ʻUALAPUʻE KULEANA HOMESTEAD SETTLEMENT PLAN

DRAFT: April 2023

DEPARTMENT OF HAWAIIAN HOME LANDS

Table of Contents

Appendices

List of Figures

List of Tables

Glossary

ahupua‘a	a land division usually extending from the uplands to the sea
‘āina	land, earth
‘āina ho‘opulapula	homesteading lands, especially for rehabilitation of Hawaiians
akua	god, goddess, spirit, ghost, devil, image
‘āina momona	fertile, productive land
ali‘i	chief
Ali‘i‘nui	high chief of a mokupuni
Ali‘i ‘ai moku	chief of an island or district
Ali‘i‘ahupua‘a	chief of an ahupua‘a
‘auhuhu	fish-poisoning plant
‘auwai	watercourse, ditch that takes stream water to places of cultivation
heiau	traditional places of worship
hoa‘āina	native tenants
ho‘oma‘a	To adapt to; to accustom; to practice; to exercise by practice; to gain experience or skill, become accustomed.
ho‘omana	To ascribe divine honors; to cause one to have regal authority; to place in authority, empower authorize.
ho‘omalu	to bring under the care and protection of, to protect; to keep quiet, still; to preside; to call to order.
ho‘omau	to make fast, as an anchor in sand or rocks; to keep perpetually in action; to persevere; to continue, keep on, persist, last.
‘ike	knowledge, awareness, understanding
‘ike kupuna	knowledge of one’s traditional past
‘Ili	small land division
iwi kūpuna	bones of the ancestors
ka‘ao	stories/fables
kahua maika	a space designated for ‘ulu maika
kai	sea, sea water
kai koholā	sea frequented by humpback whales
kai lūhe‘e	outer reefs for fishing with octopus lures
kaiāulu	community-level well-being
kānaka	general name for men, women and children of all classes, separate from the ali‘i
kanaka	human being, man, person, individual, party, mankind, population

kānāwai	actions to maintain resources
kapa	clothes made from wauke or māmaki bark
kapa moe	sleeping blankets
kapu	important resources that are crucial for ecosystem stability and community survival
keiki	child, offspring, descendant
kīpuka	clear place or oasis
ko‘a	fishing shrine
koehana	artifact
konohiki	land steward
kula	pasture
kuleana	right, privilege, authority, responsibility
kupuna	ancestor
kūpuna	plural of kupuna
lele	to jump
limu	general name for plants that live under water
lo‘i	pond fields
lo‘i kalo	irrigated terrace for taro
loko i‘a	fishponds
loko kuapā	fishpond made with a seawall
loko wai	freshwater pond or lake; fountain
maka‘āinana	commoner
mākāhā	sluice gate
makai	toward the ocean
mālama ‘āina	to keep, to preserve, to care for the land
mālama	to keep, preserve, watch over, care for
mana	supernatural or divine power
Mana‘e	east end of Moloka‘i
mauka	inland, in a direction opposite to the sea
mele	songs
Mō‘ī	king
moku	a land division comprised of several ahupua‘a
mokupuni	surrounded land mass, or island
mo‘o	Narrow strip of land, smaller than an ‘ili
mo‘olelo	story, tale, myth, history, tradition, literature, legend

mo‘omēheu	the succession of customary practices, i.e., “the path most traveled, that was handed down”
‘ohana	family, relative, kin group
‘ōiwi	indigenous, native
ola	individual well-being and life
‘oli	chants
pilina	relationships
pōhaku kihi	cornerstones
pu‘e	mound
pūnāwai	freshwater springs
pu‘uhonua	place of refuge
‘uala	sweet potato
‘ulu	breadfruit
‘ulu maika	Hawaiian sport akin to bowling
wahi	place, location, position, site, setting
wahi kūpuna	ancestral spaces and places where kūpuna interacted, which maintain relationships to the past, fostering identity and well-being in the present and for future generations
wahi pana	legendary place
wao	regions of elevation, similar vegetation, biodiversity levels, and growth patterns
wao akua	distant mountain region with sacred forest believed inhabited only by spirits (akua)
wao kānaka	an inland region where people may live or occasionally frequent
wao kele	rain belt, upland forest
wao lā‘au	agro-forest
wao nāhele	inland remote forest region, jungle

Executive Summary

The 2005 Moloka‘i Island Plan (MIP) analyzed all the DHHL lands on Moloka‘i and recommended land use designations for each tract. The MIP was created through consultation with the beneficiary community and adopted by the Hawaiian Homes Commission (HHC) on June 21, 2005. ‘Ualapu‘e, located on the east end of Moloka‘i, was identified as a high priority area to provide new homesteads for waitlist beneficiaries. However, development of residential homesteads did not occur because infrastructure upgrades to accommodate residential homesteads was never developed and the existing County water system cannot accommodate the 74 residential homesteads contemplated in the 2005 Moloka‘i Island Plan.

In February 2019, the Ahonui Homestead Association (AHA) was founded by a group of Hawaiian Homes successors, lessees, and agricultural applicants who have been waitlisted for Moloka‘i lands since 1950 as a grassroot response towards community-based governance. During the 2019 DHHL Moloka‘i Regional Plan (MRP) process, AHA proposed to HHC the idea of Agricultural Kuleana Homesteads at ‘Ualapu‘e in lieu of single-family residential homestead lots. In addition to the beneficiary feedback provided during the 2019 Moloka‘i Regional Plan process, ‘Ualapu‘e was selected for DHHL Kuleana Homestead due to its remote location that lacked existing infrastructure for residential homesteading, which would otherwise make it costly to consider single-family residential homestead development.

During the Regional Planning meetings with DHHL, beneficiaries identified various opportunities and issues for DHHL lands on Moloka‘i, which were consolidated into a list of 24 potential projects. Beneficiaries selected their top five projects from these 24 potential projects. The “‘Ualapu‘e Cultural Resources Management Plan and Kuleana Settlement Plan” received the highest number of votes of all 24 projects and was thus selected as Priority Project #1 in the 2019 Moloka‘i Regional Plan. The Moloka‘i Regional Plan was approved by HHC in February 2020.

According to the Kuleana Homestead Program Hawai‘i Administrative Rules (HAR) §10-3-30, DHHL is required only to provide a) metes and bounds description of the kuleana homestead lots, and b) an unpaved right-of-way to the awarded lots. Awardees will then have immediate access to their lots. In exchange for immediate access to lots, beneficiaries who decide to accept a kuleana homestead award acknowledge that DHHL is not obligated to provide county standard infrastructure. HAR §10-3-30 also requires that DHHL complete a kuleana homestead settlement plan in consultation with its beneficiaries prior to the awarding of kuleana homestead leases. Consultant G70 began coordinating work to develop this draft ‘Ualapu‘e Kuleana Homestead Settlement Plan (KHSP) in August 2021.

1.1 Studies Completed During the ‘Ualapu‘e Kuleana Homestead Settlement Plan Process

Prior to Beneficiary Consultation meetings and Community meetings with east Moloka‘i residents, pertinent studies, prior planning documents, and environmental studies within and adjacent to ‘Ualapu‘e were reviewed. In addition, DHHL consultants initiated various studies which were conducted to provide a clear evaluation of existing conditions in ‘Ualapu‘e. Studies conducted to date include:

- A high-resolution aerial mapping survey and digital elevation model collected via remote sensing light detection and ranging (LIDAR) in a single fly-over mission;
- Archaeological literature review and field study;
- A biological evaluation of plants and animals;
- Wildfire hazard assessment;
- Assessments on water availability and water source options;
- Roads and access study; and
- Potential for community-based economic opportunities.

1.2 Outreach Process to Date

As part of this process, a combination of beneficiary consultation meetings and community meetings with east Molokaʻi residents were held. Beneficiary consultations were held to provide beneficiaries with a better understanding of the Kuleana Homestead Program, provide information related to the site characteristics and conditions of the project area, and to better understand the beneficiaries' vision for the area and beneficiary preference for lot size and configuration. DHHL has a fiduciary trust obligation to serve and listen to its beneficiaries before others.

Community meetings were held to present the project to, and receive feedback from, the wider community, which primarily consisted of residents from the east end of Molokaʻi. Community outreach was conducted via email, newspaper announcements and mailouts to those that live in the ahupuaʻa from Kahananui to Keōpuka Loa. DHHL created a webpage to disseminate information on this project, located here:

https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/

Other than the first site visit and small group meetings, larger beneficiary and community meetings at the start of the planning process were held virtually due to COVID-19 restrictions. In-person meetings were planned once restrictions were lifted. A timeline of meetings for the Project is presented in Table 1 below.

Table E-1. Timeline of Beneficiary Consultation and Community Meetings

Meeting	Date	Meeting Type
Beneficiary Consultation #1	October 14, 2021	Virtual
Site Visit and Small Group Meetings	October 25-26, 2021	In-Person
Honuaiākea Process	November 20-21, 2021	Virtual
Community Meeting #1	December 1, 2021	Virtual
Beneficiary Consultation #2	March 2, 2022	Virtual
Community Meeting #2	April 13, 2022	Virtual
Community Meeting #3	October 20, 2022	In-Person
Beneficiary Consultation #3	November 30, 2022	Virtual

In addition to the beneficiary meetings, members of the Edith Kanaka'ole Foundation (EKF) facilitated a Honuaiākea session with a small group of members of the Moloka'i community, in an effort to incorporate ancestral knowledge into Hawai'i's community development planning process. Honuaiākea is a community planning framework that uses 'oli (chants), mele (songs), and ka'ao (stories/fables) interpreted through the eyes and experiences of community members and those who practice in those areas to understand the important resources that are crucial for ecosystem stability and community survival (kapu) and the actions needed to maintain said resources (kānāwai). The formulation of the kapu and kānāwai and their application for community management of 'Ualapu'e is further discussed in Chapter 4 of the Draft 'Ualapu'e Kuleana Homestead Settlement Plan.

1.3 Summary of Concerns and Recommendations by the Draft 'Ualapu'e Kuleana Homestead Settlement Plan

In summary, most beneficiaries thatparticipated in the consultation process supported the Draft 'Ualapu'e Kuleana Homestead Settlement Plan, but had concerns related to the provision of utilities (especially water); environmental impacts (including water and erosion), cultural, archaeological and community impacts; kuleana lease rights and responsibilities; and DHHL's relationship to future lessees.

Many east Moloka'i community members that attended the beneficiary consultation meetings are lineal descendants to the area, and care very deeply for their home. There is a perception that DHHL is acting like a foreign developer, and not listening to the generational families that live in and around these lands in 'Ualapu'e. The community raised questions regarding impacts to subsistence practices, the priority development status of the area, and who and how many beneficiaries would be awarded lots.

The following provides a high-level summary of these concerns, related information uncovered through technical studies, and recommendations provided in the Settlement Plan.

Land History/Kuleana Properties (Land Commission Awards)

- Many community members were concerned that the property owned by DHHL has no clear title and that the area could actually have kuleana parcels or Land Commission Awards (LCAs). Over 30 LCAs were awarded in 'Ualapu'e Ahupua'a primarily along the coastline in the lower flatlands around and near 'Ualapu'e Fishpond. *No LCAs were awarded in the current project area during the Māhele.*
- The DHHL 'Ualapu'e parcel was initially retained by the Crown for an initial payment of $50 by Kamehameha III in 1847. The Crown lands were leased by the Hawaiian Kingdom, Provisional and Territorial governments, and the State of Hawai'i to various individuals through to the 1960s. The land transfer from the Department of Land and Natural Resources to DHHL was completed in 1999.
- No change to the Settlement Plan is needed based on LCA research.

Cultural, Historical and Archaeological Sites

- Beneficiaries identified the preservation of historical and archaeological sites as a top priority of the 'Ualapu'e Settlement community. Respondents were equal in their preference to fence and preserve (50%), or restore for education and reuse (50%), as opposed to allowing sites to remain in current condition.

- Community members feel that this area is very spiritual and should not be developed; some people have become pupule (crazy) from collecting artifacts and pōhaku improperly.
- Two heiau, known as Kalauonākukui and Kalauonōkukui Heiau, are located along the boundary with Kahananui ahupua'a, a common location for heiau in this area. The 2022 archaeological field inspection survey of the Settlement Plan area by Honua Consulting, LLC identified a total of 103 possible historical and/or cultural sites. Approximately 60% are traditional Hawaiian constructions that date from the pre-contact to early historic period, with most initially evaluated as habitation sites (30%), cultivation/garden sites (29%), and windbreaks (6%). Thirteen percent of the sites date to the late historic period and include ranching features and structures related to water storage and distribution. The remaining 28% of the sites are indeterminate.
- The Draft KHSP recommends that an Archaeological Inventory Survey (AIS) be conducted on all of the sites within the Settlement Plan area in consultation with State Historic Preservation Division (SHPD) and other key stakeholders to further understand the function, association, age, and significance of these sites from which appropriate mitigation, i.e., preservation, data recovery, etc. would be determined.
- The Draft KHSP has delineated Special Districts around archaeological sites where homesteads would not be located. Delineation may be revised after consultation with SHPD. Proper protocol is intended when entering these areas.
- In addition, the Draft KHSP recommends formulation of a Wahi Kūpuna Stewardship Plan by the future 'Ualapu'e Homestead Association to care for and protect ancestral spaces and places.

Access for Cultural Practices, Subsistence Hunting and Gathering

- 'Ualapu'e serves as the "ice box" for the whole east end of Moloka'i as other east end ahupua'a have restricted access. Access to hunting, gathering, cultural and spiritual areas are community concerns. Currently, 4x4 access roads and trails provide access to these areas, and originated by the creation and use of hunters. The road created by DHHL and maintained by the 'Ualapu'e community homestead association needs to ensure access to these community resources.
- Beneficiaries expressed a desire to keep access open and promote interactions with other area users, i.e., hunters, gatherers, kilo, who may access the 'āina for other traditional and customary practices.

Natural Resources: Flooding, Drainage, Soil and Erosion

- Flash flooding often impacts roadways and access in the area. According to Maui County Code 19.62.060, no new construction will be permitted within Flood Zone A unless it is demonstrated that proposed construction, when combined with existing and anticipated construction, will not increase the water surface elevation of the base flood at any point. The Draft KHSP also recommends flood improvements for this area, such as berms and swales.
- Community members mentioned a diversion of water in the uplands of 'Ualapu'e that diverts water from the ahupua'a to the west side of Moloka'i . The Draft KHSP recommends that DHHL contact the State Commission of Water Resources Management (CWRM) to further investigate this claim. Removal of diversions would likely require a Stream Diversion Works Permit from CWRM.

- Community members are concerned with agricultural pesticides, fertilizers and wastewater seeping into the ground and contaminating the 'Ualapu'e well, the only well providing water to the east end. The Draft KHSP has located homestead lots in areas outside of the designated Wellhead Protection Areas. DHHL will follow wellhead protection requirements from the County ordinance, and lessees will be encouraged to follow best management practices for protecting water supply for residential and agricultural uses.
- During community and beneficiary meetings, erosion, runoff, and the impacts of that runoff on the natural resources of the kai and fishponds were mentioned. Historically (19th and 20th centuries), mauka lands in 'Ualapu'e were used for pasture. Cattle, deer and goats have deforested the area leading to erosion and soil compaction.
- To alleviate the concerns above, the Draft KHSP recommends that a community working group composed of DHHL beneficiaries, 'Ualapu'e residents, the East Moloka'i Watershed Partnership, and advisor experts convene to develop a draft Natural Resources Management Plan (NRMP). This plan could include kapu and kānāwai that were identified in the Honuaiākea process. It is recommended that AHA work with these and other groups to form a management plan and request a Right-of-Entry (ROE) from DHHL to restore native vegetation while they wait for the award process to occur.

Site Safety, Wildfire, Roads and Traffic

- Residents were concerned with the lack of fire and emergency services in the area to support the homesteads. DHHL recently issued a license that allows the County of Maui, Department of Fire and Public Safety to lease portions of DHHL property along 'Ualapu'e Water Tank Access Road for a fire house. The Draft KHSP recommends the development and implementation of a wildfire management and protection program by the Homestead Association to reduce the risk of wildfire. Health and safety codes will also apply to any homestead structure. Emergency access has been planned through two roads in and out of the Settlement Plan area.
- The existing roads are on a steep slope and severely eroded, making it difficult to traverse the entire property. The Draft KHSP recommends that new roads and the existing 4x4 roads in the settlement plan area be designed using Natural Resources Conservation Service best management practices, which will protect natural resources and minimize erosion and runoff.
- Community members were concerned with how this project would affect traffic in the area. Traffic will be analyzed during the Environmental Assessment.

Provision of Utilities

- Under Kuleana Homestead rules HAR §10-3-30, utilities are the responsibility of the lessee. The Draft KHSP provides several suggestions for off-grid utilities, including potential potable and non-potable water source options; wastewater treatment, storage and disposal; and solid waste management.

Preference for Selection of 'Ohana from Moloka'i

- The community is concerned about the changing demographics of the east end population and has a desire for Moloka'i residents to be considered first priority for the Kuleana Homestead lot awards.
- Preference for beneficiaries currently residing on Moloka'i would require administrative rule amendments and require additional consultation with beneficiaries. This could potentially take another two years before this decision is made.

- Consultation with AHA members in March 2023 disclosed the concern that native Hawaiians have already been waiting too long to be awarded a lot, and that additional time added before the awarding of lots was unacceptable. The awarding of this type of lot will sort out those beneficiaries who are willing and able to live this subsistence lifestyle from those that have other lifestyle choices and experience. The Draft KHSP recommends using the current system for awarding lots at ʻUalapuʻe. The process to discuss the preference for local beneficiaries may still occur separately, as other rural DHHL communities are voicing similar concerns.

1.4 Recommended Kuleana Agriculture Homestead Lot Plan

After the analysis conducted above, the total 401-acre DHHL parcel has been designated as follows: approximately 30 acres as DHHL Kuleana Homestead lots, 8 acres as Community Use, 85 acres as Special District, 129 acres as Stewardship, and 149 acres as Conservation *(Figure E-1).*

Of the total 30 acres that have been allocated for DHHL Kuleana Homestead lots, 23 one-acre lots are proposed for Phase 1A *(Figure E-2,* in yellow) and 7 one-acre lots are proposed for Phase 1B *(Figure E-2,* in hatched yellow).

The areas for the lots were selected primarily on lands that had manageable but steep slopes up to and around 30%, higher ratings for agricultural productivity, were not located within drainage ways or flood hazards, and primarily adjacent to existing dirt roads used by the community when accessing the DHHL properties. Utilizing existing roadways reduces development costs and minimizes potential impacts to undiscovered natural and historic properties.

The new homestead community will also include 8 acres of Community Use areas *(Figure E-2)* in order to promote community cohesion and agricultural economic opportunities. Lands designated as Community Use are common areas intended for uses such as cultural activities, parks, recreation activities, meeting pavilions, camping areas, public amenities, commercial activities, and community-based economic development.

Interspersed in the Kuleana Homestead lots are 85 acres of Special District areas *(Figure E-2)* intended to protect archaeological sites and to allow for education and continued cultural practices.

Stewardship areas (129 acres) would not be used for homesteading, but for forestry, plant restoration and subsistence agriculture in addition to, and as an extension of, the individual kuleana lots for cultural and subsistence gathering purposes *(Figure E-1).* Proposed uses for Stewardship lands could include limited opportunities for diversified agriculture outside of the kuleana homestead (including large-scale and small-scale agriculture and community gardens); establishing portions of the mauka regions as an extension of the proposed subsistence access for hunting and gathering purposes, as well as cultural practices; and providing the opportunity for watershed protection through forestry and plant restoration.

The Conservation District for DHHL's ʻUalapuʻe parcel includes areas both near the parcel's mauka border and the areas around the three gulches for a total area of 149 acres *(Figure E-1).*

1.5 Tentative Schedule of Next Steps

The awarding of kuleana homestead leases requires applicants, together with DHHL, to develop a plan for settlement and development of the designated tract. For a timeline of the planning process including projected dates, see Table 2.

Table E-2. Planning Process Timeline for 'Ualapu'e Kuelana Homestead Settlement Plan	
Action	**Date**
Literature Review and Aerial survey	September 2021
Biology, HWMO and G70 Site Visits	October 2021
Archaeological Site Visits	November 2021, March and June 2022
Lot Schemes, Alternatives, Preferred Land Use	October 2022
Draft Kuleana Homestead Settlement Plan (DKHSP)	May 2023
Early Consultation with Agencies	July 2023
Draft Environmental Assessment (DEA)	September 2023
HHC Approval of Final Environmental Assessment (FEA), Settlement Plan, and Land Use Amendments (if any)	November 2023

The timeline to complete the metes and bounds survey and road improvements is dependent upon sufficient funding being allocated to this project and thus the timeline to awards is currently to be determined.

Until such time, DHHL and HHC could consider approving a ROE to Ahonui to begin mālama 'āina activities and community work days to steward the area in the interim.

Figure E-1 ‘Ualapu‘e Land Use Designations

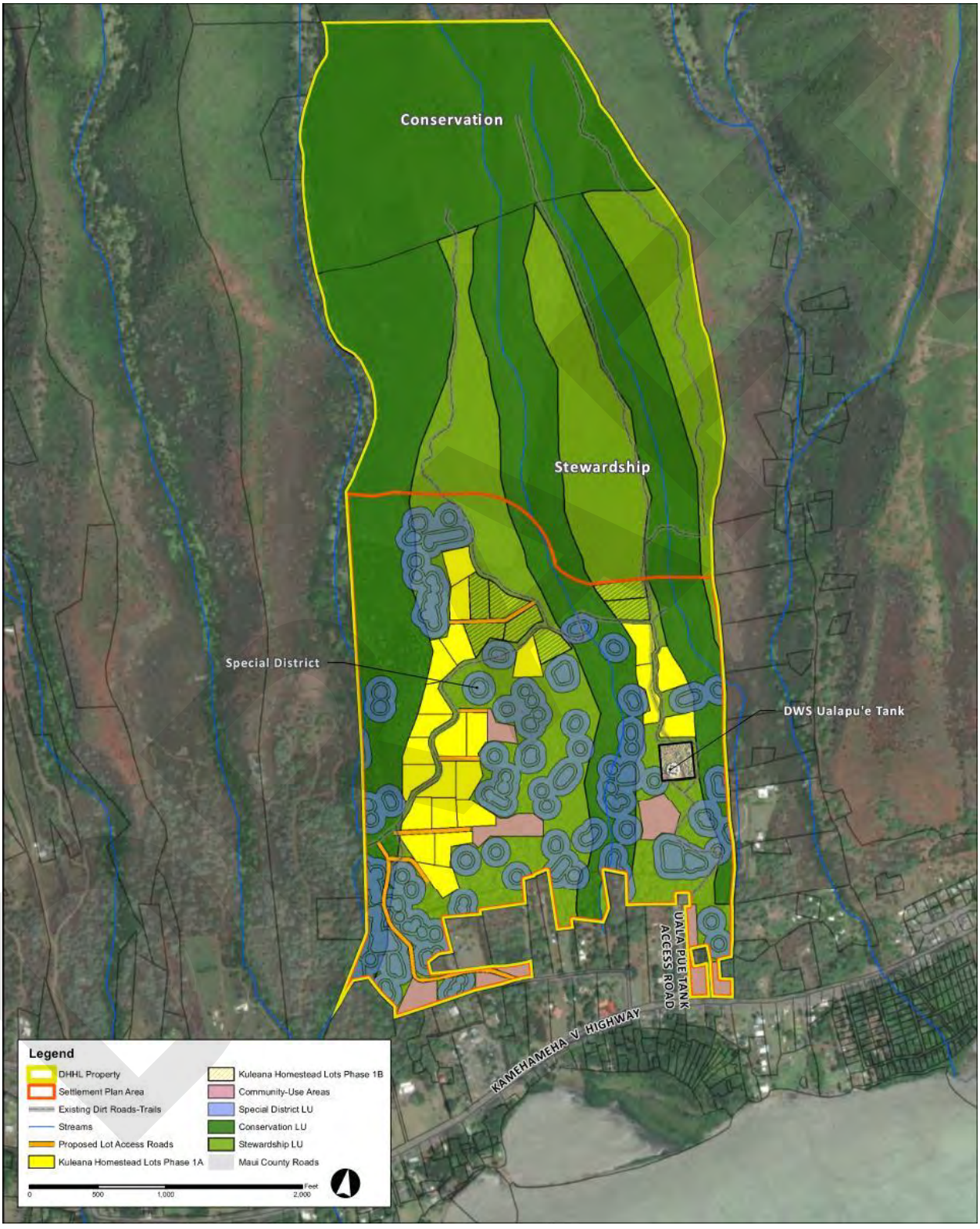
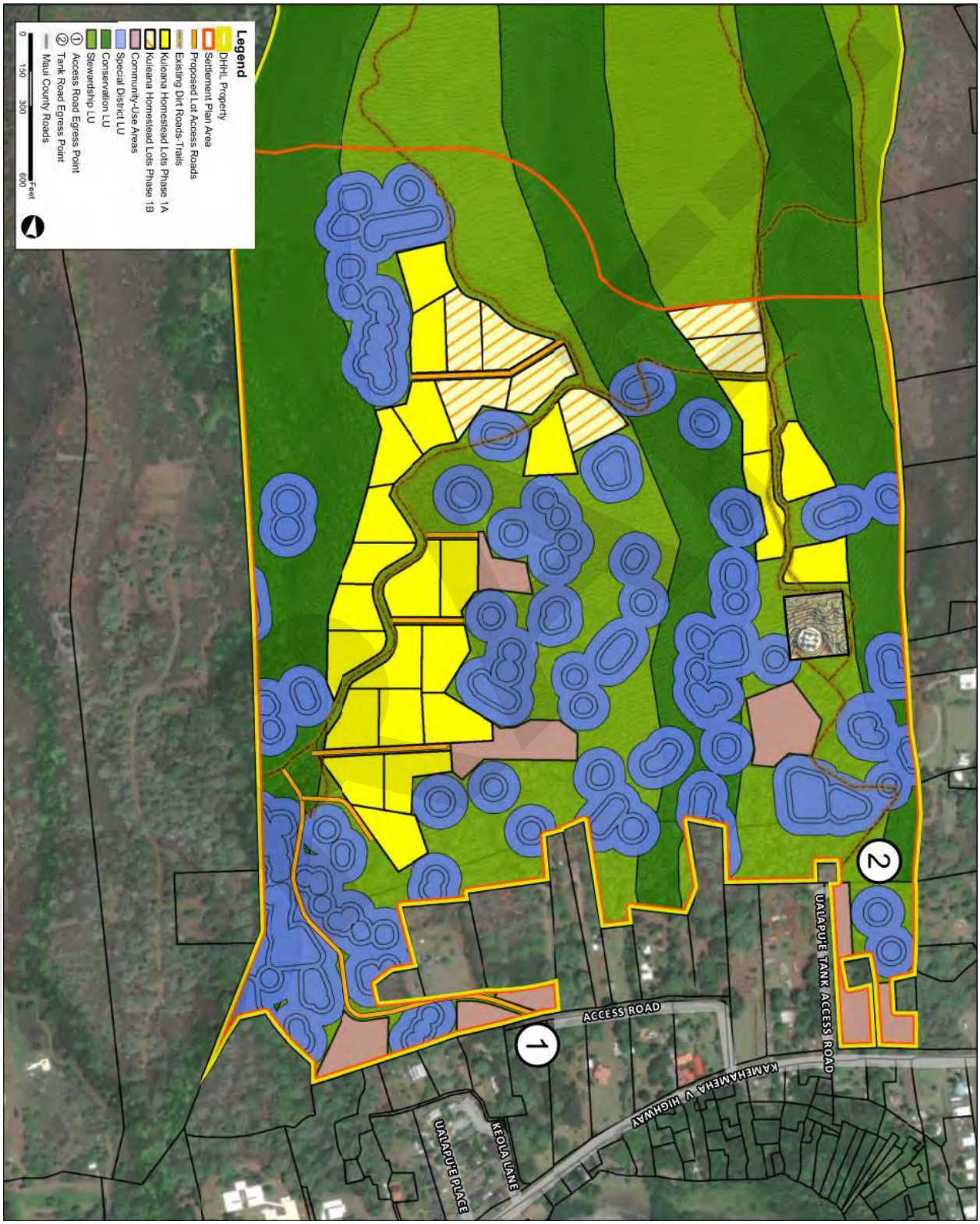


Figure E-2 ‘Ualapu‘e Kuleana Homestead Settlement Plan Area



Chapter 1: Introduction

1.1 Background on the Department of Hawaiian Home Lands

The legal basis for the establishment of the Department of Hawaiian Home Lands is the Hawaiian Homes Commission Act of 1920 (HHCA or "the Act"), as amended. Passed by Congress and signed into law by President Warren Harding on July 9, 1921 (Chapter 42, 42 Stat. 108), the passage of the HHCA marked the culmination of years of lobbying by Prince Jonah Kūhiō Kalaniana'ole and a small cadre of native Hawaiian scholars, politicians and leaders. Their efforts encouraged Congress and the United States (U.S.) Government to adopt a policy of 'āina ho'opulapula (homesteading lands, especially for the rehabilitation of Hawaiians) to address dire social and economic conditions of native Hawaiians by returning them to the land through a homesteading program. Title 1A §101 of the Act states "the policy of this Act is to enable native Hawaiians to return to their lands in order to fully support self-sufficiency for native Hawaiians and the self-determination of native Hawaiians in the administration of this Act, and the preservation of the values, traditions, and culture of native Hawaiians." Other objectives of the HHCA included preventing the alienation of lands set aside by the Act, providing adequate amounts of water for homestead lands, and aiding Hawaiians in establishing farming operations.

