because there was no one going up again and continuing that process and there was a good water flow at the time. That year was a pretty wet year. It kind of I guess washed the whole system out and then the ducks took care of the rest and that was pretty much it.

CSH: How's your water flow now? For your lo'i?

KN: Well with the previous rain it's been really good.

CSH: Yeah. Today it's beautiful!

KN: Yeah so, but the last week.

CSH: Yeah, you guys had a major storm come through.

KN: Yeah, there was but they never announced a flash flood alert you know. But there was a big flood inside. I bore witness to it, big waters. So, like any big water after the big push after the initial brown water push, you get a really nice steady flow of good, clear water. Then it will kind of subside down a little bit.

CSH: Good.

KN: Yeah, cause it fills up the aquifers yeah, then all the springs in the mountains gush it all out and as long as it keeps going then its good.

CSH: Ok. Um, let's see. Besides yourself, people in that area, in the ahupua'a. Um, any cultural practices that they practice?

KN: Um, you know, we got to define what is cultural practice, yeah. Because the buzz phrase now is cultural practice. The - in my grandparent's time, it was just life.

CSH: Way of life, yeah.

KN: It was way of life. So, I learned stuff like that but it was way of life, it wasn't one cultural practice. You never practice anything, you just did the work. So, I would virtually say yeah there are - everyone in that valley is a cultural practitioner.

CSH: Yeah.

KN: So, yeah so are there cultural practitioners? I will say...every one of those people that live in there are cultural practitioners. If you're planting food, if you're gathering food, if you do these things that is what is classified now a days as a cultural practice.

CSH: Yeah. Ummm...wow, I feel like we've already hit everything.

KN: Yeah.

CSH: Pretty much. I wanted to ask what kind of fish did you guys catch makai?

KN: [Sighs].

CSH: And what's your favorite fish?

KN: [Laughing] My favorite you can't get over there. So, the fish that we used to eat was o'opu, 'opae. I'll consider that a fish. Kole. And I never fished for them but there were the men and the younger men that fished for um and then they gave to my grandparents. Because they were the old people.

CSH: Wow. Yeah.

KN: So, anytime that there was a fish thing going on...they would always feed the old people.

CSH: Well that's how, right?

KN: Yeah, that's how. [Laughing] My grandmother would always make it a point to put money in their pockets and that was a big fight. You know, and which they would always lose. Yeah, but it was important for her to reciprocate in a fashion. And that was the way...and I'm talking about when I was in my 30s and 40s. At that time her ability or way - she was like in her 80s and 90s, and that was her way of reciprocating them. She knew that she had, um, not a lot of money, but enough money to share as they people would share. They didn't have that much money but they had a lot of fish and a lot of 'opihi and a lot of 'ōpae and a lot of that stuff. Getting back to the favorite fish, when that happened akule, dried akule. I like dried akule. And 'ō'io, raw 'ō'io.

CSH: I know [laughing] and grandma would lomi that?

KN: Oh yeah, yeah, it was lomi.

CSH: How she do? She scrape or she....she....?

KN: Oh no, scrape. Cut um open, scrape, scrape, scrape.

CSH: Did she do cheesecloth too? To get all the bones.

KN: No, she picked the bones out with her fingers.

CSH: Wow, she's one nice lady.

KN: Oh yeah, Lady Aloha [inaudible, wind blowing].

CSH: And then what she put inamona? How would she prepare it?

KN: Hawaiian salt. If she had limu kohu she would put limu kohu inside little bit, not too much. Yeah.

CSH: What about pelagics?

KN: What's that?

CSH: Like deep sea, like ahi, aku.

KN: Aku, my favorite. Dried aku. I can eat dried aku and poi every day. Forevah! That's all I like to eat.

CSH: Okay, I picked right then, yeah?

KN: Yeah picked right. That's why I said, "Oh girl you know how!"

CSH: Ok, ok, alright! Ok so....

KN: So, once in a while there are a couple of deep sea fishermen over there. They go to the buoy. And there was that time when she was alive that when they hit the big ones they would stop by and deliver that.

CSH: Nice. Yeah, yeah, yeah.

KN: And so that was her favorite fish dry aku. And dried aku that was her favorite.

CSH: And she dried them herself? She had dry box and all that?

KN: Yeah kaula'i.

CSH: Yeah, yeah. Was it all onshore or little bit offshore fishing?

KN: That we did?

CSH: Yeah, that you guys did. Or net?

KN: Definitely the little that I did with them was onshore. Um yeah.

CSH: Ok. We're kind of coming down the wire here. So, do you have any concerns?

KN: Yes.

CSH: I guess related to way of life, cultural practices, way of life, how the project will impact that.

KN: Yeah. From Nāhiku, which is where the moku of Ko'olau ends and the moku of Hāna begins. Down at the Nāhiku end that's where we go pick hīhīwai.

CSH: Ok, let me get my map so I can kind of get an idea.

KN: And 'opihi and that was where my grandmother was. So that was going to [inaudible].

CSH: Like this area or are you talking about this area?

KN: Ok, where's Nāhiku?

CSH: Nāhiku is on this side.

KN: So, in this area. Right in here.

CSH: Ok.

KN: So that's where we went to go. We picked 'opae in certain streams over there. And certain areas that were dry [inaudible]. When my grandmother was younger that's where they used to go [inaudible]. So, when those places dry up that adversely impacts the way of life, the cultural practice if you will. So, taking water, diverting water in the copious amounts that has been going on for the past hundred years, adversely impacts the people's way of life that live there. It does.

CSH: Ok. Do you have....are you still on that thought, do you have more to share?

KN: Yeah, pretty much on that thought.

CSH: Where's Waikapū?

KN: Waikapū is out – you see that mountain over there? Right through those trees?

CSH: That mountain?

KN: Yeah. See this big mountain right here? Come down see this stop light look through this puka of two trees and you see the stop light you see that mountain? Right inside there.

CSH: Yeah, yeah, yeah.

KN: That's Waikapū.

CSH: Ok, ok.

KN: So that water belongs to Na Wai 'Eha. Those guys are getting water that is diversified agriculture.

CSH: So that's 'Īao, like Happy Valley?

KN: Yeah that's 'Īao, Waikapū, Waiehu side. That's all that stuff. That doesn't have anything to do with this east side Ko'olau water system. And there are no diversified agricultural projects going on for this side right here. Now Mayor Alan Arakawa told me, his mouth to my ear, said they want to take Kīhei's water consumption off of the Wailuku aquifer and they want to supplement that with 10 million gallons a day from the Ko'olau water system. That's his mouth from my ears, no bullshit. You know the whole problem with this is for the past 150 years they've been circumventing the law. They've been violating the law. And the administrators have allowed it to occur. So when you guys talk to people out there and you tell them, oh we had to stop all the water at this impacts us adversely because the Ke'anae and the Wailua town farmers have filed one suit or one injunction to Native Hawaiian Legal Corp and they're adversely impacting the thing so and that was their narrative. And that's how they got BLNR to let them go on for another 30 years or something like that - or that's what their applying for - but they went on scot-free. You know, and that was the wrong narrative. And what we were saying is there needed to be addressed and restitution for the past 150 years of violations.

CSH: Yeah.

KN: So that's my concern, when you ask me what concerns I have. That's my concern [laughing] enough already.

CSH: So, do you have any recommendations?

KN: Yeah, follow the law! Support the law. File for your permit. There's a policy and there's procedures. Adhere to the policy and follow the procedures. And stop trying to circumvent it because you smart. You know, just be honest, be transparent. Yeah, go take your time, you got to go through the steps, no different from me. If I get land and I like one water meter it going take me 5-6 before I can get the water meter. How come I don't have the privilege of snapping my finger and then all of a sudden, I'm going Alan give me the back-door opening. You know shit, I wish I was part of that team [laughing].

CSH: Um, do you have any referrals? Like other community members?

KN: The Wendts, the Wendts are pretty akamai about all of these water issues. I don't know how much they will be able to divulge because of the ongoing case. However, I do think they should say something. I don't know what they would say, but they should be at least asked. And let them say 'due to extenuating circumstances or the case at hand we are unable to reveal [inaudible].' And maybe they can get somebody else. Cause the court documents will be public record as well?

CSH: I'm not sure. I do have testimonies from them but they're old. Um, anyone else besides the Wendts?

KN: You know I'd like to give plenty names

CSH: Yeah.

KN: ...but I don't know how'd they feel if I gave their names. I think the Kanoas would be good, Gladys Kanoa. She's pretty akamai and open about what's necessary.

CSH: Ok. Is there anything that you would like to share or anything that like I didn't touch on.

KN: Nah, I'm good. Nah. It's good? It's just the whole thing about at this point in time there's enough for everyone. Especially...look traditionally the administrators and the mangers knew about land management, they knew, or at least they know people who knew. And it wasn't about circumventing the system. It was about honest management and care and concern for the natural resources because we live on one island! In the middle of the sea! So, you had to be careful about the management of these life-giving resources, so they established rules and regulations. When you can go fish for the ahi and when you cannot fish for the ahi because their spawning. You fish for the akule.

CSH: Yeah.

KN: We got them in reverse right not that's why we're screwing shit up. We're supposed to be doing 'um the other way around. So, they knew that so there are these basic rules that nature dictates to us. So, if we just follow the rules we're going to be good as a people. We going to be able for share. That's how you live on one island. You got to share. So that's all we got to do we just got to share with each other. Stop freaking taking so much. And it's always the guys that get plenty that do most of the taking. Think about it - think about the people who get plenty you try and take a real hard look at them and see if their taking more than they really need.

CSH: Ok.

KN: Ok.

CSH: Good? Ok. Alright.

[End 56:23]

Appendix B Skippy Hau Transcription

Cultural Assessment, East Maui Irrigation: Cultural Surveys Hawai'i (CSH) interview with Skippy Hau (SH), Aquatic Biologist for DLNR Maui on February 16, 2018 in Maui.

CSH: CSH Researcher

SH: That's why they made that bypass, you know that right lane that goes off...that's what they call the Pā'ia Bypass. What happened is they, the businesses were concerned that they're gonna skip Pā'ia and then they gonna lose business and they didn't want the bypass to go through so what they did was they did a lease with the plantation and then they put in the bypass and at one time they locked the gate and then they would use it only during work hours.

CSH: [Laughing]

SH: And then now they got it 24 hours at the pull off.

CSH: Right.

SH: But I said, you know, it's kinda silly because, um, they're gonna still come, just the growth in tourism.

CSH: Yeah.

SH: So Maui...there's alot more, that's also why our gas prices are always the highest.

CSH: Uh-huh.

SH: Because the competition and stuff so we gotta pay high gas prices. Out of all the islands, this is the one...the most influenced by tourism.

CSH: Right, right.

SH: That's also why when we go out and I do work in the field and stuff...but it's interesting because you can see when there's no tourists then basically all the economy just shrinks.

CSH: Yeah.

SH: Because we're so dependent on tourism now that if the tourists don't come, they're not gonna stop places to go buy stuff too. Yeah, so little bit like the Big Island but I like Big Island 'cause they get the break and they get the cane haul road so you can pull off and I said oh, that, that, that's real good for the engineers but also good thing got the Volcanoes National Park.

CSH: Yeah.

SH: Over here, if it wasn't for Haleakalā National Park, um, we wouldn't get the, the major funding in terms of the bigger highways.

CSH: Right, right.

SH: Yeah. So you live Hilo then?

CSH: Yeah, I live in Hilo.

SH: Oh, ok. Originally from where?

CSH: I'm, I'm from Hilo. I was born and raised in Hilo.

SH: Okay. Waiakea or Hilo?

CSH: Yeah.

SH: What high school you grad?

CSH: Oh! Kamehameha!

SH: Oh, Kamehameha, ok.

CSH: Yeah up in Kea'au.

SH: Oh, ok, ok, I see but you guys the new generation that's why.

CSH: Yeah. So I was the first graduating class in, on Big Island.

SH: Ok, so, so even Maui too that's why I'm so glad that they were able to get the campuses on the different islands.

CSH: Uh-huh.

[Passing vendors on the side of the road in Ha'ikū]

SH: So these guys used to be back there. What they wanted to do was they tap on the people that wanna go visit the turtles and stuff.

CSH: Oh, what do they sell?

SH: Well what happened was when we had the big north shore swell, they closed the park.

CSH: Oh.

SH: So they moved out here and that's why they kinda have the, like the fruits and vegetable and stuff.

CSH: Oh I see.

SH: They tryna catch the tourists and stuff.

CSH: Yeah, I've been to...the campus is in Pukalani yeah?

SH: Oh, ok.

CSH: The Kamehameha campus. Yeah, I've been there a couple times.

SH: So I've worked with the Ipu Kukui and the Ho'olauna programs.

CSH: Oh, cool!

SH: And then so normally East Maui would divert water, this is the first one, this is Maliko stream. So Maliko is the first one, see over here is a boat ramp.

CSH: Oh yeah.

SH: What's also interesting is that it's not private, it's not State land. It's just...they kinda do it but I don't know how they get the funds but they kinda take care of the boat ramp here but it's not government lands and stuff...but we have a boat ramp here.

CSH: Oh that's cool.

SH: So, but Maliko is the first, from here on all the way to Makapipi Stream is where they divert.

CSH: Uh-huh.

SH: So this is where EMI starts to divert the streams.

CSH: Ok.

SH: So this one, I don't know if you read the history, this is where, I guess, um, who is that? Was that Baldwin or one of the A&B? But the one, he lost an arm and so supposedly he swung and then basically guys were afraid of working here and then so he went with the rope and da kine, he showed the workers, "I only got one hand," and then tell the workers to do it because they have siphon pipes and stuff. But they divert the water on top. But some of the other things too when you look at some of the irrigation ditches, um, there are up to four irrigation ditches.

CSH: Ok.

SH: So some of the streams, like Honopou, I think I'll stop at Honopou first. Honopou, what happens is, you have four different diversions at four different elevations. But nobody has thought about measuring how much water gets diverted from each of the streams.

CSH: Uh-huh.

SH: So that's why I noticed in the comments and I think also some other folks also commented, they want more clarification as to how much water they diverted from the stream and how much water, uh, is allowed to stay.

CSH: Yeah.

SH: And most of the time when they divert, they divert all the water.

CSH: Right.

SH: Yeah.

[Pause]

SH: So this has been diverted for over 100 years and stuff and it's kinda interesting but the, I've been disappointed because even EMI...and what happened was we also had, uh, um, it was supposed to be somebody who was supposed to, uh, be like caretaker, uh, to at least go and work, work on some of the water and stuff.

CSH: Uh-huh.

SH: And then it was interesting because they had the land agent here being the person to watch things and then they were doing a real good job and then all of a sudden you got...the position got taken away from him and then they got 'um a person from Honolulu...somebody in land management took over.

CSH: Oh.

SH: And they never came out to come look at the streams or come look at the diversions or measure water and stuff so that's one of the things that I've asked for. This is Ha'ikū Community Center.

CSH: Oh, ok.

SH: So like the Pā'ia one, they have this. So you know like for parties and stuff?

CSH: Uh-huh.

SH: But also...bathroom. [Laughing] If you need a place to go bathroom, you know, at least you can count on, ok I can go bathroom over there. Public bathrooms and stuff...besides the parks and stuff.

[Pause]

CSH: So where do you live on Maui?

SH: I live in Wailuku, I actually bought a condo... so I live in a condo.

CS: Nice.

SH: And I bought a condo thinking oh well, if I get a chance maybe if I buy a house but yeah, no. Um, the problem with the property and the lands...

CSH: Uh-huh...

SH: [Inaudible] ...the land got stolen.

CSH: Oh, yeah.

SH: When the plantations took over...so you know, real interesting because some of them too even from even Hāna and the ranch and stuff like that, people had safes... "Oh come, we go put your deed into our safe" and then all of a sudden the plantation owned it and the ranches took over the deeds...because the people didn't know right, private property.

CSH: Right, right.

SH: But they took over people's lands that way. That's why a lot of the folks they got the award, land awards.

CSH: Uh-huh.

SH: They basically, when they were stuck in the valleys and stuff, that's what the plantation did they cut 'um off. So they cut them off from...because they used to live inside the valleys and raise taro.

CSH: Uh-huh.

SH: That's why what's so interesting is now they're trying to go back and raise taro...like a whole bunch of taro patches and stuff, to raise and then to show that if you put taro then you maintain the integrity of the stream.

CSH: Right.

SH: Water gets used in the taro patches but the water is allowed to flow back into the stream and flow to the ocean, so you maintain the ecosystem, the stream ecosystem and stuff. Whereas the other way, you divert water and then the water never comes back into the stream.

CSH: Uh-huh.

SH: It just gets used and taken to other, uh, ahupua'as and then [inaudible]. They don't officially acknowledge it but they don't do anything...of the traditional way. So that's why you get more of a western, change in western concept. So that's also why one of the things that I present when I talk to students, I explain to them that what happens is, now it goes from...also, even the definition, the thing got changed so water diver...diverted water now they say it's water that's supposed to be for agriculture. Agriculture, at the time, now you had sugar and pineapple just starting to come in so but they talked about big plantation agriculture not taro.

CSH: Yeah.

SH: So in the original documents that I got, this is from, uh, Pat Tummons...went through the archives and stuff so, um, water, um, water use and stuff according to... this is Emma Nakuina. So she's related to the Metcalfe family, but what she did was she wrote about Hawaiian water rights and stuff and when you read her original document it says, basically she's saying water is for taro, taro being the principle.

CSH: Right.

SH: And the whole thing, the concept for Hawaiians for water is basically, you know, to raise taro.

CSH: Yeah.

SH: And I get that from her first paper and then when you look later on then when this guy Justice Perry sites her paper he changes the definition now in Hawai'i that water is for agriculture, not for kalo.

CSH: Not for... yeah.

SH: Yeah cause you don't have...but Hawaiians specifically was kalo and for, now him as Justice reviewing this and citing her but then saying that water is for agriculture at the time...sugar, pineapple.

CSH: Oh, funky.

SH: But she also says that, um, sugar cane was not a priority for water.

CSH: Yeah.

SH: It's indirectly but not cause they knew, also [inaudible] you had all the pressure from the King because they wanted the water to raise sugar. But then that's how, they cut 'um and [inaudible].

CSH: Right.

SH: So, historical stuff.

CSH: Yeah, interesting.

SH: And some of that stuff too I can send it to you if you want.

CSH: Ok, yeah, thank you.

SH: [Stutters] That's also why [inaudible] all the references and other people's research also...um, but that's why it's so disappointing that I submitted or the Aquatic Resources submitted stuff for the animals and the gathering and yet on the decision you don't see Water Commission saying anything about gathering.

CSH: ...Or taking that into consideration.

SH: And even then they just come up with a number.

CSH: Uh-huh.

SH: But a lot of times the number is below...what we recommend is 64% median flow which basically would, 64% median flow would restore 90% of the stream habitat.

CSH: Wow!

SH: So, but that was what we did in the study and then we submitted that but nobody looked.

CSH: Nothing happened?

SH: No. They just come up with a number and...but it's like one-third. You know when they did the 'Nā Wai 'Ehā' return of the water and stuff, so the water that they returned in, like, in 'Īao Stream, 10 million gallons. Basically I went back over and I [inaudible] ...no I recommend 30 million gallons be released, so I have a memo in house. I basically, I wanted to do that before the storm because what it is, I knew that the water is not being released, the 10 million gallons...

CSH: And with the big storm it's gonna look like there's a lot...

SH: Um, basically no, no it got washed away and what happened was...the intake got covered, got buried.

CSH: Oh.

SH: The Wailuku Water Company unburied it and redirect the stream over the intake but then they're taking the water and selling it to the County. [Laughing] So that's the politics part that nobody really acknowledges, yeah. So how are you on time and stuff I know you said you have a 6 o'clock flight tonight and that, um, so we're good...and then yesterday it was just pouring.

CSH: Oh yeah?!

SH: I tried to come out this way, it was just like wasn't gonna stop so actually I turned around and came back down. I was gonna try and get samples, probably some fish or something but I just didn't wanna come down [laughing] the water was all high.

CSH: Yeah, Uncle, and I'm sure you would know more than I would know about the traffic going back so...

SH: Oh, yeah, yeah. [Pause] See what is, is everybody tries to charge in, the other tourists, ok, and after they do the Hāna Highway stuff then when they're coming back, yeah, been there done that and they just wanna get back to their hotel.

CSH: Yeah.

SH: But when they're going in then some people don't wanna pull on the side and just let you pass. That's when you gotta watch because the residents will drive in the middle of the road or try to pass cars when they have the chance. That's when sometimes they're driving dangerously. It's so weird because now they're saying that the storm going come back again and when the trades go back again, so then the same storm going come back and going give us more rain.

CSH: Yeah, yesterday was pouring in Kona which makes sense.

[Pause]

CSH: What area are we in right now?

SH: Ok um, so we're past Ha'ikū, um, I'm gonna be heading towards Honopou. Honopou Stream. I don't know if you got to look on the map.

CSH: Yeah, I brought a map too.

[Long Pause]

SH: So what we did is... from Honopou Stream we went all the way from the ocean and then came up and did surveys in this stream.

CSH: Uh-huh.

SH: Yeah, also, access, that's why I figured we stop over here and then show you what it looks like.

CSH: Nice.

SH: Oh, good thing we came now, they going gate um. Wow, interesting. So one of the original folks who filed suit was, da kine, Beatrice Kekahuna.

CSH: Uh-huh.

SH: And then her sister passed away first and then she just passed away. But they've never commented their need for water, for their taro patches below. So I'll show you some of the modifications they did.

CSH: But people live down here?

SH: Yeah, they live downside. [Inaudible] so if you see that name, Beatrice Kekahuna...so she lives on the down side right next to the ocean.

CSH: Oh wow.

SH: And they have taro patches but they're not getting enough water so their fight was to get water so East Maui Irrigation did modifications and things. I go park over here and then we can walk down to the diversion. So this is easiest...the other we gotta go hike in. So this is what the diversion looks like.

CSH: Oh ok.

SH: Did you need a GPS or anything? Oh, you got GPS on that phone?

CSH: I don't... I don't actually.

SH: Yeah, I have...you can have.

CSH: Okay.

[End of Recording]

[Transcription File 13]

[At the Honopou Stream diversion, Figuring out GPS]

SH: ...determines the accuracy to 66 ft.

CSH: Ok.

SH: So what you can do is you can hit mark and the mark will create the GPS.

CSH: Like, push the button?

SH: Yeah, push mark okay and then there. Latitude, longitude.

CSH: Oh.

SH: Yeah, you can have that...or you can either do that or you can clear, when you clear it won't save it. Ok, but you hit this when you wanna save then you hit done. You hit the enter and then it'll save it.

CSH: Ok.

SH: Ok.

CSH: Yeah. Well I've never used GPS before so...

SH: Oh! Ok.

CSH: At all.

SH: Ok. So yeah, so this one you can just leave it on.

CSH: Ok.

SH: Yeah. Let me know if no more battery, I get double A.

CSH: Ok.

SH: So now they take two, before they used to take four but now what's interesting is that this is also recording Russian satellites.

CSH: Really?!

SH: So they're more accurate in when we do our stream work. Before we would go into blind spots and then it wouldn't get GPS coordinates, yeah.

CSH: Uh-huh.

SH: So like I said, so what they did was, you can take a look, this is what EMI did. They did all of this. They'll come in and what they'll do is remove all of the, da kine, sediment.

CSH: Yeah.

SH: But it is controlled by this gate here.

CSH: And that...that is still working?

SH: Oh yeah, yeah, yeah. All of these work. Yeah, so you can see all the other stuff but this one is modified. So when I came here, I also came here when there wasn't this ditch but then they put in this after [inaudible].

CSH: Uh-huh.

SH: There used to be one pipe, then they added two pipes and then now they let the water flow over that way. So what they did was when they put this metal then what they were worried about was all the back splash so now they put the back and the water goes down. [Inaudible] But still takes most of the other water.

CSH: Yeah, so this is all the water that's going to...

SH: Big water would go into the irrigation ditch.

[Pause]

SH: So this is Honopou...and like I said Ha'ikū Bridge. Just watch your step.

CSH: Yeah.

SH: When you walk, uh, there's algae and stuff on the rocks.

CSH: Okay.

SH: So do you go into the stream? Get 'ōpae or anything?

CSH: Do I go?

SH: 'Ōpae or hīhīwai and stuff?

CSH: No, I do not.

[Pause, Walking back to the car]

CSH: Do I keep the GPS on?

SH: Oh yeah, you can keep it on. Did you save a point?

CSH: Do we save it when we're down there?

SH: You can save it and it'll start. Yeah, yeah, I think maybe except for one place. I think when I was at home I just marked it. That's why, waypoint 1, or you can clear 'um all and we can start again.

CSH: I just click mark and done, right?

SH: Mark and then, yeah.

CSH: Or enter?

SH: Enter.

CSH: Oh, cool.

SH: So we'll do that...and normally what we'll do is we also do water and so water quality. Surveying water temperature, conductivity...and then we also do measurements. So we do flow and then how much water [inaudible] and we estimate flow but we do that after we do our surveys. Yeah. [Pause] So I think what is happening too is a lot of visitors would come here. So what happens is, da kine, it's like the beach. Yeah, with all these visitors. Get too much visitors.

CS: Mm-hmm.

[Pause]

SH: I didn't even know they were gonna put the gate up and stuff. It said March 1st.

CSH: Yeah.

SH: Yeah. So, but yeah, that's the kind of stuff, private property and everything so...So have you worked with EMI? No?

CSH: No.

SH: Ok.

CSH: Not ever.

SH: There's a Mark, yeah...um, I think Mark is the one in charge. The other name is um, Garrett Hew. He used to be in charge until he moved up and then this other person retired and now Garrett, I think, I don't know if he retired yet but they went, moved up, yeah. They'd be the guys to call and you can just get a verbal from them and then, you know, you do that and then they can tell the EMI workers, "oh, the State going come up" and kinda let them know so that they don't lock us in. [Laughing]

CSH: Yeah. [Laughing]

SH: They give us the key but sometimes they give us the wrong key. Then I gotta come all the way back to Pā'ia then they give me the key.

CSH: Yeah, I've heard of, like, growing up, I've heard of, like, the water issues here but I've never heard of East Maui Irrigation until just recently when I started working with Nicole.

SH: Oh, ok so East Maui Irrigation is on this side and then Wailuku Water Company, Avery Chum Lee, Avery Chum Lee, also, I guess is one of the big guys at the Tropical Plantation and stuff. So what they did was they started selling off the lands except for where the intake is so it's kinda interesting. So we get a right of entry to go work in the streams and stuff and then, um, but at one time the County was proposing to buy the intakes from them and then then they were gonna take over the water.

CSH: The County?

SH: Yeah, the County. But then now I guess the County doesn't wanna, well the Mayor is gonna be going so...He's ending his term and stuff. You know, sometimes is better but when they're older, just shut your mouth.

CSH: [Laughing]

SH: So he had to make these comments and stuff...and I was like, how stupid can you be? All these people remember and you know they also have theories... don't forget you have skeletons in the closet.

CSH: Yeah.

SH: ...and stuff. It's dark and you never gonna get rid of those.

CSH: Where are all these people going?

SH: Um. This is Ho'olawa. So they go to Ho'olawa Stream and I'm not sure what they...before used to have so much people used to have a pasture and then people used to...you know with cattle and stuff, but I don't know if now they make it a visitor attraction. I don't... they divert the water. It's like the little bit of water that we see...but don't forget now you get, um, three more diversions up top yeah, above, so that tells you how much more water would have been allowed to flow down. Yeah. So that is Honopou Stream and then the other one would be, um, I think when I pass by I'll let you know.

CSH: Ok.

SH: So a lot of these, yeah, we [stutter] had a project for two years we flew in by helicopter.

CSH: Oh wow!

SH: We worked, we monitored the stream on the lower side and then we had the middle side. Rarely do we have a higher side....

CSH: Uh-huh

SH: So we were doing stream work as well as the US Geological Survey was also doing work in the streams too. So it's kind of interesting because they...they disbanded. They had a team of researchers and it's kind of interesting I guess they kinda saw the politics so, why hold these guys on staff? And they just reassigned them to other locations. So they're not doing local streams anymore. Kind of interesting and I don't blame 'um.

SH: It's actually coming in right after they paved and now they put this...I guess guys who are either drunk driving or....

CSH: Right, to wake 'um up a little.

SH: Yeah but now you hate to cross because now it has the bumps and yeah so it keeps you awake but sometimes, yeah, even the residents they just drive in the middle of the road. Just to freak out the tourists sometimes but that's why I always give the highway guys, they're the ones that take care of this but it's just constant, always blowing and you know, when they get landslide they come in and clean 'um. Almost immediately. They have an assignment... they have a...they have an on-site crew but most of the guys in Ke'anae and then Hāna also. But they

take care of Hāna Highway and stuff to make sure it's clear. You don't get car sick, do you? I don't think we're gonna be going any fast.

CSH: I do a little...I do a little. This is the Hāna Highway that we're on right now?

SH: Yeah, it is the Hāna Highway, yeah. So this is Hanehoi Stream. So like with Honopou and Hanehoi, this also has people living here. There's a church just down there. So we met with residents and they're trying to get water back in. But their water system is also dependent on over here getting water. So that's why even some of their water being returned is only for a lot of it... they're asking for water returned for taro so that's why those streams that got selected with the Water Commission is so the taro growers can get water returned.

CSH: Uh-huh.

SH: So at one time what I did was I, knowing that the guys retired from EMI, they retire and they live in Ke'anae, so basically what I was telling them because at the time they were, um, that's why I know there were four licenses. So what I kinda suggested was that I said, you know, you guys are retired and stuff, you guys can go take care of the Ke'anae one. Go bid on the Ke'anae lease and then, you know, if they were organized and stuff and then take over the lease and then they can control the water for Ke'anae.

CSH: Uh-huh.

SH: ...Ask the taro growers out there. But you know they're older too yeah so their retirement come from EMI so they don't wanna rock the boat but I suggested it to them anyway. They had all these guys retired and stuff and they know the system. They don't need all the other ones, they just do the Ke'anae one and then they can take care of that and take care of their water too.

CSH: Yeah.

SH: I also understand you know because even coming from another island and stuff because I don't full complete, da kine...but I say I grew up local and stuff, but oh, you know, you never grew up on Maui kind of deal.

CSH: Yeah.

SH: But I say yeah but I know the issues and I just stay away. But you see all of this, Highways clear so da ting no get overgrown.

CSH: Yeah.

SH: Not too cold?

CSH: No, no it's good.

SH: I can take um off. So I used to drive this twice a month before and I used to do backside. So the fun stuff was when I used to go in Hāna and then I'd work and go to the streams behind. It was a lot of fun. So what happened is that, so people would cancel on the cabin so State Parks' secretary would let me know and tell, "Oh these guys canceled you want the cabins?" And they didn't have internet and stuff so they would let me go. So I'd go in on the weekend and then I'd stay the next week and I go work the backside streams.

CSH: Oh, nice!

SH: Yeah, but I worked out of the cabins so I can save time. Takes a whole hour to get into Hāna and stuff and then I just work from there into the backside.

CSH: Uh-huh.

SH: It's always been fun. I learned a lot but just get to go take look the streams...but sometimes very dangerous so that's why I also...I guess people need to understand cause some of the places that I've seen people get crushed or they were hiking...

CSH: What do you mean, crushed?

SH: Yeah.

CSH: Like landslide kine crush?

SH: Under one boulder or da kine, they're walking on these big boulders and stuff, similar like Big Island but this was unstable and stuff and then they had somebody walking and then they got pinned by the boulder and basically they had to come out and then the rescue guys came in to recover the body.

CSH: Oh my god.

SH: So there's a Alelele and a Lelekea stream. The Lelekea stream I'll always remember because we used to also fly in by helicopter. So we fly in, we were just about to land and you hear, "Oh, cancel. Plan B." What happened was we were flying over and we can see pakalolo. I couldn't see it but the pilot could and then but what it is it might be booby-trapped and stuff so we don't wanna go in pakalolo streams. And that's the only time we had to cancel and go to Plan B and so we did that and we had to go to another stream.

CSH: Pakalolo? Wow.

SH: Yeah. They were hovering over and so I just took a picture. I gotta go back and look at the picture and stuff and I have no idea what pakalolo looks like but yeah. So the pilot knew and he had to go to Plan B. That's the only time they had to cancel but what it is too it's like we have a team gut feeling knowing that somebody doesn't feel right with flying or, da kine, to basically speak up and they cancel. We'll have an alternative site or another stream to go to. So you see all this? [Inaudible]

CSH: Yeah, it's nice and open.

SH: So hopefully it doesn't cover but it'll get overgrown later. They'll come in with the pick that chops all the vegetation and stuff. You have that and sometimes the signs say "No Spray Poison."

CSH: Yeah, yeah.

SH: Cause the highway guys like to use to RoundUp.

CSH: On Big Island too.

SH: So the problem is also the wedelia, yeah. They introduced it as a plant and so wedelia will come into the streams and then it's wedelia that gets washed down and it's growing in the streams. You know which one...the yellow flower yeah.

CSH: The yellow flower?

SH: Yeah. It's wedelia. It's actually a plant that if you look good it has yellow flowers. So get that and banyan and [laughing] torch ginger.

CSH: Yeah, I'm kinda surprised at how many banyan trees are around here.

SH: Yeah and the eucalyptus. The eucalyptus is way bad because they thought the 'ōhi'a were dying so then all the CCC programs were supposed to go... this is all the East Maui Irrigation. This is in Kailua. This is their base yard over here. So over here will be Kailua Stream. So what you see later on is that all the different islands all get one Kailua, Mokuē'ia...again you can kinda get the same name and stuff but they use it on different locations on the island. So that's why a lot of times you gotta also know which island you talking about because if you say one thing, each island has their own. Yeah. So we have a project with the hau and stuff. They're supposed to cut back on O'ahu in Kahana. The hau got so thick and they wanted it cut back to kinda open it up because what was happening it would kinda like block the stream and stuff. This guy comes here, he puts his parrots and lets people take pictures. He can make money, yeah.

CSH: Yeah, easy kine money.

SH: So they say, and it's a long name, Nā'ili'ili Ha'ele. This is where most of our rescues come from. Two things, people go topless over here and they go nude sunbathing and stuff.

CSH: Like, they walk down there?

SH: The tourists and stuff...you'll see where the cars are parked on the side and they attract other tourists and even though the day is rainy, guys still go and then the rescue gotta come in. Sometimes the guys get their clothes all washed away and stuff.

CSH: So they get rescued all naked?

SH: Yeah. You know, not just that but, oh! what about the car key? [Laughing] You know not too bad, you can get back but when the car key get washed down. So all these cars over here, see look at these guys. These the guys I wish they would just tag um...but they're tourists and they not going pay the ticket.

CSH: Yeah.

SH: Cause they going be gone. That's what over here is popular for and always get this sign, 'DO NOT BLOCK GATE' and the guys still block the gate and everything. So over here I guess they get rainbow eucalyptus. So what happens, all the tourists guys they stop by and actually this is supposed to be barbed wire but the guys cut through and they walk up over here. So they park here and they walk there and take pictures over there. But that's what I was telling you about, so not all of this is State. They make this assumption that it's public and they make this assumption that oh, it belongs to the State and not really. This is private land. So that one is private but guys still, the tourists still go over there and take pictures. So just to illustrate some of the, 'cause they

make this assumption oh, that it must belong to the State but not everything belongs to the State so I was saying if they can mark it out that would be nice to mark.

CSH: So much bamboo.

SH: So yeah, they come over here to take pictures next to this one and the tour vans and everybody will stop but at least they can see the rainbow eucalyptus. It's just a eucalyptus! [Laughing] I mean everybody stops so everybody going stop too and then, oh man! So this is wedelia over here. I don't see the flower but it's all on the side but when you go down into the stream you can see on the side. Pieces break off along the stream and starts to grow. So do you know your plants? I don't know what your specialty is or da kine?

CSH: Not really

SH: So this is wedelia.

CSH: Oh, these ones right here?

SH: Yeah, the ones with the yellow flower. Those are wedelia.

CSH: I'm surprised to see a lot of hala on this side. We passed a lot when we were coming in.

SH: A lot of it was sick too. That's why I stopped collecting from Hāna. Wai'ānapanapa I used to go and collect. Yeah, I told my mom when I was weaving and stuff, oh, the baskets take too much and then I gotta keep doing that, every week I gotta go and collect leaves. So after I made couple baskets for my mom I said, nope, I just going stick to bracelets. [Laughing] Cheap dat kine. You know like place mat holders and stuff.

CSH: Yeah!

SH: I just make 'um for my cousin's kids and stuff. Then they go college and stuff and I just give them lauhala and stuff.

CSH: Nice.

SH: Were you involved with the Ipu Kukui or the Ho'olauna program? I know they have the Explorations at Kamehameha.

CSH: Yeah, no. No I didn't. I didn't go...and I only went there from 10th grade. 10th till I graduated. That's the watershed? Is there a watershed called Ipu Kukui?

SH: Um, Ipu Kukui would be on the top of Mauna Kahalawai, what they call West Maui Mountains, other side. Yeah, by 'Īao Stream. Up above. Ipu Kukui is supposed to be the wettest spot.

CSH: I have a friend that works there.

SH: Oh really?

CSH: Oh well he just started for couple years, maybe a year.

SH: Oh, ok.

CSH: So he's new.

SH: So he may know Pōmaika'i Crozier.

CSH: Maybe. His name is Jonny Pestana...or Kainoa Pestana but he's from O'ahu and he moved here couple years ago.

SH: So good thing they cut this back. It was actually coming out.

CSH: No, yeah it's right over the guard rail right there. Bushy.

SH: So Big Island get bamboo that they harvest for bamboo shoot, no?

CSH: I don't believe so, no.

SH: Over here some of the old timers go pick bamboo shoot and stuff, in fact, I don't know, if you get time maybe we go up where get bamboo shoot on the bamboo trail and stuff.

CSH: Ok.

SH: Oh, so what I was thinking of doing is kind of more heading in and then we go the farthest away and then that way we come back, when get time we just stop.

CSH: Ok.

SH: Just take our time.

CSH: Yeah, I normally get car sick but I'm surprised that I'm, I'm being pretty good right now.

[Laughing]

SH: Oh, while you're busy so yeah. If you're just riding and then we get behind tourists, it's the tourists that don't wanna stop. You see the guys go past and atleast....

CSH: Oh yeah, they're blocking the road already...hello.

SH: Yeah. It's like an afterthought. Oh, yield. [Laughing]

CSH: Oh that's what that red sign is.

SH: So actually up here too is a nice little waterfall over here. It's a shallow hike. I just went to go look what's back there. [Inaudible] I'm so glad they're knocking back the bamboo and stuff cause it gets so thick. So just like that other vehicle, I guess somebody doesn't like abandoned vehicles cause what they do is they torch 'um then the County is stuck with trying to remove it.

CSH: Oh wow.

SH: Plus you have to make sure your car no break down. [Laughing] Yeah you see, this is all wedelia. You see how high it grows and how thick. B Highways brought it in as a, da kine, you know, landscaping vegetation and now they can't control it.

CSH: [Laughing] That's always the case.

SH: Yep. All these things that got brought in and people don't know, same like with the ginger. I'm glad Hilo got strong Hawaiian Studies programs and stuff.

CSH: Yeah! I know lot of... a lot of people come from other islands.

SH: You know what it is also, get away from Mānoa.

CSH: Yeah.

SH: And then, that's why at one time I know they were proposing to move agriculture to Big Island. I wish they did. The Tropical Ag. Move everything over to Big Island because not everything has to be at UH Mānoa.

CSH: Yeah.

SH: You see, residents.

CSH: Yeah, whipping 'um.

SH: So over here is Waikamoi Trail. It's a popular place. Actually, on that gate it said 'DO NOT BLOCK' so they're blocking it. [Laughing] So there was a [inaudible] who used to work for EMI. So he was the one, before he died, I remembered him getting interviewed so he said it was Waikamō'ī, so I guess Water of the King.

CSH: Uh-huh.

SH: [Inaudible] So that was his definition. So like I said I remember him saying that. So right over here you'll be able to see a waterfall that's why everyone is stopped on the side. Down here get mosquito fish and swordtails [Laughing] [Inaudible] You see the pool? [Inaudible] See most of the cars if they go slow and they stay on this side... [Inaudible]

[End of Recording]

[Transcription File 14]

SH: That's why by doing that, then also your nori stays crispy.

CSH: Mm-hmm. [Laughing] Alright, that makes sense...if not, going be all mushy with the rice.

SH: No, no, no...but it's like origami and stuff you know you gotta take the time but yeah. Would be 'ono. It's all Japanese. That's why I gotta give credit to 7-11 but even then when you see and they get spam musubi...I wonder if they do that and take it to the mainland or other places and stuff.

CSH: Yeah.

SH: Guys have no problem eating spam, you know, just the mainland you know. You know during the war and everything everybody ate spam. They get the view of the shoreline then all these people wanna get their cameras out and slow down. See like that? That's Ke'anae the peninsula.

CSH: Oh!

SH: So what they did was...

CSH: This is the only way to get to Ke'anae?

SH: Mm-hmm, but what happened is, um, forester Bob Hobdy was telling me he said he thinks they found the caves where the guys they used to pass by gourds. The dirt got transported onto the peninsula and then they raised taro over there. So that's why when you look at all the taro

patches, the taro patches actually go back...way back. They had to bring the dirt onto the peninsula.

CSH: Why though? Why would they grow kalo on there?

SH: No, no cause they got water from the streams and they were able to raise the taro on the taro patches. Later I'll show you the taro patches from up top. Was pretty neat because they have the forest to confirm. Good thing they found the caves where, um, they probably had to form lines. You know like how sometimes even rocks and stuff.

CSH: Yeah.

SH: People had to form lines to go pass rocks for heiau and stuff. So this, of all the streams, I wanted this as priority one to get water restored.

CSH: Which one is this?

SH: This is Honomanu...and the reason I recommended Honomanu is because public access. People come here to go get fern and go gathering and stuff so they'll come here and they'll also fish, they'll also surf. So the public has access to be able to see the stream. All these other places all would be locked up and then they lock up the gates and then the public really won't be able to see the stream. So over here the water gets diverted yeah, but the trickle comes down here. That one is Punalau Stream and that one is Honomanu. So remember I told you, the other streams I had to find by helicopter?

CSH: Mm-hmm.

SH: So this one is accessible so you can drive down to the beach and stuff. If we get time maybe we stop by when we're coming back out. So the stream will flow over here and get the hīhīwai lines and stuff, I would pick them up down here.

CSH: That's cool.

SH: Yeah. So water flows over here and then there's a bridge over here...[Pause] The water is nice and clear. Yesterday it was brown. Yeah, you see [inaudible].

CSH: Yeah.

SH: I had lines before up here actually, that would be summer time. So just about now they're starting to recruit. So now got people now wanting to ride bike. So what it is, I think people come in and then they help bring in the bikes and then they drop 'um off and then they ride off.

CSH: Like as a tour thing?

SH: Yeah. See over here get little bit land slide but down here got the road. That's the one that goes to the beach. So the other month had the tree came across and thank goodness that guys cleared away the trees. They just came last week. Resident [Laughing] They don't slow down for nobody [Laughing]

CSH: Dangerous this bike thing.

SH: Yeah. I don't recommend this highway to ride bike. The west side would be better, less cars. This one is too congested.

CSH: Yeah, especially with the locals just whipping it down here.

SH: You know it's not like a Sunday bike ride or something. It's just congestion and too much cars cannot mix. That's why I feel for the kids... you know before at least when we were growing up, you could ride bike, I said but now it's not safe for the kids to ride bike. Had one big landslide, they're trying to stabilize. I think they're gonna put concrete on the side.

CSH: Oh. Oh yeah.

SH: Yeah, you see. They're putting rebar in.

CSH: This whole thing came down that's why?

SH: Yeah, yeah. See this came down and I'll show you the other one that they fixed before, before we get to Ke'anae.

[Pause]

SH: So your family from the Big Island then?

CSH: Um, my parents are originally from O'ahu.

SH: Oh ok.

CSH: They both grew up in Waimānalo.

SH: Oh Waimānalo, really?

CSH: Yeah.

SH: You wouldn't happen to remember Waimānalo Snack Bar, do you?

CHS: Oh, not me, no.

SH: Ok, yeah so my Aunt used to run Waimānalo Snack Bar next to Mel's Market. Where the McDonald's is.

CSH: Yeah, yeah, yeah.

SH: So my Aunt used to run Waimānalo Snack Bar next to the barbershop and stuff. [Laughing] They were the McGinley's and now my cousins all live on the mainland. [Laughing]

CSH: I'm sure my parents would remember but...

SH: Yeah ask them if they remember Waimānalo Snack Bar.

CSH: Yeah!

SH: Yeah, they used to be next to Mel's Market and stuff because I remember we used to work with my Aunt, they used to get da kine, oh, "Put it on my tab" and they would write it down on a piece of paper and stuff and then later on they'd pay for their meals. But my Aunt also used to make laulau and stuff. Funny because I have a....John Kahiapo, he's the Education Specialist on Big Island, yeah?

CSH: Uh-huh.

SH: But he also works with DoCARE and then but his family is Kahiapo and it's funny because over here when we passed East Maui, there's a Kahiapo Road.

CSH: Oh.

SH: But yeah, his family. But when I told him about...he knows my cousins and stuff because there used to be a Sherwood Forest and stuff and the guys break in cars and stuff like that over there. Guys go surfing and go to the beach and stuff. So my cousins went to Kailua and it's so funny that you hear about Kailua...used to have a Kailua bunch and then the Waimānalo guys.

CSH: Yeah.

SH: [Laughing] So I used to take Eddie Wine and his sister is Kristina and I took them to do hīhīwai stuff.

CSH: Oh cool.