These efforts arose in response to the widespread displacement of Native Hawaiian people from their lands following European contact; the decimation of the native Hawaiian people due to the illegal, unsanctioned overthrow of the Hawaiian Kingdom; and the ensuing annexation and occupation of former crown lands by the United States government. The mission of the Department of Hawaiian Home Lands (DHHL) is to effectively manage the Hawaiian Home Lands Trust and to develop and deliver lands to native Hawaiians. To accomplish this, DHHL works in partnership with government agencies, private landowners, non-profit organizations, homestead associations, and other community groups.

Under King Kamehameha III, the land system in Hawai'i was reformed in 1848 (generally referred to as the Great Māhele). In this separation of land rights, the King retained one million acres of his private lands as his individual property, which became the Crown Lands, to maintain the state and dignity of the crown. Of the remaining lands, one third of the remaining land was to be for the Hawaiian Government; one third for the Chiefs and Konohiki; and one third to be set aside for the Hoa'āina or native tenants, the actual possessors and cultivators of the soil (Young, 2016). An Act of the Legislative Assembly of 1865 noted that the Crown Lands "shall be henceforth inalienable, and shall descend to the heirs and successors of the Hawaiian Crown forever" (Crown of Hawai'i, 2023). These lands, though under the control of changing sovereigns and governments (Kingdom to Provisional Government to Republic to Territory to State), were in and continue to remain in the 'public domain' for the public good.

Under the Territorial government, the HHCA set aside approximately 200,000 acres of former Crown and Kingdom lands for exclusive homesteading by Hawaiians of at least 50% Hawaiian ancestry. The lands would be parceled out for homesteading under 99-year leases at a charge of $1.00 per year. The lands would be under the jurisdiction and control of the Hawaiian Homes Commission (HHC, or Commission) and designated as "available lands" in the Act, eventually assuming the status of "Hawaiian home lands" in the Hawaiian Home Lands Trust (the Trust). Beneficiaries of the Trust are defined as individuals having at least 50% Hawaiian blood of the races inhabiting the Hawaiian islands previous to 1778, and their successors who have at least 25% Hawaiian blood.

Following the passage of the HHCA, the first homestead lands were opened on the island of Moloka‘i, first in Kalama‘ula, followed by Ho‘olehua (Keala Pono, 2017 from Keesing, 1936). Awards of agricultural, pastoral and residential leases occurred between 1921 and 1923. As the program began to prove successful, lands on the other islands of Hawai‘i, O‘ahu, Maui and Kaua‘i became designated locations for home lands. However, the HHCA Hawaiian Home Lands program struggled for the first 50 years, due to poor suitability of designated land for practical homesteading, the nature of improvements required before homestead occupancy, the qualification and selection of those to be awarded homesteads, a lack of sufficient funding through legislative support, and systemic challenges at the State and Federal levels of government with administration of the Act.

In 1959, Congress enacted the Hawai‘i Admission Act, 73 Stat. 4 (Admission Act), to admit the Territory of Hawai‘i into the United States as a State. As a condition of statehood, Hawai‘i adopted the HHCA as a law of the State through Article XII of its Constitution. While the Admission Act effectively vested the State with administrative authority over the Hawaiian Home Lands Trust, in section 223 of the HHCA, Congress reserved to itself the right to alter, amend, or repeal the HHCA.

Over the years DHHL has primarily delivered “on-grid” or "traditional" single-family home awards in addition to some agricultural and pastoral awards. A major challenge has been that funding for the infrastructure for new communities and awards has been significantly less than needed and fluctuates over the years, thereby hampering long term planning and delivering on commitments (SMS 2017). In addition, if the beneficiary did not qualify for a loan or mortgage, their name was passed up and the next beneficiary on the list contacted.

Many of these long-time and continuing concerns of and for native Hawaiians were focused and articulated in a civil action filed by the Hou Hawaiians and others against the U.S. in 1980. The complainants sought a declaratory judgement, writ of mandamus and an accounting for breach of trust duties requesting one of two actions be taken: 1) to bring suit against the State to cease violations, to commence immediate and widespread distribution of Hawaiian home lands, to void commercial leases, and to provide an accounting to the plaintiffs and all other native Hawaiians for the economic loss they have suffered due to the failure of the State to carry out the HHCA; or 2) to bring suit seeking a termination of the Hawaiian Homes trust, a return of Hawaiian home lands to the United States, and for the United States to establish and administer a program of distribution of Hawaiian home lands to native Hawaiians for homesteading purposes (Federal-State Task Force, 1983).

A review of the administrative records on the implementation policy and practice relative to the HHCA during territorial years and the years since statehood gave government executives no comprehensive view of the program's effectiveness. In July of 1982, a Federal-State Task Force was appointed by the Governor and Secretary of the Interior to provide a comprehensive review of every facet of the HHCA in order to make recommendations on ways to implement the Act and accelerate the distribution of benefits to beneficiaries. The Task Force recommended to DHHL a range of alternative development models (ADMs) intended to broaden the range of options for beneficiaries and reduce development costs for DHHL, which could be developed as prototypes or pilot programs. Components of development that were modified and/or combined included changes to the extent of land improvements, types of housing, types and levels of financing, and the level of beneficiary participation in development. Examples of ADMs included awards of undeveloped raw land without any improvements whatsoever provided by DHHL; minimally improved agricultural lots with rough graded access and a waiver of water requirements; and minimally improved residential lots, such as an upgraded lot with no housing provided by DHHL.

The struggle for distribution of benefits to beneficiaries continued. In 1993, General Lease No. 101 to Maui Factors, Inc. terminated. This lease encompassed approximately 15,620 acres of Hawaiian home

lands at Kahikinui, Maui. Cattle ranching on this land destroyed the native forest and its watershed functions. Prior to the final termination, DHHL was reviewing alternative uses and management options for all of the 22,809 acres of DHHL land at Kahikinui. Several community meetings were held to receive input, identify potential land use alternatives, evaluate the benefits and detriments of these alternatives, and attempt to reach consensus on a recommended plan of action. A Land Use Plan was formulated to respond to major land use options suggested by the community, and not only recommended natural and cultural resource management of the property, but alternative homestead use to protect these resources. In spite of the remote location and a lack of infrastructure, native Hawaiian beneficiaries expressed a strong desire to pursue alternative settlement options and to play a role in helping to manage and preserve the natural and historic resources of this area. DHHL was urged to consider offering unimproved lots to those applicants who may be willing to accept an award on this basis. It was recommended that a portion of Kahikinui be set aside to test the viability of this approach (DHHL, 1993).

The HHC and various staff members of the Department held two sets of retreats in late 1993 in order to examine the Department's current work and to set the course for the next fifteen months. Several ideas (although many not new) emerged for expanding DHHL's programs, for shifting responsibilities and for increasing the placement of native Hawaiian beneficiaries on the land. The Chairman, with the assistance of the Governor and the Office of State Planning, created a State Task Force to review these ideas and to make recommendations on their adoption (Task Force, 1993).

One of these recommendations was the Kuleana Hou program, a new homesteading program that responded to increasing beneficiary requests for raw land. It moved away from paternalism toward greater empowerment of beneficiaries. It offered beneficiaries an opportunity to settle on the land more quickly and allowed them to take more control over the pace and settlement of the land - they would enjoy greater freedoms but would accept greater responsibilities. In November 1993, HHC granted conceptual approval for the Kuleana Hou Program and authorized the department to proceed to implement with three homestead projects -- at Kawaihae and Lalamilo, Hawai'i; and Kahikinui, Maui; with a total of 1,162 undeveloped lots ranging from two to ten acres (Task Force, 1993). Today, only Kahikinui has homestead leases, while Kawaihae and Lalamilo were close enough to infrastructure and were developed as "traditional" lots.

Legislation from the 1990's improved the situation of today's DHHL. In the 1990s, thousands of acres of Hawaiian home lands were returned to DHHL via Act 395, Session Laws of Hawai'i 1988, after it was found that the lands were "allegedly used, disposed of, or withdrawn from the trust" by both the territory and State of Hawai'i and the federal government in breach of the HHCA. A Memorandum of Understanding (MOU) was signed that provided for the settlement of DHHL land claims against the State. This 1994 settlement awarded approximately 16,500 acres of public land statewide to the DHHL Trust, including lands in 'Ualapu'e, bringing the total amount of DHHL lands to the current 203,500 acres of land inventory (DHHL 2023).

In 1998, the Kuleana Homestead Program was officially adopted as part of the Department's Hawai'i Administrative Rules (HAR) §10-3-30. Under this non-traditional homestead program, the Department agrees to survey, stake and award lots, and provide a compacted unpaved roadway suitable for four-wheel drive vehicles to access the lots. Hawaiian Home Lands beneficiaries, who choose to enter into this homestead lease agreement, understand and agree that the provision of utilities, housing and the maintenance and repair of the access road becomes the responsibility of the lessee. The Kuleana Homestead Program provides this homesteading alternative for immediate access to raw land and an opportunity to create a new self-sufficient community. As a result of the adoption of HAR §10-3-30, 75 Pastoral Kuleana Homestead lots were awarded in Kahikinui, Maui in 1999.

1.2 Kuleana Homesteading

For many years, beneficiaries have expressed a strong desire to pursue alternative, non-residential settlement options and to play a role in helping to manage and preserve the natural and historic resources of DHHL lands. In response, DHHL developed "non-traditional" programs, designed to provide opportunities for beneficiaries to manage their lands and deliver homestead lots at a quicker rate than "traditional" developed parcels with infrastructure, by awarding raw, undeveloped land. Factors influencing this decision involve the long lead times required for securing infrastructure financing, major difficulty in obtaining new monies for development and the need for DHHL to seek innovative solutions in order to increase the pace of distribution of lands to Native Hawaiians.

This concept is based on the definition of the term "kuleana", which refers to a small area of land awarded to a native Hawaiian tenant by the King or ruling monarch of the 1850s. This granting of land carried with it the responsibility to respect and care for the land. In return for wise stewardship, the land provided sustenance and well-being to its occupants. Although separate and distinct from historical kuleana lands, this sense of responsibility, both to the land, and to those who share in the use of the land, is the guiding principle for the Kuleana Homestead Program (Task Force, 1993).

Under the Department's provisions, the Kuleana Homestead Program expands the range of program options provided to native Hawaiian beneficiaries. Under a standard residential community concept, it is necessary for infrastructure to be developed in advance of settlement. As a non-traditional program, awarding raw, undeveloped land for beneficiaries to develop and manage, the Kuleana Homestead Program places responsibility for development of infrastructure in the hands of beneficiaries in return for availability and early access to unimproved land.

According to HAR §10-3-30, the following criteria determine the suitability of land for designation as kuleana homestead lots:

1. Physical and environmental characteristics of the land;
2. Excessive cost to develop the tract for any reason including: the physical characteristics of the land, the distance of the land from existing electrical, water, wastewater disposal, communications, and other utility systems;
3. Department land management plans and programs;
4. Applicant interest or proposals identifying tracts of land; and
5. Suitability for use by lessees who wish immediate access to the land for subsistence uses and who are willing to live on the land and accept an unimproved lot.

This site selection can occur based on the land assessment of unimproved available Hawaiian home lands, or based on applicant interest, such as if a group of applicants expresses an interest or presents a proposal for Kuleana homesteading. In the case of ʻUalapuʻe, it is both. See *Chapter 2, ʻUalapuʻe in the DHHL Planning Process* for more information. The Commission determines which homestead wait list, or which combinations of wait lists, should be used to make Kuleana Lease awards.

According to HAR §10-3-30(f), DHHL is required only to provide a) metes and bounds description of the kuleana homestead lots, and b) an unpaved right-of-way to the awarded lots. Awardees will then have immediate access to their lots. No other infrastructure will be provided by the Department. This is a clear deviation from the Department's current and past practices. Awardees will have to be well-informed and, once informed, will have to select wisely between this and other choices. The concept is not a new one but one that revives the traditional sense of homesteading. That is, individual

homesteaders are responsible for developing water, wastewater, solid waste disposal, energy and telephone/communications services, as well as responsible for the protection of siginifanct historical and archaeological sites, as their resources and abilities allow (DHHL 2022).

The Kuleana Homestead Program is not for everyone. A suitable lessee will want immediate access to the land for subsistence uses, and is willing to live on the land and accept an unimproved lot. The program is designed for the beneficiary who can handle the rigors of an "off-grid", subsistence living life style. "Subsistence" means building a dwelling and being able to raise enough crops and livestock on the homestead lot to provide the household with food and other necessities for survival.

Beneficiaries who want typical subdivision infrastructure should not select a Kuleana Homestead lease award and wait for the Department to provide improved lots. However, the Kuleana Homestead Program's target beneficiaries include those who are unable to qualify for residential awards due to their inability to qualify for home financing under the Department's housing development program. The Kuleana Homestead Program demonstrates that the Department's spectrum of programs addresses the diversity of its beneficiaries' socio-political-economic status and accompanying value systems.

Because the parcels will be provided with roads only, uses will be based according to the resources of Kuleana recipients. Over time, land uses are expected to range from relatively undeveloped parcels for those who wish to have an occasional retreat and gradually work on improvements to their homestead lot, to fully developed parcels with a range of amenities typically associated with a full-time subsistence lifestyle.

Empowering Hawaiian Home Lands beneficiaries with the opportunity to determine as a group or as individuals, choices on how they wish to develop their Kuleana Homestead awards is another guiding principle of the program. Lessees must participate as an active member in the kuleana homestead association to develop and comply with the association's rules and agreements and must participate in the maintenance of the right-of-way to the kuleana homestead tract and lots.

1.2.1 Kahikinui Pastoral Kuleana Leases – Lessons Learned

For this current Settlement Plan, DHHL intends to provide Kuleana Homestead lots within 30 acres of a total of 401 acres of DHHL property in 'Ualapu'e, Moloka'i. In order to inform this 'Ualapu'e Settlement Plan, reference is made to the Kahikinui, Maui project – the first DHHL Kuleana Homestead Program that occurred in 1999. Seventy-five pastoral homestead leases were awarded. For Kahikinui, the Kuleana Homestead Program was favored to the "traditional" DHHL award programs that offered infrastructure, because this program, with minimal infrastructure, reduced the time on the waitlist. Homesteaders didn't have to buy a house right away that was out of their financial reach, and were given the ability to start small and expand their activity over time. The settlement at Kahikinui planned for and required community-based management, giving residents a feeling of more independence. However, because this was the first of its kind, difficulties were encountered and lessons learned.

Lessees provided feedback to DHHL for improving the program for both the Department and beneficiaries (SMS Consulting, 2017). The initial settlement process at Kahikinui was challenging for the beneficiaries. After 18 years of the program, only lots were settled, but lessees remain determined to build a sustainable community. Beneficiaries expressed that a major challenge for lessees awarded a Kuleana Homestead lease is understanding the scope of work required to build and maintain a community, as lessees are not trained engineers and planners. Under the provisions of the Kuleana Homestead Program, DHHL is not required to provide working infrastructure or utilities due to high costs and prolonged time of construction, putting the development of working infrastructure and utilities in the hands of lessees.

Once DHHL issued the leases, the awardees felt "abandoned", as DHHL did not follow up to provide needed support. It was not until after lessees received their award did they understand the scope of work needed to build working infrastructure on their homestead, and the estimated costs to meet County standards. Without individual Tax Map Keys (TMKs) awarded to lessees, lessees struggle to receive traditional loans to develop infrastructure to meet County standards. In addition, without individual TMKs, homesteaders were unable to get addresses from Maui County and acquire home insurance or even a driver's license. With only 12 households residing full time, the community was too small to manage community resources such as the roads, forests, historic sites, fire and feral ungulate management. Others won't move to this location because of poor road conditions given the topography and weather conditions, making it a daily challenge to commute to school and work (SMS 2017).

Based on recommendations from Kahikinui beneficiaries, the following actions can be taken by DHHL to help ensure a more successful Kuleana Homestead program:

1. Educate applicants about the Kuleana Lease program well in advance of getting an award so they understand what they're getting into
2. Provide funding for lessees or create affordable loan packages
3. After the award, provide lessees with technical assistance and funding for renewable energy, water systems, waste disposal, and economic development
4. As a tradeoff to saving on time and funding in terms of development of physical infrastructure improvements, DHHL needs to invest in the social and training component to have a successful kuleana homestead.

This Settlement Plan, as well as a budget request for engineering, design and construction of roads and the survey of lots, must be approved by the HHC. The use of DHHL lands, as state lands, also subject the project to the environmental review process outlined in Hawai'i Revised Statutes (HRS) Chapter 343 and as promulgated through HAR 11-200.1.

Chapter 2: Background

Since the passage of the HHCA in 1921, and the acceptance of the State of Hawai'i's responsibility for the trust as a condition of statehood in 1959, thousands of acres of Hawaiian home lands were wrongfully used or withdrawn by the Territory of Hawai'i and the State. In recognition of these allegations and toward their resolution, the legislature enacted Act 395, Session Laws of Hawai'i 1988. To move toward further resolution, a Memorandum of Understanding (MOU) was signed that provided for the settlement of DHHL land claims against the State. This 1994 settlement awarded approximately 16,500 acres of public land statewide to the DHHL Trust, including lands in 'Ualapu'e, bringing the total amount of DHHL lands to the current 203,500-acres of land inventory (DHHL 2023).

2.1 DHHL Waiting List

In accordance with HAR, Title 10, Chapter 3, DHHL is required to maintain and make available waitlists of applicants. HAR §10-3-4 sets forth the provision of a residential lot waitlist, HAR §10-3-5 sets forth the provision of agricultural or pastoral lot waitlists, and HAR §10-3-6 sets forth the provision of island-wide waiting lists. As of December 2021, there are a total of approximately 2,000 applicants on the waiting list for Moloka'i: 1,000 of which are on agricultural waitlist, 800 for residential, and 200 for pastoral.

2.2 DHHL Planning System

DHHL uses a tiered Planning System for developing long-term strategies to determine responsible uses for its land *(Figure 2-1)*.

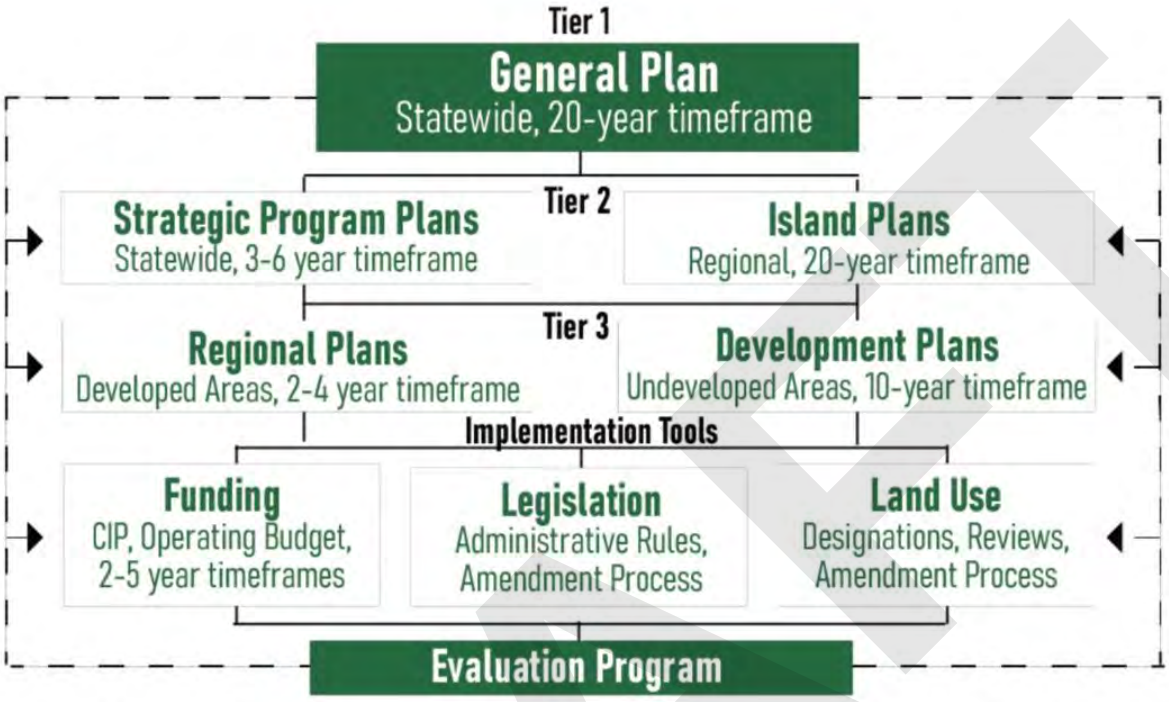
2.2.1 DHHL General Plan

The DHHL General Plan (2022) is the first tier, which sets the vision and establishes long-range goals and policies to guide discussions and decision-making of the HHC. The General Plan is meant to be actively consulted and referenced by DHHL staff, Hawaiian Homes Commissioners, and beneficiaries within all tiers of the planning process. It guides the DHHL plans, programs, and policies for a 20-year timeframe, focusing on seven priority areas: Land Use and Water Resources, Infrastructure, Housing, Food Production, Healthy Communities, Natural and Cultural Resource Management, and Revenue Generation and Economic Development. The land use framework established by the General Plan is intended to bring DHHL plans into greater alignment through providing consistent land use designations, criteria, and dispositions to be used across all DHHL lands.

2.2.2 DHHL Strategic Program Plans and Island Plans

At the second tier, there are Strategic Program Plans that are statewide in focus, covering specific topic areas such as the Native Hawaiian Housing Plan and a Native Hawaiian Development Program Plan. This second tier also includes the Department's Island Plans that identify the Department's Land Use Designations per island. These regional 20-year visioning documents designate areas for various types of homesteading, as well as conservation, special district, community use, and income generating areas. The Moloka'i Island Plan was updated and approved in 2005 by the HHC.

Figure 2-1 DHHL Planning System, DHHL General Plan (2022)



2.2.3 Regional Plans and Settlement Plans

Regional plans are located at the third tier in the Department's planning system which focuses on the community/regional level, and apply the goals, policies, and land use designations to specific geographic regions. These plans are meant to build a sense of community and capacity, stimulate partnerships for development and improvements, and put homestead lessees in the "driver's seat." Regional plans empower beneficiaries with a recurring opportunity, to convene as neighbors and friends in order to identify and solve their own problems. Working with the DHHL Planning Office staff and consultants, regional plans identify priority projects to respond to issues and areas of concern within existing and planned homestead areas. The Moloka'i Regional Plan was updated and approved by the HHC on February 18, 2020 following a series of beneficiary consultation meetings. These consultation meetings were held between September 2018 to June 2019 to understand community issues, concerns, values and vision for their community, to identify potential projects to address issues and concerns.

Settlement Plans are also on the same tier as the Regional Plans and focus on areas that are not yet developed. According to HAR §10-3-30, the awarding of kuleana homestead leases requires applicants, together with DHHL, to develop a plan for settlement and development of the designated tract. The Settlement Plan must include the following:

1. The location and description of the tract of land;
2. The approximate size and number of lots to be awarded;
3. The location of a community center and common areas;
4. The preliminary conceptual proposals for community management and economic development of adjacent Department lands, if applicable;

5. A plan for identifying, protecting, and preserving all significant historical, archaeological, and biological sites; and
6. A timetable to commence settlement after the award of the lots.

The Settlement Plan must be approved by the HHC.