SH: So we've seen when the hīhīwai would just cover the rocks and everything. So their grandmother is still on O'ahu and stuff and they go back to visit. So I said yeah, I go back, I go China Town buy stuff and then I bring 'um back. So this is the other one had the big landslide so I don't know why people always stop over here just to take picture.

CSH: Right!

SH: So they built this...it's a stone wall and all of this was all exposed. The whole thing came down. They had to go back and rebuild. Now it's all overgrown again.

CSH: Uh-huh.

SH: But that used to be like how the other one...all that got wiped out and then they torch 'um again. In a matter of time, they burn um. You see they're stunned because there's no middle line. [Laughing] [Inaudible] So this is da kine, Ke'anae. Get the Highway guys over here. So these the guys in the middle, so they catch it on both sides but they always maintain the highway. This is the "Y" over here...Ke'anae Y. Camping and stuff. Over here is the Arboretum. So got two streams, this one they call Pi'i Na'au Stream and then the other one is called Palauhulu.

CSH: These people...

SH: Yeah. The Arboretum. So had a Aunty Sarah Ka'auamo, when she was living she used to live in this house over here. It's all boarded up now but Pi'i Na'au Stream comes this way, Palauhulu comes the other side and behind her house that's where the two streams join in. So over here.

CSH: Ka'auamo?

SH: Ka'auamo. Yeah. So Aunty Sarah Ka'auamo. So one time when I was coming out, remember when I was telling you I was staying like in Waianapanapa...

CSH: Mm-hmm.

SH: So I'd bring my lunch and I'd have sandwiches and I get drinks and everything but I always bring my ice chest and then this French couple...French couple was stuck in Honomanu. They went slam the door and the door was locked...air conditioning on and everything...and then I

went bring the wife and she went go call the rental car. She had to pay \$200 something dollars or something...

CSH: Oh boy!

SH: But the 2-3 hours we had to wait for them to come out, I went go make sandwiches for them and stuff. French couple. Poor thing they were stuck... they slammed the door and then they're out there, air conditioning, car on everything so I went take her and we went to call the rental car....This is Ke'anae.

CSH: Is there like a general store here? Or like, where would these people shop for food or...

SH: Oh, they shop outside and come in, yeah. The main store, yeah, or da kine, Costco and stuff then come in. Get the Wal Mart...Foodland...Safeway. So over here got that and got one ATM and then banana bread and shave ice and stuff.

[End of Recording]

[Transcription File 15]

SH: 'Aha Moku.

CSH: Yup, yup, yup. I know the son, Pololū.

SH: Oh, ok, ok. So up here, all the taro patches over here still get the Chinese snail.

CSH: Chinese?

SH: Cause get the apple snail, yeah? But this the one, my mom grew up and was eating that kine snail.

CSH: Oh wow!

SH: That one doesn't eat the taro but they still had 'um so if you look inside the freshwater book that's the one I had them take pictures of but they have 'um over here and they're still raising 'um.

CSH: Oh cool!

SH: Yeah. So...

CSH: I didn't know that.

SH: I guess the Chinese name is "tinure" or something and then my mom told me she used to eat 'um when she was growing up and that's why it's kinda good to know cause I guess the Chinese had all this other stuff. 'Cause later on what happened was the Chinese also started planting rice that's why they talk about how they raise rice in addition to raising taro and then they had like um, they raise and they grew their own rice, not coming from California but used to be raised over here in the islands. They used to make their own rice. So one time too, had somebody went spear one eel and that was the unagi, you know, anguila and then that came from look like 'Alelele Stream on the back side.

CSH: Oh.

SH: I wasn't able to confirm but it was back side. They speared it when they were spearing for prawns, they saw the eel so they speared 'um and when they looked at the eel, you know what, can I get permission, I'm gonna send it to Bishop Museum. So Bishop Museum, uh, did some genetic testing and they were able to confirm that it was anguila.

CSH: Oh wow!

SH: Yeah, so that was a [inaudible] we got a paper audit and a theologian followed up and then so they made a paper audit but it was the first, at least we collected him in the wild. At one time they wanted to, there was a guy Richard Matsuura when he was senator of Big Island wanted to bring in, wanted to do unagi aquaculture...

CSH: Uh-huh

SH: ...in the islands and then they shot him down. No, they weren't gonna bring 'um. But what's interesting was that when they, I talked to the guys at Bishop Museum they said that in the 20's and 30's had, so you know how people used to raise koi ponds?

CSH: Yeah.

SH: They used to raise eels at home.

CSH: Oh!

SH: Yeah but when you think, just like when we talk about sushi.

CSH: Yeah.

SH: So they, they made their own unagi and then da kine, don't forget they had to also make their own nori. So they had to go collect and I have a documented case at Maliko.

CSH: Mmm. Nori?

SH: Two ladies and a son died from picking, da kine, nori. Yeah. All the others are always picking 'opihi but this one I documented and followed up. What happened was the, the Wildlife Biologist, his uncle went out to help retrieve the body and that's how he knew. And then so before he retired he told me about that story. So I looked and I found it in the paper, 1950.

CSH: Oh.

SH: Yeah. You see these crazy guys trying to climb down and you know they're in regular clothes...not even hiking. You know what I mean? Then when they get hurt then what?

CSH: Uh-huh! Always the case though.

SH: Yeah. But they're on vacation. Invincible. [Laughing] So we go West Wailua Iki and then maybe we go do that walk first.

CSH: Ok.

SH: So you read the book Sugar Water...by Carol Cox?

CSH: No. No I haven't.

SH: They have some photos in there and stuff. Carol Cox is uh, she's from uh, Carol Wilcox, she's Kaua'i...the Wilcox family. It's funny cause it's like, oh, I know all these people. [Laughing] How are you doing? You ok?

CSH: I'm good. I'm good. Yeah.

SH: Ok, yeah.

CSH: Surprisingly! I'm surprising myself!

[Pause]

SH: So get the different Wailuas. So that was Wailua Nui and now we're going to the Wailua Iki's. There's a west and a east. [Pause] So West Wailua Iki is coming up.

CSH: This almost reminds me of the horseshoe turns on Hāmākua...on Big Island.

SH: Actually that's why the same guys who developed the irrigation ditches they went to Kaua'i and they went Big Island too.

CSH: The same, yeah?

SH: So when I talk with the forestry guy, oh yeah, I guess when they, way back in the Civilian Conservation Corps, so they went to the islands to go plant trees and stuff.

CSH: Yeah, yeah.

SH: And then they had their own baseball team or something with weekend tournaments and stuff. So this is lower. Where we're going we going hike up above. There's another waterfall. So what you gotta think, the 'ōpae and stuff all have to come up and so the fishes climb the waterfall. See right over there get one space. I came on Friday, last Friday, and then I came and the tourists was over here. Coming back, I let two cars come up and then one tourist came and then parked, blocked my way. [Inaudible] But get 'ōpae when we go up, where we did our study site.

CSH: Whoa, that's scary.

SH: Wait till you see the gas truck coming out of Hāna [Laughing] I think they go in twice a day and probably the same thing with the beer truck too. [Whispering, Inaudible]

CSH: Wailua Iki.

SH: I'll turn around.

CSH: Oh, a car just parked over there.

SH: Yeah, no, I going park the other side.

CSH: Oh.

SH: It's safer. The cars...when they whip around I wanna make sure they can see me. I going park over here. [Laughing] That way we can turn this way and watch the traffic here.

CSH: Yeah.

[Parked at Wailua Iki]

[End of Recording]

[Transcription File 16]

SH: To the waterfall or we'd go hiking and things like that, yeah. 'Cause right now I think they may come under the assumption that if they get this license then they can just keep everything locked out for only EMI access and control. If it's only just for maintenance for the irrigation then you know, I mean to make sure that its clearly worded that way. And not for them to get total access and then prevent other people from getting in. EMI will keep like parks and wildlife when their looking at endangered plants, yeah. They didn't cooperate with them.

CSH: Really?

SH: They didn't want them listing endangered plants.

CSH: Oh well of course.

SH: They lose access. But it's not for them to determine. Once it gets declared then it kind of prevented access for other researchers to get the data and possibly nominate more endangered species. That's why it's interesting because if you look at like the maintenance but you don't see any justification, or explanation, or restoration of streams or say endangered species habitats. Yeah, there's not – it wasn't even discussed in the determination. So, all these roads all used to be nothing but EMI before.

CSH: Oh. So it doesn't look like anyone has been on it in a while.

SH: Yeah, [inaudible]. The road passed this way. I tried the freshwater – the Corbicula. Yeah, I made them da kine. Just boiling with salt water, little bit black bean, and then garlic salt and butter. 'Ono [laughing].

CSH: Sounds 'ono.

SH: Yeah. So that's what they did too, see over there how they controlled the water? they build a damn and then a control gate. So down that, over that.

CSH: Right.

[End of Recording]

[Transcription 17]

[Exploring Wailua Iki]

SH: So a lot of other places just like this.

CSH: Is this stream on the map? The map that you have.

SH: That would be like a tributary, with Wailua Iki. But that's the main stream and then we have da kine-- when you get to the valleys so then on the side. So this one isn't as big but they still tap it, you know.

CSH: Yeah.

SH: Yeah. So, what's interesting is also the ditches also go into the mountains and so when they came in they did that as well as -- what they did is that they used dynamite that's why they probably lost people, so all these immigrants. So, for EMI looks like they hired I guess an engineer was Japanese engineer. and he basically da kine, plotted da kine. This is what the EMI do too, they did not only that but then also put it in an elevation where you don't have to do any pumping. It's just all gravity fed. It's, for engineering, it's you know spectacular.

CSH: Yeah.

SH: But for the ecosystem they are just cutting it. But then those things were not addressed by the Water Commission. They kind of implied that they are going to take all this information so...that's why you get the Water Commissioner asking questions and that's why -- it's already been a done deal. So anyway, the kūpuna kind of prepared me when I do my own studies and things. I do anything they tell me to [inaudible] still make mistakes [inaudible]. They going to make all these promises and then 20 years later it's still going to be the same. And that's what happened and now it's like 30 years later all this stuff, all these people, all these ties, all this stuff that they promised no one remembers what they said.

CSH: Yeah.

SH: This is what I do, I pick [inaudible].

CSH: What is this?

SH: That's Job's Tears. Those are Job's Tears, they grow like weeds. But there are different kinds.

CSH: There's furry ones, right?

SH: What's that?

CSH: Furry like, some of 'um.

SH: Oh no, no, no those belong to the clidemia and that's not. This one you can use for crafts, like make leis and things.

CSH: Oh, uh-huh.

SH: Yeah, they're called Job's Tears. White and black and all kinds, gray, all kinds, designs and stuff.

CSH: Oh wow.

SH: You're going to learn over time like 'oh interesting'. But then all this clidemia is everywhere. This is what you were talking about. Yeah, yeah, yeah. That's the seed. We're not going to get rid of it. See all the little green ones. [Inaudible]

CSH: Yeah, it's beautiful.

SH: Imagine all the rain, now there -- they're always drying out you know- oh boy. So it rained I guess, good timing on the rain now everything kind of green again. Big Island too, were you in drought? I don't think so, yeah. You guys got some big rains.

CSH: Yeah, yep definitely wouldn't say we are in drought.

[Separate recording at diversion]

SH: Other places when you go in east Maui what they'll do is they tap off the trickle and put PVC pipes in the water close to the stream. Help add water to the intake. So, nobody enforces it so they just keep adding. [Pause] Did I tell you [inaudible] [laughing]

CSH: I got you uncle, I got you.

[End of Recording]

[Transcription File 18]

SH: When they go bathroom and they gotta... so you'd rather have them go, rather do it in a portable potty, rather than everybody pissing and taking a dump all over the place and toilet paper and everything so. And it just...

CSH: 'Cause that already happens in so many places.

SH: This is East Wailua Iki. Yeah but, you know, it's so interesting because I gotta blame the Visitor's Bureau, they are the ones trying to hype up the numbers. Need more tourists, more planes, more flights. Um and yet they haven't increased the servicing of public or the state parks, you know. Like we going to a state park go look, no more hand towel, no more soap. [laughing] We try and call us would class tourism and stuff. It's such a shame, it's so sad.

CSH: They advertise for it but they can't accommodate the numbers.

SH: Yeah, yeah I mean they have this vision and they thinking that they world class and it sucks. I said unless you go to a- next to a hotel and stuff, then you go the bathroom and stuff, you know cause the bathrooms are well maintained by the hotels, but the hotels are taking it upon themselves because the State and the Country don't have it - adequate facilities, you know. It's kind of sad.

CSH: Umm-hmm.

SH: So now nobody like look if anybody coming in that direction.

CSH: And there's a gas truck that comes down here?

SH: Yeah.

CSH: Dang.

SH: Standard station down in Hāna. So, I think at least once a day. But you would think with tourism it would be even twice. That and everybody gotta back up and stuff. [Pause]

SH: So, this name is Haipua'ena, get one waterfall.

CSH: Pua'ena?

SH: Haipua'ena.

CSH: Haipua'ena.

SH: Haipua'ena Stream. We can look on the map after. So, this one actually that water comes out here at the tunnel and then the water goes through there. That's why they talking about mixing over here. 'Cause they don't want to have to do an isolated, keep them separate from the system.

So, what they do is they actually divert the water from the stream and so you get mixing. So, in case you get invasive species and stuff the possibility of introducing. This is the irrigation ditch over here. Oh well maybe I can pull later on when we coming back out and everyone else stop to take a look. But the water going to be low because they not directing. remember I told you they pulled the gates?

CSH: Uh-huh..

SH: So, but the irrigation ditch flows through the mountain.

CSH: But normally it's always high when the gates are closed?

SH: Yeah, yeah. So but they pulled the gate in so, since they close then the water has been flowing...and then but the 'ōpae, the numbers are spectacular.

CSH: Nice!

SH: Yeah. So that's why I always tell them, 'oh got to go check the 'ōpae' you know. Now you can go gathering and stuff and I said yeah, totally different. Because before I got – yeah you go over there but once you fish them out then you probably cannot come back for maybe a year or so. So, we going park the other side and then what we going to do is when we come up to the EMI, I'll show you which gate. So wayside park called Pua'a Ka'a So we'll come back over here, we going up through this gate.

CSH: Okay.

SH: We not going to be hiking up the mountain, we just come up here and go just go through the walk up the road. Much easier. Just take our time coming back this way. Over here's the park. So hopefully someone will be leaving. They all trying to do pit stop, there's a bathroom over here. One eating. . .

CSH: Or not.

SH: So, we'll pull in here and hope someone comes out. Did you need to go? And then da kine.

CSH: I'm going to go.

[End of Recording]

[Transcription File 19]

SH: This is a lot easier.

CSH: Oh, okay.

SH: The big one, water would flow down here. [Inaudible]

[Long Pause, Walking to entry point]

[New Conversation]

SH: [inaudible] [laughing]

CSH: Yeah.

SH: So, they get 'ōpae, and then so what – the first import they got were, is what happen is then the guys go come in and they go feel inside the moss and inside where get dead 'ōpae. So, the guys came in with electric shockers, they put the net down and then electric shocker. Shrimp fall and come and get caught in the net. So that's how they were caught, said, 'oh someone was coming to electric shock over here.'

CSH: Is that normal?

SH: No, no, no that was long time ago. But that was – at that same time was about 'Īao. Somebody had electric shocker they threw them in the rubbish though.

CSH: Oh.

SH: [inaudible] They're like, 'oh I seen Hāna now I got to get back to my hotel.' So, they going to drive like the residents coming out, you know what I'm saying.

CSH: Yeah, yeah. Now that they know the road.

SH: Been there done that. The waters down already from yesterday. Yeah this is the waterfall, top of one. So, this one is the one they discuss about Nahiku and about how they wanted to guarantee a certain amount of flow for the folks in lower Nahiku.

CSH: Mm-hmm.

SH: Yeah. Ok?

CSH: Ok.

SH: So, we going to head back out then I going stop on the side and can take a look at the ditch coming up.

CSH: Alright.

SH: [Inaudible] [Laughing]

[Walking back to car]

SH: So Makapipi is here and then from. . .

CSH: So, we saw all of this right?

SH: Yeah and then Maliko. What – so that's all the streams that we passed over.

CSH: Cool!

SH: [laughing] And now the rain came! So just drive slow. I'm so glad, because before it used to have all the cuts you had to go through. Now you got the bridge so you can go all the way out to the point. Then I heard the bridge broken so they don't let people drive out there.

CSH: Oh, well that's good.

SH: Okay. So nice yeah get the 'ōpae and stuff, yeah.

CSH: Uh-huh.

SH: Yeah. So, but only the guys who get 'ōpae so they would be used to the more rugged – like how you have Big Island. Everybody no get 'ōpae yeah? They probably go for the prawns.

CSH: Yeah, yeah.

SH: Was there anything you needed to go – wanted to take a look in?

CSH: No, if you want to stop anywhere else. . .

SH: Ok.

CSH: I feel like it's just good to see the range of all the diversions 'cause I'm not even familiar with this at all.

SH: So that is 100 years, yeah. So, they did a job. It's awesome engineering but when you think about it you're like, 'oh wow all this water been diverted for all these'. . . but it's interesting how the government is still trying to accommodate a plantation even through no more plantations, yeah. The politics still there.

CSH: Yeah, yeah.

SH: So, you see like that, yeah. that's to Hāna. Here's a guy charging.

CSH: From Makapipi how long more till we would reach like Hāna? Like that. . .

SH: Oh, well right there.

CSH: It was that road going down?

SH: We're just above, yeah. Going down yeah, when you get into the flats. Then you going to be going into, um, oh, it would be da, da kine, there would be the cave, and the airport, and then Hāna.

CSH: Mm-hmm.

SH: Right after that. Yeah, you gotta keep going in. So, start way up with the elevation and then you start to lose elevation. . .

CSH: And that road is more windy than this?

SH: No, no this is the windy part. Yeah up here. This is Hāna. We should park the other side [inaudible].

CSH: Oh, more people stay now.

SH: Yeah.

CSH: Oh, and they charge 'um in the mud with the rental cars.

SH: That don't belong to them anyway.

CSH: Yeah.

SH: I think there's space. I'll just pull on the side, yeah. I'm going to go back, oh another one. See that and the rain too don't help.

[New Conversation]

[Walking over to bridge]

SH: They might slip and fall on the rocks. Remember I told you how they dam?

CSH: Yeah.

SH: So, there's a dam over here that has an intake pipe over there. What they do is they redirected the water over here and then they use this as an input. So, this is taking in water. And then over here there's supposed to be a well but I have no idea what... Maui Land and Pine is no longer yeah, but I have a feeling they still have the well. But I don't know who [inaudible]. Maybe Maui Land Company. I don't even think you can look that up nowadays.

CSH: Yeah, yeah.

SH: But they built these stairs over here, the guy probably cleans the intake for the water.

CSH: And, where's the pipe though?

SH: So that's where the natural waters supposed to be... It's underneath.

CSH: Oh.

SH: Yeah, so they went underneath. So, like over here that how you get – probably have to go clean out some of it then the sediment go down [inaudible].

[Inaudible, very loud background noise from waterfall and passing traffic]

SH: You see this one, get 'ōpae and da kine, 'alamo'o.

CSH: 'Ōpae and 'alamo'o.

SH: So, you know what, we go on the bridge to go that side.

CSH: Ok.

SH: Whenever the cars slows down. But I think this is a natural one but they redirected it this side, so it goes into the pool and then they dammed it. But it's already been dammed so they're not gonna bring back the natural flow, yeah.

CSH: Yeah.

SH: In here get 'ōpae. On this side you can...remember I told you about the watercress, it used to grow wild on that side but nobody taking care of it anymore. I used to be able to pick one bag before I go home [laughing]. See all around here 'ōpae. So, I don't know the status of the water and how much water or who the water goes to, but I'm pretty sure that Maui Land and Pine would not give it up.

CSH: Right.

SH: So, either maybe Maui Land Company or something would probably... that would be interesting to find out, [inaudible] but nobody asked so. But its separate from the EMI but this is Maui Land Company. They're one of the big companies here with the pineapple. Over there is a 'ōpae. But this at the down side there's a place they call Big Spring. And then Big Spring flows off to the ocean. [Inaudible] But I have a feeling when they were drilling for wells they wanted to tap into Big Spring and then tap that big water. That would, you know, it's like endless water.

CSH: Yeah.

SH: So, the amount of water that's just flowing out to the ocean there.

CSH: Are we going to stop anywhere?

[End of Recording]

[Transcription File 20]

SH: But that's why we're seeing – why I put in about the tourism. Because we need to consider it, so like with all these people drowning and stuff and they need keep hearing the same old spiel. I mean you increase the numbers that means you're going to get more drownings and then – but with that much people you gotta at least start improving, you don't want people dying all the time from drownings. But a lot of it is dumb mistakes.

CSH: Yeah, but then again, the sign is right there and it says keep out.

SH: That and then guys are snorkeling by themselves. You got all these 50, 60, 70-year-old's that get heart attack or something happens. They're swimming by themselves, your alone, you know. That's why they try and make this big deal about the full-face mask with the snorkel included.

CSH: Yeah but then I heard people die from that too cause. . .

SH: No, no, no but it's something else but it's complicated. But I say even I who used to with snorkeling and stuff, say how you going to take off the mask? You know, you're so used to you know just be able to just pop off the snorkel and stuff and breathe you know. This one you cannot breathe you just have a whole mask that filled with water and then you going to freak out, right?

CSH: Yeah.

SH: So I say no, these guys couldn't be able to and we talking about people who are used to the water. I say no they don't have enough data and information on how you da kine, how you clear, how you da kine. They think it's easy you just breathe through the face mask but then they saying that carbon monoxide build up. I say could be but I'm not really clear. They gotta – they should have monitored that in the lab and stuff. They can't do that, but do that before they. . .

CSH: That seems like a super basic issue.

SH: Yeah, before they sell it to the consumers. But they not going to, they want to make plenty money. Like Takata airbags [laughing]. I thought my vehicle was, da kine, I ran the number again on top and then mine got picked up so they did this lawsuit or something. So asked if I could send in my da kine, my registration and stuff and then they go. . . I'm listed on...so for the Takata airbags settlement. Give you plenty space.

CSH: Mm-hmm.

SH: You not as big as da kine, the gasolines, da kine. I give the guy credit, I mean just going in even around full gasoline, you empty out the gasoline and you still gotta drive 'um out.

CSH: Yeah.

SH: Oh, you got a full rig now with gasoline and stuff. Just imagine, most of these guys only one time they're driving into Hāna and one time they going to be driving out [laughing]. They ain't got no [inaudible], every day they got to drive in and drive out. Oh man.

CSH: That is kind of crazy to me.

SH: Yeah you talk like two hours driving and stuff.

CSH: Yeah.

SH: They go home, go sleep and then time to go work the next day and drive back out again. I know Bob Carol he's a councilman, he does that commute.

CSH: He lives in Hāna?

SH: He lives in Hāna. But he's the representative, yeah, councilman.

CSH: Oh wow.

SH: For East Maui. [Long pause] See over here the Hāna folks refer to over here as Three Tridges [laughing].

CSH: Yeah.