2.3 'Ualapu'e in the DHHL Planning Process

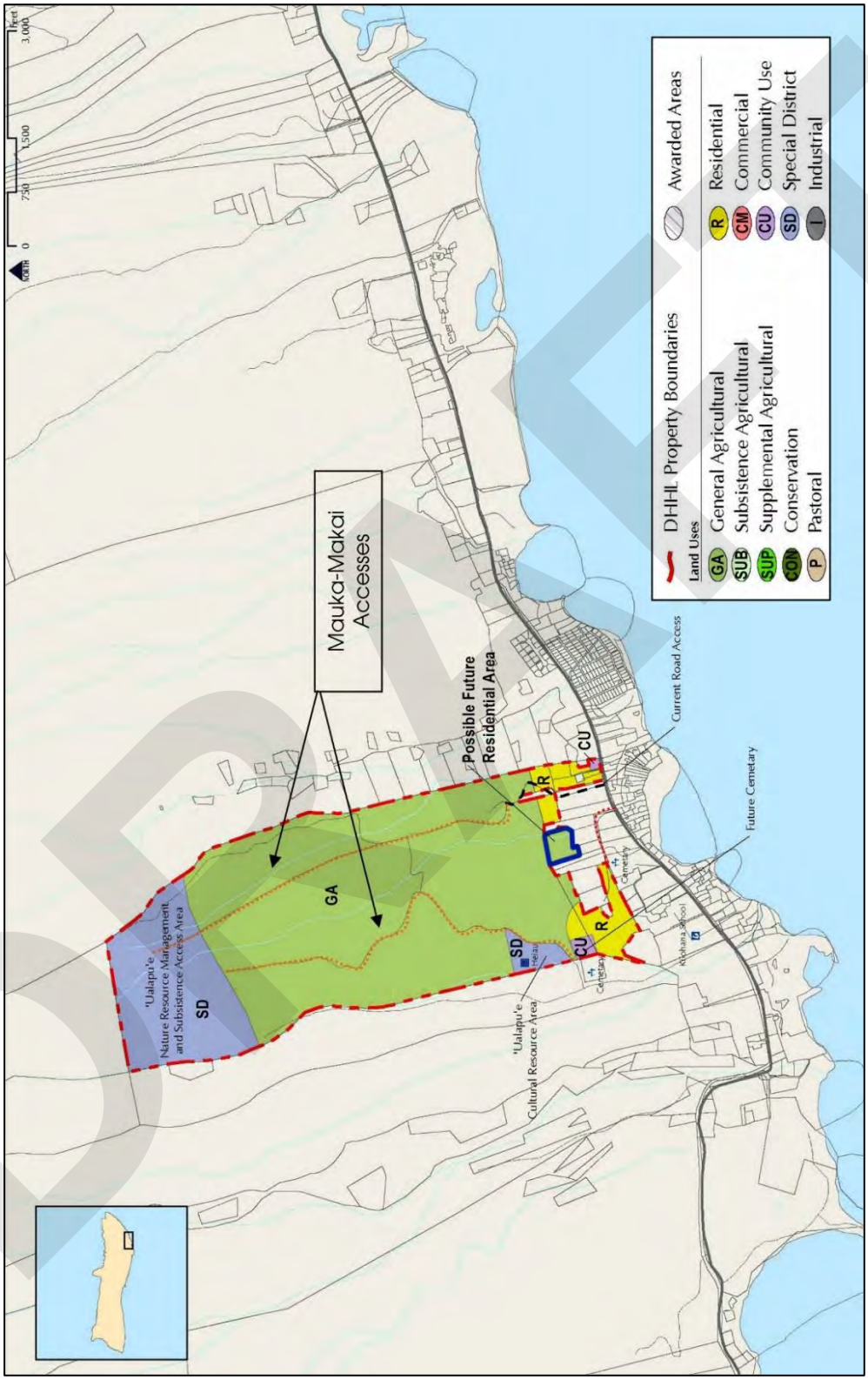
The 2005 Moloka'i Island Plan (MIP) is a second tier plan that analyzed all of the DHHL lands on Moloka'i and their land use designations. The MIP was created through consultation with the beneficiary community and accepted by the HHC on June 21, 2005. 'Ualapu'e was identified as a high priority development area and was selected as the first priority of the Moloka'i Island Plan for new residential areas. Land use was designated as Residential, General Agriculture, Special District, and Community Use (Figure 2-2) in accordance with the then current DHHL General Plan (2002). Under this plan, these land use designations were suitable for the following:

- Residential: Residential subdivisions built to County standards in areas close to existing infrastructure.
- General Agriculture: Intensive or extensive farming or ranching allowed. Uses subject to HRS Chapter 205. May serve as an interim use until opportunities for higher & better uses become available.
- Special District: Areas requiring special attention because of unusual opportunities and/or constraints, e.g. natural hazard areas, open spaces, raw lands far from infrastructure (difficult to improve), mixed use areas, greenways.
- Community Use: Common areas for community uses. Includes space for parks & recreation, cultural activities, community based economic development (CBED), & other public amenities.

However, development of residential homesteads did not occur because an award to contract was pending an increase in water allocation from the County of Maui by the State Commission of Water Resources Management (CWRM). The matter of water allocation for DHHL lands in 'Ualapu'e as well as the entire East End has still not been resolved. See additional discussion regarding the 'Ualapu'e aquifer in *Chapter 3*. Furthermore, DHHL updated its General Plan in 2022, thus bringing a change in land use designation categories and definitions. For more information on revised land use designations for this Project, see Chapter 6.

In February 2019, the Ahonui Homestead Association (AHA) was founded by a group of Hawaiian Homes successors, lessees, and agricultural applicants who have been waitlisted for Moloka'i lands since 1950 as a grassroot response towards community-based governance. "Ahonui" means to wait patiently, and the group was formed "to address the frustration with the history and false promises made by DHHL in the development of 'Ualapu'e" (AHA, n.d.). Their vision is to seek restoration for native Hawaiian beneficiaries to their land and to prevent homelessness and hardship due to the high cost of rent; to restore skills to beneficiaries in budgeting, fishing, farming, repairing, maintenance, trading or bartering, gathering rights, accountability and responsibility as stewards of the land from mauka (mountain) and makai (ocean); and to increase self-determination through self-governance to beneficiaries participating in discussions on issues, concerns and solutions (OHA, 2019).

Figure 2-2 'Ualapu'e Land Use Designations, Moloka'i Island Plan (2005)



During the 2019 DHHL Moloka‘i Regional Plan process, AHA proposed to the HHC the idea of Agricultural Kuleana Homesteads at ‘Ualapu‘e in lieu of traditional homestead residences. Although the 2005 MIP proposed residential homesteads at ‘Ualapu‘e, the consideration for Agricultural Kuleana Homesteads was preferred by beneficiaries, during consultation in 2019, amid identified concerns regarding water availability and the socioeconomic status of Moloka‘i beneficiaries. According to HAR §10-3-30, Kuleana Homestead leases are designated for available, unimproved Hawaiian Homesteads. Kuleana Homestead leases are ideal for lessees who wish for quicker access to land for subsistence uses in exchange for an unimproved lot.

In addition to the beneficiary feedback provided during the 2019 Moloka‘i Regional Plan process, ‘Ualapu‘e was selected for DHHL Kuleana Homestead primarily due to its remote location and high sloped terrain, which would make it costly to consider a traditional homestead development.

During the Regional Planning meetings with DHHL, beneficiaries identified various opportunities and issues for the project area. Various issues and opportunities identified by beneficiaries were consolidated into a list of 24 potential projects. Beneficiaries selected their top five projects from these 24 potential projects. The “‘Ualapu‘e Cultural Resources Management Plan and Kuleana Settlement Plan” received the highest number of votes of all 24 projects and was thus selected as Priority Project #1 in the 2019 Moloka‘i Regional Plan. The Moloka‘i Regional Plan was approved by HHC in February 2020.

AHA was designated as the project proponent for this Priority Project. Responsibilities of the project proponent include:

- Focusing their time and attention to ensure that the community’s vision and needs are integrated into the project;
- Conducting a site and infrastructure assessment to ensure that the location is appropriate for what they would like to do;
- Create a master plan synthesizing the community's vision and needs with the site and infrastructure assessment, including a financial plan with forecasted initial development costs, long-term operational costs, and financing to cover these costs;
- Once an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is prepared in accordance with Hawai‘i Revised Statutes (HRS) Chapter 343 on the master plan, then obtaining the necessary permits, approvals, and proceeding with implementation.

The awarding of kuleana homestead leases requires applicants, together with DHHL, to develop a plan for settlement and development of the designated tract. For a timeline of the planning process including projected dates, see *Table 2-1.*

Table 2-1. Planning Process Timeline for ʻUalapuʻe Kuelana Homestead Settlement Plan	
Action	**Date**
Literature Review and Aerial survey	September 2021
Biology, HWMO and G70 Site Visits	October 2021
Archaeological Site Visits	November 2021, March and June 2022
Lot Schemes, Alternatives, Preferred Land Use	October 2022
Draft Kuleana Homestead Settlement Plan (DKHSP)	May 2023
Final Kuleana Homestead Settlement Plan (FKHSP)	June 2023
Early Consultation with Agencies	July 2023
Draft Environmental Assessment (DEA)	September 2023
HHC Approval of Final Environmental Assessment (FEA), Settlement Plan, and Land Use Amendments (if any)	November 2023

As part of this process, a combination of beneficiary consultation meetings and community meetings were held *(Appendix A)*. Beneficiary consultations were held to provide beneficiaries with a better understanding of the Kuleana Homestead Program, provide information related to the site characteristics and conditions of the project area, and to better understand the beneficiaries' vision for the area and beneficiary preference for lot size and configuration. DHHL has a fiduciary trust obligation to serve and listen to its beneficiaries before others. Community meetings were held to present the project to, and receive feedback from, the wider community, which primarily consisted of residents from the east end of Molokaʻi. Community outreach was conducted via email, newspaper announcements and mailouts to those that live in the ahupuaʻa from Kahananui to Keōpuka Loa.

Other than the first site visit and small group meetings, larger beneficiary and community meetings at the start of the planning process were held virtually, due to COVID-19 restrictions. Once restrictions were lifted, in-person meetings were planned. A timeline of meetings for the Project is available in *Table 2-2*.

Table 2-2. Timeline of Beneficiary Consultation and Community Meetings		
Meeting	**Date**	**Meeting Type:**
Site Visit and Small Group Meetings	October 25-26, 2021	In-Person
Beneficiary Consultation #1	October 14, 2021	Virtual
Honuaiākea Process	November 20-21, 2021	Virtual
Community Meeting #1	December 1, 2021	Virtual
Beneficiary Consultation #2	March 2, 2022	Virtual
Community Meeting #2	April 13, 2022	Virtual
Community Meeting #3	October 20, 2022	In-Person
Beneficiary Consultation #3	November 30, 2022	Virtual

Prior to Beneficiary and Community meetings, pertinent studies, record drawings, master planning documents, and environmental studies within and adjacent to 'Ualapu'e were reviewed. Previous plans related to the project area include:

- Master Plan for 'Ualapu'e Ahupua'a (1990)
- Governors Moloka'i Subsistence Task Force Report (1994)
- DHHL Moloka'i Island Plan (2005)
- Mana'e GIS Mapping Project (2008)
- Moloka'i Forest Reserve Management Plan (2009)
- Pāku'i Watershed Project Final Environmental Assessment (2017)
- Moloka'i Island Community Plan Update (2018)
- DHHL Moloka'i Regional Plan (2019)

In addition to reviewing previous plans, various studies were conducted to provide a clear evaluation of existing conditions in 'Ualapu'e. To capture the lay of the land, a high-resolution aerial mapping survey and digital elevation model was collected via LIDAR in a single fly-over mission. Following studies included an archaeological reconnaissance survey, a biological evaluation of plants and animals, wildfire hazard assessment, assessments on water availability, roads and existing infrastructure, and the potential for community-based economic opportunities.

A initial site visit was conducted on October 25-26, 2021 to better understand the 'āina of 'Ualapu'e, along with a series of small group meetings with local residents. These small group meetings included conversations with local residents, kūpuna, and the Moloka'i Fire Department. Topics included cultural practices and protocol, land history, lack of fire and emergency services in the area, water availabililty, wellhead protection, impacts of development on traffic, erosion and soil build-up, disaster evacuation, and changing demographics of the East End population.

The purpose of the first beneficiary meeting on October 14, 2021 was to introduce the project team, history, scope, process, and timeline. There were 75 attendees, and 50 participants responded to the meeting's online poll. Three quarters of the participants self-identified as DHHL beneficiaries, most (60%) were on the agriculture waitlist, and some (40%) were on the residential (some respondents are on multiple waitlists). Half of respondents saw 'Ualapu'e as a place where they and their families could be homesteaders, though more information on kuleana homesteading may need to be provided first. The discussion revealed concerns over the provision of utilities (especially water); environmental, cultural and community impacts; kuleana lease rights and responsibilities; and DHHL's relationship to future lessees.

In addition to the beneficiary meetings, members of the Edith Kanaka'ole Foundation (EKF) facilitated a Honuaiākea session *(Appendix B)* during the weekend of November 20-21, 2021, with a small group of members of the Moloka'i community, in an effort to incorporate ancestral knowledge into Hawai'i's community development planning process. Honuaiākea is a community planning framework that uses 'oli (chants), mele (songs), and ka'ao (stories/fables) interpreted through the eyes and experiences of community members and those who practice in those areas to understand the important resources that are crucial for ecosystem stability and community survival (kapu) and the actions needed to maintain said resources (kānāwai). The formulation of the kapu and kānāwai and their application for community management of 'Ualapu'e is further discussed in *Chapter 4.*

The purpose of the first community meeting on December 1, 2021 was to introduce the planning process to the wider community. Seventy-seven people from the community participated in the meeting. Concerns over environmental impacts (especially water and erosion), cultural and archaeological impacts, and impacts to cultural and subsistence practices were raised during the meeting. Questions related to the priority development status of the area, and who and how many project beneficiaries were also raised.

The purpose of the second beneficiary meeting held on March 2, 2022 was to provide a background of the DHHL Kuleana Homestead Program, the planning process, the work done to date and future work to be done, and the kapu and kānāwai from the Edith Kanakaʻole Foundation's Honuaiākea Process. This meeting was held virtually with 32 attendees, 23 of which participated in the meeting's online poll. Participants identified the preservation of historical and archaeological sites as a top priority of the ʻUalapuʻe Settlement community, followed by improving site safety and access, and securing potable water. Individual lots were preferred by 88% of the respondents and a majority (90%) believed that a one-acre lot would be too small for their subsistence agriculture homestead needs. 55% of respondents cited backyard susbsistence agriculture as the preferred primary agricultural activity for the homestead community. Repondents had many ideas for Community Use areas, some of which include a community kitchen, medical service area, community farms, and a place for educational and cultural practices. Prior plans have identified several potential income generating opportunities that may be suitable for ʻUalapuʻe, and based on these plans, respondents ranked an Agriculture and/or Aquaculture Food Hub / Co-op as the top option, followed by a Commercial Kitchen and Farmers Market, opportunities for Green Energy, and a Cottage Industry that promotes garment or craft production.

The purpose of the second community meeting on April 13, 2022 was to receive feedback from the wider community. 93 people from the community participated in the meeting. DHHL's planning process, the planning history of the area, the Kuleana Homestead lease, and Environmental Assessment process were described. The community was also updated on current and future site work. Concerns voiced by the community were similar to that of the first community meeting with an additional concern raised over the insufficient outreach regarding the community meeting.

The purpose of the third community meeting on October 20, 2022 was to present the project's work-to-date and preliminary archaeological findings. Seventy-five people from the community participated in the meeting. The presentation covered the history of the DHHL Kuleana Homestead program, technical studies done to date, a description of the archaeological study conducted and preliminary findings (see *Chapter 5* for details), and G70's land resource evaluation analysis (see *Chapter 6).* Community members provided feedback through oral testimony and written comments. Similar concerns were raised to the two previous meetings, with an additional desire for Molokaʻi residents to be considered first priority for the Kuleana Homestead lot awards. If it turned out that ʻUalapuʻe was not a feasible place for settlement, then an alternative should be provided.

The purpose of the third beneficiary meeting held on November 30, 2022 beneficiary meeting was to receive DHHL waitlist applicant feedback on the initial lot layout for the ʻUalapuʻe Kuleana Homestead Project. Details of the lot layout are presented in *Chapter 6.* This meeting was also held virtually with 17 participants attending. An average of seven participants responded to the meeting's online poll.

To increase participation, the survey was emailed as well as physically mailed with a self-addressed, stamped envelope to agricultural applicants. Including the online participants, a total of 73 surveys were answered. A majority (64%) of respondents were DHHL applicants. While 31 respondents indicated they were from Moloka'i, 11 indicated they were from 'Ualapu'e or Mana'e (east end of Moloka'i) specifically. Respondents answered that they would like to learn more about water availability (72%), subsistence agriculture (57%), archaeological sites (51%) and individual wastewater systems (51%).

With regard to homesteading, 30% of respondents think a one-acre lot size is a "perfect size", while 20% believe it was "too small." Participants envisioned the Community Use areas as a place for communal garden spaces and composting areas (46%), or a Resilience area with composting toilets (38%) in case of emergency.

With regard to access to the area, participants were asked about gates and roads. 36% of participants felt that gates to control access in and out of the homestead weren't necessary, as the land should be open to all homesteaders and the community. Others prefered gates with approved access (24%), or prefered gates that remain open and closed when absolutely necessary (27%). A clear majority of respondents (56%) said they need drivable access at all times and emergency vehicle access to and from the homestead. Very few (16%) have the capacity to drive an off-road vehicle and deal with roads that have been washed out. Most participants (47%) felt the community has the resources, ability, and means to provide long term maintenance and repair of roadways, but needs support from DHHL.

As water availability is important to this project, respondents provided that a storage tank, fed by DWS, supplying directly to lots is the most ideal option (47%), the second being a spigot in 'Ualapu'e (27%). However, a majority of respondents (41%) said they would not be willing to wait for the provision of water or a paved road if it meant it would take DHHL longer to award the land.

Regarding cultural/archaeological areas and sites, respondents were equal in their preference to fence and preserve (50%), or restore for education and reuse (50%), as opposed to allowing sites to remain in current condition. A majority of participants felt they needed a lot of training in order to prepare for this off-grid lifestyle *(see Chapter 7)*. Overall, if offered, 42% of participants would accept a one-acre kuleana homestead lot as laid out in the initial lot layout as presented in the third beneficiary meeting.

Upon preliminary review and approval of the Kuleana Homestead Settlement Plan by the HHC, a Chapter 343 EA will be prepared. A final approval by the HHC will be concurrent with the completion of the EA.

This page intentionally left blank.

Chapter 3: Location & Description of the DHHL ‘Ualapu‘e Parcel

The island of Moloka‘i is known historically as “‘Āina Momona” or “Abundant Land,” referring to the bounty of food that was produced on its fertile and fruitful lands (McGregor, 2007). Self-sufficiency and management of the land and water for sustainable yields were paramount in the pre-contact era (before 1778) (Wyban, 1990). During the post-contact era, the native population rapidly decreased due to disease and relocation to active centers of business and commerce. Pineapple agriculture dominated Moloka‘i’s economic sector in the years following. The closure of pineapple operations in the 1980s spurred a drastic drop in the Filipino population, stunting Moloka‘i’s population growth. In 2020, it was estimated that Native Hawaiians and Other Pacific Islanders accounted for approximately 3,610 (27%) of the 13,563 residents on the island of Moloka‘i, one of the highest percentages on any island.

DHHL’s inventory of lands on Moloka‘i consist of approximately 25,900 acres in five geographic areas: Kalama‘ula; Ho‘olehua-Pālā‘au; Kapa‘akea, Kamiloloa and Makakupa‘ia; Kalaupapa-Pālā‘au; and ‘Ualapu‘e. The ahupua‘a of ‘Ualapu‘e is located on the eastern side of Moloka‘i, between the ahupua‘a of Kahananui and Kalua‘aha (*Figure 3-1*). ‘Ualapu‘e and its neighboring ahupua‘a were renown for their natural and cultural resources (*see Chapters 4 and 5*) including numerous heiau, loko i‘a (fishponds), and lo‘i kalo (taro patches). ‘Ualapu‘e fishpond was known for the “fatness of its mullet” and the spring named Lo‘ipunawai is subject to many legend and local stories (Wyban, 1990). The wind of ‘Ualapu‘e is called Makaolehua. The name ‘Ualapu‘e comes from “‘uala” (sweet potato) and “pu‘e” (mound), reflecting the traditional sweet potato agriculture in the area. The hillside of ‘Ualapu‘e provides excellent panoramic views of the southern edge of Moloka‘i, including neighboring ahupua‘a, coastal fishponds, and nearby islands.

The ‘Ualapu‘e ahupua‘a falls within Census Tract 317. According to the 2020 American Community Survey 5-Year estimates, Census Tract 317 had an unemployment rate of 6.6%, a poverty rate of 14.5%, and 23.0% of households receiving food stamps/Supplemental Nutrition Assistance Program (SNAP). These indicators were all relatively higher than Maui County (unemployment rate 5.1%, poverty rate of 8.8%, and 8.9% of households receiving food stamps/SNAP). Census Tract 317 also had a lower median household income than Maui County ($52,991 vs $84,363), and a higher proportion of Native Hawaiian/Other Pacific Islander (32.5% vs 11.2%). Economic development efforts on Moloka‘i face a unique set of challenges including limited local market capacity and competition due to a small, isolated population; high cost and limited transport options; and over-reliance on fossil fuels for energy production and transportation.

3.1 Surrounding Location

‘Ualapu‘e is a rural community with a mix of surrounding uses owned and managed by several private owners and a few large entities *(Figure 3-2).* The private landowners are primarily located on the makai side of the project area, with lands to the east held by D.C. Dunham Trust, pockets of land mauka (Moloka‘i Forest Reserve) and makai (‘Ualapu‘e fishpond) are owned and managed by the State Department of Land and Natural Resources (DLNR), and private, State and Kamehameha Schools lands are located to the west. Land usage in the area consists of residential homes and agricultural plots. DHHL’s ‘Ualapu‘e property is located approximately 14 miles east of Kaunakakai and approximately 14 miles southwest of Hālawa Valley. Regional access is provided via Kamehameha V Highway (State Route 450).

Figure 3-1 Ahupua‘a Map

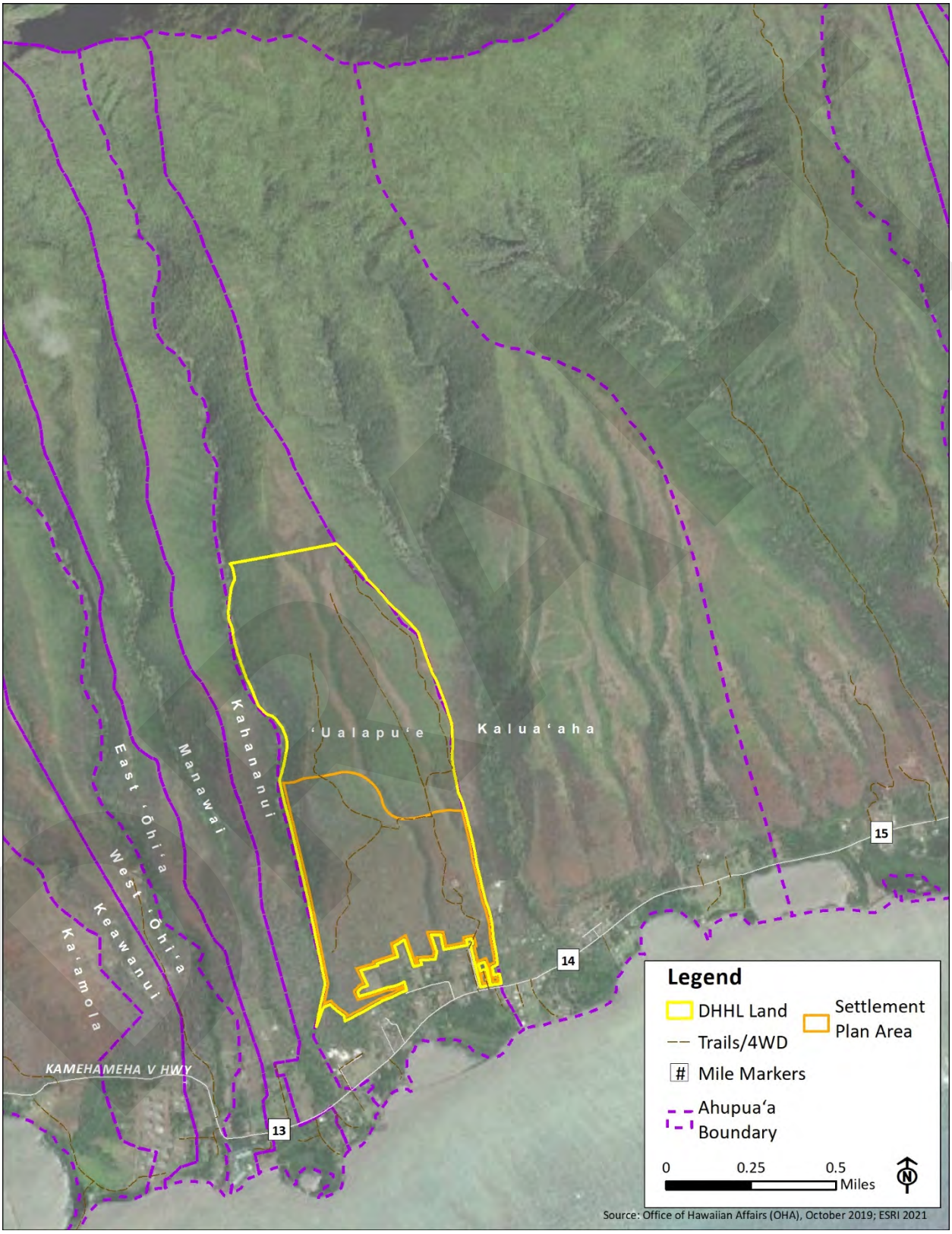
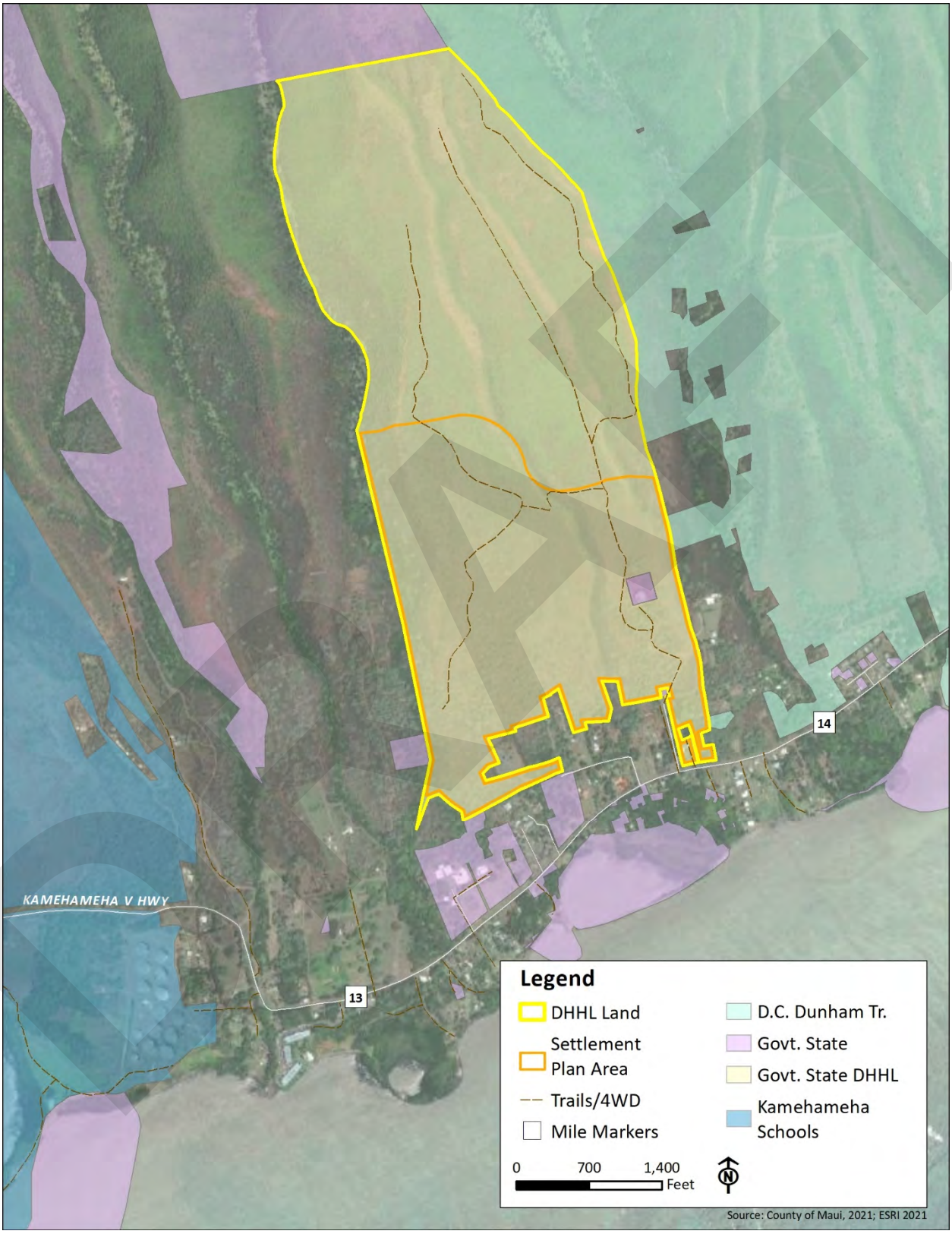


Figure 3-2 Large Landowners



There are a handful of public facilities in ʻUalapuʻe *(Figure 3-3).* Kilohana School is located makai of the project area, the site of which used to be a community hospital. ʻUalapuʻe and Kilohana cemeteries are in the vicinity of the project area. The nearest fire station is currently in Manaʻe. However, due to poor building conditions, the Molokaʻi Fire Department is planning to convert a recently purchased private residence in ʻUalapuʻe along the Water Tank Road into a new fire house, which would house firefighters (see *Chapter 4).* Without the securing of property in ʻUalapuʻe, fire services would be relocated to Kaunakakai, leaving the entire east end of Molokaʻi without fire department services.