SH: They're little bridges, but yeah. . . But they know where Three Bridges is. Over here they refer to it Three Bridges. [Long pause] Oh, so how much comments did you guys get? A lot?

CSH: So far for EMI, for this project?

SH: Yeah.

CSH: Umm not a lot, actually.

SH: Oh really?

CSH: Yeah.

SH: I just felt it was important, so that's why I did.

CSH: Oh, I'm sure. I'm sure.

SH: I remember working all these years and I say wow, there's data out there but is it being used, I don't think so.

CSH: I mean I feel like we're pretty persistent too. We don't just try once, you know, and if they don't respond then we're not like 'oh well, we tried.' We definitely try to do it a couple times and if no one responds then we start just cold calling people to get their mana'o.

SH: Right, no that's good. Yeah sometimes it's like pulling teeth.

CSH: Yeah.

SH: Other guys like waste time [laughing]. But better get the comments in then complaining later on.

CSH: That's what is kind of hard to explain too, you know. Because some people they know and understand the CIA process but a lot of their feedback is 'why should we tell you?' Nothing is going to be done anyway there still going to do what they want to do. But it's like the point is adding your comments and. . .

SH: Put the truth in.

CSH: Yeah, you know if they do still build it then they can look back and be like well no one said anything about it. Like no one said. . .

SH: Well it's like the Kū'e Petition, you know. At least people you know on record, even they go back and look at them a little later you know look at all these thousands of people sign one petition [laughing].

CSH: Yeah.

SH: I see this guy, I'll let you go brah. Go ahead, yeah.

CSH: Resident [laughing].

SH: When you truck bigger than mine you take the lead [laughing]. Yeah, I going to pull on this side. This the ditch that came in. They used to have a sign over here, the East Maui Irrigation Ditch.

CSH: They had a sign?

SH: Yeah, they used to have a sign. It was on that pole before but then all the trees all fell over and stuff. So, this is nothing like it used to be. So, when the water used to be up, all this used to be clean. They, you know the maintenance and stuff used to be a lot better. But yeah, they don't need the water to add. They leave everything alone than cleaning even the vegetation and stuff. It's more efficient if you clean the water right you know. So that would also be some of the comments for maintenance, to go clean the debris.

CSH: Mm- hmm.

SH: The falling, the leaves, and the debris that all accumulate inside the ditches. I don't – you know it's up them but it's you know what I mean.

CSH: Mm-hmm.

SH: So instead of having to – when they decide they want to clean then they going to clean after they get permit. But in the meantime, they aren't doing any kind of maintenance.

CSH: Right.

SH: Yeah. So yeah, the irrigation ditch. Full on, max.

CSH: Like just below those rocks kind?

SH: Yeah. I'm pretty sure the water was probably up like three quarters and then the thing dropped down.

CSH: That's crazy.

SH: Yeah. But interesting upcountry, upside the upper ditches I would look inside then I would get like all o'opu nakea, prawns, 'ōpae, I could see them inside so. . . [long pause, heading back to car]

SH: That's why it's a big difference now when I see, it's like they don't care, they're just leaving everything. Everything is falling, the trees and leaves.

CSH: Not up keeping or anything.

SH: Yeah. So, like I said this is the one about the mixing in the water and stuff they have that ditch running right across the stream.

CSH: Mm-hmm [long pause]

SH: I'm glad the rain was light so it went away, cleared up.

CSH: Yeah. Choke hō'i'o or pohole. Oh, that van.

SH: [Laughing] Get on your side, yeah he no stay on his side maybe big boulder came. That's when they drive like the residents [laughing]. Take the whole road. See how much people.

CSH: Oh, still plenty.

SH: Yeah, yeah, yeah they still coming.

CSH: These people are crazy when they're walking out like in their bikini thinking it's some like. . .

SH: That's probably how it's being sold, go swim by the waterfall and stuff.

CSH: Yeah.

SH: But look how many cars, no signs now [laughing]. That's what I'm saying about guys just making that assumption that its public.

CSH: Yeah.

SH: But you know, some of the places are not public. See they get the Jeep and they drive half way over.

CSH: Yeah [laughing].

SH: It's not like they have a big SUV or they got a Cadillac, or something you know. Small car but you know how drive or what [laughing]. I hope you're not getting too hungry, we going to stop at Ke'anae.

CSH: I mean I only got a manapua. I didn't really eat too much cause I know I get carsick [laughing].

SH: I think we probably going get stuck behind cars going back.

CSH: I am loving all this koa. That was a nice tree back there.

SH: I'm glad you recognize the koa. I usually see them and say 'ah neat.' Cause when I grow up Kāne'ohe and stuff no more koa. Then I go over here and whoa. That's so funny cause when you go up Haleakalā and stuff and then you see all the young koa cause and I say 'oh wow, look like haole koa!' [laughing]. Oh yeah look like but then everything change, oh wow that's neat. Over here and stuff too.

CSH: Yeah, 'ōhi'a, all this koa.

SH: So that and then the African tulip.

CSH: Yeah [laughing].

SH: See this is all the da kine the wedelia. Yeah all on the side and everything, the uluhe. I know you know, but you see all the strawberry guava.

CSH: Yeah, choke waiawi.

SH: When I used to do stream stuff then on the way out I go pick the guava. Pick the guava and make guava jelly.

CSH: Really? Oh, look all the 'ie'ie on that tree. That's crazy. Even over here, oh my god.

SH: Somebody intentionally planted that heliconia. You see how that thing growing out?

CSH: Yeah.

SH: Yeah. You see how patchy on the uluhe?

CSH: Yeah.

SH: So I don't know what's – that's why I was wondering if we were going into drought. [Pause]

CSH: This is Ke'anae?

SH: Actually, yeah we coming toward Wailua first then Ke'anae. This is crazy, people never used to park off here. But now a days. . .

CSH: What are they parking to see?

SH: They go walk down to the waterfall.

CSH: Oh. That's a walk alright.

SH: Yeah. But also supposed to be no parking and guys park. They trying to prevent people from parking there and they still park. That's why they did all this, 'cause guys would still park. You wouldn't believe.

CSH: That's not even half-way off the road. They're just like parking right in the street.

SH: Like a parking lot. And then just block the traffic coming out of Hāna. What a nightmare, and then on top of that you got all the residents fuming and stuff 'cause you know, bad enough, they have to put up with the tourists [laughing].

CSH: Yeah.

SH: So, this is the Wailua lookout. I going to take you to da kine now, Waialohe lookout above Ke'anae and stuff over there. [inaudible] So, this is the main one to get water, yeah, to the Wailua fields, the taro fields and stuff. So, Waiokamilo, look they get this one over here. This is all ancient taro patches and stuff. So I think they were getting problems with pigs and that's why they put up the fences. They never used to have before. Yeah, I think. . . We also get one problem with deer too yeah.

CSH: Really?

SH: The deer population increasing upcountry. That's why they were trying to get this ag inspection so that they can start harvesting some of the venison and stuff for sale and stuff. They wanted to make jerky and all this stuff. So, this is Wailua and this is Waiokamilo Stream. That's Uncle Harrys. Uncle Harry Mitchell. Are you into lā'au lapa'au, lapa'au?

CSH: Uh, yeah. I mean I feel like just from dancing hula we have to know a lot about plants and stuff. So, I'm just kind of getting into plants and what not.

SH: So, Uncle Harry, way back when he had cancer and stuff he was I guess he got caught inside the reserve. And he had a citation and stuff so I have this letter and we were talking about the stuff he was gathering and using – medicinal. It's an in-house letter and stuff but I have them, it's old but I was thinking oh for da kine, maybe get information in the future.

CSH: Yeah.

SH: Yeah, 'cause they threw out the case and stuff. But yeah. So over here they wanted the State to certify the water and then what they wanted to do was, they wanted to come in here for the water bottling plant. To sell water.

CSH: What? A water bottling plant?

SH: A water bottling plant. They were going to sell water, like Fiji water. Yeah, they wanted to do that. The State wouldn't certify it. That's why it's kind of interesting you know, like certain things – whatever the State does they don't ever make money for anything [laughing]. They always seem to lose money, instead of doing it for the right reasons they always do it for the wrong. Or they reacting after something else go wrong. We going to pull up over here. So, this is Waialohe and I look over here because of Waialohe Pond and stuff. Remember I told you about the Palauhulu and Pi'i Na'au Stream.

CSH: Mm-hmm.

SH: It flows down here and then goes into a pond over there. It's called Waialohe Pond. We can go eat over here. Over here and then you look over – like I said this is the peninsula and then they carried the dirt and then put it on here for the taro and stuff.

CSH: Yeah.

SH: Yeah, some of the taro patches are from way back.

[End of Recording]

[Transcription File 21]

CSH: Um, you've participated in CIA's before?

SH: Mm...

CSH: Like with Cultural Surveys or...?

SH: Um.. some.

CSH: Ok.

SH: Mm-hmm.

CSH: Just if you're not familiar with it, we'll normally start off the first paragraph explaining who you are and your affiliation to the project or your connection to this area. But we kinda went

over that when we were driving down...that you were born in or born and raised in Kāneʻohe and then you moved here.

SH: I moved here in '85 so now I've been working here 33 years this month as an Aquatic Biologist. So I work for the State, yeah.

CSH: But this...today you're not representing this, you're just speaking on what you know of...

SH: Oh as an Aquatic Biologist, yeah.

CSH: Yeah, yeah.

SH: What I've learned while working here...

CSH: And now you said you live in Wailuku?

SH: I live...my house...my residence is in Wailuku.

CSH: And your connection to this area is through your work as an Aquatic Biologist.

SH: Work, as an Aquatic Biologist.

CSH: Yeah.

SH: So I've worked with all the animals. Started with 'ōpae and then the different 'o'opu and then now I'm working on...my current research is on hīhīwai. So I'm trying to put together a manuscript and then from that manuscript then I think it's time for me to retire.

CSH: Once that's done?

SH: Yeah. I finished my field work so I'm trying to get papers out.

CSH: Mm-hmm.

SH: Yeah.

CSH: Just you personally, do you have anyone that you would wanna...that you think we should talk to about this? About this project?

SH: Hmm, what did you want to know cause um, I got other people who live here so like, um, Mrs. Awapuhi Carmichael.

CSH: Well they may or may not be on our contact list already...

SH: But yeah, so she would be one because it was actually her mom remember I told you about Aunty Sarah Ka'auamo?

CSH: The house that was...

SH: Yeah, by the two streams...

CSH: Uh-huh.

SH: ...that joined behind her house. That's her mom.

CSH: Oh!

SH: So that's the daughter So she started doing the 'ōpae. So she's teaching her grandkids, gathering and 'ōpae and hīhīwai.

CSH: And you guys always meet up or..?

SH: So I talk with them and then I stop by and stuff. In fact, this year I didn't. In fact I should stop by and maybe drop off some tide calendars to her.

CSH: Oh! That's nice!

SH: [Inaudible] Oh maybe we can stop by and then I can introduce you to her if she's home. If not, then it might be Vegas. [Laughing] But they would be good people to talk to. They're the ones who'd be doing the gathering and things but she used to work with the um, ho'olaule'a and they used to get, basically, scholarships for the kids who live here.

CSH: Oh that's good.

SH: So after they graduate high school then you give them a scholarship to go to college and then at least start them in college...

CSH: Yeah, give them a chance yeah.

SH: Yeah.

CSH: Ok... I feel like some of these questions are kinda hard because we covered such a big area...

SH: What are you asking?

CSH: Um, are there any cultural, archaeological, historical, or burial sites like...within this whole area.

SH: Mmm, it's funny because I also work with Historic Preservation...

CSH: Oh yeah?!

SH: And I'm gonna have to meet with them and they're gonna return human bones and stuff that they found there but cause by coincidence I would work in the streams and had this policeman and then so I went to go look so he was showing me somebody found bones. They weren't sure if was human and so they recovered the bone and took it to Historic Preservation and now their guys are telling me, oh! So you were the one that ended up with the bone and I go, oh I know where because a policeman went show me where. So if they wanna return the bone, I know where the location and they can go back and bury um in the same place that I saw where they buried it. Yeah, yeah so I'm aware of some of those places like that and then we've had um burial sites exposed like when eroding by the rain...

CSH: Right, mm-hmm.

SH: ...before Ho'okipa there was a big tree and then basically bones were washing up on the beach and stuff...

CSH: Oh

SH: So yeah, stuff like that, yeah. So but that would be, um, oh, um, oh boy, that would be by Kū'au...Kū'au Ho'okipa. Yeah. In that area. Would be graves and stuff and then the archaeologists explained to me because I guess they were talking about how they buried and then they pointed in the direction to 'Īao Valley.

CSH: Oh wow! That's interesting!

SH: Yeah, yeah, so they were explaining to me... I didn't even know there was a direction [laughs] I thought they just buried um!

CSH: Yeah, yeah.

SH: So yeah I learned a lot from them and then da kine when they do excavation sites and stuff a lot of it, I also worked with them in Waihe'e...

CSH: Mm-hmm

SH: Because a lot of it they pick up, da kine, marine shells...

CSH: Really?!

SH: Marine shells would be inside the, yeah. So when they go down in the layers..

CSH: Yeah!

SH: They keep picking out shells and stuff.

CSH: Oh! That's interesting!

SH: Yeah, yeah. So, so some of that I've been involved with, yeah.

CSH: Um, I know we've talked a lot the whole way down but is there anything more that you wanna share about the general history of this area?

SH: Hmm, history in terms of...

CS: Like, past or present land use?

SH: Umm, well more, I guess, there's a push to try to raise taro...

CSH: Right.

SH: ...but I also feel this conflict with water commission and water decisions that really haven't [inaudible] I mean if you look at their actual return of water or their in-stream flow then I disagree with it because I said I'm kind of waiting for this official decision, um, but each time they choose a lower amount. Remember like I told you about the 65 percent?

CSH: Yeah, yeah.

SH: I can show you how the Aquatic Resources got to the 64% median flow which would return, actually, 90% of the stream habitat for the animals and yet they've always stayed away from that. So when they return the water for like the Nā Wai 'Ehā...

CSH: Mm-hmm

SH: So the 10 million gallons is one-third, so it's no where near 64 percent.

CSH: Right.

SH: Yeah, so that's why I told you I wrote a letter...

CSH: 30 million...

SH: And I asked, I asked for 30 million gallons a day and I said but I also wanted to make that clear because I wanted to get all that flow data that USGS had collected and then base it upon that and the 64% percent would be 30 million gallons.

CSH: So regardless of the, the facts that you bring up they just throw out the..

SH: No, no, they, they really aren't planning to... I think once they make a decision then I think it's set in stone to the next generation because no one is gonna rock the boat so they kinda, oh well, we came up with a decision. So although it's supposed to be interim in-stream flow, I don't have, I don't see them pushing to get a permanent as well as they're not asking all these questions, then what about gathering rights, what about for endangered species habitat and all these other things. Guys aren't asking those questions they're just coming up with this number and saying, well we're agreeing and we're returning some of the water into the stream. Yeah and I don't see them down the road gonna be changing their mind. They're coming up with an amount and then they're gonna...so I said that's for the future to decide but it's not based on any data. We kinda tried to do all this research, tried to give information so that they could give an intelligent compromise and yet I see politics.

CSH: Yeah.

SH: But yeah, I'm not gonna rock the boat or anything. That's also why I guess, a better understanding. I guess when you get older it's tough and you think, ah, too young. I'm gonna die before... [laughing] ...and nothing is gonna change. I just feel for the old folks because all the folks that passed away all that time they really, we want water for taro, we want water for taro(They were fighting for it yeah?), we want water for taro but they passed away and they still no more water for the taro and they're still controlling the water even though there's no plantation using the water... they're still diverting the water. Nobody is returning the water to the streams. Yeah.

CSH: Um, let's see...do you have any memories of what existed here like, cultural events, I know you said with getting just gathering...

SH: Gathering. Gathering and then dependency on fishing and fisheries but I also because I'm also interested in the fishing history in Hawai'i. Part of my problem is also, when guys see throw net, they claim it's traditional. That was introduced by the Japanese. But it's interesting how that they now, it's not Polynesian. It's coming from the Japanese side and influenced from Hawai'i. Yeah.

CSH: I see.

SH: So that is kinda interesting because you see a lot of, you get the throw net on top the covers and everything and then you think that they would know better but no. They're using mono-filament throw net.

CSH: Mm-hmm.

SH: You know, it was introduced.

CSH: Yeah.

SH: They're using modern gear but that's why when you're looking at...for them to claim traditional, you're talking modern traditional. We're not going back to the old traditional.

CSH: You're not using those things to...

SH: Yeah, cause it's similar to like when I was asking Kaho'olawe to review their fisheries management plan and I asked them, would you guys consider putting in traditional fishing use? But I said, if you're going traditional, no wet suits. No fins. No masks. Tell them go spear. You gotta go make your own gear and stuff like that. [stutter] But what I wanted was a discussion because it's like now...because what you're getting is this, um, modern interpretation but then now we're using gear, we're using boats, we're using gasoline engines, we're using...and then how do we give the bottom fishermen traditional when the guys are using depth recorders, GPS...

CSH: Yeah, yeah.

SH: And then claiming, oh, this is my traditional right! Then they're not fishing by hand so when I used to interview like Bill Shinsado at Kewalo Basin. He told me he used to go get one Sampan, used to go out to the Northwestern Hawaiian Islands, they'd go down with 17 hooks, by hand and pick um up by hand. No more power reels, no more hydraulic gurdies or anything to, you know, we're talking SamPan. We're talking old style.

CSH: Yeah.

SH: But these guys when they feel the line, they tell me they can tell what kind fish went bite on the line.

CSH: Really?

SH: Because, you know, that's how intricate...but you go try ask the kids now they all get electric reels and then they're not... it's not all by hand. They used to do um by hand but they used to put down as many as 17 hooks to go catch bottom fish. Yeah.

CSH: Wow.

SH: But it's interesting too because they also used to take turtles. They flip the turtles and then they take the turtles up live and then when they wanna eat meat then they kill the turtle and then they eat turtle meat on the boat.

CSH: Wow!

SH: Yeah [laughing] that's why it's interesting to see and then those are the guys that passed away but that was there at their time at, you know, to see what they considered traditional and what they had to do

SH: So, so I learned a lot from the kupuna.

CSH: Do you have any personal ties to this area?

SH: Nope. I grew up on O'ahu so mostly to Kāne'ohē Bay...

CSH: But you know a lot of kupuna here...

SH: That's what, that's what got me interested into fishing and then, um, so that, like I said, originally when I first came here I had to get first aid certification. That's how I first met Aunty

Sarah. She had to get first aid certification so we took first aid class together and then so after I talked with her, oh yeah, I like study 'o'opu and stuff like that. She tell, come my house and, da kine, so actually when I started doing the research because she knew I was interested in 'o'opu and stuff but I think it's also with her blessing because it because it's like her, leave alone this ka'a, he's coming in to do stream research and stuff like that.

CSH: Right, right, right.

SH: Nobody mess around with my car and stuff but basically I kinda have a feeling that I get this protection from her saying that, oh yeah, he going come and do research on top the 'o'opu and stuff..

CSH: Mm-hmm.

SH: ...and the hīhīwai.

CSH: Yeah.

SH: Yeah so that's why when I come out with papers I share with them and then...

CSH: Oh that's cool. Do they have any feedback for you?

SH: Oh, no, no. Like I said even like with all this stuff with the fish and stuff I say, you know, when you think about it... it's not us rediscovering because we see that and then the kupuna know.

CSH: Mm-hmm.

SH: So when the thing running, they the ones going be catching um and then they the ones going dry um, they the ones going be eating um that way and stuff.

CSH: Yeah.

SH: So way back so when the 20's and 30's that's when they used to go catch. I don't know if you know the 'ōhua? The 'ōhua is the manini. Before they make the stripes, so they're kinda like clear...

CSH: Mm-hmm.

SH: So just before they get stripes what they have, what they, technically I think what they're supposed to do, they said they go out and gather them inside the near shore but when they gather um, they go before sunrise. I guess they think that when the sunrise, then the stripes going come out already.

CSH: Mmm.

SH: So they're trying to get um before the ting pick up the stripes and stuff but they go catch the 'ōhua. So 'ōhua is the manini before the ting...

CSH: ...get the stripes.

SH: ...get the stripes. But that's what they wanted. They catch um, but they used to put um out, put um in the dry box and they dry um.

CSH: Ahhh.

SH: And they eat um like candy.

CSH: Like candy?

SH: Like dried fish.

CSH: Nice.

SH: Yeah but all the baby fish, so like the hinana. Hinana too they dry um up. You know how, da kine, go eat aku?

CSH: Yeah.

SH: Yeah, same thing, dry um and then just eat.

CSH: Nice.

SH: But that was their candy and stuff...but they're talking by the thousands. So, but, this is, they told me they used to do that in the 20's and 30's so up until then they were still doing this post-larvae recruitment...all this fish is coming upstream. But they were catching um in baskets and stuff. Yeah.

CSH: And how drastically did the numbers drop?

SH: Oh, no. They don't see that anymore.

CSH: At all?

SH: The big recruitment and stuff like that was when they were kids and they saw that and the now that they're adults they don't see that anymore. Yeah.

CSH: Oh.

SH: But it tells you how much more water that was just flowing in the stream...or when they tell me they go and catch 'ōpae, when they catch 'ōpae that means the water in the stream when the taro patches were cold enough to have 'ōpae. They never did go up the mountain, they catch um down low. So that means the water was coming down cool. So you can tell now, so like when I go Ke'anae would be by the intake...

CSH: Mm-hmm, where you went in, yeah?

SH: I wonder if you can see...so right on the corner over there, before then the thing redistribute the water. There's a flume that goes across...

CSH: Ok..

SH: But there's a intake. At the intake then the water gets distributed right in the corner by the taro patch.

CSH: Mm-hmm.

SH: You see the green taro patch?

CSH: Yeah.

SH: But then there's like concrete and then the thing split up the water. Right over there get 'ōpae and stuff inside. Yeah. Get 'ōpae, get prawns over there.

CSH: Oh!

SH: Yeah I've gone to go look and then I...so, when I was studying in here I would go, I looked at these clams. They call um fingernail clams. They're inside with the taro. So I was sampling, so I have a paper on fingernail clams. I didn't even know about um, I was working with, uh, a researcher from Dayton University and then, so I sent to him, he would measure um, and then they wrote up a paper and I was co-author with them on that.

CSH: Oh cool!

SH: These taro patch clams...the...

CSH: Fingernail clams?

SH: Fingernail clams, yeah. They call um musculium and pisidium clams, yeah.

CSH: Never heard of that.

SH: And then so that and then the, possible the fishes and maybe the birds probably ate the clams.

CSH: Oh.

SH: But they probably came in and it got distributed by when people, you know like when they...taro, when you replant the taro. It probably would be in there and so the clams would probably get redistributed that way too.

CSH: Oh yeah that makes sense.

SH: It's fresher...freshwater clams.

CSH: Oh.

[Pause]

CS: As far as agricultural, this is pretty much a lo'i place on this side...

SH: Well these are historical. So in here too..

CSH: In Ke'anae here?

SH: In Ke'anae. So over here too what it is is, what they have, or what the taro patch growers... you have what they call hui land. Ok, I don't know if you've heard of that before.

CSH: No...

SH: So in the hui land what it is, is...it's owned by a group of people...

CSH: Ok...

SH: So, say I wanna go to taro patches so they take charge of two taro patches and they grow taro at two taro patches...

CSH: Mm-hmm.

SH: They pay taxes for those two taro patches and stuff...but it's still considered hui land. Which is probably unique. I don't know if Big Island get um like that but that's what I get from over here.

CSH: So they still get to plant kalo and whatever...

SH: You plant...but you plant according to how much you...so they take on that as well as responsibility to pay taxes for the property tax and stuff for the hui land. Yeah. So it's tied in with the family, not everybody going plant taro.

CSH: Right.

SH: But somebody may be gung-ho or if they're younger or something may get more taro patch than other people.

CSH: Mm-hmm.

SH: But they would do that but they would be required to take care not only that but supposedly the water supply and go clean the ditch and clean the...right? It would be shared responsibility but that's what's so interesting because you got all these guys but they want somebody else go clean. They want the water at the end but they not helping the guy up here go clean.

CSH: Mm-hmm.

SH: Yeah, the Kanoa's the one, a lot of times doing the cleaning.

CSH: Interesting!

SH: Yeah, so that's what I get. Yeah. Over here is like Hatfields and McCoy's too.

CSH: Really?

SH: Yup! So...

CSH: Families scrapping out...

SH: No, no...but I heard and I'm like, oh...okay. [Laughing] And they're married to each other now...

CSH: Oh yeah?!

SH: Yeah, married and they got war and everything. Oh boy [laughing] So... interesting, yeah because I got to learn that too...so like I said but that's why I said I make sure I get the good kupuna da kine, protected by the kupuna and nobody mess around... [laughing] Only one time...they go flatten my tire.

CSH: Really?!

SH: They put stone inside and then all four tires were flat. Yeah.

CSH: Wow!

SH: So the other guy, good thing da kine taro farmer had his compressor on top his trailer...to come down and fill my tire up. Was Friday...and then, aw man, I don't wanna get new and then, oh wait, wait. Then he came with his da kine and go fill me up so I could get out. If not, I gotta stay overnight and da kine [stutter] And only one time they did that so I went go and park inside

so I get somebody never like that so they flatten all my tires so after that I park um outside, I no park inside. Yeah. But I say, nobody else is doing research.

CSH: Yeah.

SH: So after all these years, yeah, nobody.

CSH: Mm-hmm...but out on the road it seems like a lot of people recognize you...at least out here.

SH: Oh, I don't know. [laughing]

CSH: Um, do you know any legends maybe about this...or old mo'olelo?

SH: Oh, like I told you about that, um, people have asked me if I've seen mo'o...um, but I swim over here and da kine, I...one of the things I guess I've been brought up with is that, I have no problems. Like when I work with the bones and stuff and then actually what was interesting when I did the Kū'au one, I went help Historic Preservation go recover bones, the last thing I found was this human skull was inside the sand...and I looked like, oh, get one skull. So was one full skull. You know what I mean... [laughing]

CSH: Oh yeah!

SH: Yeah, because they ask me if I'm bothered and I said, no, not really because I said even my dad was saying, make sure you're not conniving. You're going there to help clean up and da kine, you know. But I said, you don't...you get conniving [inaudible] and stuff...

CSH: Yeah.

SH: ...the thing going come back and haunt you kind of deal. So other than that, I'm not bothered by that... I don't have that, you know, oh ghost going come after me or something like that...

CSH: Mm-hmm, you don't ever feel that way?

SH: No. I think, yeah, must have been the way my dad, da kine, what he said, you know how get the conniving, you try to do something that's not kosher or da kine, you know. So he said dat going come back and haunt you. So but I've never had any problems even if I pick up bones or...yeah.

CSH: Mm-hmm...umm, hmm...

SH: So that one was a mo'o, um, what else? So actually I, there is a cave on the side and everything and I looked and everything but I said no, um. People have told me, even like the mo'o by da kine, Lahaina, yeah. Um, the Moku 'Ula and things like that, so I've heard of that one and I also heard Waihe'e, also of the mo'o over there. But no... I haven't had any strange feelings or [inaudible] like that, no.

CSH: Um, what about any ancient trails in this area?

SH: Mmm, not so much here. I guess the only one was, um, so that's why when I was allowed to go here I followed, basically, the trail that the fishermen used and I come in along the side and then I jump in along the water and then I swim to the waterfall. But what it is is, I'm also looking at safety and the reason I decided to study that waterfall was that it's safer here. I don't have the wave or the ocean behind me.

CSH: Yeah.

SH: So where I gotta watch big waves or something going come and hit me from behind.

CSH: Mm-hmm.

SH: So inside the pool I can always go back away from the water and then I'm safe in the pool but whereas if I'm in the ocean then I may get ocean swells. You know like how I told you about the 'opihi pickers and stuff like that?

CSH: Yeah, yeah.

SH: Dat kine you gotta watch the swells. So yeah, that's the only, um, terminal falls that I worked on. Yeah. It's just more for safety but that's how all these different things. I got to watch the fish climb out and get 'ōpae, and get hīhīwai...

CSH: Yeah.

SH: [Inaudible]

CSH: That's cool... um, do you have any knowledge of any observed cultural protocols here? Like...maybe from back in the day or even now that is still being practiced?

SH: Um, not too much. No, not even the oli and the chants, no. Yeah.

CSH: Um, what about any mauka/makai relationships like with 'ohana who live mauka and makai and how they interact.

SH: You know what I've noticed and then it's not just my family and everything it's just everybody gotten older and stuff and I guess now being older and stuff then we don't have the kids and stuff like before. All my cousin's kids and everybody all graduated college and everything so it's not like when small and you get the kids...you know, take them to the beach, take them go swimming, like that...

CSH: Yeah...

SH: ...so my mom would always have the kids go swimming lessons and stuff so like my mom would babysit and stuff.

CSH: Mm-hmm.

SH: So that's why would be interesting cause I said when we got older then it's the kids that my mom took care of, you know life, eh, come, go in the car we go, you know, [inaudible] go get ice cream or da kine, dat kine stuff...and then my brother used to take the kids go, go get the newspaper but then right next is the fire station...

CSH: Mm-hmm.

SH: So the kids all know the fire...firemen and all the guys who worked at the fire station so when the fire engine going out then the kids all waving and the guys all waving to the kids, right, because they know the kids because they come pick up paper with my brother. So the kids would do that but my brother would also train them so what it would be is like, so like, they see the helicopter, they see the helicopter really small. From the time they were small they were always

trained so, oh, can see the helicopter. You no hear the helicopter but they already see um, but they used to looking and then later on then the helicopter come over and then but the kids pay attention to stuff like that. But you bring um up, but the kids would know if you ask them to look and then later on they pick that up on their own.

CSH: That's cool.

SH: So yeah, that kine stuff yeah my brother kinda followed up with my mom for take care the kids and stuff, that kine stuff. But always the kids...make the kids considerate.

CSH: Yeah.

SH: Yeah. That's why we always joke cause my mom passed already but it'sso funny. She could just tell them, my mom going give you this eye. She give you da eye, she no need say nothing. [laughing] Then the kids would sit by the bank and sit down.

CSH: And be quiet.

SH: Yeah, yeah. Dat kine stuff. But I said I guess you gotta be brought up that way...because I say we no need say nothing, yeah you see her eye and then okay, you get the evil eye. [laughing]

CS: Yeah.

SH: We know what my mom is thinking. She no need say nothing. [laughing]

CSH: Umm...

[Pause]

CSH: It's a kinda broad question but...um, like what do you think would be some concerns with the community that is related to any cultural practices in this area that the project might interfere with?

SH: Hmm, what do you mean? In terms of the project, we're talking about return the water?

CSH: Yeah.

SH: Umm, well I guess that's also why I asked for the clarifications.

CSH: Yeah, yeah.

SH: How much water being diverted that those kinds of things because the guys who are on the water commission aren't asking those questions or asking specifics. How much water? When they going release the water? What the water going be used for?

CSH: Yeah.

SH: Even though we just keep getting the, oh yeah, they going do diversified ag then in the newspaper they read, oh they may do cattle ranching...

CSH: Yeah, yeah.

SH: Then oh, how many cattle and where are you gonna put the ranch?

CSH: Right, no specifics.

SH: There really is no specifics other than, oh well we're going into diversified ag as a blanket and then no information at all.

CSH: Mm-hmm.

SH: Specifically to really addr...how much water are you gonna need? How many head cattle you gonna raise? Where are you gonna raise um and where is your livestock? Where you going slaughter? Where you going feed?

CSH: Right.

SH: And are you gonna, is it all gonna be, you know, what kind of feed are you gonna raise um on, like hay? That's why it's different cause like on the mainland you get like all the hay farms and stuff right, so they stock up on the hay and then other time then they get feed lots and stuff and then but there's nothing. Nothing is said, what kind of feed, what are you gonna raise, what kind of cattle and stuff? So...when they're raising the cattle are they gonna ship um to Japan? You know what I mean?

CSH: Oh yeah, what's gonna happen?

SH: So are they just raising um, so like with some of the ranches, they're just shipping off the cattle to get slaughtered on the mainland and stuff.

CSH: Yeah.

SH: Yeah, so I don't know all that...that kind of stuff. But that is just more from what we've heard like with the ranching here cause when they were getting all drought conditions...like right now, no problem. A lot of rain but when everything start drying up and everything then they're worried so they're talking about shipping cattle out just to get um fed, they don't want, you know, the cattle dying here cause not enough feed because the biggest cost could be feeding um.

CSH: Right. And even with the lo'i too?

SH: Umm, lo'i, I think it would pertain to certain families. At least it's still in the family so they wanna continue it but I guess, well most of what we hear is with more water then they should be able to raise more taro. But right now when they're not getting more water...sufficient water to expand production or anything...buggah just barely hanging on and stuff.

CSH: Mm-hmm.

SH: Yeah.

CSH: Do you personally have any recommendations, um, regarding, I guess, the preservation of this area?

SH: Umm, I know things are gonna change but um I guess having seen, I know that they do wanna make sure that, uh, kalo growing is part of, I guess their lifestyle...but it would be helpful if they would get more water and stuff, um, but it's not all EMI. So like even over here, the flume...

CSH: Yeah.

SH: It also involves the State and so the State also gotta....that as well as taking care of the watershed not wait until say the tree falls over and then disaster then no water and then they have to wait and then they kinda ask County or the State to help clean up for them.

CSH: Yeah.

SH: Yeah, um, it's kinda interesting cause you know, historically, so from CCC time, um, civilian conservation corps, when they planted all the, cause at the time they thought all the 'ōhi'a were dying...

CSH: Right, what did you say, the eucalyptus?

SH: So they planted the eucalyptus. Do we have any plans on what to do with the eucalyptus? Cause even like Olinda now, they're talking about trying to take down some of the trees and stuff because they're overgrown but then they, uh, they were originally planted for harvesting. But the guys were so opposed for them to harvest anything then they let the eucalyptus just grow dense. So now basically it's a fire waiting to just burn everything up. So you got all this dead under story and stuff and when it burns, it's not gonna be just the eucalyptus, it's gonna be all these peoples homes and stuff.

CSH: Yeah.

SH: Because they were the ones that said, no, we don't want you guys to cut the eucalyptus but the eucalyptus at the time was proposed for this eucalyptus harvesting...

CSH: Mm-hmm

SH: And it never happened.

CSH: Yeah.

SH: So it, you know, I guess trying to deal with the public after you already done that so when I look at that I say but is there a eucalyptus plan or even in the future and stuff? Um, and if they don't do anything then again we get this big burn up Olinda so with that you're gonna lose homes and things and then what's gonna happen after all these places get burned? Just like on the mainland...

CSH: Right, right.

SH: I'm asking that now because when you get the big burns and you can't evacuate these people and everything gets burnt up then I don't think anybody is preparing, what are you gonna do...but I have a feeling that's what's gonna happen. They're not gonna do anything until something burns and then they're gonna start from scratch in asking what do we need to do. So one of the things would have to be cleaning up. So now they're trying to clean up the ones by the highway and by the road cause what happens is, when they fall on the road then basically then traffic is screwed.

CSH: Mm-hmm.

SH: So but basically that's all they're doing. They're trying to address the, you know, what can government do so they're trying to clear the, the ones actually going fall on the highway but you still got all that other burn stuff. When that goes, I don't think people have even thought about it.

CSH: Yeah.

SH: Yeah, but that's in the background. That's one of the things that's gonna need, be needed, to be addressed.

CSH: Mm-hmm.

SH: So, I'm telling you first... [laughing]

CSH: And I am making notes... [laughing]

SH: So when you see that, yeah [laughing] [inaudible] Just stuck um with the foresters and everything cause they used to have the 'alalā because the facility used to be up in Olinda and stuff before so now the other guys are doing it so now they got all this bird people and if they knew then oh, we can release 'alalā.

CSH: Mm-hmm

SH: And then the 'io come and knock um off.

CSH: Yeah!

SH: So but I look at that and say no, it's typical, but I say but no forget you're making numbers. We just, ok, we raised six and then what? We going release six? And then now you lose, say four? What have you done? Are you making a difference or are you just, you're spending millions of dollars now...

CSH: Yeah.

SH: ...to try and bring um and then now they supposedly they took um back in from the wild and then they going re-train um and then they going put um out and then they're supposed to be smarter and not get hit by the 'io. Who's smarter? I think the 'io going knock um out.

CSH: Mm-hmm.

SH: Eventually.

CSH: Yeah.

SH: Just my...[laughing] Sorry I not the wildlife biologist [laughing] They're just preparing the 'alalā to be, da kine, dinner, you know.

CSH: [Laughing]

SH: So I don't know what you can do [laughing] I'm a DLNR employee so I don't know...we would think about stuff like that [laughing] [inaudible] So yeah, I'm sorry I never get a chance but if we had gone to, da kine, if we hiked up by Waikamoi would get the, da kine, abandoned like, one um, like a drilling rig that's off to the side inside the bushes in the bamboo and stuff but the thing is overgrown and all rusty and then...I don't know, whenever, I have no idea and I don't think they would ever...

CSH: Move it?

SH: ...go back to go clean all that stuff up. It's all abandoned equipment. They got places they built, da kine, they get roofs so that, I guess, they could do work up there but I don't know if they

would even reveal that they have um up there but these places that they, for construction and everything might keep you out of the rain and stuff but those kinds of places and stuff nobody is addressing any of that but they use that to prepare a rig or even pouring concrete and stuff like that.

CSH: Umm, I see you have your book here...

SH: Oh you want me... ok I can go over some of the stuffs.

CSH: Yeah... just anything you wanna share or things that I maybe didn't ask you or we didn't cover....

SH: No, no, there's only a few stuff but um...

CSH: I'm very interested to see what that is...

SH: I don't know how much, how in depth you guys are gonna go look up for information. So I'll give you...this is USGS, um, and I'm really not gonna use it already cause East Maui already been decided so what it is is, it looks at the natural flow conditions in the streams.

CSH: Uh-huh.

SH: This is done for, this is a USGS report, k.

CSH: Ok.

SH: So you can look at that and then get one map too. So what they were doing was, they did this study on, I'll give you this and the other one, but it's a USGS report. It's just information.

CSH: Ok.

SH: Yeah. So they're talking about median and low flow characteristics.

CSH: Oh, no, yeah. This is...great.

SH: Ok, so the other one that I have is this. So what they did was they went back and then they had some areas in five other streams in East Maui. They went back and they did long term study at the habitat and things and then so this is another one so this one I think was um, by Steve Gingrich and, ok, and Ruben Wolf.

CSH: Ok. Do you want this stuff back?

SH: No, you can have um. This is USGS reports but you can have um and then so this other one I just wanted to show, cause what it is, I had David Higa, he retired already but, um, he was with the water resources folks so then so he sent me this. This is for the Honomanu water license so in this they talk about the ditch and this is their application so at the time, so this is Garrett Hew, okay, so what happens is that this is how much...no data reported. Yeah. So this is way back, so this is '89 and stuff but, um, so this is Spreckles, so just to show you.

CSH: There's nothing.

SH: They submitted but they got the license anyway. So, but that's the way the system is. So they submitted no license and then they may have submitted so many million gallons of water taken, um, so like here, um, "1879 constructed concrete" So you can go look through it.

CSH: Yeah, so interesting.

SH: So this...also about what they're gonna use the irrigation for then that's why you see sugar and pineapple, ok. Then so it's just information.

CSH: Ok.

SH: Um, yeah, this is old already but but kinda...

CSH: Yeah, but interesting to go through for sure.

SH: But kinda gave me an explanation because I said, they don't have to submit anything and yet they going get the license anyway.

CSH: Yeah, a blank form...basically.

SH: Yeah so but that's what's in the files and then so it's not my decision but it's up to water resources to decide so it's not us but we, like I said, we recommend 64% median flow, um, and I have some reports and stuff that we had come up with for East Maui, um, and if you want um, just email me and I'll sent it to you.

CSH: Yeah, I don't think I have your email though.

SH: When you're ready, skippy.hau@hawaii.gov.

CSH: Ok.

SH: So I don't have a middle initial and I don't have a long last name so that's my email so...

CSH: Simple enough.

SH: At hawaii.gov.

CSH: Hawaii.gov, okay.

SH: So that was it.

CSH: Ok.

SH: So you can email me and then just email me when you're ready and I'll send you a whole ton of stuff and I'm not sure if you wanna get into ecosystem stuff... if you wanna get into insects, if you wanna get into...all other stuff. I'll send you other stuff too that I got from other people, other researchers...

CSH: Yeah.

SH: ...cause I guess at the time when we were doing research, other people did stuff on insects, other people did stuff, so we had, so we did our da kine, so when we compared, um, this would be, our research for um, we looked at, um, Waikolu Stream on Molokai and Makamaka'ole Stream on Maui and then we looked at, um, 'o'opu alamo'o populations so we also went in and we collected fish and we looked at the fish then they looked at the females, they also looked at if they were carrying eggs and also measured the eggs and everything. It was a very comprehensive

report we did and then basically what they were saying was that because of the diverted flow in Waikolu, the fishes weren't healthy. They weren't ready to reproduce whereas Makamaka'ole had much healthier population with natural flow. Yeah, but that was never used by water commission. So it was interesting because everything was all in the abstract and everything just said we're looking at impacts of diverted water and then they didn't use it. Yeah. So they're not the only ones so like I said, I have the other papers as well as even about water use, Hawaiian water use, so like I said, I don't know...Emma Nakuina, then Metcalf, and then, uh, I have the Justice Perry, because she comes out, he comes out afterwards and then basically just like changes the definition so his definition is, oh, water is for agriculture.

CSH: Right.

SH: But then agriculture now includes pineapple and sugar. Yeah, pineapple and sugar is now included. So, but here, we're talking this is all the late 1800's so that changes and so that's why when I talk with the kids or when I do presentations, I talk with the kids and also explain that on their agricultural zoning, agricultural zoning also includes golf courses.

CSH: Oh.

SH: The land use, never had golfing back then but now it does include and the politicians never address golfing under land use for agriculture. So that's one of the issues that should be addressed but they intentionally left it alone so that's gonna come back probably to haunt you know for land use and when hotels wanna go build they're gonna say they wanna do a golf course and they going divert the water for golf courses because we're using the water for ag. [laughing]

CSH: Ok. But so basically the next part of the process is that I'm gonna play back all the stuff that I recorded today and all the stuff you give me and basically like do a write up of today and then I'll email it back to you... maybe I'll just email you first so you can email me other material.

SH: Ok, ok.

CSH: And then I'll email you back the summary just so you can look through if I missed anything, if I'm not getting the message out properly then you can edit and send it back.

SH: Umm, maybe the only other thing I would probably include would be the fishing side. So cause that's something I grew up with and that was fishing.

CSH: Mm-hmm.

SH: And then but what's interesting is that now I've seen how things have changed, not just for fisheries but for limu, for crabbing, for all these things that we used to do when I was a kid. I've seen that change even here, we've seen ogo disappear from Kihei and stuff and that's from over harvesting. Our regulations really didn't work and, uh, I can say that now but doesn't help when people are buying ogo at \$10 a pound under the table and then, yeah, I mean so they just kept wiping out and then there's no limu and then why are people now asking, oh why no more limu in Kihei? And all these people were over-harvesting limu. They'd wait for graduation time and then everybody would just go and take.

CSH: Oh yeah!

SH: Yeah and that's everywhere. SO now the ogo grounds are just like being treated like fishing grounds. Nobody says where they fish. Nobody says where they pick limu. They go pick limu and just give you limu and no say nothing about where they got um form. It... I could see that coming but I didn't realize it would be so dramatic cause even the environmentally about four years ago the ogo blooms just disappeared so now it doesn't have the limu that used to wash up on the beaches and everything it just disappeared. In all this place no more waiwai iole, no more, um, līpoa, and in all this places that used to be able to be able to go gather...

CSH: No more?

SH: Um, get a little now but just disappeared. I don't know what was the reason, I don't know if it was acidity or...could be warming temperature and stuff too but could be a compliment of other factors and why we don't have...but that's why it's hard because even for the fishing because you always have the fishermen, 'oh don't blame us' and then when you look, you gotta go blame everybody. It's the guy who left the ogo, it's the guy who never pick the 'opihi, and then the next guy come in and then he does pick the 'opihi and stuff so it's more of a aggregate affect rather than just individuals because the individuals wanna claim, 'oh but I left some' but they realize that somebody else came up behind them and then just harvested everything else they had and then no limu, no ogo, no more crab, no more 'opihi.

CSH: That's sad.

SH: [laughing] And then the 'opihi not going come back, the 'opihi gotta wait for the 'opihi grow and we not going wait for the Northwestern Hawaiian Islands. The thing gotta be all localized...same with the fishing, gotta be localized. They gotta take care their own fishery and let the fish grow. Yeah. So, yeah, that and then seeing the pipes and stuff, the only other thing would also be, um, you know what going happen, cesspools are gonna be a big problem. Because alot of the folks don'thave, um, they don'thave sewers.

CSH: Down in...?

SH: No, all these... would be cesspools. We're talking isolated homes and stuff on this side. They don't have sewer systems and stuff and then they're making a big deal about it in Honolulu, yeah? Because they're talking about, oh they wanna have the guys convert off of cesspools.

CSH: Yeah.

SH: But I said no but all these individual homes, māla, yeah, they don'thave sewer. There's no sewer system. So they're using leaching fields and now they're saying that the thing is now going into the ocean...impacts are gonna occur but you're getting more people...demand for more houses...and then, um, I don'tknow how they're gonna get affordable housing because now you gotta tell them you want the housing to be, uh, environmentally...oh! whale, right over there...just on the surface [laughing].

CSH: Oh wow. Is this normally the time?

SH: Oh, yeah yeah, yeah. They going stay till next month and then after February then they go back but they're all over the place. If you go in the water then you listen and you can hear the whales.

CSH: What do you mean?

SH: Yeah, right there, spouting at the surface. Just a small one, yeah.