DHHL's property in ʻUalapuʻe is located mauka of Kamehameha V highway *(Figures 3-4 and 3-5)* and includes TMK: (2) 5-6-002:001, :024, :025, :026, :027, :036, (2) 5-6-006:017 (por.), :040; for a total of 412 acres of undeveloped land. These parcels extend from Kamehameha V Highway mauka to the Molokaʻi Forest Reserve, which is owned and managed by the DLNR.

A County Water Supply tank *(Figure 3-3)* is located within an easement along the lower southeastern portion of the DHHL property and is served by the ʻUalapuʻe Water Tank Access Road, a paved road off of Kamehameha V Highway. This road provides one access point to the DHHL property. A secondary access point west of ʻUalapuʻe Water Tank Access Road is provided by a public utility easement that runs through a residential area and abuts the DHHL property. From these two access points are several unimproved earthen 4x4 roads crossing the property. These roads are on a steep slope and severely eroded, making it difficult to traverse the entire property. Elevation in the project area varies from approximately 25 to 1,000 feet (ft) above sea level *(Figure 3-6)* and sloped terrain primarily between 11-20%. Slope between 11-20% is considered moderate, making development challenging and increasing costs.

Today, DHHL leases two portions of the property. Under License Agreement No. 667, Ka Hale Pomaikaʻi has leased approximately two acres at the corner of Kamehameha V Highway an ʻUalapuʻe Water Tank Access Road (TMK: (2) 5-6-002:001) since 2006. Ka Hale Pomaikaʻi operates a residential substance abuse treatment center and garden that has been providing substance abuse recovery programs. DHHL's future plans for this parcel and the surrounding vacant Hawaiian home lands parcels will be determined upon completion of this ʻUalapuʻe Settlement Plan and Environmental Assessment. The most recently updated license in 2021 will allow Ka Hale Pomaikaʻi to continue services to the people of Molokaʻi while DHHL continues planning for this region.

License No. 846, issued in 2022, allows the County of Maui, Department of Fire and Public Safety (DFPS) to lease portions of TMKs: (2) 5-6-002:001 and 5-6-002:036. This allows for widening access to the DFPS parcel so that fire apparatus can safely enter and exit the fire house property.

The remainder of the approximately 400 acres of DHHL property has been used by the community to access hunting areas further mauka, but has otherwise not been actively managed.

Figure 3-3 Public Facilities in 'Ualapu'e

Figure 3-4 Plat Map

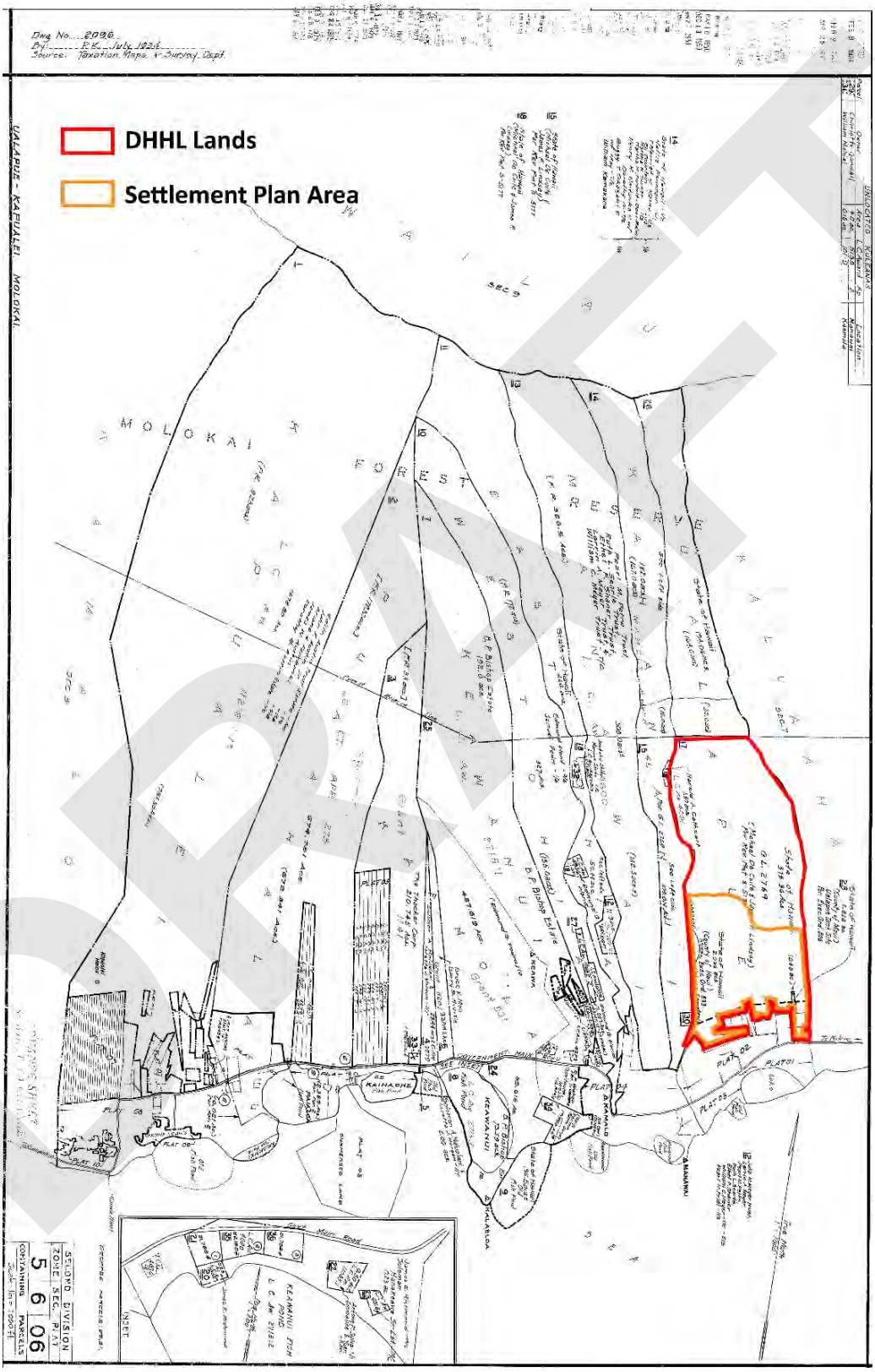


Figure 3-5 Tax Map Key (TMK)

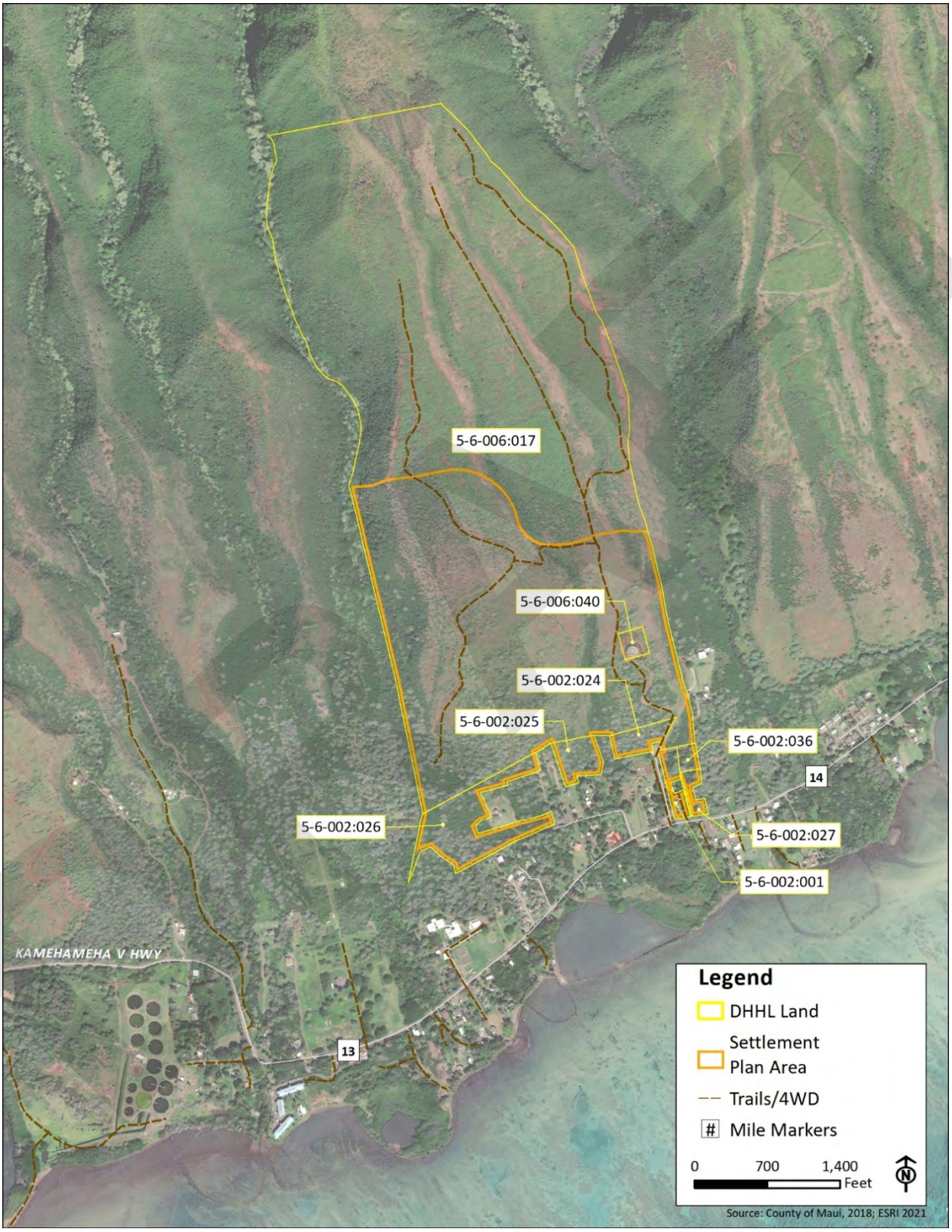
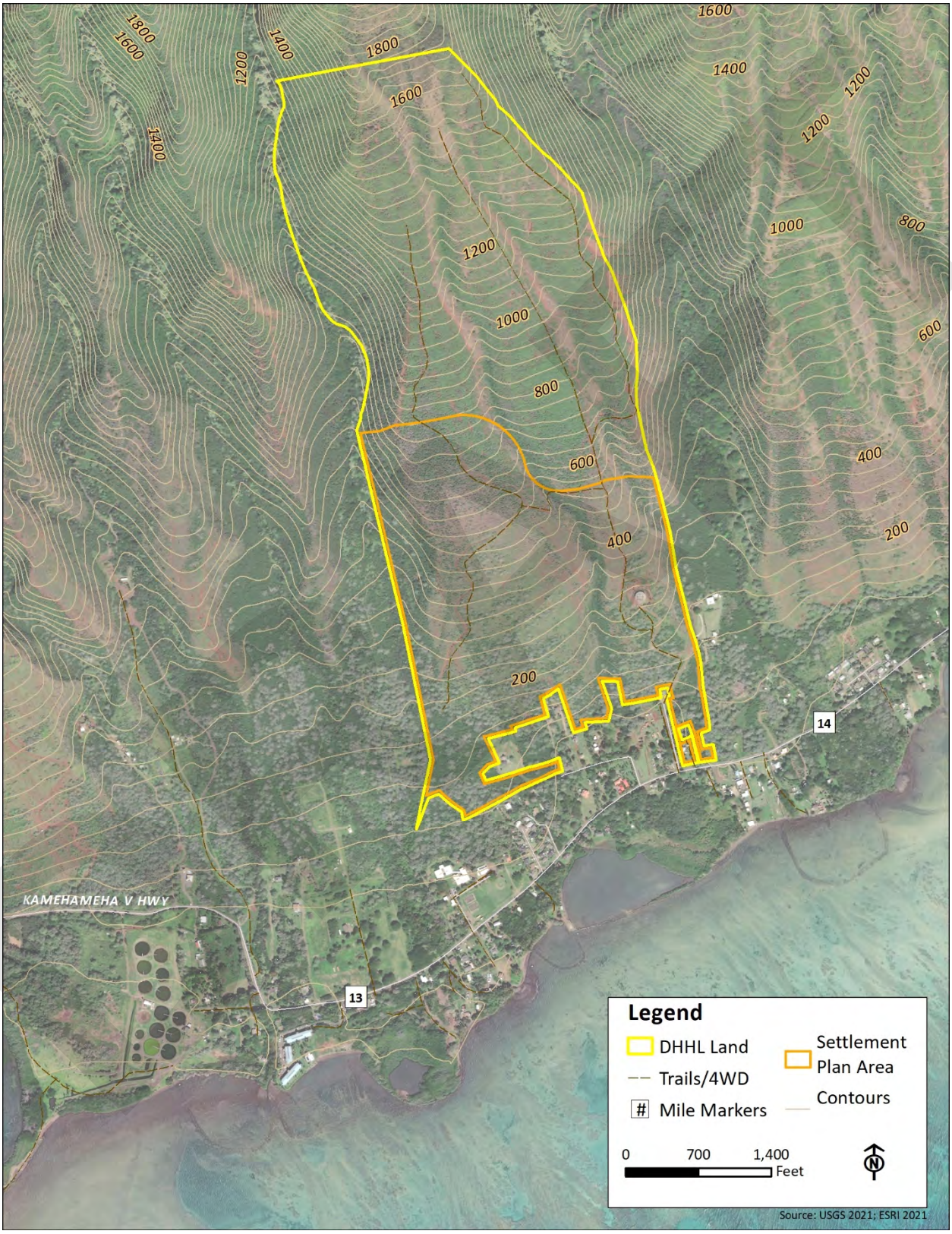


Figure 3-6 Topography



3.2 Water Resources

'Ualapu'e has rainfall that ranges from 35 inches per year (makai) to 85 inches per year (mauka) *(Figure 3-7)*. Community members who live in the area attest to higher rainfall in the mauka regions, as evidenced by the abundance of rainbows that can be seen. The land is characterized by isolated plateaus and the deep ravines of Kahananui, Ki'inohu, and Mo'omuku Gulches. Mo'omuku and Ki'inohu are ephemeral streams (lasting for a very short time), flowing after a two-to-four-day rain event. Kahananui is characterized as an interrupted perennial stream (stream with continuous flow). All three gulches originate in the mauka area of 'Ualapu'e, eventually flowing makai on the property *(Figure 3-8).* Handy and Handy (1972) provide, "the small streams on the southeastern coast carried more water than they do now, and it is certain that in many of the interior valleys there are small sections of terraces." This was echoed by many community members, who attest to the decline of water flow in the streams during their lifetime, impacting agricultural and aquacultural pursuits. These streams have a high flow rate and volume after a rain event, and flash flooding often impacts roadways and access in 'Ualapu'e. Community members have mentioned a diversion of water in the uplands of 'Ualapu'e that diverts water from the ahupua'a to the west side of Moloka'i.

There are two wells within the project area, and one private well in the project vicinity and thus has a designated Wellhead Protection Area (WHPA). A WHPA is defined by the 1986 Amendments to the Safe Drinking Water Act as "the surface and subsurface area surrounding a water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield," or in other words, the area from which pollutants are likely to contaminate well water. The 'Ualapu'e well has three designated Wellhead Protection Overlay Districts (WPOD): Zones A, B, and C *(Figure 3-9).* WPOD characterizes the susceptibility to contaminants using set distances for Zone A, and Time of Travel (TOT) for Zones B and C. Zone A is a fixed 50 ft radius around the well to protect from direct contamination. Zone B is a 1,000 ft radius based on survival times of bacteria and viruses to travel to well. Zone C is a protective measure from travel time of a contaminant spill. Zone C is located outside of the DHHL parcel.

During the various beneficiary and community meetings held between 2020-2022, concerns regarding the impact of any human activity in near proximity to the well and within the wellhead protection zones were expressed by some participants. Some provided that the well is a skimming well, a well for extracting water from the upper portion of the aquifer, and therefore unfit for heavy demand and usage. Others raised concerns that human activity above the well – specifically regarding agricultural and human waste treatment, storage, and/or transmission – would possibly be detrimental to the water source.

To prevent groundwater contamination, a Draft Wellhead Protection Ordinance, County of Maui, Hawai'i (DWS 2011) defines permitted uses within the WPOD Zones (although not yet adopted). DHHL will follow wellhead protection requirements from the County ordinance. Only public utility or facility development is allowed in Zone A, including the construction, maintenance, repair, and enlargement of drinking water supply related facilities such as, but not limited to, wells, pipelines, aqueducts, and tunnels. Prohibited uses include any subsurface sewage leaching field, hazardous waste landfills and ponds, chemical storage, or treated effluent injection well. No portion of the DHHL 'Ualapu'e parcel is in WPOD Zone A (see *Figure 3-9).*

Figure 3-7 Mean Annual Rainfall (Inches)