CSH: Oh yeah!

SH: [Laughing] That's why I tell the kids, when you guys go in the water you listen and you can hear the whales underwater. When we were doing surveys you can hear um. In the background you can kinda hear the whales. [inaudible] They just broke the surface but no more wind too so when get the white caps try look. [laughing] Right there, you see?

CSH: Everytime I look away!

SH: You see the little white? Yeah, yeah. But that's why, fishing eye...you gotta watch [laughing]. Sorry, yeah I know I'm going off [laughing] Oh, um, any other questions you wanna go...maybe I can introduce you to Awapuhi Carmichael. If she's home.

CSH: Yeah, no...

SH: I figured we can go drop off tide calendar. It's now 2:40.

CSH: Ok.

SH: Yeah, we go look. Maybe she's home then I go, I guess I'll drop off couple tide calendars.

CSH: Alrighty.

SH: I know I'm giving you plenty homework.

CSH: Yeah, I like it!

SH: So actually I was reading a book, reading a Dick Van Dyke, but I just finished this book on, uh, Father Damien and I found out that his older brother was actually the priest that was supposed to come out to Hawai'i.

CSH: Oh yeah?

SH: And then he took his place and then Father Damien was here and it talked about how Father Damien was more radical but I said you put him out there and then he's with all the guys with the leprosy patients and then he got leprosy and stuff but I said that it was interesting because we went there just this year. So I got, last year we got to go see, in September.

CSH: Oh cool!

[Inaudible]

[End of Recording]

[Transcription File 22]

[Leaving Ke'anae, heading back to Pā'ia]

CSH: What were your parents' names?

SH: Um, my mom was Rose and then she was Wong. She also had a Chinese middle name, so she was [inaudible] Wong and then my dad was a [inaudible] Hau and then when they went to school then they get their English name. So then he became Arthur. So Arthur is his given English name and he went to school up until eighth grade...but he went to, where we was, uh,

Ben Parker. At the time, eighth grade was the highest in terms of the grade school. Then later on Castle High School opened up. So even my Aunt, she was able to go to McKinley. So she graduated from McKinley. Kinda funny because you know, I didn't know until late, she went to McKinley but I didn't realize that my Aunt used to go Vegas and I was thinking, 'oh really?!' [laughing] [inaudible] So when she was younger I guess she used to go Vegas I guess before she was married and stuff. So we think back, oh, would've been nice if maybe my uncle or my dad ever got a chance to go travel.

CSH: Mm-hmm.

SH: Yeah, my dad was in the army. In the Pacific I think he went to Solomon Islands or something.

CSH: Oh!

SH: Yeah.

CSH: Yeah, my parents go to Vegas pretty often.

SH: Oh really?

CSH: I mean, well they go at least twice a year.

SH: No, but see, guys always wonder why all the Hawai'i guys go Vegas. I said, you know, the other thing is that, when you go Vegas you see all these people from Hawai'i! [laughing]

CSH: Yeah!

SH: And then in Hawai'i, you don't see them cause they're too busy working [laughing]. At least when we go up there you can at least relax a little bit, you know.

CSH: Yeah.

SH: And then I know it's high cost of living but that's why we get play money, go out, go shopping...don't have to worry about like when you're home, same 'ole hassles, same 'ole stuff here. You see, like I told you. Been there, done that. They're just trying to get out of here as fast as they can. [Pause] Well I'm glad she remembered Darryl. Darryl Kuamo'o, we used to work in the streams. He does that stuff on the Big Island so when we used to do the studies or the photographs or, yeah. He used to come here and help me do, da kine, survey over here. We did the two-year study. We fly in by helicopter. Did you wanna see the hīhīwai?

CSH: Yeah.

SH: If you no mind, I going stop on the side...

CSH: Ok.

SH: ...to go walk in next to the stream then I can show you where get hīhīwai. [Pause] You see how the hala droop?

CSH: Yeah.

SH: [Inaudible] I saw that all the way back to Hāna. So ever since I used to collect in Wai'anapanapa, I stopped collecting. Oh, did you need to use the bathroom?

CSH: Um, I'm good.

SH: Ok.

SH: [Inaudible]

CSH: Yeah, it's scary.

SH: [laughing] At your own risk... [inaudible] So have you been in the streams to go collect hīhīwai or anything?

CSH: No, I have not, no.

SH: So good thing you got your boots because we'll go through a muddy part and right next is the stream. Do you eat fern shoots?

CSH: Like this? Like the hō'i'o?

SH: Yeah.

CSH: Yeah.

SH: This is normally where people gather so they stop.

CSH: Same place as the hīhīwai?

SH: [inaudible] Guys pick fern, they pick bamboo. That's why, like I said, that's also why Honomanu was my number one recommendation for East Maui to restore the stream [inaudible] When they restore the water, the fisheries, then the public would be able to see that and all these other places what they do is, they have their locks on top. You know when you go to the gates?

CSH: Yeah.

SH: And then the public wouldn't have access to those areas. EMI cuts um off so they can't go up to the gates [inaudible] this is the only one that's open. So Awapuhi said she was, what? 81? Did you hear? She said she just had her birthday.

CSH: Yeah, yeah. She said the last time she went to the river was when she was 79...?

SH: So I'm not going down to the beach, I going park on the side and we'll go in from there.

[End of Recording]

Appendix C Garret Hew Transcription

Cultural Impact Assessment, East Maui Irrigation Water Lease renewal Project, Cultural Surveys Hawai'i (CSH) interview with Garret Hew (KN), at his home in Kula, Maui, on 26 June 2018

CSH: CSH Researcher

GH: Garret Hew

GH: Yeah, so...when they asked me, "Eh, would you be interested in taking this survey?" I said, "Eh, you know, I'm retired now..."

CSH: Yeah.

GH: And I said, "You know, I worked for the company and I still have bonds....I don't have bonds to the company..."

CSH: Uh hmm.

GH: "...but my heart is still there."

CSH: Yup.

GH: So, I don't know if they're looking for things like that but...

CSH: Uh hmm.

GH: ...I work with a lot of people out there and got to know a lot of people. Tell me stories.

CSH: Yeah, yeah, yeah.

GH: You know about East Maui area that maybe somebody don't know, yeah?

CSH: Right, right, right.

GH: But you know, I retired in—last year---2017. August. So not quite one year.

CSH: Ah. Ok.

GH: Yeah.

CSH: Nice.

GH: Your recorder on now?

CSH: Yup! Recorder is on!

GH: Ok.

CSH: Ok. So let's start with your full name.

GH: Ok. Garret Hew. G-a-r-r-e-t H-e-w.

CSH: Ok. Um, where were you born?

GH: I was born in....Pu'unene, Maui.

CSH: And you were raised....here? In Kula?

GH: Raised in Kula, yes.

CSH: Umm. Did you ask you when you were born? [Laughing]

GH: Sure! 8-3-1955. I'm an old man already.

CSH: [Laughing]

GH: I can collect Social Security [laughing]

CSH: Ohhhh! [Laughing] Um, who are your parents?

GH: My parents are um, Harry. Harry Hew.

CSH: Ok.

GH: And my mother is Nellie. Her maiden name was Shim. She was from the Big Island, Kōhala. Hawī area. And my dad grew up here in Maui. And uh, he actually only had a, you know, 8th grade education and had to go out and work, so he worked for the plantation.

CSH: Uh hm.

GH: And you know—very, very cheap pay. So he had an opportunity to go to the mainland for schooling. So he went to California to get um—machinist schooling. So he went there, came back, and went to work at Pearl Harbor Navy Yard as a machinist.

CSH: Oh. Ok.

GH: Yeah. And then he married my mom. I guess my mom's folks from Kōhala moved to Oahu when my grandfather passed away.

CSH: Uh hm.

GH: And then um, he worked there quite a long time for Pearl Harbor. And then he started farming again in Lualualei.

CSH: Ok.

GH: On O'ahu. And then eventually moved back to Maui in the early 50s. So in the early 50s. Yeah.

CSH: Ok. So when...how did mom and dad meet? Or when did they meet?

GH: [Loud sigh, thinking] Hmmm. God, I don't know how they met but they met on O'ahu.

CSH: Oh, ok. They met on O'ahu.

GH: Yeah.

CSH: And you have siblings, yeah you said?

GH: Yes! I have three sisters. And one brother. My brother is now deceased but my three sisters are still here.

CSH: Ok.

GH: And like I said, this was our family house—nine of us.

CSH: Uh hm.

GH: And I was in charge of making hot water every night. So we had a hot water heater....

CSH: Uh huh.

GH:...and I was in charge of cutting wood, hauling wood, and splitting wood and making the fire for nine people every night.

CSH: Wow!

GH: Yeah.

CSH: Not a *furo*, like actual bath then?

GH: Actually my father made coils with steel pipes so I would make the fire under the coils. The water would heat up and go into the hot water heater. And then re-piped it into the house.

CSH: Oh ok, ok.

GH: Yeah.

CSH: Gotcha.

GH: So we had a brand new electric hot water heater here in the house that sat for like, 40 years that we never did use.

CSH: Wow.

GH: I was the hot water heater [laughing].

CSH: [Laughing] Ok. Um. So...let's see. What was it like growing up here in Kula?

GH: Kula?

CSH: Yeah.

GH: Very, very...rural. We're farmers. My dad was a truck farmer up here. He grew mostly Maui onions, Kula onions. And tomatoes and a whole lot of variety of um...crops. And then my grandmother or my Popo, which is my dad's mother.

CSH: Uh hm.

GH: Was also farming with my grandfather. My grandfather was a rancher. My grandmother used to farm over here in Kula. Her mother, which is my great-grandmother. She was born in Hawai'i so they lived up in this Kula area. So I guess I'm 4th generation.

CSH: Uh hm.

GH: Great-grandmother, grandmother, father, me.

CSH: Yeah.

GH: So I'm fourth. So she was here and then they went...she went back to China little while for something. But then there was the Japan-China War so then she came back to Maui. And eventually settled on O'ahu for long time.

CSH: Ok.

GH: But she lived to 100 and something. So she passed away in 19...I wanna say about 80. Or something like that. Very nice lady. Yeah.

CSH: So you all had farm chores then? You and your siblings?

GH: We all had farm chores.

CSH: Yeah.

GH: You know, the motto here was... "If you wanna eat, you better work."

CSH: Ahhhhhh [laughing] so everybody gotta work!

GH: [Laughing] Yeah! Everybody work. It was a hard life but it was a good life. You know, growing up outside with vegetables, fruits, and cattle and everything else.

CSH: Uh hmm.

GH: What's funny is that my grandfather only did cattle. And my father only did farming.

CSH: Uh hmm.

GH: But when my grandfather passed away my dad tried to do cattle, that didn't work out so we leased the land.

CSH: [Laughing]

GH: And now I do cattle and farming.

CSH: Oh wow! Ok.

GH: Yeah.

CSH: Your cattle is....

GH: I have one head down here....

CSH: Ok.

GH:and I have half a dozen up by Polipoli Road, by my house.

CSH: Ok. Ok. And you slaughter them all too or....?

GH: I...I usually raise them. I have a cow/calf operation. I have a bull with cows and what I do is when the calves are about 8 months, 9 months old—I sell em. Usually they ship out to the mainland for fattening in feedlots.

CSH: Uh hmm.

GH: And then they slaughter them there and ship the meat back here.

CSH: Nice.

GH: Yeah. It's....

CSH: Wow.

GH: Yeah, I do that or sometimes I sell one or two here or there. Yeah, yeah, yeah.

CSH: Cool.

GH: It's a good lifestyle.

CSH: Yeah! That's what I'm striving for in life!

GH: [Laughing] It's hard work but, you know—it's open and my grandkids, you know, they love to come with me and go taro patch and go run in the dirt. Feed the cows everything. My cows are all tame. You know, I pick ti leaves and. They come running...

CSH: Yeah, they love that!

GH: Yeah, they love that yeah. It's like candy!

CSH: Yeah and albizzia, I learned.

GH: They love albizzia? No kidding?

CSH: Yes! Yeah, that's what I heard too.

GH: Wow! Albizzia is plenty on the Big Island. Eh?

CSH: Yes, yes. It's bad.

GH: It's a nuisance tree to me.

CSH: Even on O'ahu now.

GH: Yeah.

CSH: Yeah, it is a nuisance tree. It sucks up all the water.

GH: So, you know, my growing up days was all farming and ranching and chores.

CSH: Mmhmm.

GH: And that's about it. And then you know when... we went to this old school over here. Ke'oke'a School and then Ke'oke'a School they shut it down in 1964, when they built Kula Elementary School. You passed that when you came up the road.

CSH: Yes.

GH: And Kula Elementary basically took kids from Ke'oke'a School and took kids from Kealahou School which was on the Waiakoa side.

CSH: Ok.

GH: So they merged and then we went there. And eventually I went to Maui High School at H-Poko and then half way through my junior year, they moved us to Kahului, to the new school—in Kahului. That was a real shock, because all this time we were in the country and H-Poko or Hamakuapoko is out in the boonies. And then we got to move to the city.

CSH: Oh, yeah, ok. I see.

GH: So then we got to move to the city – no grass, no trees, hot. Everyday you gotta wipe your desk because it's all sandy, all dust.

CSH: Mmm.

GH: So the last year and a half, it wasn't that pleasant, but, you know, I finished it up.

CSH: So when did you start working for EMI? Was it ... right after high school?

GH: No, after high school I went to college on the mainland. I went to this small university-- Pacific University in Forest Grove, Oregon. Took up some business and then it wasn't for me, so I worked a little bit, I went part time to Portland Community College. And then eventually, I went down to Corvallis, Oregon. Oregon State University. So, I graduated in 1978 with a Bachelor's Degree in Horticulture...and a little bit business. So, I came home. Shortly, thereafter my dad retired, so I took over the family farm. Raised onions and tomatoes and other vegetables.

CSH: Mmhmm.

GH: So that lasted for about five years. So, I mean, there are so many elements you cannot control about farming--

CSH: Mmhmm.

GH: So, you either gotta go really big and then try make it, or you're not going to make it, eh?

CSH: Yeah.

GH: Or you try to grow something special. Weather issues, bug issues. So, finally I said ok. I'm gonna get a job. So I started at HC&S in December of 1983 and I started in the irrigation department. I was a ditch supervisor, regulating water. That's when it all started. And then shortly thereafter, in 1985, they transferred me over to EMI. Yeah. I was in charge of the administrative functions of EMI.

CSH: Ok.

GH: Throughout all those years. However, there was a gentleman, Steven Cabral, that was our field superintendent. He was the old school type and he took me every place and everywhere that you could ever imagine. So, the first week I worked EMI, he said, "Ok, we're going out in the woods, you know, on Thursday, or whatever." Ok. "So bring your shorts, change of clothes. Whatever." Ok. We walked the tunnel. So we go inspect the tunnel. We go and jump in and going through this tunnel.

CSH: Yeah.

GH: And I think, "Ok." So, EMI has 50 miles of tunnels, 25 miles of open ditch where you can, you know, actually see the ditch, yeah?

CSH: Mmmhmm.

GH: So, the tunnels are all underground. So, we started in one section, and we kept on walking and walking and walking. So, after four or five hours, I said, "Steven, how much longer?" "Ah, a couple more hours." So, that was the training that I grew up with. Because, that's how the old guys they train you. If you cannot hack the first couple of days, you can't work for the company.

CSH: Yeah.

GH: Down the road. So, no problem walking in the tunnel. They look at me, yeah, eh, college guy, he work in the office. But they kinda had an idea that I worked on the farm and stuff.

CSH: Right, right.

GH: So then ok, another time, they tested me again, oh, we gonna try see if you can hike up the hill and read the rain gauge up there with somebody. So they get their best, you know, runner. Ok, we go. So, we go up and hike the mountain...

CSH: Yeah.

GH: The guys says, "What? Can make um?" "Yeah, yeah, yeah." "Keep on going." "Like rest, no?" "No, keep on going." Come back. "Wow, fast eh?" "Yeah." And that guy says, "That guy can go still yet."

CSH: Yeah [laughing].

GH: "Yeah, whatever you guys want to do I can do, no problem." No sweat on me.

CSH: Yeah.

GH: And the supervisors, one was Robert Pu'u. He was our Ke'anae supervisor.

CSH: Mmhmm.

GH: He was Chinese-Hawaiian. And you know, he kinda look at me, "Hey boy, you work on the farm?" I go, "Yeah!" "Mmmm. I can kinda tell."

CSH: [Laughing]

GH: "Oh, you no scared anything, ah?" "No, no, no, I do anything you like. You just tell me what you want to do." So, I remember one time when we were doing a tunnel inspection with Robert and Steven Cabral, and we had to go from, I think it was Ke'anae, Pi'inou and we came out to Kolea Powerhouse. I think that's—you know---a couple, three, four miles tunnel.

CSH: Yeah.

GH: Found some rocks on the floor. So, what we do is we bring inner tubes, tire tubes.

CSH: Yeah.

GH: We blow air into the tube and strap a piece of plywood on top. So what you do is, you jump on the plyboard and float down, and when you see rocks on the tunnel floor you stop and put it on the plyboard. And if you have plenty rocks, you turn the tire upside down where the plywood is under water...

CSH: Yeah.

GH: And you throw rocks in it and then you float them down.

CSH: Yeah, yeah. Ohhhh.

GH: So, at one place, plenty rocks. So we pick them all up. Ok. So three of us, I think we had three tubes...and the thing kinda weighted down, yeah?

CSH: Mmmhmm

GH: More weight you got, the more the inner tube go in the water, yeah?

CSH: Right.

GH: So more weight the faster the tube goes in the water.

CSH: Yeah.

GH: So then Robert says, "Eh, we got to get out at Kolea." Ok. So, we're going, going, going. He says, "Oh, there's one ledge over here so we got to keep to the left of the tunnel wall. Yeah, ok, because there's a little channel there that can take debris out of the tunnel. But we only walk in the tunnel whenever there's 40 million gallons or water or less, because anything more than that it's hard to stand up.

CSH: Yeah. Ok. Ok.

GH: So, you have to go at a certain level to have any control.

CSH: Yeah.

GH: So we come to Kolea where there is an opening in the tunnel— these guys holding onto the tubes loaded with rocks with the ropes. "Eh! Eh! Kolea, Kolea." Aw Man, I don't want to let the tubes with all of the rocks go floating past this point so I jump in front, and I'm hold the tubes which is under water and keep on holding 'em, Robert saw me holding the tubes from floating any further downstream he got out of the tunnel and pull one tube at a time out. I keep on holding the tubes until they were all out of the tunnel. Robert said "Come out. Oh boy, lucky thing you hold onto those tubes. If you hadn't held that, we gone, we gone."

CSH: [Laugh]

GH: I never like go pick up more rocks downstream or something.

CSH: Yeah. Wow.

GH: So we got them all out. Everything good. That's how I got to get their respect. You know, work with them. And. So they taught me a whole lot. They taught me everything about the ditch system.

CSH: Mmmhmm.

GH: Robert taught me how to blast rocks. I got an explosives license.

CSH: Wow.

GH: Because we had to clear roads and stuff like that before. So, small kind. If the rock too big, you blast 'em. Now, we have machines. We can do other kind of things, yeah?

CSH: You transitioned from admin to being like in the field?

GH: Not really.

CSH: Not really.

GH: I was admin all the way. My boss at that time, who was the Assistant Vice President at HC&S in charge of ag operations said, "Eh, whenever you can, the more you can learn, you go out in the field with these guys." So that's what I did. I did administrative work, but I went out in the field. But, I was in charge of administration and Steven was in charge of the field.

CSH: Ok.

GH: So, we did that for years and years. And then finally, Steven Cabral retired at...he worked there...let's see, 52 years. So, 70 years old he retired.

CSH: Uh hmm.

GH: So when he retired, they promoted me as the manager of EMI. So, I was responsible for the entire company.

CSH: Mmhmm. Yeah.

GH: I oversaw the company.

CSH: Ok. So, let's see from 1985 to 2017 wow, that was a long time...[inaudible]

GH: August 31, 2017 was my last day. I also wore two hats when I went back to HC&S in 2003 as the Paia Farm Manager responsible for growing about 9,000 acres of sugar cane and then in 2008 I was put in charge of all of the water resources at HC&S which included all of the irrigation facilities, deep well pumps and hydroelectric power plants. And I was also responsible for EMI at the same time. The Paia Farm operations was transferred to someone else when I took over all of the water resources.

CSH: Ok. [Laughs] Oh wow, you went down to the day!

[Both laugh]

GH: Yeah, so, I retired. You know, I help out the company as they have been good to me and also my former co-workers are also my good friends. I'm not a paid consultant.

CSH: Yeah, yeah.

GH: They call me, I help them out. I've done a couple of other things, but I'm going cut that out already. I like to help out, but I don't like to be with the politicians or going to meetings, so.

CSH: Yeah, you're retired!

GH: Yeah, I know. But I have a life. But you know, my grandkids come first. The kalo and the cows.

CSH: Yeah. Nice.

GH: Volunteer work and stuff. So, it's all good.

CSH: That's good. Um...so, when you lived here, but obviously you've spent a lot of time on the east end.

GH: Yeah.

CSH: Have you come to any stories or traditions of that area?

GH: You know working with the people out there, you know, they taught me a lot, like Robert Pu'u, our Ke'anae Supervisor, he lived in Ke'anae,

CSH: Mmmhmm

GH: And ah...he worked there 30, 40 years too, yeah?

CSH: Mmmhmm.

GH: Um, and he said, all of Ke'anae/Wailua at one point, had rice growing. I said, "How come rice?" He said because there was an influx of Chinese in the late 1800s that intermarried with the local Hawaiians over there.

CSH: Yeah, yeah.

GH: And they settled down and then had kids and they started growing rice, because that's their staple, instead of taro.

CSH: Mmhmm.

GH: So he said, "Lot of rice patches, Plenty of guys growing rice." I said, "I thought it was always taro?" "No, had rice." Then he told me that Maggie Alu had a *poi* shop up Kūpau Valley. How they used to make *poi* and everything else. He said "You know, after a while, you know, people couldn't make it growing taro, so they got jobs in the County, outside here, outside there, and stuff like that." So, we, as the company, used to hire a lot of those people in Ke'anae, Wailua, Kailua to come work for us, you know, because they're born and raised there. So, like Robert, was born and raised there and also Jimmy Hueu, Steven Cabral was born in Nāhiku so we tried to keep up the tradition and give them opportunities. So, that went on for a while. Usually, you worked for EMI, you work until you retire, yeah?

CSH: Yeah.

GH: But then, times change. Lot of hotels were built and construction jobs paid well. Lot of different kind of opportunities. People don't want that kind of job. They go to college, which is good, and they find other kind of work, yeah?

CSH: Mmmhmm.

GH: The first part of my career it was pretty easy to find people who wanted to work for EMI, of course, mostly labor positions. You would have to enjoy that kind of conditions - when its wet, raining, to work for the company

CSH: Outdoors!

GH: Yeah.

CSH: Yeah.

GH: So, when we hired somebody we tell them, "You gotta remember two things, every day you come to work, bring your raincoat, rubber boots, and bring your lunch.