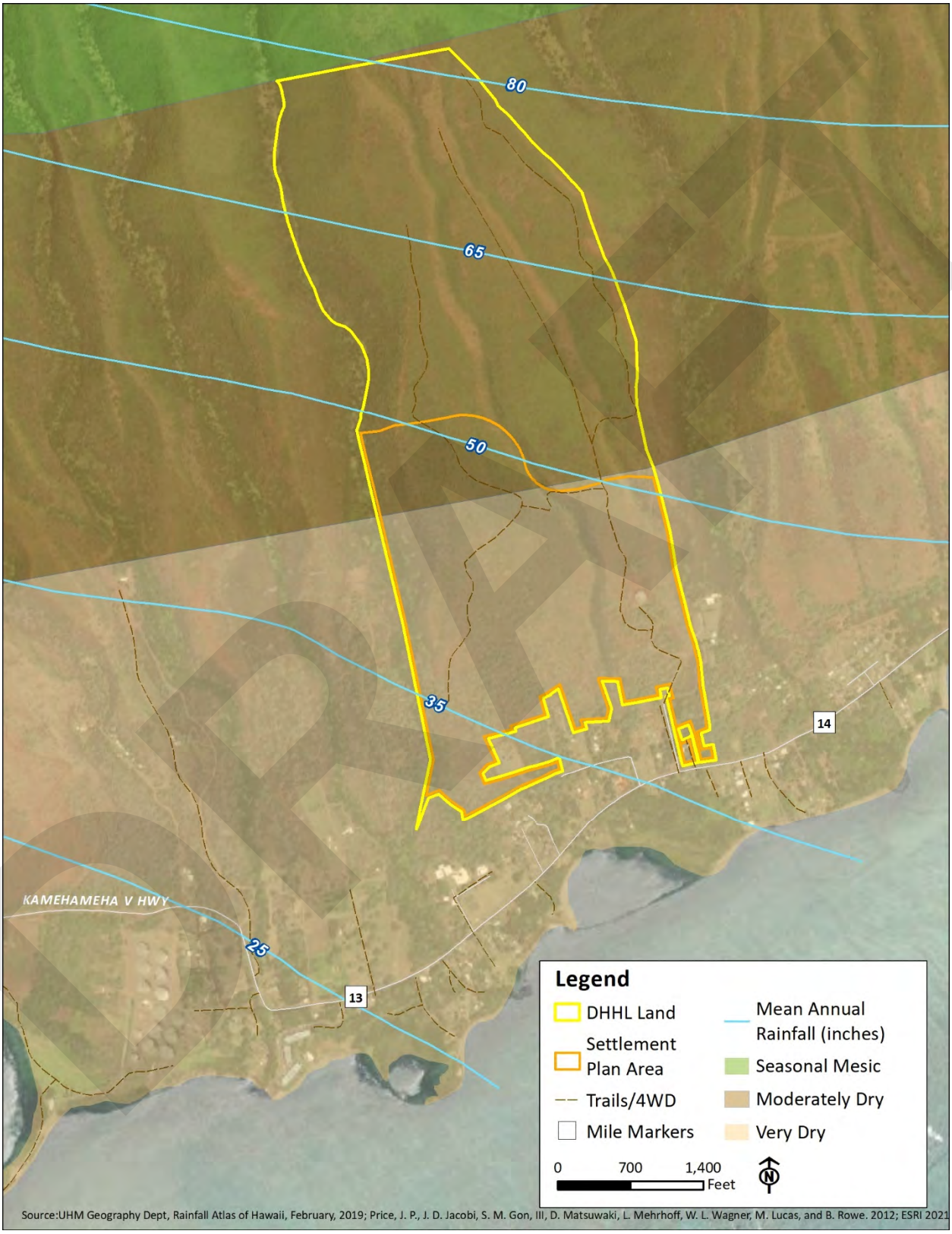


Figure 3-8 Gulches, Streams and Fishponds

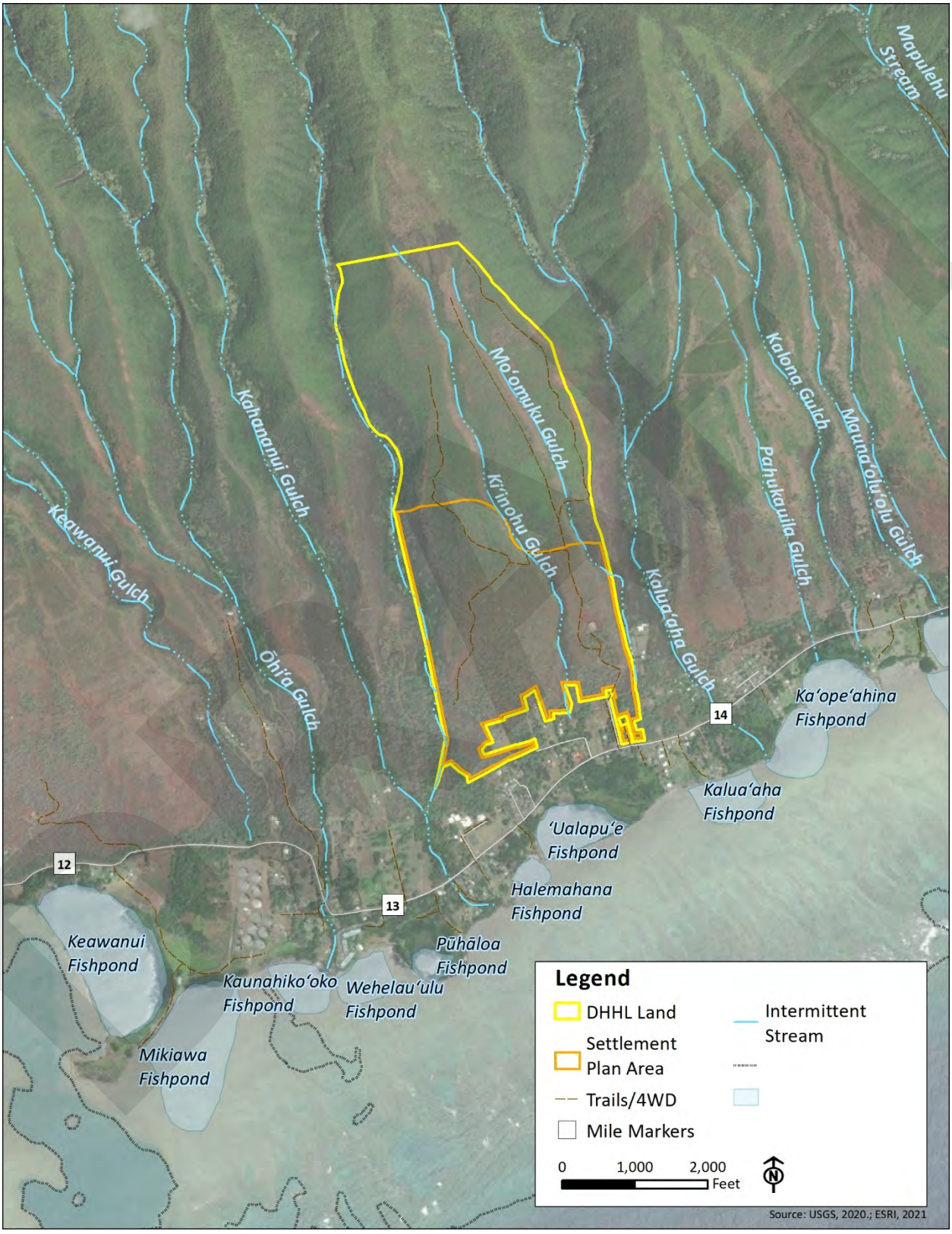
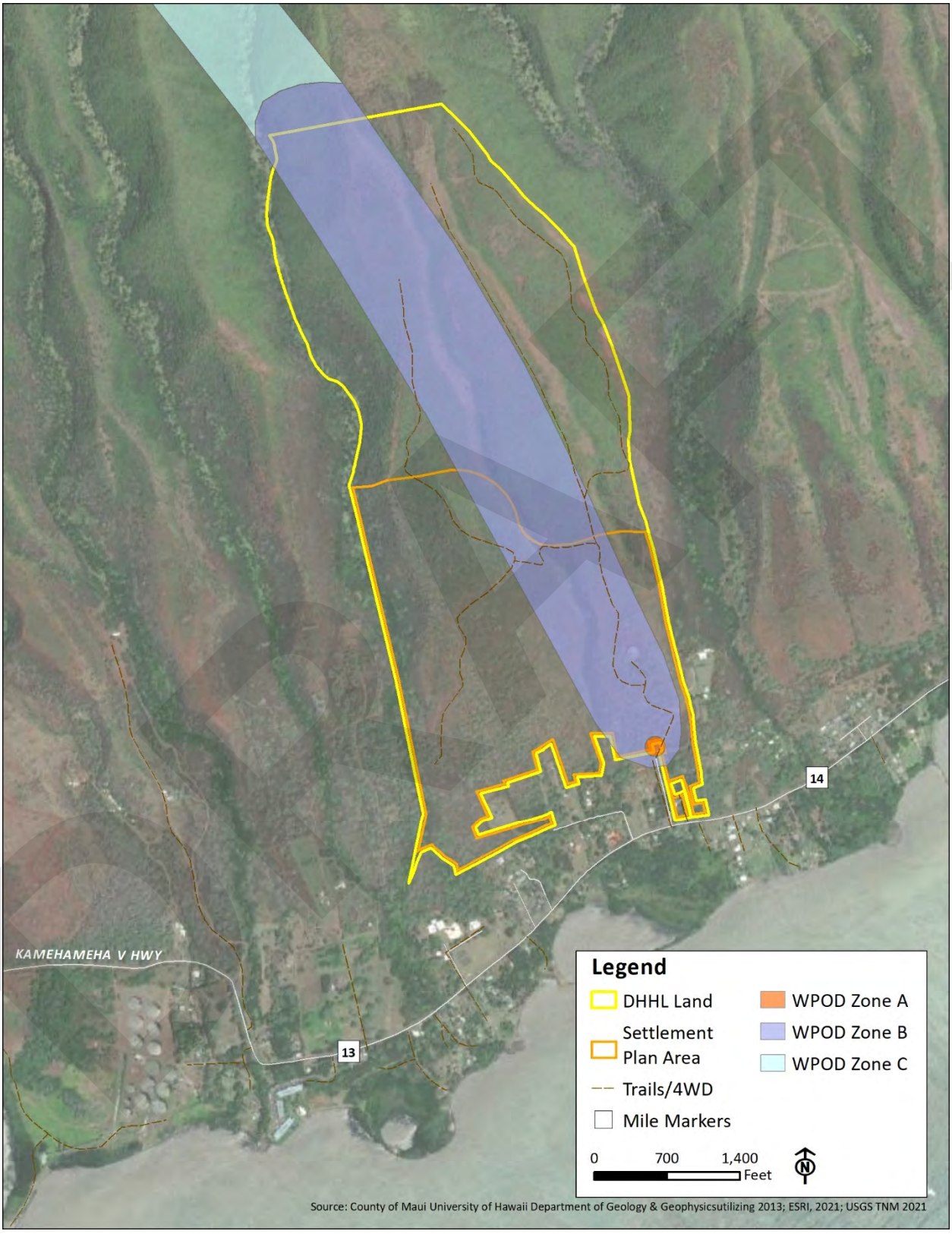


Figure 3-9 Wellhead Protection Zones



The minimum unsewered residential lot size in Zone B shall be two acres. Prohibited uses (subject to exception) include (among others) land divisions resulting in high density (>1 unit/2 acre) septic systems; or other facilities involving collection, handling, manufacture, use, storage, transfer or disposal of any solid or liquid material or waste having potentially harmful impact on groundwater quality. Such protection measures are also in addition to State Department of Health limitations of placing individual wastewater systems within 1,000 ft of a well or public drinking water source. Due to these measures, it is recommended that lots in the Settlement Plan area within Zone B use incinerator or composting toilets. The eastern-most portion of the Settlement Plan area (including eight Kuleana Homestead Lots and one Community Use area) is located within WPOD Zone B. The County of Maui Department of Water Supply (DWS) website also supplies information providing best management practices for protecting water supply for residential and agricultural uses.

In Hawai'i, aquifers provide ground water for potable water and some agricultural needs. The amount of ground water that can be pumped from an aquifer should be sustainable. "Sustainable Yield" is defined as "the maximum rate at which water may be withdrawn from a water source without impairing the utility or quality of the water source as determined by the commission" (HRS §174C-3). Sustainable Yields in Hawai'i are estimated by the DLNR Commission on Water Resources Management (CWRM).

The 'Ualapu'e aquifer is located from Kapulei to Kainalu *(Figure 3-10)*. According the Preliminary Draft of the Moloka'i Water Plan (2022), the sustainable yield of the system is 8,000,000 gallons per day (GPD). Currently, the permitted use of the 'Ualapu'e aquifer system is 250,000 GPD; only 3% of the system's sustainable yield. With an adequate potable source, project development would require coordination with DWS to consider future expansion of county source storage and transmission to the area.

The DHHL parcel is currently not serviced with potable water, however the surrounding region is serviced by the DWS 'Ualapu'e system. This 9.7-mile-long system extending from Kamala to Moanui streams supplies an average of 185,000 GPD (DWS, 2022). According to a 1982 DWS Molokai Water Systems Plan, its single source, the County-owned 'Ualapu'e well, can provide approximately 450,000 gpd (DWS, 1982). The 'Ualapu'e Maui-type well (0449-01) has a vertical shaft that is 41 ft deep and is fed by 180 ft of skimming tunnels, with two 500 gallons per minute line shaft turbine pumps.

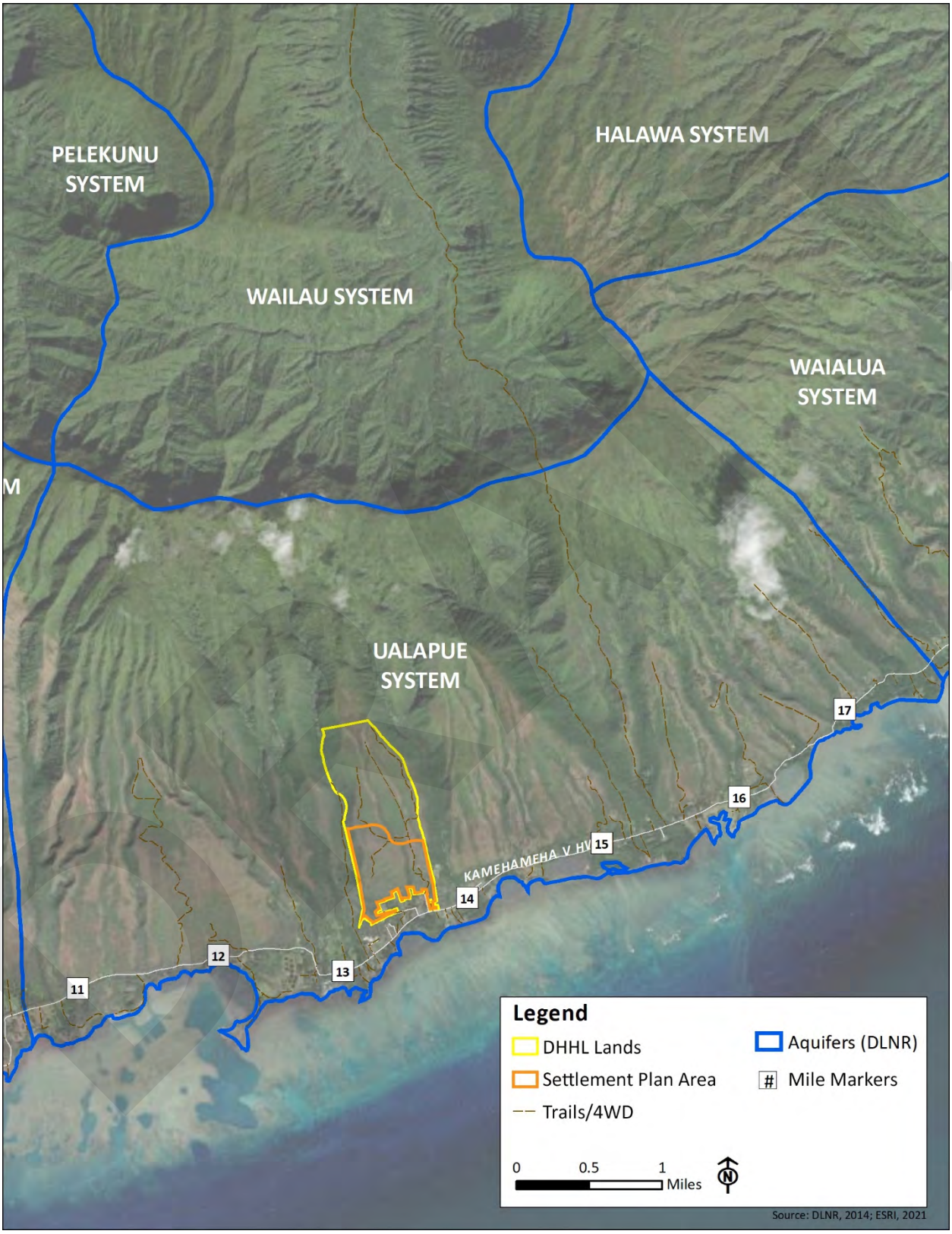
Most of the 'Ualapu'e system is served by an existing 12-inch distribution main line located along Kamehameha V Highway. Due to the layout of the lines, DWS needs to occasionally flush the lines by releasing water out of a fire hydrant at the most eastern end of the line. The 1.0 million gallon concrete storage tank is located on DHHL land at elevation 250 ft above the well in 'Ualapu'e, and the property is leased by the County of Maui.

A second well located on DHHL property near Kamehameha V Highway has been dry for at least 20 years, according to local sources (email communication, 9/14/2021). Another well is located on private property makai of the DHHL parcel.

Many community members have had to leave 'Ualapu'e because the County is unable to provide additional water. This has added to community concern about where the water will come from to provide for new residents and agriculture on the DHHL parcel.

The County of Maui DWS is currently working on a Moloka'i Water Plan and is not issuing any new meters in the area at this time. In February 2020 the County submitted Water Use Permit Application (WUPA) No. 01094 to CWRM requesting an addition in allocation from 'Ualapu'e Shaft from 185,000 GPD to 350,000 GPD to accommodate an increase in service connections as well as to assist with required water line flushing and acceptable water quality maintenance of its system.

Figure 3-10 ‘Ualapu‘e Aquifer System



The WUPA was accepted by CWRM as complete on April 27, 2020. However, multiple objections to the WUPA were filed and petitions for contested case hearings were granted on October 20, 2020. Objections by petitioners relate to adverse effects from additional pumpage of 'Ualapu'e Shaft on fishponds, lack of evidence of quantified impacts to nearshore environments, lack of water to petitioners from the 'Ualapu'e Shaft, among other concerns. Due to the numerous objections, along with the proposed requirements put forth in the request for a contested case, DWS hereby withdrew their request in January 2021.

In January 2022, DHHL made a formal request for a ground water reservation of 855,000 GPD from the 'Ualapu'e Aquifer System for future homestead opportunities. This request was based on the AHA plans for 175 two-acre homestead lots in the 2019 MRP. In March 2022, CWRM approved the launch or first step of rulemaking (HRS §91), which is required for Ground Water Management Areas (GWMA). The entire island of Moloka'i is designated a GWMA, which is based on criteria that evaluate threats to a ground water hydrologic area "by existing or proposed withdrawals of water, water quality problems, or serious disputes." DHHL will revisit the rulemaking process with CWRM once this Settlement Plan has been approved and will refine the request for water based on the number of planned Kuleana Homestead lots.

On July 22, 2014, the HHC adopted a Water Policy Plan ("WPP") to provide comprehensive and consistent guidance and direction to the HHC, DHHL staff, and its beneficiaries on water-related issues, actions, and decisions. The WPP was developed relying on existing legal authorities, previously approved policies, and plans (e.g., General Plan 2002), and two years of extensive beneficiary input and consultation in compliance with DHHL's Beneficiary Consultation Policy ("BCP") (2009). One of the four primary goals in the WPP is to "[a]ggressively, proactively, consistently and comprehensively advocate for the kuleana of the beneficiaries, the DHHL, and the HHC to water before all relevant agencies and entities." WPP Additional Goal III. 6. is to "Secure adequate and enforceable reservations of water for current and foreseeable future needs for all of its lands across the islands."

In 2007, the Moloka'i Water Working Group reconvened to review and update the recommendations of the 1996 Working Group Report and to clarify the availability of water on Moloka'i for agricultural purposes. After ten meetings, several recommendations were made. Those that apply to 'Ualapu'e include:

- All large-scale water planning and water management should support the goal that agriculture will continue to be the economic and cultural "heart" of Moloka'i.
- DHHL foreseeable water needs be reserved first.
- Priorities for water use should follow the lead of community development as determined by the intent of the Moloka'i Community Plan and the DHHL Moloka'i Island Plan in force at the time CWRM makes its decision.
- Implementing a plan to capture surface water overflow during heavy rain from intermittent streams and other slope areas for surface water use, increasing recharge of the associated aquifer, and decreasing sedimentation of Moloka'i's reefs.
- All the water rights of DHHL homesteaders as provided under the Hawaiian Homes Commission Act, State Water Code, and other laws must be recognized, preserved and implemented by the State of Hawai'i and the Counties of Maui and Kalawao. Other rights which might exist, pertaining to Hawaiians not residing on DHHL lands, must also be honored.
- There should be a core of undisturbed watersheds on East Moloka'i.

3.3 Soils

Soils in the lower portion of the DHHL parcel mainly consist of Hoʻolehua silty clay (HzE). In general, such soils are well drained with high runoff and severe erosion. It is primarily used for pasture. The northern portion of the DHHL lands includes a mix of Alaeloa silty clay (AeE), Kahanui gravelly silty clay (KATD), and rough mountainous land (rRT). Alaeloa silty clay is characterized by moderately rapid permeability, medium runoff, and moderate erosion. It is best suited for pineapple, pasture, truck crops, orchards, wildlife habitat, and homesites. Kahanui gravelly silty clay is well to moderately well drained and is best suitable for woodland, pasture, wildlife, and water supply. Rough mountainous land is steep, with 70 to 400 inches of annual rainfall, and is best used for water supply, wildlife habitat, and recreation *(Figure 3-11).*

The Land Study Bureau of the University of Hawaiʻi prepared an inventory and evaluation of the State's land resources during the 1960s and 1970s. Ratings were developed for overall productivity, with a rating of "A" very good, to "E" not suitable. Lands comprising the project area are classified as "D" and "E", which are considered relatively low for agricultural production *(Figure 3-12).* However, the rating is based on existing inputs, technology, management at time of survey. For example, land type with good soils may be "E" without irrigation, but "A" with irrigation. Also, it is important to note that these crop productivity ratings were developed for the dominant crops at the time, including pineapple, sugar, vegetables, forage, grazing, orchard, and timber.

The Agricultural Lands of Importance to the State of Hawaiʻi (ALISH) designates agricultural lands into "Prime", "Unique", "Other", or "Unclassified" lands, based on their agricultural capacity and potential. The lands in ʻUalapuʻe are primarily designated "Other", with pockets of "Unclassified" lands *(Figure 3-13).* Prime and Unique agricultural lands are able to produce high yields of crops when treated and managed according to modern farming methods, such as coffee, taro, rice, and watercress. Other Important Agricultural Land is also of statewide or local importance to agricultural use for the production of food, feed, fiber, and forage crops.

Although ʻUalapuʻe may have what is classified as poor soil and limited rainfall, this climate provides for drought-resistant plants with full sun. Common indigenous dryland crops that are well suited to the land and climate include ʻuala *(Ipomoea batatas,* or sweet potato), milo *(Thespesia populnea),* ʻulu *(Artocarpus altilis),* kukui *(Aleurites Moluccana),* maile *(Alyxia Stellata),* koʻokoʻolau *(Bidens micrantha ssp. Kalealaha),* wauke *(Broussonetia papyrifera),* lama *(Diospyros sandwicensis),* hala *(Pandanus tectorius)*, dryland taro (*Colocasia esculenta)*, ʻuhi *(Dioscorea spp;* or yam), kava *(Piper methysticum),* ti *(Cordyline fruticosa),* kō *(Saccharum officinarum* or sugarcane), and arrowroot *(Tacca leontopetaloides)* (Wyban, 1990 and Kurashima et al., 2019).

The introduction of ungulates (cattle, deer, and goat) have transformed and eroded the landscape. Community members have mentioned that deforestation and erosion have hardened the soil in the project area. During heavy rain, soil is eroded from the land and deposited into ʻUalapuʻe fishpond and on to the coastal reef. Hardpan and eroding soils are a problem for the entire island of Molokaʻi. In November 2009, Molokaʻi Land Trust (MLT) initiated a two-acre pilot project for hardpan restoration on the interior of the Mokio Preserve in a highly eroded area. In partnership with the Molokaʻi Community College (MCC) Hawaiian Field Biology Class, this initial planting project turned out very successful. In 2011, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plant Materials Center signed a Cooperative Agreement to work with MLT on test plots and field trials for direct seeding of native species produced at their operation on Molokaʻi. This multi-year trial will ultimately yield important data and best practices for future broadscale direct seeding of highly erodible soils with native species across the state, including ʻUalapuʻe.

Figure 3-11 Soil Types in 'Ualapu'e

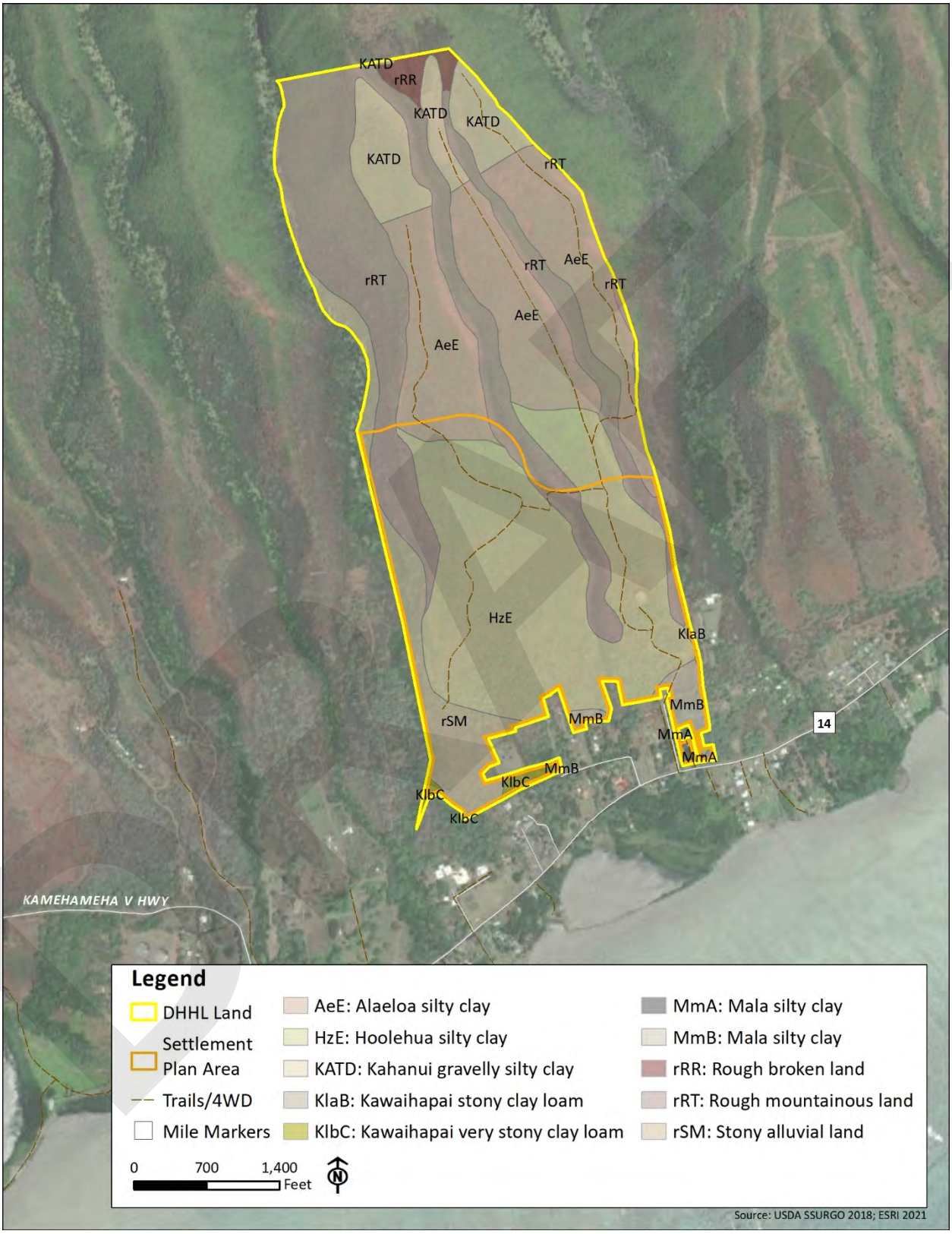


Figure 3-12 Land Study Bureau Rating

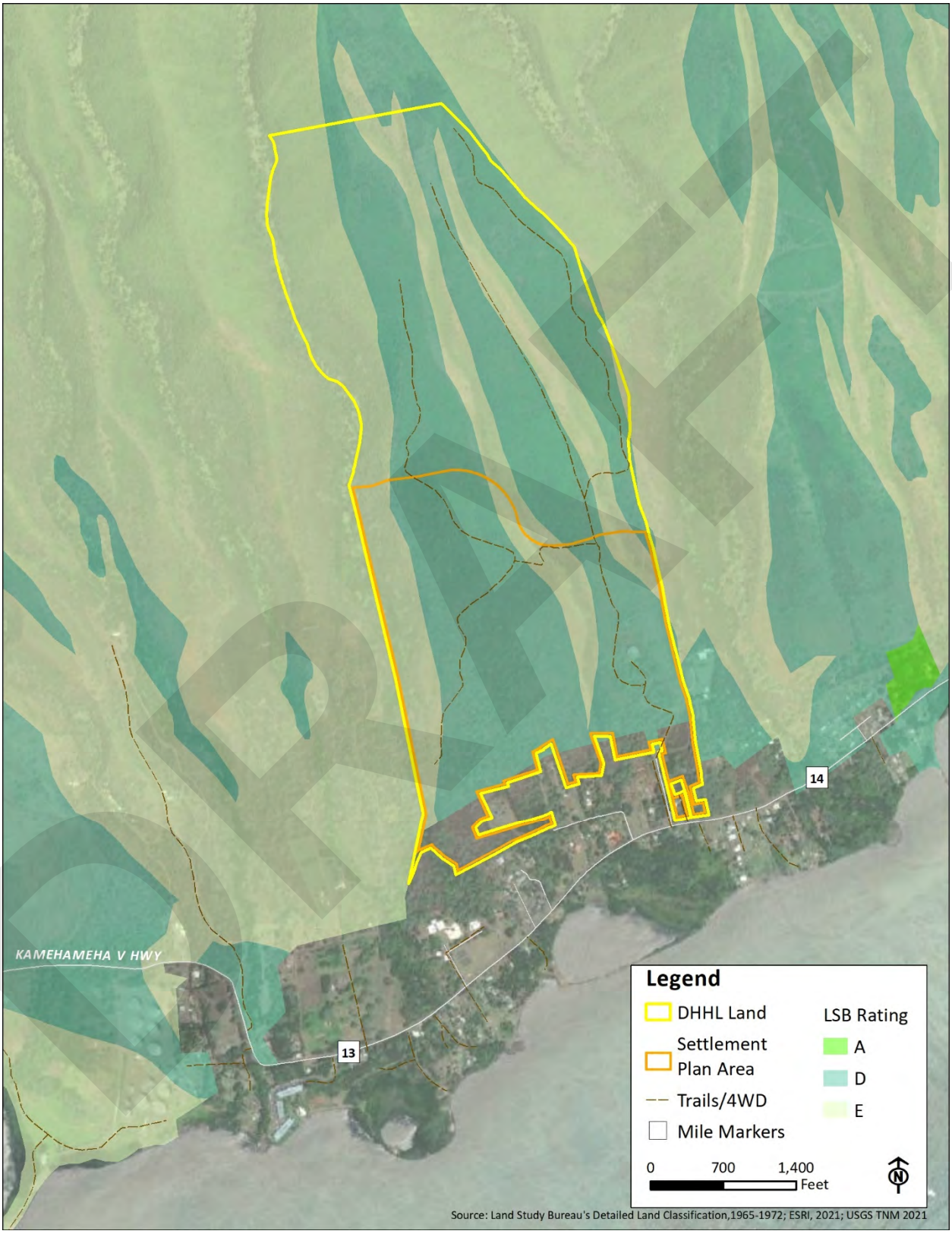
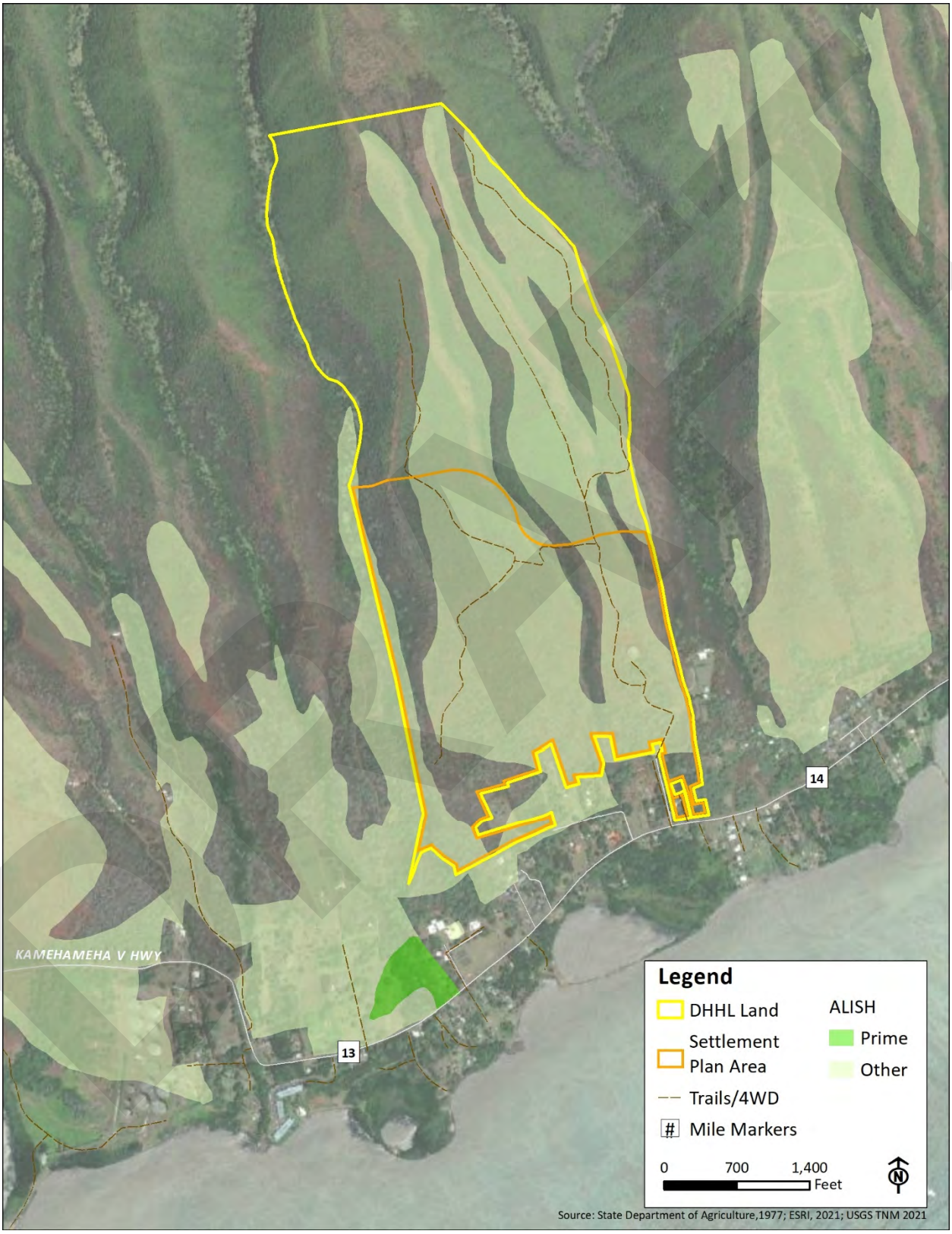


Figure 3-13 Agricultural Lands of Importance to the State of Hawai'i



3.4 Natural Hazards

3.4.1 Flood Zones

The majority of the DHHL parcel is located in Flood Zone X (areas where the annual flood risk is less than 0.2%). Moving closer to the coast, there is a small portion of the southeast property located in Flood Zone A, an area with a 1% or greater chance of flooding in any given year *(Figure 3-14).* According to Maui County Code 19.62.060, no new construction is permitted within Flood Zone A unless it is demonstrated that proposed construction, when combined with existing and anticipated construction, will not increase the water surface elevation of the base flood at any point. In addition, the southwestern point of the DHHL parcel is located in Flood Zone AE. Flood zone AE is also known as a special flood hazard area, as this is generally a zone where flood risks are very high and flooding can happen once every 100 years.

3.4.2 Tsunami and Extreme Tsunami Evacuation Zones

A small corner of the property is located in both the designated Tsunami and Extreme Tsunami Evacuation Zones *(Figure 3-15).* The sudden displacement of the ocean floor (earthquakes), landslides, or volcanism can generate tsunamis, which are a series of waves that can reach speeds of up to 600 mph. Upon reaching a coastline, a tsunami (tidal wave) can become a wall of water reaching heights of 30 ft or more and capable of moving inland several hundred feet. The 1960 Chilean earthquake caused a tsunami that damaged the ʻUalapuʻe fishpond wall.

The Tsunami Evacuation Zone is used for most tsunami warnings. For this evacuation a person is considered safe when they have reached outside of this zone mauka. This zone is based on the historical tsunami impacts on the State of Hawaiʻi over the past 100 years. If an earthquake happens in the Eastern Aleutian Islands with a magnitude 9.0 or greater, it would cause a rare, more extreme tsunami event that would result in much more extensive flooding. In this rare case, officials may advise evacuating further inland beyond Extreme Tsunami Evacuation Zone. For ʻUalapuʻe these zones are the same. Although the project area is outside the HRS §205A Coastal Zone Management (CZM) Special Management Area (SMA) *(Figure 3-16),* all state and county agencies are required to enforce CZM objectives and policies as set forth in HRS §205A-2.

3.4.3 Sea Level Rise

The Pacific Islands Ocean Observing System (PacIOOS) runs the State of Hawaiʻi Sea Level Rise Viewer, an interactive mapping tool in support of the State of Hawaiʻi Sea Level Rise Vulnerability and Adaptation Report. The Sea Level Rise Viewer provides information on Sea Level Rise Exposure Area (SLR-XA) for the Hawaiian Islands, inclusive of Passive Flooding, Annual High Wave Flooding, and Coastal Erosion. According to the PacIOOS Sea Level Rise Viewer, the settlement plan area is located outside of the 3.2 feet of Sea Level Rise (SLR) *(Figure 3-17).* While Sea Level Rise does not directly impact the project area, Kamehameha V highway is located in the 3.2 SLR-XA and is susceptible to sea level rise. Should Kamehameha V highway face inundation from 3.2 ft of sea level rise, proposed roads for this project could potentially provide alternative routes of access. However, community members are concerned with the impact on archaeological sites with the construction of an additional road.

Figure 3-14 Flood Zones

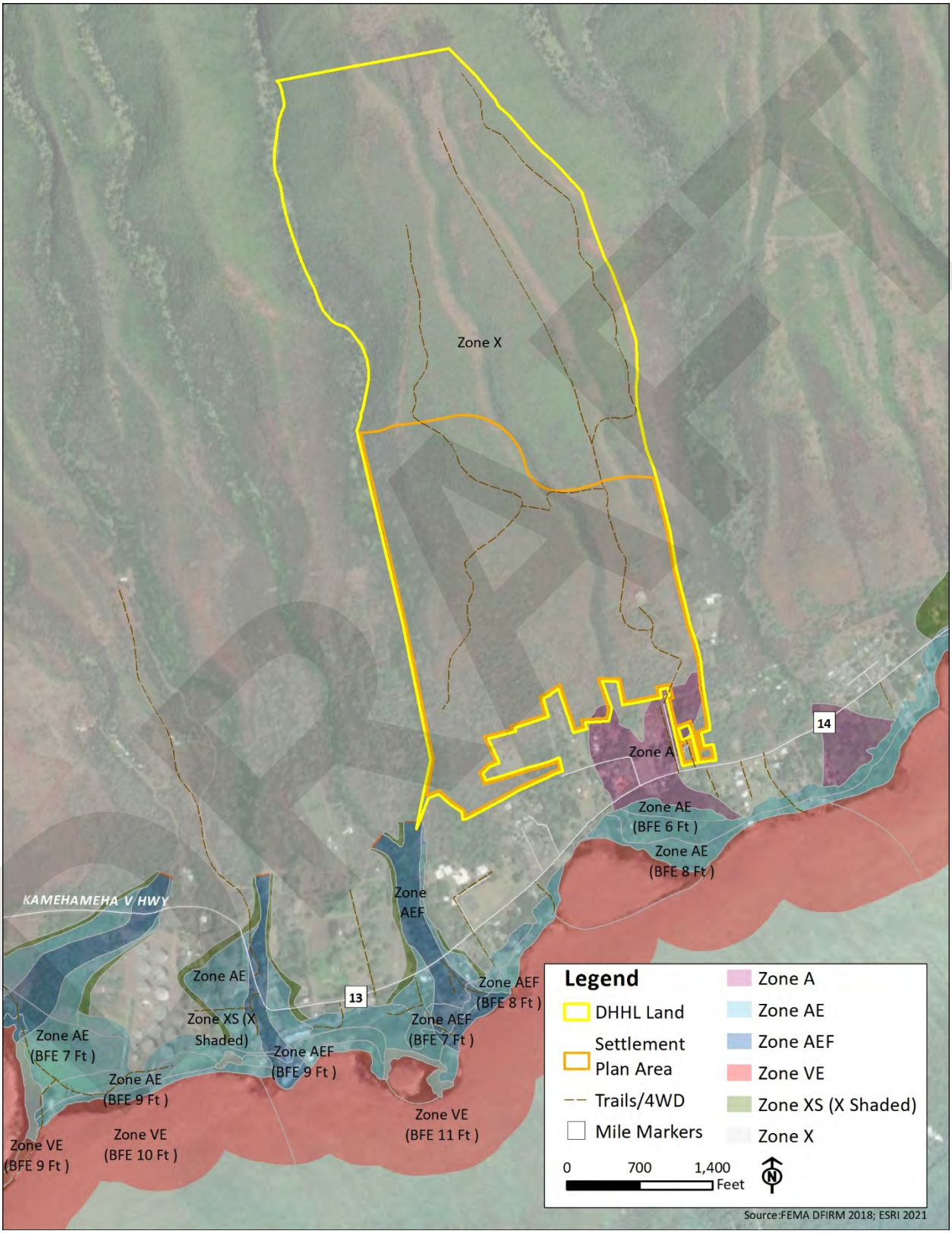


Figure 3-15 Tsunami and Extreme Tsunami Evacuation Zones

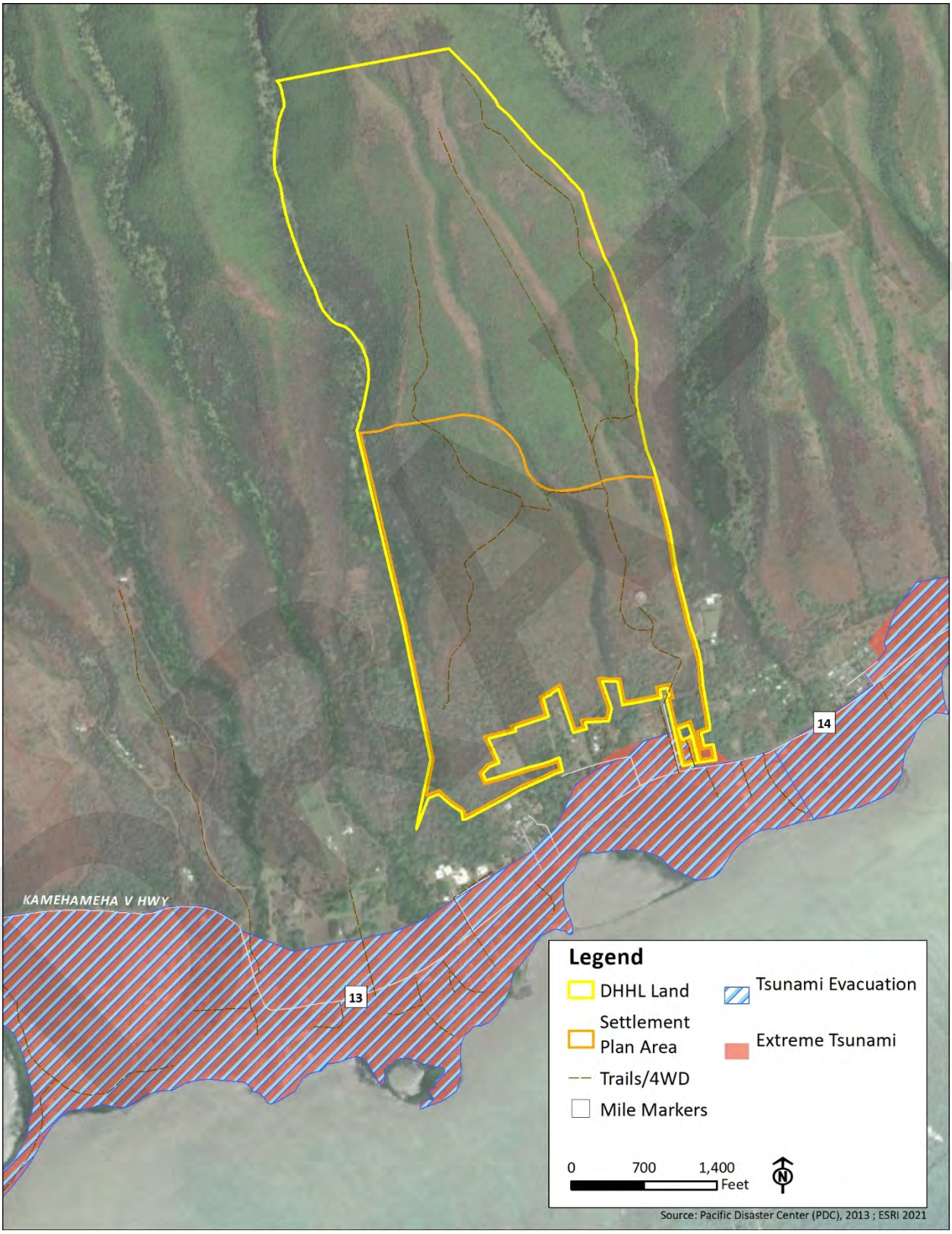


Figure 3-16 Maui County Special Management Area

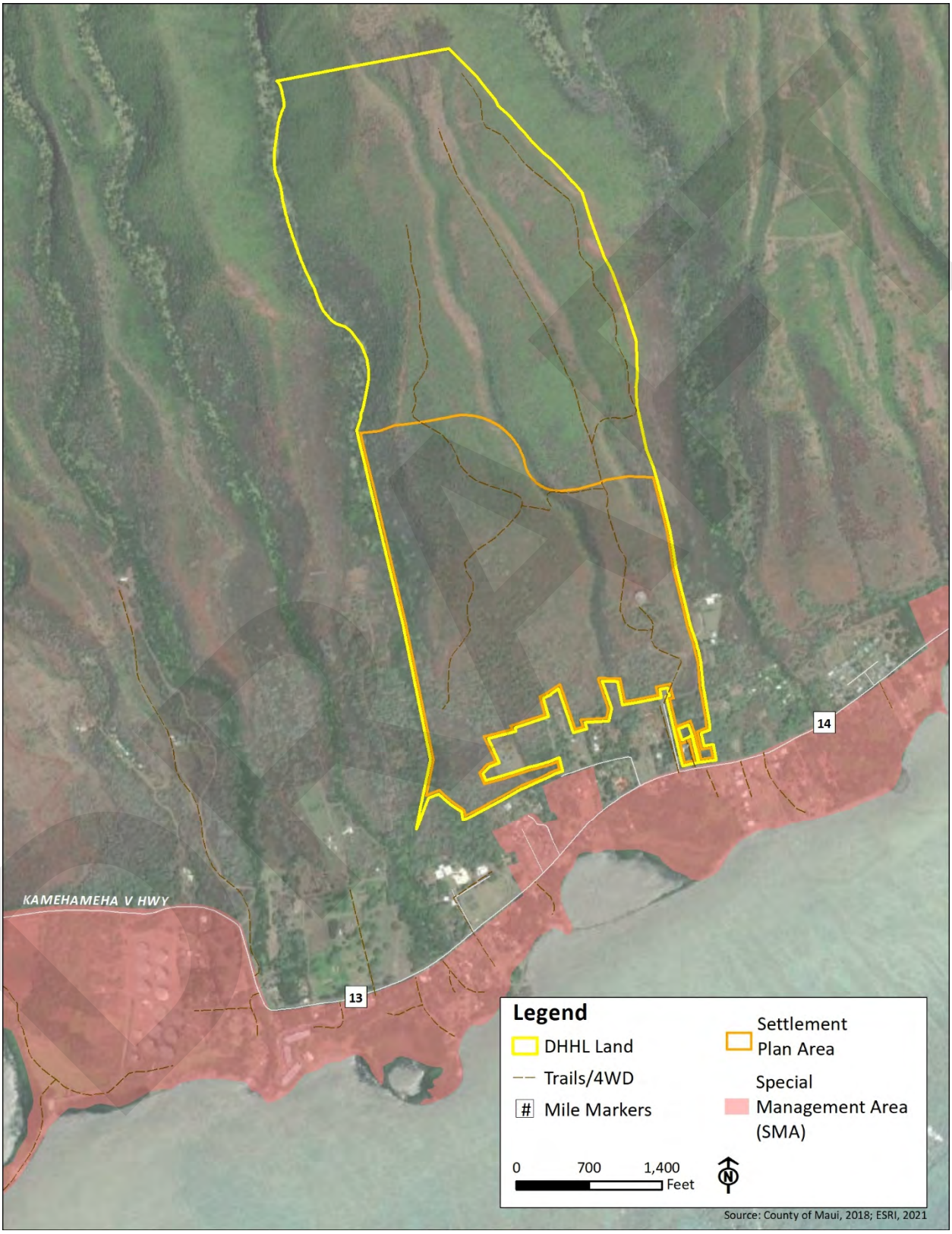
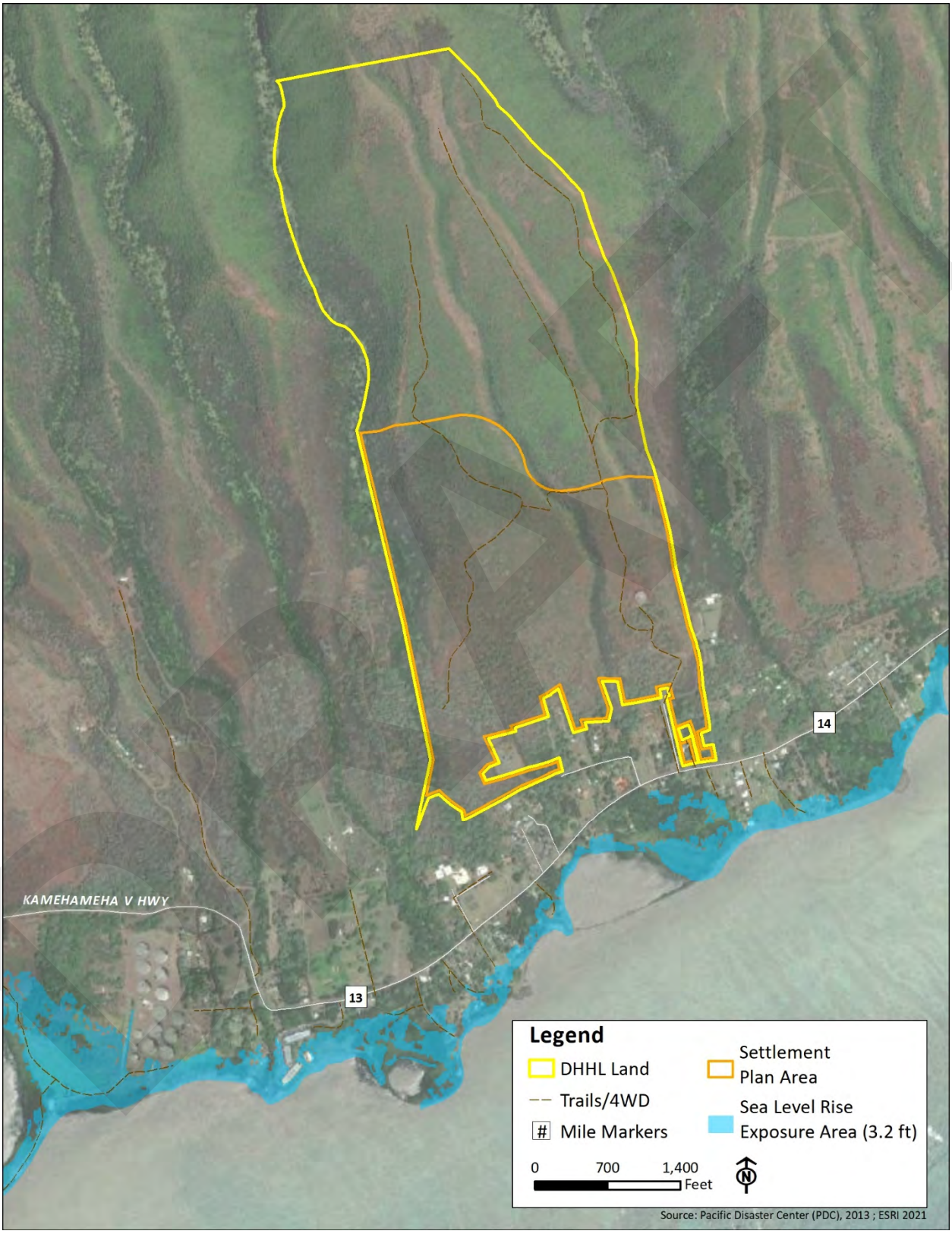


Figure 3-17 Sea Level Rise Exposure Area (SLR-XA)



3.4.4 Wildfire

A wildfire assessment was completed the Hawai'i Wildfire Management Organization (HWMO) to determine the project area's susceptibility to wildfire *(Figure 4-8).* Many factors influence wildfire outbreaks, with human ignition being the primary concern. Other influential factors include proximity to infrastructure (homes/roads), wind, lack of water, and long fire response times. For the project area, the highest wildfire risk zones are areas that consist of dry vegetation, high wind exposure, and in close proximity to human activity (i.e. roads/trails) where ignition sources are more prevalent. Additional discussion regarding wildfire risk is discussed in *Chapter 4.*

This page intentionally left blank.

Chapter 4: Plan for the Identification, Protection, and Preservation of all Significant Biological Sites

4.1 ‘Ualapu‘e Ahupua‘a

While the DHHL property does not encompass the entire ‘Ualapu‘e ahupua‘a (*Figure 3-1*), it plays a significant role and is poised to positively influence the biological health of the ahupua‘a. An ahupua‘a is a traditional Hawaiian land management system based on the availability of resources, generally running from mountain to sea. Within the boundaries of an ahupua‘a were the resources that could support and sustain human life. This land division is not only a physical description of the land but comes with a social structure that recognized the importance of a precise management program for resource sustainability.

The largest land division was the mokupuni (surrounded land mass, or island). This large division was under the authority of the Ali‘i‘nui (high chief). Stewardship of the land was given by the king to those of high rank. The largest land unit within a mokupuni was called a moku (interior land district). The moku would be under the authority of the Ali‘i ‘ai moku (chief of an island or district). An island could have several moku, although Moloka‘i only has two moku, Kona and Ko‘olau. ‘Ualapu‘e is located in the Kona moku.

Each moku was divided into ahupua‘a, which typically extended geographically from the mountain to the sea. Each ahupua‘a was governed by an Ali‘i‘ahupua‘a (chief), typically managed by a konohiki (land steward), and contained all of the resources necessary for a village or settlement of people to survive. The size of an ahupua‘a depended on availability of resources in an area. An ahupua‘a was a complete settlement that made use of the upland, lowland, and shore resources together in a balanced system for the needs of the people who lived within it. Essentially, people who lived in the mountains would barter with those who lived near the ocean. A complete balance in this land system is what kept the Hawaiian people alive.

The next smaller division was called the ‘ili. These estates were given to ‘ohana (families), and often two or three could take up a large area of the ahupua‘a. ‘Ili that were not connected to each other were called lele, which means to "jump", and could be associated with extended family (Winter et. al., 2018). ‘Ualapu‘e is said to have had a lele in Wailau called Halekoki (University of Hawai‘i, 1993 from Monsarrat, n.d.a:90). Within the lele, a smaller section of good farmland was called the mo‘o, which usually did not extend to the sea. The maka‘āinana (commoners) cultivated crops in a land tract called a kuleana.

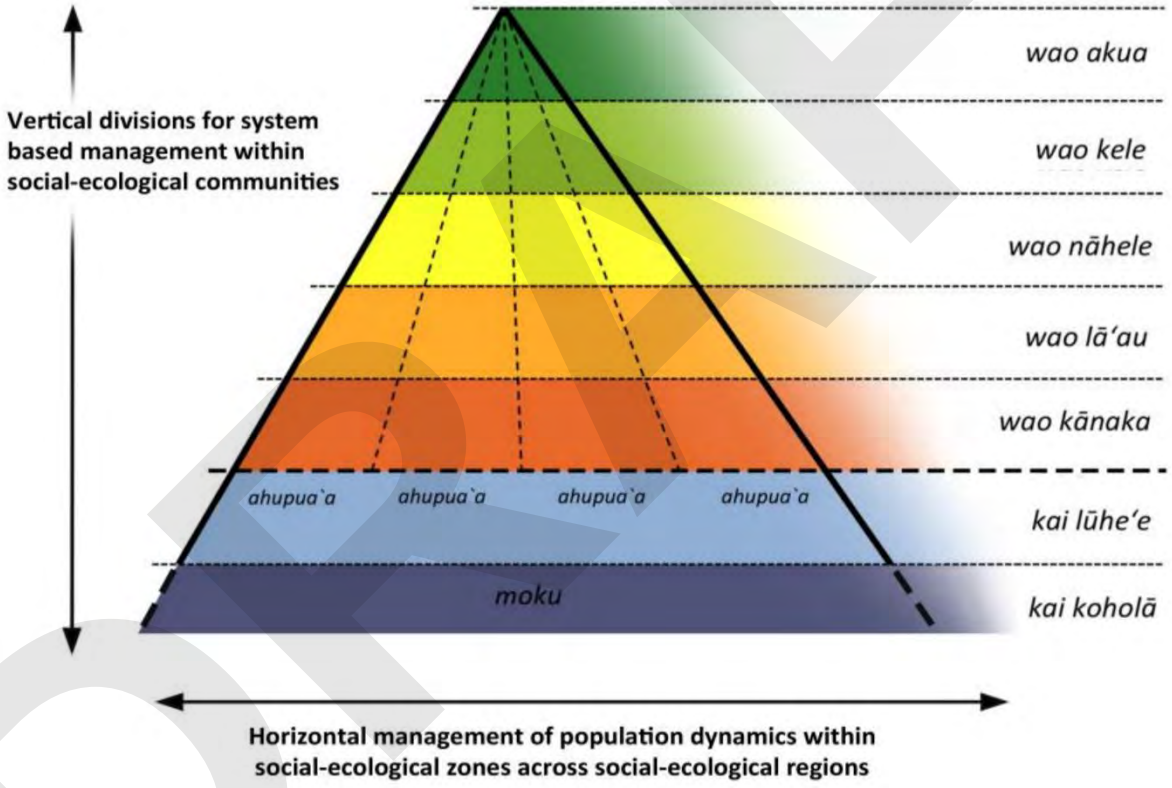
The konohiki was an advisor to the ali‘i on matters of land and resource management. The konohiki would use his skill as a keen observer and knowledgeable practitioner, to make recommendations to the ali‘i as to the best, most productive use of the ‘āina. The konohiki had consultations with all involved members of the community, and his responsibility was great. The ‘ohana living there would sit in council with the konohiki to derive production goals and determine how their resources would be used.