CSH: Yeah.

GH: Cause if you don't you going be miserable.

[Both Laugh]

CSH: Yeah.

GH: Yeah.

CSH: Yeah.

GH: So after, a while, you know none of those people was available and you know, we had more rules and regulations with pre-employment screening and all that. It's more difficult to find workers at EMI.

CSH: Oh.

GH: Because we had, when I started we had 23 people, when I retired, we had 17 approved positions, but probably only a dozen workers physically,

CSH: Mmmhmm.

GH: You know, closure of plantations. Somebody younger says, "No, I going to find another job." So, you know, you're in your 20s and you get a job with the County, better benefits, ok whatever, or with the State whatever," so they went.

CSH: Mmmhmm.

GH: To be comparable or more than comparable so that we can keep good people you need to compensate them. Yeah?

CSH: Yeah. Retention.

GH: Yeah, retention.

CSH: So, I mean, I met Kai, so that's the kind of stuff that you guys are looking for at EMI?

GH: Yeah.

CSH: Folks to just maintain regularly?

GH: Yeah. At EMI we had [clears throat] we have our maintenance worker. We have mechanic welders...

CSH: uh huh.

GH: We have supervisors, truck drivers, equipment operators. But no matter what your title, you better be able to do all that.

CSH: You're a laborer. Period.

GH: Yeah. I am the manager, I labor too. When I go out in the field, I gotta work. I work. Everybody does that. No matter what. You out there and one tree comes down, you can't go call somebody, go cut the tree for me, No. Everybody got one chainsaw in their truck.

CSH: Oh yeah.

GH: Everybody get one winch, everybody got a cane knife. Unless, you're really stuck, then you call. If not, cut yourself out.

CSH: Yeah, I learned that real quick.

GH: You went with Kai? Yeah.

CSH: Oh yeah, at one point there were four...

GH: ...Trees.

CSH: ...or five downed trees. He just brings out...

GH: ...The chainsaw?

CSH: Oh, what kind of chainsaw is that? I got to get one like that! Small, but powerful that one.

GH: The company buys Stihl chainsaws as they are the best.

CSH: Yeah and then you gotta haul it out.

GH: Yeah.

CSH: Yeah. And then if you want to get past, you got to.

GH: That's the way it goes.

CSH: That's hard work.

GH: So, you gotta be prepared.

CSH: Yeah.

GH: But yeah and you know, luckily I had opportunity to work with older guys that worked for the company for a long time and figured all of the tricks to the trade.

CSH: Mmmhmm

GH: You know, Robert was a real good resource, cause he grew taro in Ke'anae.

CSH: Mmmhmm

GH: And you know, we were going for our water license back in the 80s, 90s and trying to figure that all out. So he taught me a lot about the taro system in Wailua and Ke'anae.

CSH: Mmmhmm

GH: And I learned how to measure water from my predecessor and with USGS people.

CSH: Oh, ok.

GH: So, we became friends and he made sure I knew how to measure and you know, did it the proper way and everything else. So, we measured water and we did studies and things like that. But, maybe one thing that a lot of people don't realize, Nicole, is that Ke'anae and Wailua are the prominent taro growing areas on Maui, besides, Waihe'e and you know, some other places like that.

CSH: Mmmhmm. Yeah.

GH: And they continue to grow taro to make a living and to feed their family, but then, our ditch in that area was built in the 1900s.

CSH: Mmmhmm

GH: So I know we taking water from the stream, that usually goes down to the taro patch. So then I asked Robert, "Robert, if we divert water from the stream into our ditch, how come you still get water down there?" So, he says, "Oh Boy, come over here, I show you." So below our diversions, within the stream, there are springs that come up.

CSH: Ohh!

GH: So the springs rise below of our ditch system and feeds into the streams and feeds the taro patches.

CSH: Nice.

GH: So, in Wailua, there are springs below the Ko'olau ditch, and East and West Wailuanui Stream and then Waiakamilo Stream, which is the main one that feeds Wailua. They had a big spring over there called Akeke Spring, we used to call that Banana Spring, but it's actually Akeke Spring they call it. It brings a lot of water in and everything else. Robert used to tell me, he says, "You know, if you want the water, you know, you gotta go get it." So, I said, "What you mean?" So he says, "Well, like our ditch, if you don't clean it and maintain it, the water is not going to flow." So I said, "Same like taro patch, water only goes where you take care of it." So I said, "So how you take care of all that?" "Every Saturday, depending on how many taro patches you get, you send one person if you get 5 patches, you get 10, you send two. And they all go clean, religiously."

CSH: Ok.

GH: And they used to do that all the time.

CSH: So it's just a matter maybe taking out rocks and cleaning...

GH: Cutting brush, keeping the thing open, shoveling the debris out of the *'auwais*. Repairing the walls, the main *'auwais* and all that.

CSH: Ok.

GH: So, they did that and it worked out fine. But then [clears throat] as the older people retired or gave up taro or passed away, you know, that tradition wasn't kept up, maybe not to the fullest.

CSH: Mmmhmm

GH: Things got into disarray and at one time we even offered to assist them with the cleaning of some of the *'auwais* and stuff like that. But, you know, they weren't receptive to our offer. So, it's fine It's fine.

CSH: Mmhmm.

GH: But we did do some work on their water system. We rebuilt a dam that diverted water around a losing section of the stream and diverted that water back into the stream. So that was the main thing. But, I think the main thing is that if you got a problem, you gotta address it, take care of it. Same like your house. You got a leaky pipe, you gotta fix it. If your water tank leak, you no fix it, you no more water.

CSH: Yeah.

GH: But, you know, I can see where, maybe, some people were angry, I guess, at the company, because of the fact that we, you know, had diverted for so long and everything else.

CSH: Yeah.

GH: And you know, I can see that. You know...we tell them, I tell them, "Eh, I work for the company, I didn't build the ditch and as far as I know the company pays me so I got to do this. I have no more animosity with you, or anyone else."

CSH: Yeah.

GH: "But if you feel differently, I'm sorry."

CSH: Yeah. Yeah.

GH: So, I think a lot of it was, you know, because of this water issue. And lawyers involved and everything, got *pilikia*.

CSH: Yeah.

GH: But I tell our guys when I was working, "Hey, you just have to let it go in one ear and other the other. We just do our thing. If anyone like make humbug with you, just walk away."

CSH: Yeah.

GH: "No make humbug. Just walk." "Ok, boss." They talking stink, never mind. Just in one ear and out the next. Just do your thing, do our thing. You know, we get jobs, so everything is okay. You guys have family, you guys got to take care so, just – it's just the way it goes, yeah?

CSH: Yeah.

GH: Sometimes family fight family too, yeah? Which is hard.

CSH: It is, it is.

GH: But Robert showed me in all the places where the springs came out, where there were problems with leaky sections, and how it was resolved, and everything else. I go out there today and I still see that nothing was done.

CSH: Yeah. Yeah, yeah, yeah.

GH: It's not our *kuleana*, it's the people who need the water who should take care of their system.

CSH: Yeah. What about any traditional or historic trails up there?

GH: Ah, that's a good question. Let's see, before the Hana Highway was built...

CSH: Ok.

GH: ...they used to use the EMI ditch trail to access going to Hāna. So, you either catch the boat from Kahului, go all the way to Hāna, which is real rough ride. Or you go horse and mule and you catch our ditch trail at Pāpa'a'ea and go up the road, come all the way across, and either come down Pi'ina'au Road or over across to Kopiliua stream. So, from what I recall, Jimmy Hueu who was our former overseer in Ke'anae. He told me that the Hāna Highway was built in sections, so the Hāna Highway from Pāpa'a'ea to Pi'ina'au was built in 1923 to 1925.

CSH: Wow!

GH: And from Pāpa'a'ea on they used our trail, to go towards Nāhiku side, Hana.

CSH: Ok.

GH: So they built the other section of the road from Pi'ina'au to Kopiliula from 1925 to 1927. And there's this Chinese guy, he was an engineer for the State. His name was Paul Lo.

CSH: Ok.

GH: Yeah, he was the guy who did all this. But basically, the trails up there are ditch access roads and were used by people wanting to go to Nāhiku or Hana or whatever.

CSH: Is that the one that hugs the...I feel that I was really high up in the Ko'olaus, and its got this full-on just drop down. That's the trail that they used?

GH: Yeah. Well, actually, Pāpa'a'ea is in Kailua and you would have to go all the way up and come across. But you went up, I think Wahinepe'e Road and you went all the way up. And then you have to cross a bridge, there's a waterfall come down, right?

CSH: Yup.

GH: And you kept on going in.

CSH: Yup.

GH: Locked gates. And then you guys went to Honomanū, which there's a real narrow road, had waterfalls.

CSH: Yup.

GH: Yeah. Dead end then come back, right?

CSH: I didn't get to the dead end. Yeah...

GH: Oh, did you guys walk or drive?

CSH: We drove part of it and I remember it splits. And then we walked on the upper part and so we walked on the upper part...then we went past one waterfall, which had like a plank too.

GH: Yup. The waterfall was real high, yeah?

CSH: Yeah.

GH: We call it "High Falls Honomanū."

CSH: Ok.

GH: And it has a plank you could go.

CSH: I said, "No, I'm not going on that." [Laughs]

GH: You want to hear a story about that?

CSH: Yeah. Sure.

GH: That plank there, washed away, so – we had a storm coming, a hurricane. So Saturday, Steven Cabral and I, we had to go out – "Eh, this storm coming, we gotta sluice the ditch." In other words, lift up this gate so the water would go down the stream. So no water goes in the ditch, to avoid lots of rocks and debris and damage, ah?

CSH: Yeah, yeah, yeah.

GH: So we go out. Ok, we go Honomanū, these other guys were here, we had the crew going there, Saturday. So we walk past high falls, instead of going on the plank, but no plank.

CSH: Yeah.

GH: So we're walking through, sluice everything, and come back out. By the time we come back out...there's too much water, cannot cross. So I look at Steven, "So what?" Ahhh, I don't know. He ran back found one pipe. He put the pipe over this – by the plank. And he walked on the pipe. So I'm watching him. If he ever fall – I don't know what I gonna tell your wife.

CSH: That's one far drop.

GH: Long.

CSH: Yeah!

GH: So he's on the other side – so he's waiting for me. "After you." "Ok, if he made it, I gonna try. I just walk gently on the pipe over the little rails - and go," and off we went. That's the kind of stuff, I was thinking "Ok God, if it's my time, it's my time."

CSH: That's how I felt when we were crossing some of those bridges where it's just that teeny tiny little roadway, I mean, Kai get em. He knows this...

GH: Oh yeah.

CSH: You know? But we're all in the back, squeezing and really...

GH: In the pickup truck?

CSH: Yeah, in the Tacoma. I'm like "Tell my kids that I love them."

GH: How many people was with you guys?

CSH: There were three in the back and then, yeah, there were like five of us.

GH: Oh!

CSH: And then Kai was six. Oh man! But I was like, "Kai got this!"

GH: That's what we do when younger guys we hire come. Put 'em with an old timer. They drive the road with the old timer.

CSH: Yeah.

GH: And when they feel confident...

CSH: Yeah.

GH: Then we let them drive, if not, you don't drive. You walk.

CSH: Yeah, yeah, yeah. Woooo!

GH: That's one thing, you have to learn to drive the road.

CSH: Did you guys ever, you know when you were talking about how the water is just gushing, did you guys ever have to camp out over night? Where it got that bad?

GH: No.

CSH: No?

GH: Um, I got caught in my career on several occasions.

CSH: Mmmhmm.

GH: So where the river crosses the road...

CSH: Yeah.

GH: When you go – you turn around. You check it out. Cannot go, yeah? So you wait.

CSH: Ok.

GH: Cause streams in East Maui are very flashy.

CSH: Oh!

GH: So rain, stop, rain, stop. So what I do is...one time I took these people out- so we crossed this stream, 'O'opuola and drove towards Ka'aiea. Ka'aiea cannot cross. Big water. Ok, turn around, go back to 'O'opuola. Cannot cross 'O'opuola stream because of high water.

CSH: Yeah.

GH: "Oh no! What do we do?" I said, No worry. So we sit down here. So I get one rock and put it right where the water is. Ok, "Eh Sally, what have you got to eat?" "Oh, I made chocolate chip cookies," "Ok, go eat." These are some people, I forget who, but anyway, I took them out on a tour. Then the husband says, "Oh, what kind car is this?" "Oh, one Ford Explorer." "You know, my Nissan would make it right through this water." The wife said, "Shut up, Garrett know what he's doing. So shut up."

CSH & GH: [Both laughs]

GH: So, I wait. Look at the rock. The water go down. Ok, we can make it. So we go.

CSH: Awesome.

GH: So you just gotta know. You cannot rush 'em. Cause, if you do and your car die, you die.

CSH: Yeah.

GH: Forget it.

CSH: So there wasn't any trails that went, like from mauka to makai? It was mostly just...

GH: There were trails from our EMI system, where you went to.

CSH: Yeah.

GH: There were a couple of trails, but mostly hunting trails.

CSH: Ok.

GH: Going up mauka.

CSH: Ok.

GH: We made one trail, no, let's see, not made it, but yeah---we cut the trail from Honomanū going up to the lower pipe line. That's where we maintain the County system. The problem is to go walk up hill takes 2 ½ hours in thick mud.

CSH: Ohhhh!

GH: So, you either do that or you drive from Kailua when you're assigned, drive all the way through Makawao, go all the way to the top, come all the way down, and you hike along the pipeline for 2 ½ hours. So it takes you five hours to go in and come out - if you're in good shape.

CSH: Yeah. Wow!.

GH: But most of the guys that we send, is, you know, the younger guys, eh? You know like me, I get enough years and I'm *makule*. I check and clean the first two diversions which is the shortest walk.

CSH: Yeah, yeah. [Both laugh]

GH: I da boss.

CSH: Yeah.

GH: But, I take you the first time. Yeah, I take you.

CSH: Oh.

GH: Now you know. That's how we do it.

CSH: Yeah, yeah.

GH: But as far as trails going up, it was mostly pig-hunting trails.

CSH: Mmmhmm.

GH: Yup. Mostly pig-hunting trails. No established trails, going up or not.

CSH: Do you hunt?

GH: Yes, I do.

CSH: Did you hunt up there too?

GH: Um, little bit.

CSH: Yeah.

GH: But you know, I was in the Kaupō Gun Club, so I used to hunt this side of the island.

CSH: Yeah. Yeah. West side.

GH: On the east side all pig. So you need dogs.

CSH: Ok, ok, alright. But no more deer, axis deer you guys have?

GH: There's some axis deer. Um, not as prevalent as here, because I think it's wetter over there. Here it's a bit dryer.

CSH: Yeah.

GH: Yeah.

CSH: Ok. What did you do when you had your deer, pig? You like, make smoke meat? Or?

GH: Usually, I...the deer I take the meat and make teriyaki or whatever.

CSH: Ok.

GH: The pig, I give my friends, they make smoked sausage, ah?

CSH: Oh, ok.

GH: Because they need so much to get a batch going and get the machine going and make the sausage smoked. So it's just like now, that I retired that I grow stuff, I get these Chinese bananas, ah?

CSH: Oh, ok.

GH: As you come up on the right-hand side, so the bananas, I give to this lady. She makes pasteles out of that.

CSH: Oh ok, nice.

GH: So instead of her buying, I give her the bananas and she give me pasteles. Good trade, eh?

CSH: That's a good trade.

GH: And my friends, I give them. They go fishing, they give me fish, they give me 'opihis whatever. It's like I'm back in the bartering system, ah?

CSH: Yeah.

GH: So, I don't sell kalo. I don't sell anything. If I get extra, I give friends and if I have plenty extra, I donate to the Maui Food Bank cause I was on the Food Bank board for seven years and was the vice chair and chair during the last several years.

CSH: Yeah.

GH: But I still feel associated with them.

CSH: Nice. That's awesome.

GH: Yeah.

CSH: Do you recall seeing any, um, *heiau*, or archaeological sites, when you were up there? Pōhaku?

GH: You know, the only ones I can recall is in Honomanū, where you folks went.

CSH: Mmmhmm.

GH: And just when you reach Honomanū on the west side where you park, you know, maybe a couple of hundred yards up, I recall that there was a small grave up there. And then, I took the picture and I sent it to a friend who could read Chinese.

CSH: Oh. Ok. That's the one on the right-hand side?

GH: Yeah, yeah, yeah.

CSH: Yeah, I saw that one.

GH: This was right off the road?

CSH: Yeah.

GH: You talking about right off of Pi'ina'au road

CSH: Is that the one going up to the Power House?

GH: Ah, no. Which one you talking about?

CSH: There was... Let's see, it was after Ke'anae,

GH: Yeah...

CSH: And then you had to up, it seemed kind of flat. And then, it's on the right-hand side, there was like a Chinese or Japanese grave.

GH: Right on the side of the road. You could see it, ah?

CSH: There's a bottle?

GH: Yep, that's up Pi'ina'au Road. So, that one there, we translated that – it was a small child, she said. Then the one in Honomanū? I believe also a--small child.

CSH: Mmm, ok.

GH: So, I think, you know, that people lived up there, cause from what I'm told, way in the past, there was a ditchman, who lived up there, maintained the ditch, regulated the water. So, that person had a family up there.

CSH: Oh, ok.

GH: He would live up there with family and would maintain that section of the ditch. I think there were eight ditchman houses before. The ones I recall more, is the one up Pi'ina'au Road. If you look at the EMI map, there's a small piece of land up there...

CSH: I have some historic maps here. Hawai'i historic maps.

GH: Oh. You got a colored one with green and the..

CSH: I have this, with all the water diversions.

GH: No, if you got one map with ...

CSH: I have a small one.

GH: Oh, here we go, here we go. You see this right here? That's owned by EMI.

CSH: This one, this is owned by EMI?

GH: Yeah. And this is Pi'ina'au Road going up. So, the grave you saw was down here and up here was that lot that the ditchman used to live there and maintained that section over there.

CSH: Is that right next to where the...ummm...

GH: There were large pine trees over there and some tangerine trees.

CSH: I don't remember seeing those...

GH: You have to get off the road and go a little bit inside to see that.

CSH: I remember seeing, like what looked like lava tubes.

GH: Yeah, yeah. Have plenty.

CSH: And on the left-hand side was the ditch and then there was like a cluster of rocks there, that had some glass fragments.

GH: Ah, yeah, yeah, yeah.

CSH: But, I was wondering, did somebody live here? Because there was a teacup too that was cemented in.

GH: Yes. I guess...

CSH: Is that where they lived? Over there?

GH: No further up.

CSH: Oh, further up! So you go up on the right-hand side. Right?

GH: Yeah.

CSH: Ok, ok. Got you.

GH: Look at this, this is all red, this is all State-owned.

CSH: This is the project area.

GH: This here, I think is 34-acres, I forget, but anyway. That is owned by EMI, so is the ditchman's house right there.

CSH: Ok.

GH: And the other ditchman's house that I recall was by Waikamoi. West side of Waikamoi.

CSH: Where is Waikamoi?

GH: Waikamoi -- Ke'anae, Honomanu -- should be around here, Waikamoi. It should be, should be around here. I no more my glasses,

CSH: Ok.

GH: But Waikamoi, along the ditch road, there's this -- and it's hard to tell, but lots of bamboo -- Do you remember Representative Patsy Mink?

CSH: Yes.

GH: Her family lived up there. Her uncle, Takemoto, was a surveyor for EMI before.

CSH: Wow! Cool.

GH: Yeah. There's some stories about that and I can't remember what, but there was some *pilikia* with him and the boss or something like that. He worked for someone else, but their family was up there, taking care a section of ditch. Yeah. Cause Patsy Mink, her maiden name was Takemoto. Somehow her family was up there.

CSH: Hmmmm.

GH: You can see some cement, some old kind of stuff.

CSH: Ok, is that the one where it forks?

GH: I don't think you went there.

CSH: Oh. There is another area where I saw some scattered rice bowls, it was by a mango tree.

GH: If you get the map with the green and the yellow – easier, I can show you where you went.

CSH: Green and yellow.

GH: Yeah.

CSH: I don't have that one.

GH: It's just like this but it shows State Land...

CSH: Ok.

GH: As yellow. And green then is EMI. And Orange is A&B.

CSH: Ok.

GH: And it has a ditch road. It just has the ditch system on it. It was a ditch map.

CSH: Ok. ok. I'll see if we have that at work. Ok, Cool.

GH: But you stopped at our base yard in Kailua, when you went with Kai?

CSH: Yes. We stopped at the base yard.

GH: Did you see that big map on the wall?

CSH: Oh, I didn't go inside the office though.

GH: Oh.

CSH: Yeah, yeah. I never went inside the office. Yeah.

GH: Did you stop at our Paia office?

CSH: I did, but we didn't go inside either.

GH: Oh.

CSH: We just met there outside and convoyed after.

GH: I see.

CSH: Ok. So did you guys, or do you know of people gathering from the mountains? Or did you guys gather anything from the mountains?

GH: Um...

CSH: Like fruits or veggies?

GH: Well, I know people gathered in the streams there. But, to my knowledge, everybody went to the ditch first. Because if it was low water, and they could go in and there was an influx of 'ōpae, yeah?

CSH: Oh.

GH: So, easy for catch, ah? And even for us, when my kids were growing up, I took them out there. Today, we go inside this tunnel. So we go.... bring the net. Catch enough, go home.

CSH: What would you guys do with it? Just fry them up?

GH: Yeah.

CSH: And how you eat them--with poi, kalo?

GH: Yeah.

CSH: Nice. What else do you get from the ditch? Are there any...

GH: The ditch had prawns, but Tahitian prawns.

CSH: The big ones.

GH: Yeah, they eat the 'ōpae. Yeah?

CSH: Yeah.

GH: The Tahitian prawns are mostly confined to the lower ditch. The Haiku ditch. But like 'ōpae and stuff like that, was mostly Ko'olau Ditch. But you can tell when someone had party or something because when you went over there and you go with your net and you no catch anything, you know that someone has just been there.

CSH: Yeah.

GH: But sometimes, the flow is high, say winter months...

CSH: Yeah.

GH: So, it's raining--December, January, February--three months straight rain. And then it starts tapering off. "Oh, let's go down, low flow." "Hey, can go catch 'ōpae. Cause now you can jump in the ditch, eh? Shucks, somebody went before me." Can tell someone went before me.

CSH: Yeah. Yeah.

GH: But when we go, I teach my kids and friends, we take what we need and that's it. We don't take everything.

CSH: Yeah.

GH: Cause bumbye no more, yeah?

CSH: Yeah.

GH: So we're always mindful of that. And they always remember that too. Yeah?

CSH: Yeah.

GH: But we still – I still take the kids down to other places, and we used to go catch hīhīwai...

CSH: Ohhhh!

GH: Yeah. Fresh water.

CSH: How did you guys prepare that?

GH: That one there, you can boil 'um, and put garlic and salt on top.

CSH: Ok. Ok. Nice. Ok. Anything else in the streams? Ok.

GH: Hīhīwai, 'ōpae. I mean, I didn't see like 'o'opu and stuff. I would rather eat reef fish than 'o'opu.