In this chapter, adjacent lands within the ahupua‘a are noted, significant biological sites will be identified, and a plan will be presented for their protection and preservation.

4.1.1 Wao and Kai

Within the ahupua‘a are stratifications of elevation, called wao (realms). Wao are regions of elevation, similar vegetation, biodiversity levels, and growth patterns that exist in Hawai‘i’s natural environment. Wao are not uniform across islands, rather, they vary depending on the environment, vegetative density, and resource management practices on each island. Wao typically contain their own microclimates, have their own physical characteristics, and contain prominent plant and animal species. Each wao also provides resources for humans. Generally, these regions are as follows: wao akua (a distant mountain region with a sacred forest, believed inhabited only by spirits (akua)), wao kele (rain belt, upland forest), wao nāhele (inland remote forest region, jungle), wao lā‘au (agro-forest), wao kānaka (an inland region where people may live or occasionally frequent), kai lūhe‘e (outer reefs for fishing with octopus lures), and kai koholā (sea frequented by humpback whales) (Winter et. al., 2018) *(Figure 4-1).*

Figure 4-1 Designation of Socio-Ecological Zones (Wao)



Source: Winter, et. al (2018)

The lands above the wao kānaka (wao akua, wao kele, wao nāhele, and wao lā‘au) would have been held in common for use by the residents of the ahupua‘a, given their role in generating and maintain cultural, biological, and spiritual balance. Wao kānaka lands in the interior of ‘Ualapu‘e were areas for cultivation, habitation, or direct management of natural resources. The dispersal of kukui (*Aleurites moluccana*), kī (*Cordyline fruticose*) and mai‘a (*Musa paradisiaca*) in the upper gulches of the East End region act as evidence of human presence in this part of the landscape (Keala Pono, 2021). Previous, nearby archaeological studies identified pre-contact (before 1778) habitation sites and artifacts, and charcoal analysis puts the earliest dates for those areas between 1299-1370 (See *Chapter 5).*

4.1.2 Kapu and Kānāwai

These different wao within an ahupua‘a were managed through the establishment of **kapu** and **kānāwai. Kapu** are the resources that community members and the natural environment alike cannot survive without. **Kānāwai** are the guidelines or management tools that must be used to maintain the **kapu**. **Kapu** and **kānāwai** were based on genealogical knowledge and understanding of how ecosystems within an ahupua‘a functioned. This knowledge was often passed down through generations via ‘oli (chants), mele (songs), and ka‘ao (stories/fables).

In 2022, beneficiaries took part in a Honuaiākea Process, a community planning framework that uses ‘oli, mele, and ka‘ao interpreted through the eyes and experiences of community members intimately familiar with the place and of those who practice in those areas to understand the important resources that are crucial for ecosystem stability and community survival (**kapu**) and the actions needed to maintain said resources (**kānāwai**) (Appendix B).

There are three parts to the Honuaiākea Process:

1. **Pre-session**. The Pre-session portion of the Honuaiākea session involves determining the general topic (in this case ‘Ualapu‘e), gathering relevant source material (one ka‘ao from the story of Kū‘ula-kai and one ‘oli, the ‘oli Kī‘au‘au from the story of Kū-a-Paka‘a), and convening the group (those who have knowledge of ‘Ualapu‘e or the practices mentioned in the ka‘ao and ‘oli).
2. **Session**. The Session was held on November 20-21, 2021. Members from the Moloka‘i community, G70, Edith Kanaka‘ole Foundation, and DHHL met over Zoom to analyze ‘oli, ka‘ao and mele.
3. **Formulation of kapu and kānāwai. Kapu** and **kānāwai** were created using the notes and synthesis from each ‘oli and ka‘ao analyzed by the group to pinpoint what resources were crucial for the overall ecosystem health.

The process yielded three **kapu**, each with two associated **kānāwai**:

- **Kapu 1: Ua ka ua, Kahe ka wai. Water needs to flow to all inhabitants of the ahupua‘a. Mauka forests hold the water then flows down to inhabitants.**
  - **Kānāwai**: Kū‘ula uka, kū‘ula kai. Growth must happen up uka as it does in the kai.
  - **Kānāwai**: Hina-ulu-Ohi‘a. The moon controls the growth of our forests as it controls the movement of water in the ohi‘a.
- **Kapu 2: Ko‘a (ākoʻakoʻa, pūkoʻa). Succession. Teaching the community and next generations the traditions gathering of fish, gathering of community, providing nutrients to people and fish.**
  - **Kānāwai**: Ki‘au‘au. Coming together and being prepared. Reach a place of healing and reconciliation to move forward as a lāhui.
  - **Kānāwai**: Hina-puku-i‘a. Feeding community members with ‘ike (knowledge, awareness, understanding), food security, kuleana, skills, and traditions that allow them to give back to the ‘āina.
- **Kapu 3: Kui ka ‘ina. Growth and birth cycle of the marine life of the shore break and kai koholā are free to proceed without hindrance.**
  - **Kānāwai**: ‘Ai-‘ai. Managing abundance for this era and future generations. Sustainability through practice, practice based on community tradition and knowledge of place.
  - **Kānāwai**: Pupuhi ke kukui malino ke kai. The process to see below the surface, observation is key to understanding your coastline. Also, a reference to managing externalities and external powers.

4.2 Identification of Significant Biological Sites

4.2.1 Molokaʻi Forest Reserve

The Molokaʻi Forest Reserve could be located within the wao akua, wao kele and/or the wao nāhele. Mankind seldom ventured into this area during ancestral times, except when a particular kind of tree was needed and could not be found elsewhere, which then deserved substantial offerings. This is the region where the forests had a greater variety of trees. The trees in this area should be healthy so as to supply seeds and regenerate new growth to keep the forest alive. There is frequent cloud cover and cool temperatures, where freshwater runoff from rain creates the rivers that originate in this area. The Reserve is also located in what is known as the Kuahiwi region, or the mountain area, where plant life is abundant in this cool and wet rainforest, with trees, ferns and plants that are adapted to thick, dark understories. Some of the trees and plants found here were hoʻawa (*Pittosporum Pittosporaceae*), maile (*Alexia oliviformis*), alani (*Melicope mucronulata*), koa (*Acacia koa*), and ʻohiʻa (*Metrosideros polymorpha*). According to the Ecological Zones and Native Planting List (DOT-H, 2014), the reserve is located with the wet and mesic ecozones.

The Molokaʻi Forest Reserve is immediately adjacent to and mauka of the DHHL boundary line (*Figure 4-2*). It is owned by the Department of Land and Natural Resources (DLNR) and managed by the DLNR Division of Forestry and Wildlife (DOFAW). The Molokaʻi Forest Reserve was established by Governor's Proclamation in 1912. The purpose for establishing this Reserve was for protecting and permanently maintaining mountain forests, so that the sources of water, including springs and streams, would be safeguarded and their regularity of flow assured. The Reserve is the only State of Hawaiʻi forest reserve on Molokaʻi and is currently comprised of several non-contiguous areas totaling over 11,500 acres of public land spread across the island. Infrastructure in the portion of the Reserve above ʻUalapuʻe is minimal, consisting primarily of four-wheel drive (4×4) roads and hiking trails. According to the 2017 Final Environmental Assessment (FEA) for the Pākuʻi watershed, a 5.5-mile fence was proposed to protect the Pākuʻi watershed, which includes mauka areas of the ʻUalapuʻe ahupuaʻa.

Public hunting (birds and mammals) is allowed in the Molokaʻi Forest Reserve (*Figure 4-2*), according to Hawaiʻi Revised Statutes (HRS) Title 13 Chapter 121. All lands within Molokaʻi Forest Reserve are classified as A-2 (Mixed Game and Other Uses), where game management is an objective integrated with other uses. The portion of the Molokaʻi Forest Reserve adjacent to the DHHL ʻUalapuʻe property lies within Unit B, where feral pigs (*Sus scrofa scrofa*) and goats (*Capra hircus hircus*) are the designated game mammals. The bagging limit is two goats and two pigs per day, with no season limit, and a year-round hunting period. Rifles, shotguns, bow and arrows, and dogs are the permitted hunting methods. The DHHL ʻUalapuʻe property is used by the community to access these hunting grounds.

The 2004 Hawaiʻi Biodiversity and Mapping Program identifies over 40 listings for rare plants within the Forest Reserve boundaries. According to the United States Endangered Species Act, 34% of these plant species are listed as endangered, 15% are candidates to list as threatened, and 37% are species of concern. Critical plant habitat within the Reserve near the DHHL boundary *(Figure 4-3)* includes alani and twocleft stenogyne *(Stenogyne bifida),* a rare nonaromatic member of the mint family known to grow only on the steep ridges of east Molokaʻi. Critical plant habitat located mauka in the adjacent Kaluaʻaha ahupuaʻa include Kamakahala (*Labordia trifloral*) and haha (*Cyanea procera*).

Figure 4-2 Forest Reserve and Hunting Areas in ‘Ualapu‘e

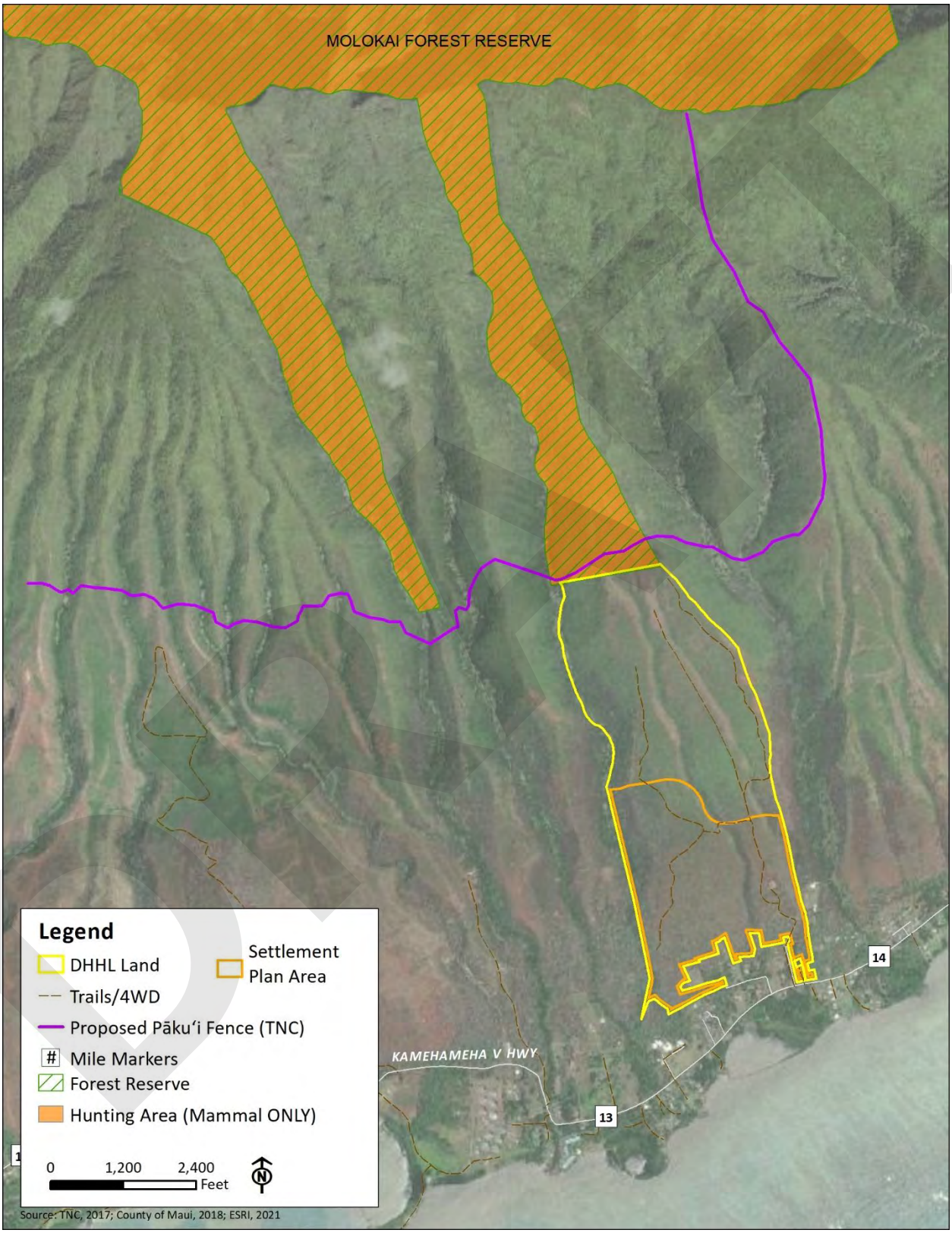
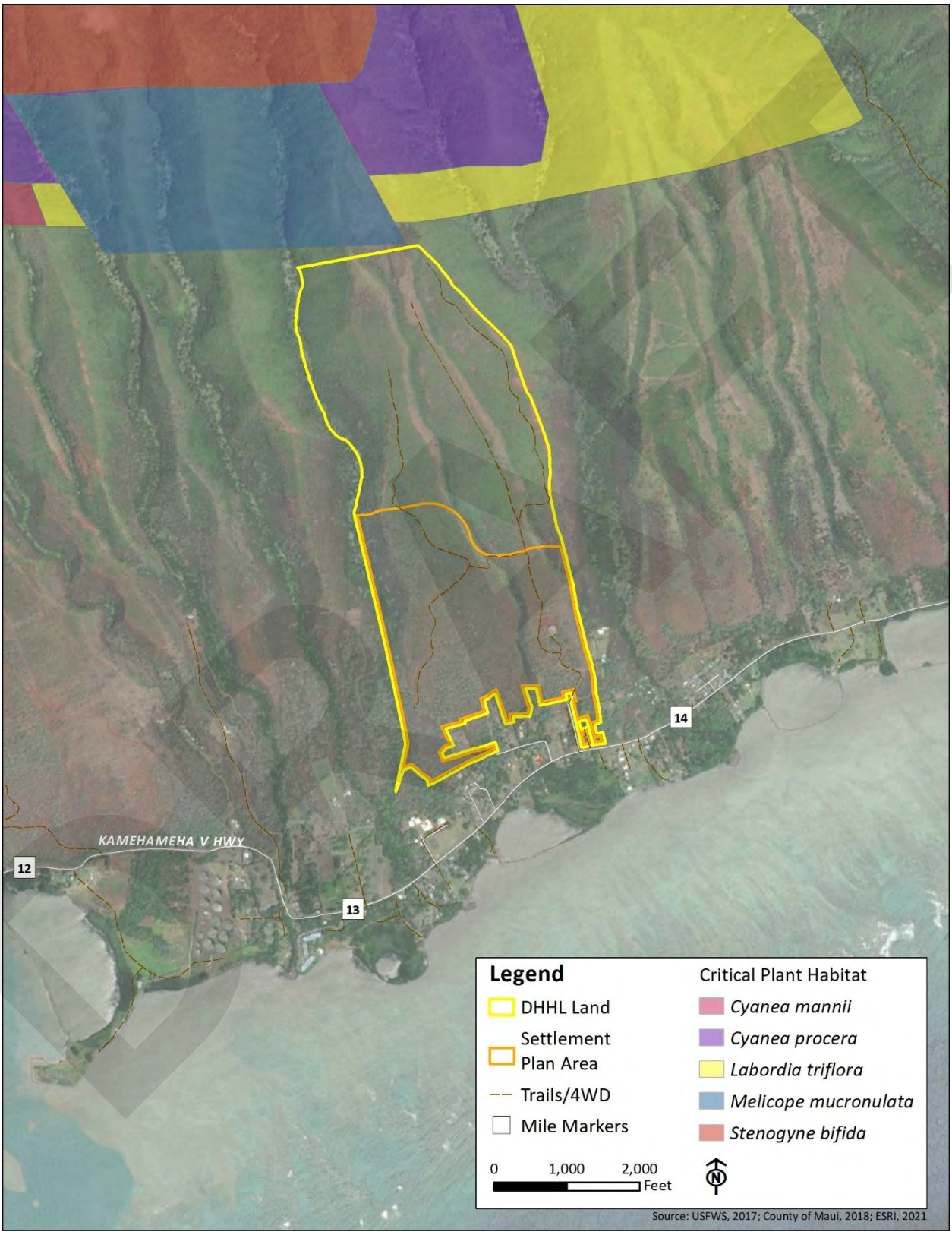


Figure 4-3 Critical Plant Habitat near ʻUalapuʻe



The portion of the Reserve immediately mauka of the DHHL parcel is classified with three levels of vegetation, starting at the DHHL/DLNR boundary up to the Kamakou ridge: V-4 (Badly Degraded Areas), V-2 (Predominantly Native Areas and V-1 (Highest Quality Native Ecosystems). The types of vegetative cover found mauka of the DHHL property include alien forest, lantana *(Lantana camara)* shrubland, alien shrubs and grasses, alien grassland, native shrubland with alien grasses, open 'ōhi'a *(Metrosideros polymorpha)* forest with uluhe *(Dicranopteris linearis),* native shrubland / sparse 'ōhi'a with native shrubs, and native wet cliff vegetation.

4.2.2 Identification of All Significant Biological Sites

A biological survey was performed on the 'Ualapu'e Kuleana Homestead Project Area by AECOS, Inc. in January 2022 *(Appendix C).* The survey was conducted to identify and catalog native plants and animals, especially those native species protected by federal and state statutory authority, throughout the DHHL property. The survey also included an assessment of whether or not the three gulches in the area (Kahananui, Ki'inahu, and Mo'omuku) contain surface waters that are federally jurisdictional as authorized by the Clean Water Act (CWA).

Flora

56 taxa of plants were recorded in the project area. There were no endangered or threatened plant species recorded. Twelve plants (21%) of the taxa were native, including; five endemic: kīlau (*Pteridium aquilinum* var. *decompositum*), *Carex wahuensis*, wiliwili (*Erythrina sandwicensis*), *Metrosideros waialealae* var. *fauriei*, 'ākia (*Wikstroemia oahuensis/Wikstroemia uva-ursi*), and seven indigenous: uluhe (*Dicranopteris linearis*), pala'ā (*Sphenomerus chinensis*), moa (*Psilotum nudum*), mānienie 'ula (*Chrysopogon aciculatus*), pūkiawe (*Leptecophylla tameiameiae*), 'uhaloa *(Waltheria indica),* and 'ūlei *(Osteomeles anthyllidifolia).* Two canoe plants, niu (*Cocos nucifera*) and kukui (*Aleurites moluccana*) were also found.

A majority of the plants on the 'Ualapu'e interfluve (upland slopes extending inland between major gulches) are not native to the Hawaiian Islands and are relatively recent introductions (from the 19th and 20th centuries). The dominate shrubs at 'Ualapu'e are waiawī, or strawberry guava *(Psidium cattleianum f. lucidum)* and lantana. Where the waiawī is absent; the dominant herbaceous species is sourgrass *(Digitaria insularis)* in the lowlands, and broomsedge *(Andropogon virginicus)* above, up to a monospecific forest of paperbark *(Meleleuca quinquenervia)*.

The biological survey described the area as having several vegetation "types" *(Figure 4-4).* Lowland vegetation is described as koa haole *(Leucaena leucocephala)*-dominated scrub forest (LcF) and kiawe *(Prosopis pallida)*-dominated forest and savannah (KwF). The lowland Lcf and KwF contain an understory of koa haole and sourgrass. In open areas, trailing lantana (*Lantana montevidensis*) is abundant as a creeping shrub. 'Uhaloa and 'aki'a (Wikstroemia uva-ursi), niu and noni can be found here but are considered rare or uncommon. 'Uhaloa and 'aki'a prefer open or even disturbed sites.

At elevations above 250 feet (the elevation of the water tank), the vegetation on the ridge or interfluves is waiawī scrub growth (PsS). Where the waiawī is sparse or absent, the PsS contains lantana (*Lantana camara*). Two native shrubs, 'akiā (W. oahuensis) and 'ulei, occur mixed with the waiawī. 'Ūlei shrubs are occasional (meaning moderately common), this 'akiā uncommon. The waiawī plants are small and scattered at lower elevation, but gradually increase in size and density upslope, becoming a scrub forest. Large numbers of axis deer occupy the scrub forest. Two native ferns occur near the upper part of this vegetation type—pala'ā and kīlau, the latter rare—in open areas not so dominated by the waiawī. Most of the other species found in this extensive scrub growth occur in scattered open areas such as along the old roads crossing or climbing through the scrub growth.

The PsS is followed by grassland meadow (GrM), and finally a *Meleleuca* paperbark forest (MIF) at the top of the site. Mounds of the fern, palaʻā, are scattered across the GrM. Above the GrM is the MIF with moa and an unusual species of ʻohiʻa (Metrosideros waialealae var. fauriei). Several individuals of this plant were confirmed, although the elevation of occurrence is a little low. The presence of this uncommon ʻōhiʻa relative on the edge of the Meleleuca forest is perhaps an unusual feature of this ʻahupuaʻa.

Larger gulches further makai have riparian forest (RpF), and smaller gulches have scrub forest. The smaller gulches of Kiʻinohu and Moʻomuku support a vegetation generally the same as that on the adjacent interfluval slopes: koa haole with kiawe near the bottom and waiawī above. The much larger Kahananui Gulch has an associated riparian forest in which kukui is a prominent member. A single wiliwili was observed at the lower end of this gulch. The forest that grows on the steep margins of the two deep gulches, Kahananui and Kaluaʻaha, may well support additional species of interest. Because of the difficult access and low likelihood that the Project will impact this very steep terrain, these slopes were not surveyed.

It is difficult to speculate on what impact the nature of the dominant introduced species has on the former native vegetation of ʻUalapuʻe, but it is likely the slopes were dominated in ancient times by pili grass (*Heteropogon contortus*, possibly a Polynesian introduction) and a mixture of shrubs such as ʻākia, ʻūlei, ʻōhiʻa, and pūkiawe with scattered wiliwili trees. All are present in small numbers on the Project site. However, the location of the Project strongly suggests that non-vascular plants, invertebrates, fishes, amphibians, or reptiles of conservation interest or concern would not be present.

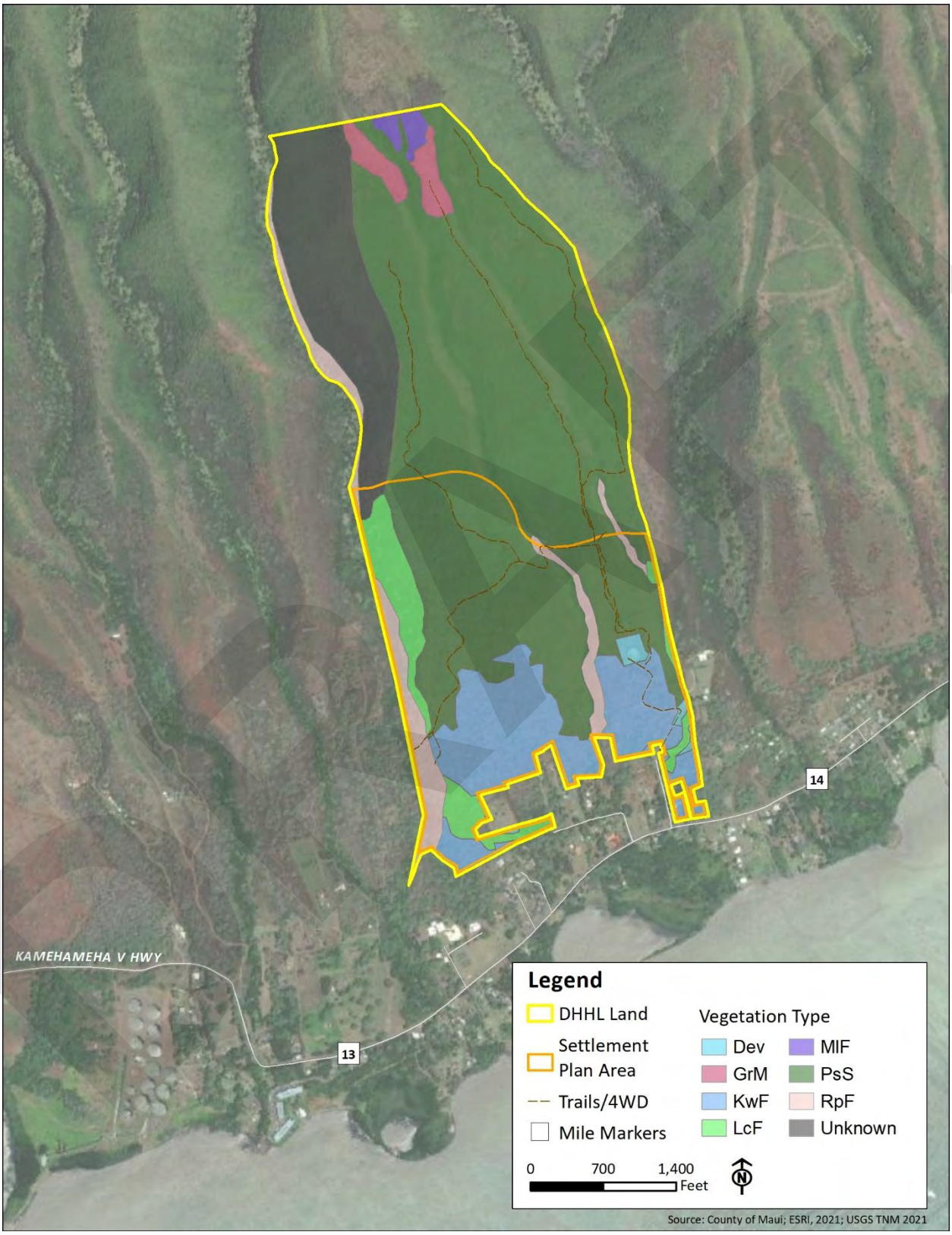
While the total number of native species is low, when considering the survey's large area and elevation range, the percentage of native plants is at least double that of typical surveys of the lowlands of the Hawaiian Islands (10 to 12%). Likely, the native plants reflect only a portion of the European pre-contact (before 1778) composition of the flora once found in this area. The forest that grows on the margins of the deep gulch Kahananui may support additional species of interest, but was not surveyed as it is difficult to access and would have a low probability of impact from the project.

Mammals

The survey recorded six mammal species within the DHHL property. These included: domestic dog *(Canis lupus familiaris),* small Asian mongoose *(Herpestes javanicus),* house cat *(Felis catus),* pig *(Sus scrofa),* axis deer *(Axis axis),* and domestic cattle *(Bos taurus).* All of the species recorded are alien to the Hawaiian Islands. No mammalian species currently proposed for listing or listed under either the federal or State of Hawaiʻi endangered species statutes were recorded in the Project area.