CSH: Not your thing? What kind of reef fish?

GH: Anything. Anything. Reef fish. I like, my favorite is kūmū.

CSH: Well, that's a given, come on now! [laughs]

GH: Yeah. I like parrot fish, which is the kine - uhu.

CSH: Stuffed? With what? Lup cheong?

GH: Yup. Cut 'um open, put cabbage....

CSH: Oh!

GH: I mean won bok.

CSH: Ok!

GH: Lup cheong. And then you get garlic and some black bean sauce and then you steam that buggah.

CSH: Oh!

GH: 'Ono.

CSH: Ok. Nice. That's your favorite?

GH: Uhu is one of my favorites. Yeah.

CSH: Ok.

GH: My son-in-law is a diver, but now he get kids he no more dive.

CSH: [Laughing]

GH: But once, later on... he would dive, oh, plenty food yeah?

CSH: Yeah. Ok. What was the coolest thing that you've experienced? Up there in the ditches.

GH: Uhh. Just how it was built and how they could build it in that kind of environment. Yeah, I mean, I don't think you could ever replicate it today with all the environmental laws and everything else. Just for people that had limited training to go and even survey the right line, and grade. Because you figure, the Ko'olau Ditch starts at Makapipi, goes 20-something miles, ends up at Kamole Forebay. And it starts at 1,350 feet elevation and 20 something miles later it goes down to 1,150 feet, a 200 foot drop, in 20 something miles. Today, we get roads that people make, engineers, but no match yeah?

CSH: Yeah. Yeah, yeah, yeah. So which one is the one – I went to, it ends up in Nahiku, Which ditch is that?

GH: Ko'olau Ditch.

CSH: That's Ko'olau Ditch. Ok, ok. That one is how long?

GH: Ko'olau Ditch is actually from Makapipi to Alo.

CSH: Ok.

GH: And then from Alo to HC&S Maliko Gulch is the Wailoa Ditch. So, they built the Ko'olau Ditch first. And then they dropped it down to this new Hāmākua Ditch that took the water to HC&S. But then, later on, the new Hāmākua gave some trouble with siphons and stuff like that, they built this Wailoa Ditch in 1923. That was the last of the ditch construction.

CSH: Mmmhmm

GH: 1923.

CSH: Wow. Cool.

GH: But everything changes with the environment and things like that. I mean, like, there was this earthquake in 1938. Big earthquake. January. So, a lot of landslides. Hāna, they had some oil tanks that slid off and I don't know how much oil went into Hāna Bay. EMI had damage. I remember this guy telling me Mokulehua Stream, which is past the EMI system in Nāhiku, that ever since that earthquake, water would always go down the stream, but because of that earthquake, there were cracks in the stream so water would sink into the ground instead of flowing all the way down to the ocean unless, there would have to be a large flow of water to reach down to the ocean.

CSH: Yeah, yeah.

GH: So, there's things like that, that happen.

CSH: Yeah.

GH: Big floods I've seen that washed away some ponds. And now the water doesn't reach the ocean, like Makapipi. In spite of the ditch – used to take the kids down to Makapipi, go swim down there. Get some nice ponds. Every time, always nice water. And then back in the 90s or 90-something we had two days of rain, and I think we had like 30 inches of rain in two days. And then this pond, right below the Hāna Highway, the kids used to jump in the pond right from the bridge, that pond disappeared in a landslide. And now, the pond is 200 feet down below. So, you can see the water going into the pond, but it doesn't come out into the stream anymore. Everybody who lives down stream wonders why the stream doesn't flow anymore.

CSH: Yeah. What can you do? That's nature, right?

GH: That's nature.

CSH: Yeah. Wow.

GH: But it's funny, because you know, when you go in the tunnel and stuff like that, it's just like you're taking one geology class, because you can see all the different layers, the lava...

CSH: Yeah.

GH: You know, some places, I remember just one place, Pi'ina'au, walking through the tunnel - the tunnel is maybe seven feet high and six feet wide. You go with your flashlight, or your carbide lamp and you know, you're going through the water inspecting the tunnel for maintenance or repair issues. All of a sudden, a big cavern opens up inside this tunnel. So when they dug this ditch they hit one lava tube.

CSH: Ohhhh!

GH: Big cavern. Big, big cavern.

CSH: Cool.

GH: Yeah. So amazing.

CSH: So, when you go into the tunnels the ground is not flat then. It's not like paved.

GH: Yes, it is.

CSH: It is paved?

GH: Most of the Ko'olau Ditch is lined.

CSH: Ok.

GH: With cement.

CSH: Just on the bottom though.

GH: It's lined with cement on the bottom and the walls.

CSH: On the walls. Ok, ok.

GH: The top is just solid rocks.

CSH: Yeah.

GH: You know when they blasted. Yeah?

CSH: So your job was to pick up all the rocks on the bottom, right?

GH: Whatever was blocking, impeding the water we would remove.

CSH: Ok.

GH: That's what we would do.

CSH: Ok. Was there any vines coming down and stuff too?

GH: No, because usually these tunnels go through mountain ridges and it's too far down to have roots penetrate.

CSH: Yeah. Way far up, yeah?

GH: As you get closer to the opening or the exit, there may be some vines coming in. Certain tunnels...

CSH: You gotta clean all that too?

GH: Yeah.

CSH: Ok, ok.

GH: Yeah. Because as you exit, you know, the mountain goes down too. So then trees over there, roots come in and stuff.

CSH: What was the most interesting thing you found in the tunnel while cleaning? Was there, like animal debris that would come through or?

GH: No. Let's see. I've seen pigs in the tunnel.

CSH: Live?

GH: Dead. Because they....

CSH: They just wander, yeah?

GH: And they get hung up on a gate.

CSH: Oh, smelly! No?

GH: Yeah, yeah, yeah. What was real interesting, in a couple of places, like I said the floor was concrete lined and the wall is lined 4 feet up and at the top there is a small little ledge, like this.

CSH: Ok.

GH: And when you go through the tunnel, you got seeps of water coming in from the roof. Yeah? Some places more than others. That's why it's interesting when you go to EMI or anyplace. When you look at a stream, the stream - you got the water, but then some places you have losses the water goes in the ground. Sinks.

CSH: Ok.

GH: And then you walk some more, hey, the water comes back up.

CSH: Ok, ok.

GH: Some more water sinks.

CSH: Ok.

GH: So, you know there's losing stretches and gaining stretches, in streams that is very, very important.

CSH: Mmmhmm.

GH: And in the tunnel, its mostly gaining, water coming off the roof. However small but...what was interesting was this one place, I recall, had a steady drip on the cement. Drip, drip, drip.

CSH: [Laughs]

GH: So this ditch was built in 1923. The drip must have been going on for years and years, and decades. So there's a little impression in the cement.

CSH: Like the Chinese Water Torture?

GH: Yeah.

CSH: [Laughing]

GH: Just dripping.

CSH: Yeah, yeah, yeah.

GH: Just a little depression.

CSH: Cool.

GH: Yeah, that was pretty cool. And like I said, the lava tube that we went ... encountered, and stuff like that. That was really neat. But I recall going into tunnels when hurricanes were approaching...um, Hawaii, and to be safe we wanted to shut down operations, so that in case something happens, nothing overflows, nothing breaks. And I recall going into this tunnel with Steven Cabral, "Eh good time to inspect." "Yeah, we going to inspect." So we walk, walk, walk, keep on walking. I don't know, about halfway through, he goes, "I wonder if the hurricane when hit" "Oh my god, I think we're in the safest place because we're in a tunnel." Then he look at me, "I know what you're thinking." "What?" "We go out, everything decimated. And me and you the only people living on this earth."

CSH: [Laughs heartily]

GH: Terrible eh? [Laughs]

CSH: Yeah. Oh man. Ok.

GH: Off the record. If you need lua break, right through that door.

CSH: Ok, alright.

GH: Whatever.

CSH: Let's see. Ok. We kind of gone through a lot of stuff already.

GH: Yeah. You know the mountain has changed, Nicole. From the time I started to now. The vegetation and everything else. It's like you coming up here. It's changed. I go mountain today, change.

CSH: So what kind of vegetation did you see there before?

GH: More native plants. Not a lot of non-natives.

CSH: Yeah.

GH: You get hau growing all over...

CSH: Yeah.

GH: You got all kine.... like invasive weeds. Like ... miconia, the rose-apple dying.

CSH: Do you feel like there's a whole lot of tourists too who use the road as well and that kind of has affected...

GH: I don't think that. I don't think the tourists affect the growth that much - as man.

CSH: Yeah.

GH: Man do stupid things, eh? We have good intentions, like bringing the mongoose over here to control the rat.

CSH: Yeah.

GH: One in daytime, one at nighttime. No work.

CSH: Yeah.

GH: Now we got mongoose. Eat all our native birds. Ok. We go build Pukalani Bypass. Coming up to Pukalani. So, they need to go seed hydromulch both sides, after they grade the road, and all that. Eh? So they bring in the seed from, I don't know, New Zealand or whatever.

CSH: Yeah.

GH: Got fireweed in the seed. Now the pasture, all fireweed.

CSH: Oh no.

GH: Yeah.

CSH: Oh wow. I did not realize that.

GH: When we [clears throat] you ask the State Forestry Department, I work with them quite a bit, you go up Pi'ina'au Road, where you have the graveyard, where you have the grave.

CSH: Yeah.

GH: Notice all the big eucalyptus trees and all that kind?

CSH: Yeah.

GH: You know why they're there? Cause State thought, "Hey, all this rubbish – 'ōhi'a and koa, we'll get rid – go plant eucalyptus – that way we can go harvest the wood and make money." So they cleared the whole forest, all native species and plant non-native.

CSH: Oh, so, is this supposed to be a bio-controllish or just commodity?

GH: Commodity.

CSH: Yeah.

GH: And then, I don't know if you noticed when you went up Pi'ina'au road on the right-hand side. Had an old bulldozer, parked right there. All rotten.

CSH: I think so, yeah.

GH: This guy said he was the last guy operated, he said, yeah, they tell me go, I push down the koa, I push down the 'ōhi'a, stack them up, come behind, we plant all this...

CSH: Oh, yeah, I do remember that.

GH: That was in the forest.

CSH: Yeah. I remember seeing that. Oh, I was like, "I would love that at my house." [Laughs]

GH: No work. And still like, Nāhiku side, um, in the 30s, they had the civilian, the CCC, the Civilian Conservation Corps, no job, because depression, so, the President at that time, got the CCC started.

CSH: Yeah. That's right.

GH: Eh, you know what? Go plant paperbark, Nāhiku side because plenty bogs and runoff areas, they go plant yeah,

CSH: Yeah.

GH: All dry up the forest [laughs].

CSH: Oh gosh.

GH: [chuckles] Florida, they got 1 million acres of paperbark. And they wonder why their water table went down.

CSH: Yeah. Ok. Makes sense now.

GH: So, man is our worst enemy, yeah?

CSH: Yeah.

GH: You know, you think it's good. Have good intentions. But sometimes it's not going to work out.

CSH: Ok. Went through trails, talked a little bit about stories of that area. Legends, no?

GH: Legends, uhh! Jimmy Huelo in Kēpa Maly's Native Tradition and Oral History in East Maui, he tells some good stories. Yeah.

CSH: Did you have anything—I don't know--supernatural or scary happen to you while you were out there? It's quiet out there. I got lost for a little bit and I was scared. Hey, either I'm not moving or I'm just going back to the truck.

GH: No. I really enjoyed my career at EMI. Me and the guys I worked with.

CSH: Mmmhmm.

GH: You know, from the very get go I knew what kind of guys these guys were. They never knew who the heck I was. But then, when I got to know them, and they got to know me, hey, it was like hey, alright man. One more hand.

CSH: Yeah.

GH: When I took over management, you know, I knew exactly what we needed out there to make things easier.

CSH: Mmmhmm.

GH: So I started buying equipment that could, you know, replace the kind of job that could be done with equipment, like

CSH: Mmmhmm.

GH: We used to go by hand – chain saw and cane knife, clear the road when the brush come over, eh. Hau, stuff like that.

CSH: Mmmhmm.

GH: So I buy this machine, an excavator, it has a rotary mower attachment that is able to cut brush and overhanging tree limbs adjacent to the road. You just need one person to operate the machine, rain or shine, just keep going. This frees up a 3 or 4 man crew to do other tasks and nobody gets hurt chopping brush with their cane knife.

CSH: Mmmhmm.

GH: You know, things like that, does a job faster and safer. We had [chuckle] You know what's a siphon, ah?

CSH: Mmmhmm.

GH: You know, water go in one end, come down, come back up the other end. One end is higher than the other. Ah?

CSH: Mmmhmm.

GH: So, the water keeps going. All of EMI's 12 steel siphons were concrete lined on the inside with a half inch thick layer of concrete in the late 1960s early 70s so that would extend the life of these siphons. The contractor who did the concrete lining guaranteed it to last 20 years. So after the warranty expired, we gotta inspect the siphons. So, out we go. We get this small little cart, about 3 or 4 feet long and about 18 inches wide, made out of a steel plate, with a hook on it to attach to a cable. The cart had small wheels attached to the bottom and a small foot rest welded on the opposite side of the hook. So, you stand on that cart, and the thing is hooked up to a cable winch on a truck.

CSH: Mmmm.

GH: The winch on the truck lowers the cart you are standing on to the bottom of the siphon. As you are lowered you can inspect the concrete lining for any cracks or damaged sections. The longest siphon is 983 feet in length and 72 inches (6 feet) in diameter.

CSH: Mmmhmm.

GH: It takes you ten minutes to go down this siphon. There is an elevation difference of about 160 feet from the top of the siphon to the bottom of the siphon.

CSH: Mmmhmm.

GH: So, since I'm the office guy and the boss, I go down first. Steven Cabral is out there. So, they start lowering me down the siphon while standing on the cart and about $\frac{3}{4}$ of the way down [makes sound] the cart stopped. And then, you know, you're in a 72-inch pipe, you can hear everything, yeah?

CSH: Mmmhmm.

GH: Somebody, I hear says, "Hey, Steven, the winch - something wrong." "What wrong?" "I don't know. The key way look like coming out." Oh boy! The key way is something that locks the winch to the cable mechanism.

CSH: Oh no!

GH: ...so it doesn't free spin.

CSH: Yeah.

GH: So, here's this cable on the cart I'm on, and I'm on hanging on to this rope,

CSH: Yeah.

GH: No more safety line. Only one rope. So, I hear Steven go over there "Hey, Garrett, you can see the bottom?" "No!" "You can jump off and go to the bottom?" "No!"

CSH: [chuckle and then laughs]

GH: So, Cabral, Portuguese, they famous for hammer. I hear him hammering something. Bahm, bahm, bahm. I wait, I wait, I wait. Maybe 15 minutes, 20 minutes. "I think I can go." Ok, the thing goes down, I go all the way down, Stop. I inspect the bottom, take a couple pictures.

CSH: Yeah.

GH: "Ok, ready, go up." So they winch me up, winch me up. So when I get to the top, all these guys looking at me, "Brah – must have been terror, yeah?" I say "Hey you guys, thanks a lot for bringing me back up. Mahalo ah."

CSH: [Laughs]

GH: So everybody laugh. So I told the story to my boss and he told me, "Eh, you go find one winch that's OSHA approved."

CSH: Yeah.

GH: So I did, it was made in Germany.

CSH: Yeah.

GH: So, you know, it has all the safety features, and you know.

CSH: Yeah.

GH: But those days, we did what we needed to do, eh? Lucky, nobody get hurt.

CSH: Yeah. Totally different, today everybody has a hook on. Right? Tie on?

GH: Yeah, even EMI, you know, it's a big system, you're working in rain. It's wet, slippery, you got trees all over the place.

CSH: Yup.

GH: You gotta carry a chainsaw. You gotta know how to use a chainsaw. Yeah, it's a great experience to work for a company like that. I never knew about the water company until I went to HC&S.

CSH: Mmmhmm.

GH: Made a lot of good friends...

CSH: Mmmhmm.

GH: ...still today, it's good.

CSH: Yeah.

GH: But I'm glad I retired.

CSH: Yep. [Laughs]

GH: There's a lot more of this kind of stuff then.

CSH: Yeah. Did you have any... I guess that's kind of it. Did you have any concerns about the project or?

GH: You know, the only thing I can say is that the IIFS came out, the Interim In-Stream Flow Standards, whether the other side is happy, which they say they are in the paper. But whether our side is happy, with what we think we're going to get, remains to be seen.

CSH: Mmmhmm.

GH: So I just hope it doesn't go into litigation where one party or the other party says, I don't think it's fair and we file....

CSH: Yeah.

GH: And then we're back to square one. You don't have to finish this.

CSH: [Laughs]

GH: I just hope, you know, that whatever the hearing's officer had recommended is something both sides can live with.

CSH: Yeah.

GH: Let's move on. I mean, the lawyer's getting rich, everybody – you know, but the people not happy – businesses are uncertain how much water they will get. We cannot lease the land because we don't know how much water will be available after the IIFS is set.

CSH: Mmmhmm.

GH: You guys smart. We'll figure it out.

CSH: Yeah.

GH: How much we should get.

CSH: Yeah. Ok.

GH: If not, I go back to my files and try to figure it out.

CSH: Yeah. Yeah.

GH: For the average person, it's the best you can do, yeah?

CSH: Ok.

GH: But I think, you know, I think with A&B agreeing to really release all the water – in all those taro streams – East and West Wailuanui, Waiokamilo, Palauhulu, Pi'ina'au, Hanehoi,

Honopou, and Puoloa. I mean there's nobody else downstream that can complain, no more water, about taro.

CSH: Yeah.

GH: And then there's other streams that the hearing's office said so much water had to go down, you know, for flora and fauna, cultural resources, stuff like that. Fine, Good.

CSH: Mmmhmm.

GH: But, as long as we have the ability to take water whenever there's excess. So certainly, the taro streams, all that water goes down – if it reaches – you know, because sink holes and whatever, yeah. The rest, the scientists say, ok, you release this much, you achieve 90% habitat restoration, but, whether it's true or not, I'm not a scientist, but if it helps, then it's good.

CSH: Yeah.

GH: If it's not, then, you know, cause you hate to see people grumble about something that - to me is really easy to settle. Ah?

CSH: Yeah.

GH: I know people get hard feelings and this and that, but, you know, overthrow the Hawaiian Kingdom, took the water, da, da, da. But the King had signed the lease for us to take the water. So, at that time, in his mind, this was something good, because he collected revenue. And hopefully, helped the people out, whatever. But, that is water under the bridge. Yeah?

CSH: Yeah.

GH: I just hope that going forward, everybody can kind of be at peace.

CSH: Yeah.

GH: Yeah. That's what counts.

CSH: Do you have any recommendations? Or is there anything else that I missed and that you want to touch on? Or is that kind of...

GH: Um. This is only my opinion...

CSH: Yeah.

GH: My recollection of my years at EMI and HC&S are my personal thoughts whether if it's good or bad or whatever. It's my mana'o. It's what I think. It's what I believe should be fair. Some water should go down the streams. I think the company did right by agreeing to put water back in all those streams. Hopefully, the people are you know.

CSH: Happy.

GH: Yeah! And if they're not, then what you gonna do?

CSH: Yeah.

GH: You can only give so much. If you give them all... they're still not happy, then what?

CSH: [Laughs] I don't know.

GH: But there's a lot of different things that come into play, yeah?

CSH: Yeah.

GH: Politics and this and that.

CSH: Ok. Alright!

GH: I'm an on-the-ground kind guy.

CSH: Yeah.

GH: I had to be discreet in what I say when I worked for the company.

CSH: Right.

GH: The company pay for my children's education and everything else.

CSH: Yeah.

GH: So, I owe it to the company.

CSH: Yeah.

GH: Yeah. We try our best to work out things.

CSH: Right.

GH: Not to be adversarial. Right?

CSH: Right. Ok, I think that's it.

GH: Good.

CSH: Let me turn this off.

[End 1:15:42]

Appendix D Response from OHA

PHONE (808) 594-1888

FAX (808) 594-1938



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAII 96817

HRD18-8414

February 26, 2018

Hallett H. Hammatt, PhD, President
Cultural Impact Studies Department
Cultural Surveys Hawai'i
1860 Main St.
Wailuku, HI 96793

Re: Comments on Request for Information for a Cultural Impact Assessment for a Thirty-Year Water Lease proposed by Alexander and Baldwin, Inc. and East Maui Irrigation Makawao and Hāna Moku; Maui Mokupuni
Tax Map Keys: (2) 1-2-004:005 and 007 (por.); 1-1-002:002; 1-1-001:044; 1-1-001:050, and 2-9-014:001, 005, 011, 012, and 017

Aloha e Dr. Hammatt:

The Office of Hawaiian Affairs (OHA) has received your letter requesting information in preparation of a cultural impact assessment (CIA) for a draft environmental impact statement for a proposed thirty-year water lease to Alexander & Baldwin, Inc. and East Maui Irrigation (EMI). The water lease will enable the lessee to continue to divert water from approximately 50,000 acres of land through approximately 388 intakes; twenty-four miles of ditches; fifty miles of tunnels; and numerous dams, intakes, pipes, and flumes. The water lease will also enable the lessee to continue to access State lands to maintain and repair existing access roads and trails used as a part of the EMI Aqueduct System.

The Office of Environmental Quality Control Environmental Council's Guidelines for Assessing Cultural Impacts (guidelines),¹ identifies matters that should be addressed in the CIA including, "a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resource within the project area affected directly or indirectly by the proposed project" and "a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs." The guidelines also encourage field visits by

¹ Guidelines for Assessing Cultural Impacts, Adopted by the Environmental Council 1997, Available at http://oeqc2.doh.hawaii.gov/OEQC_Guidance/1997-Cultural-Impacts-Guidance.pdf

Dr. Hallatt H. Hammatt
February 26, 2018
Page 2

preparers accompanied by informants. OHA appreciates that aspects of your CIA study, as indicated in your letter, seeks to address the matters listed in the guidelines. OHA recommends that an archaeological inventory survey (AIS) be conducted of the lease area prior to conducting interviews so that the interviewees can adequately identify their concerns about cultural resources that may be affected by the issuance of the lease. If an AIS has been conducted of the lease area, OHA requests copies of the AIS reports.

As stated in your letter, the EMI Aqueduct System has been diverting water for more than a century to transport water to central Maui mainly for large-scale sugarcane cultivation. OHA recommends that the CIA address both current and historic impacts of the water diversion, including impacts to Native Hawaiians' abilities to traverse or utilize the license area to engage in traditional and customary practices.

OHA recommends consulting with the subsistence farmers, community members, individuals, organizations, and Department of Hawaiian Home Lands beneficiaries that live in or are connected to the ahupua'a and vicinity of the lease area.

Thank you for providing the opportunity to comment. We look forward to reviewing the draft CIA. Should you have any questions, please contact Teresa Kaneakua, OHA Lead Compliance Specialist, at (808) 594-0231 or teresak@oha.org.

'O wau iho nō me ka 'oia 'i'o,



Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:tk