Although no rodents were recorded, all four of the established alien Muridae found on Molokaʻi - European house mouse *(Mus musculus),* roof rat *(Rattus rattus),* brown rat *(Rattus norvegicus),* and black rat *(Rattus exulans hawaiiensis)* - likely occur and use various resources found within the Project area. These human commensal species are drawn to areas of human habitation and activity. All of these introduced species are deleterious to native ecosystems, causing erosion, damaging native plants, spreading disease and invasive seeds, as well as providing competition for and preying upon native animals.

Figure 4-4 Vegetation Map of DHHL ‘Ualapu‘e Lands



Avifauna

The biological survey recorded 387 individual birds from 17 species during survey station counts. All of the species recorded during the course of the survey are alien to the Hawaiian Islands, and are common established human-introduced species.

Avian diversity and densities were in keeping with the highly disturbed, alien vegetation present on the site. Three species - Warbling White-eye *(Zosterops japonicus),* Zebra Dove *(Geopelia striata),* and Feral Chickens *(Gallus gallus)* - accounted for 42% of all birds recorded during station counts. The most frequently recorded species was the Warbling White-eye, accounting for 30% of the total number of individual birds recorded.

The endangered Hawaiian Petrel and the threatened Newell's Shearwater may fly over the project area between April and the middle of December in very low numbers. Suitable nesting habitat for these seabird species is not present in the vicinity of the Project site.

Invertebrates

There were relatively large numbers of butterflies seen across the Project site, especially in areas with lantana. The three most common butterflies were Lantana scrub-hairstreak *(Strymon bazochii),* clouded yellow *(Colias ponteni),* and fiery skipper *(Hylephila phyleus).*

Gulches & Waters of the United States Jurisdiction

Three gulches occur within the Project site *(Figure 3-6).* Two of the gulches, Ki'inohu and Mo'omuku, originate near Maileli'i (in the Moloka'i Forest Reserve) and bisect the DHHL parcel. Both gulches are ephemeral (flowing after a 2- to 4-day rain event), essentially dissipate on the coastal plain within developed parcels mauka of the highway, and neither gulch has a distinct surface connection to the ocean. A third gulch, Kahananui, demarcates the western boundary of the Project site and of 'Ualapu'e. Kahananui is an interrupted perennial stream that originates at the top of Kamakou ridge, reaching the ocean after flowing under a bridge on the highway. A perennial stream has year-round, continuous flow in at least part of its bed; flow need not be continuous from upper reaches to the sea in all seasons.

Kahananui Stream has a surface connection to the ocean and is reported to flow after every rain event, so that effect is likely to be categorically determined as significant. Evaluated with the potential of the stream serving as a migratory pathway for amphidromous animals, it is reasonable to assume Kahananui Stream is jurisdictional. Jurisdictional waters are surface waters that come under federal jurisdiction as authorized by the Clean Water Act and the Rivers and Harbors Act. Conversely, Ki'inohu and Mo'omuku streams do not have a surface connection to the ocean and flow is less frequent than in Kahananui, so are not likely to have a significant nexus and are not likely to be jurisdictional waters of the U.S. If specific future homesteading activities are to occur within jurisdictional limits of Kahananui Stream, a federal permit will be needed from the U.S. Army Corps of Engineers.

Although not recognized in the Hawaii Stream Assessment (1990), at least five meeting participants noted that upland streams may have been diverted (not verified), similar to other area streams in the early 1900s for plantations and ranches. If upland streams have been diverted, restoring the flow of these streams would benefit groundwater recharge, near-shore ecosystems, native wetland species, coastal spring flows, and Native Hawaiian cultural practices, such as subsistence gathering and fishing.

4.2.3 Loko ‘Ualapu‘e

The fishpond, Loko ‘Ualapu‘e, is located a short distance makai (seaward) of the highway. This is potentially another part of ka wao kānaka, where fish were cultivated. Different kinds of loko i‘a (fishponds) were found in this area, including, loko wai (freshwater pond or lake) and loko kuapā (fishpond made by building a wall on a reef).

Loko ‘Ualapu‘e is a loko kuapā, a walled fishpond constructed off the shore to raise fish tolerant of a wide range of salinity. Loko ‘Ualapu‘e is situated to the east of the Kahananui Stream mouth, but directly across the highway from the terminus of Ki‘inohu and Mo‘omuku streams, possibly indicating that runoff from these gulches was insignificant (or at least controllable via ‘auwai or ditches). It does not appear that ‘auwai still exist, but water in Loko ‘Ualapu‘e is brackish (salinity range: 0 to 29.7 ppt, average 22.3 ppt; Wyban, 1990), most likely due to pūnāwai (freshwater springs) within the loko.

Loko ‘Ualapu‘e originally consisted of 22 acres with a seawall 8 to 19 feet wide, and was constructed of coral and basalt (NPS, 2019). The date the pond was built is unknown, but it was in continuous use until the tsunami of 1960 damaged the wall and destroyed the two mākāhā (sluice gate). Hawaiians actively managed freshwater contributions to these fishponds to best facilitate growth of the life stage and species being raised in the pond. Historically, ‘Ualapu‘e was noted for the fatness of its mullets and was considered one of the best fishponds on Moloka‘i. The west side of Loko ‘Ualapu‘e was ideal for kalo cultivation.

Loko ‘Ualapu‘e shares its western wall with Halemahana fishpond. Halemahana was a small loko kuapā, approximately 3.3 acres in area. It was used commercially in 1901. This loko kuapā is now filled with sediment and the remainder of the wall has been destroyed, with only some sections of the foundation still visible in a 1975 aerial photo.

Loko ‘Ualapu‘e and Loko Halemahana are the property of DLNR. The most recent lessee was Bronson Kalipi of the non-profit group Ma‘oli Aquaculture and Agriculture Native Assistance (MA‘ANA), who, along with volunteers, took care of the fishpond in the past through grants. However, volunteer efforts were stifled due to the COVID-19 outbreak, and work on the fishpond has not been revived (pers. comm., Bronson “Duke” Kalipi, October 28, 2021).

4.2.4 Nearshore Waters

A 34-mile long fringing reef lies offshore of the south coast of Moloka‘i and extends up to 1.25 miles from the shoreline in some areas. At least 60 ancient fishponds were constructed on the south Moloka‘i shore to take advantage of mixing of freshwater from the numerous streams and springs and marine waters on the shallow reef flats (James, 2001) . The nearshore waters of ‘Ualapu‘e certainly are influenced by freshwater, but the significant contributions of freshwater and associated nutrients are primarily from the coastal groundwater. AHA members report collecting various species of limu (seaweed), including limu kohu *(Asparagopsis taxiformis)* and limu ‘ele‘ele *(Enteromorpha prolifera),* from nearshore waters. Limu ‘ele‘ele, in particular, is dependent upon some degree of brackishness and the nutrients terrestrial runoff provides.

In an interview conducted in 1989, William M. Akutagawa, Jr. describes the nearshore waters:

> *"In the front of 'Ualapu'e Pond is an extension of coral reef that runs out almost to the breakers. And this coral is like a bunched coral. You know, it's like table coral, but it runs out in a pattern. It runs straight out. And those used to be the favorite diving place for us because the fish, the kūmū, would run in and out along that coral reef that extended out from in front of the pond. There are several places they call hoaka. It's one of those like blue holes and go dive over there for kala, the unicorn fish. The reef area used to be real productive in front of 'Ualapu'e. Perhaps one of the best reproductive areas" (Nishimoto, 1989).*

The 'Ualapu'e area was noted for being one of the prime he'e (*Octopus cyanea*) grounds.

Poor land management on Moloka'i at the turn of the 19th century resulted in severe coastal erosion and, in 1902, red mangrove *(Rhizophora mangle)* was introduced to Moloka'i with the intent of stemming coastal erosion (Chimner et al., 2006). Unfortunately, the introduction of mangrove intensified problems resulting from terrigenous sediment deposition along the shoreline. At present, mangrove has invaded most of the ancient fishponds and the mangal trapping sediment is contributing to a prograding (advancing toward the sea) shoreline (Coastal Geology Group, n.d.).

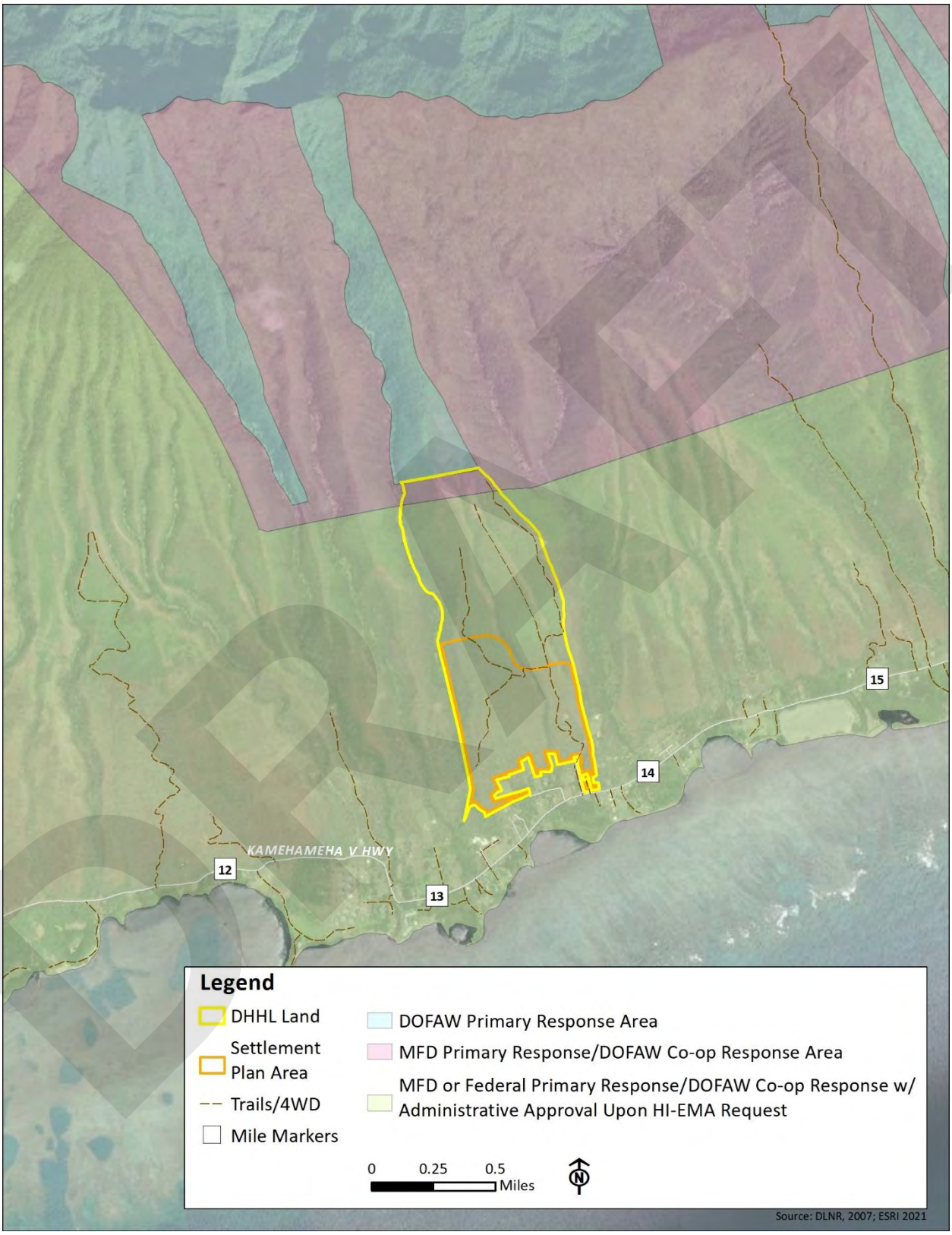
4.2.5 Wildfire Management

Management of the Conservation District areas will also require the development and implementation of a wildfire management and protection program. Wildfires are a mauka to makai issue, affecting everything from human safety, infrastructure, drinking water, agricultural production, cultural resources, native forests, watersheds, and coral reefs. In Hawai'i, 98% of wildfires are caused by people, both accidental and intentional. Communities can be at high risk of wildfire due to unmitigated fuels, limited community engagement, insufficient water and firefighting resources, and under-addressed pre- and post-fire planning and preparedness.

Initial response to the majority of wildfires, as well as all medical and other emergencies, is the responsibility of the County of Maui, Department of Fire and Public Safety (DFPS) (which services the islands of Maui, Moloka'i, Lana'i, and Kaho'olawe). DFPS has mutual aid agreements with the State Department of Transportation, Airports Division, Crash Fire Rescue Unit (CFRU) and DLNR-DOFAW. CFRU has historically supported the DFPS fighting wildfires on DHHL lands. Currently, DFPS is the primary response team for any fires in the 'Ualapu'e area (*Figure 4-5*). DLNR-DOFAW will provide cooperative response with administrative approval upon the Hawai'i Emergency Management Agency request.

Currently, the closest fire station is located in Puko'o, approximately five minutes away from 'Ualapu'e. The Fire Department has purchased a home located near 'Ualapu'e Water Tank Access Road, which will be remodeled to include firefighters' quarters and office space for three personnel. It will be renamed as the 'Ualapu'e Fire House when the Fire Department relocates from the current Puko'o station, which is expected in late 2024. The Puko'o Fire Station currently has a 1,250-gallon pumper fire engine that provides the capability of fighting larger fires with more than two firefighters, and a 30-feet utility truck that can be used in rough terrain when searching for lost hikers or responding to plane or helicopter crashes.

Figure 4-5 Wildfire Response Areas



The Hawai‘i Wildfire Management Organization (HWMO) assessed the wildfire occurrence history, hazard risk, and methods for reducing overall ignition risks for the project area. HWMO is a nonprofit organization that serves as a hub of wildfire prevention, mitigation, and planning activities in the Hawai‘i-Pacific region through proactive, collaborative, and forward-thinking projects.

To assess the likelihood of future fire occurrence in an area, it is helpful to understand its fire history as an indicator of human fire-starting behavior in an area. In general, HWMO looks at ignition history (indicating likelihood of additional ignitions), slope, wind, vegetation type (grass, shrubs, trees, and moisture content), topographical features that affect fire spread, and fire suppression response time.

Fortunately, a review of fire history in the broader ‘Ualapu‘e area indicates that the project area is generally at low risk for fire starts, due to low structure density and low ignition probability with the limited number of people that live in the area *(Figure 4-6).* However, due to steep slopes and unpaved roads, the upper areas are harder to access and more challenging for firefighting operations. A fire engine can ascend a slope of 20%, but only if paved. Without a paved road, there is limited fire support. In addition, proposed homestead lots are located over 1,500 feet away from the nearest hydrant. For wildfire response, aerial defense comes from Maui, with an estimated 15-minute wait time.

According to HWMO, there is a continual general sea to summit slope for fire to travel upslope, and strong winds will exacerbate this. There are some differences in vegetation (grasses and shrubs), where there is generally a faster spread across the more highly ignitable invasive grassy zones, and during times of drought, the shrubs and trees become another dry fuel source. The highest risk (*Figure 4-7*) tends to be in, around, and upslope of the gulches, as they are extremely difficult to access. Downslope, the lower areas are closer to accidental ignition likelihood, wherever people can access (such as community boundaries and trails/roads).

Rainfall patterns across Hawai‘i are changing and have led to intense wet and dry pulse events with heavy rains and floods as well as periods of dry and/or drought conditions. It is during these dry conditions that wildfire hazard may be high. Desiccated and dense vegetation can allow fire to spread rapidly. Combined with heavy winds and steep slopes in the area, the wildfire hazard under those circumstances increases dramatically.

Considering the increased risk of wildfire ignition as the Settlement Plan Area further develops, the DFPS may see an increase in fire responses in ‘Ualapu‘e. Wildfire management recommendations provided by the HWMO have to be integrated into the design and maintenance of the entire Project area. Adequate firefighting access (such as road width and turnaround areas), defensible space, water availability, roads to serve as fire breaks, and multiple evacuation routes are key factors of the lot scheme addressing human safety, efficient wildfire suppression, and limited wildfire impacts on the landscape. Once these basics are met in design, the best prescriptions of all include community-based and roadside fuels management as well as prevention education to reduce accidental ignitions.

Figure 4-6 Wildfire Incidents near 'Ualapu'e Between the Years 2000 to 2012

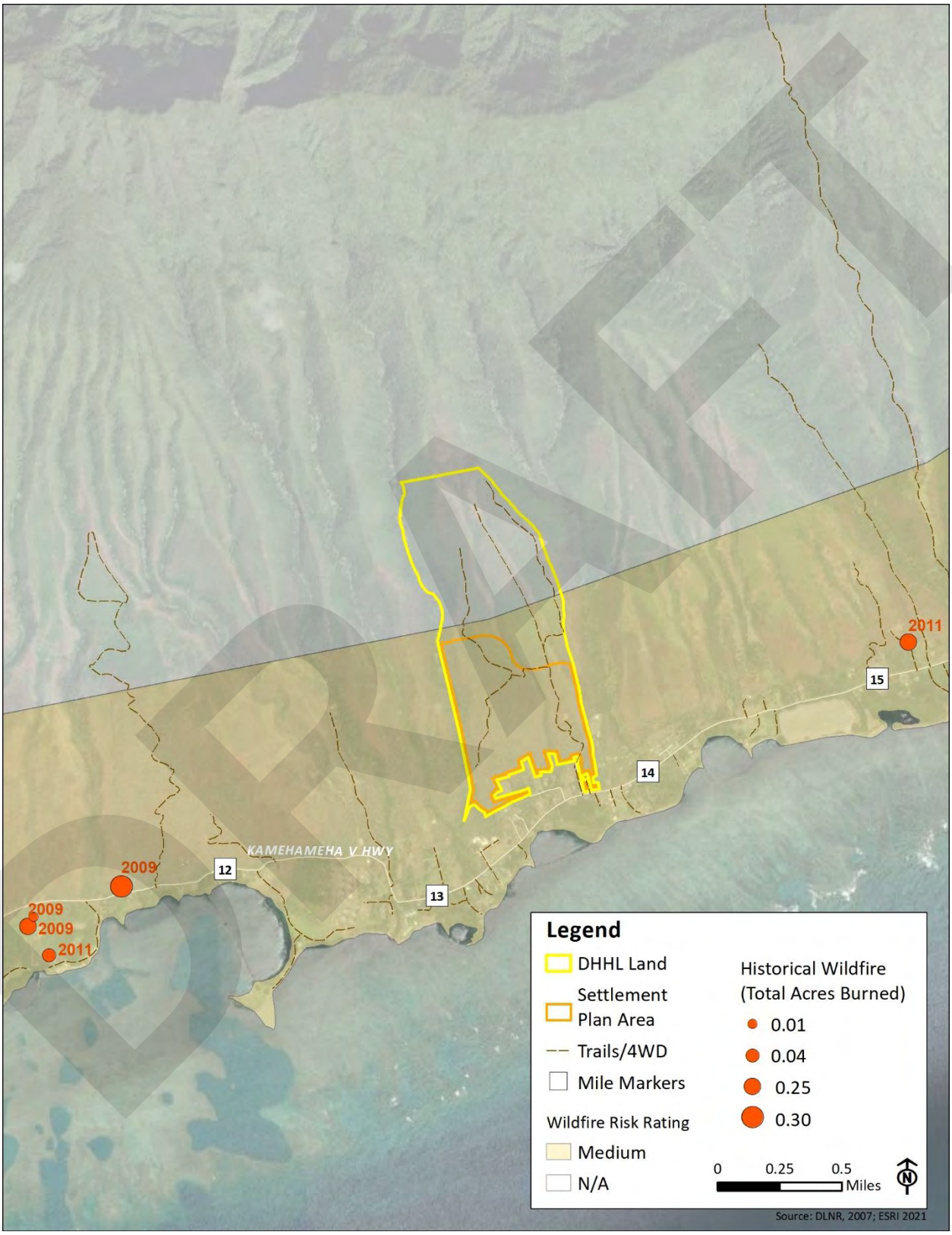
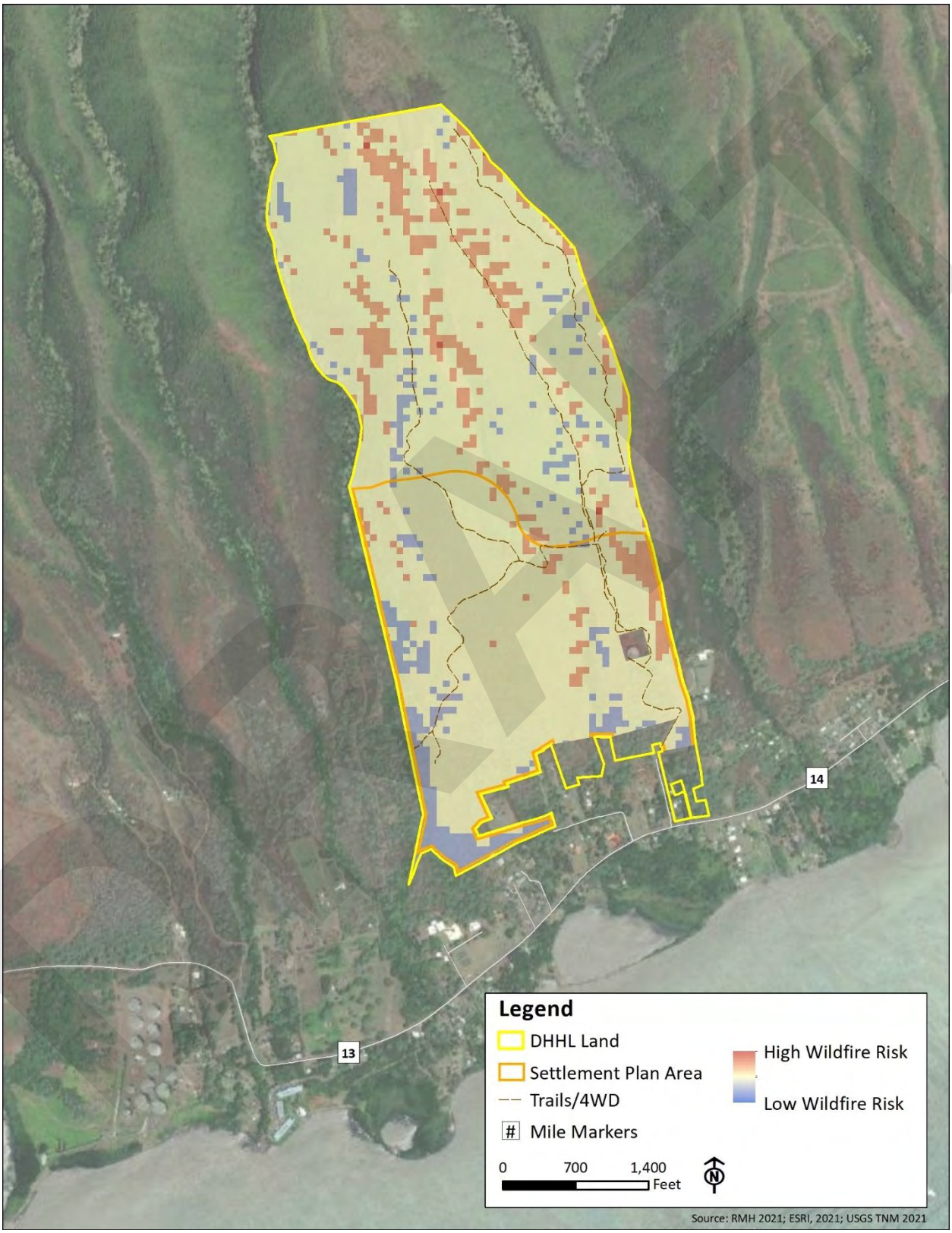


Figure 4-7 ʻUalapuʻe Wildfire Risk



To mitigate the increased risk of wildfire ignition, the Kuleana Homestead Association will require lessees to become active participants in their community to develop rules and agreements for community-based management. As part of the community-based management approach, lessees are expected to agree upon procedures to effectively manage and maintain fires in the Settlement Plan Area. The HWMO has recommended wildfire management prevention, which includes:

- reducing and maintaining vegetation along roads and in human-accessed areas
- managing grasses to interrupt continuity of fuel sources throughout the Project area
- managing "ladder fuels," or areas where ground vegetation is connected to canopy vegetation
- eliminating illegal dumping, and
- creating buffers of reduced vegetation around developed areas, including homes, agricultural structures, areas used for parking vehicles, and equipment storage areas.

Planning for drier conditions posed by an annual cycle of seasonal heavy growth of vegetation followed by a months-long drier period will also be necessary for wildfire protection. Homes built in the Settlement Plan area would benefit from ongoing wildfire mitigation measures, such as the use of noncombustible building materials, regular vegetation and debris pile maintenance, proper storage of combustible materials, and structural and/or yard sprinklers. These risk-reduction measures limit the ability of wildfire to spread across vegetated areas and reduce structural ignition potential during a wildfire incident. The national Firewise program offers a framework for neighbors in fire-prone areas to get organized, find direction, and take action to increase the ignition resistance of their homes and communities. The Hawai'i-Firewise approach is based on community and capacity building within and between all of Hawai'i's communities through actions that reduce wildfire hazards, such as, promoting both individual and community-level responsibility for safer home construction and design, ongoing landscaping and vegetation maintenance, and taking actions that ensure effective emergency response. Becoming a Firewise community increases wildfire safety and resiliency / readiness, unites community, builds new partnerships, and gain greater access to federal grant funding for projects. There are 15 Firewise communities in Hawai'i.

A portion of the space allocated for Community Use near the 'Ualapu'e Water Tank could be used as a staging area to set up a dipping pool for firefighting purposes. This would be the same area with a Resilience Hub for the community to evacuate to in case of tsunami or other disaster. The staging area should be relatively flat and easily accessed to accommodate a pumper truck and other several parked trucks in addition to the temporary water tank. The area above should be unobstructed for helicopters to access.

The Homestead Association would need to store and maintain the portable dipping tanks. To accommodate the size of the Settlement Plan Area, the homestead association should plan for a 3-5,000 gallon tank up to 16' x 16'. There are several types of tanks the association could utilize including: supported (steel or aluminum frame), or self-supporting (onion tanks, blivits, pillow, or bladder). See *Figure 4-8* below for concepts.

After any fire, post-fire stabilization of soils is important. In particular, the slope and particular type of soil in 'Ualapu'e make the area prone to erosion and flooding. Wildfires can intensify erosion issues by removing soil-stabilizing plants and changing soil properties to become more erodible. Since the highest risk of catastrophic events happens during the first year after the fire, the implementation of any emergency treatment must be conducted quickly after the fire. Stabilization treatments should consider the effectiveness of the treatment, the cost of production and transport, and values-at-risk to be protected. Some suggestions include seeding, erosion barriers, and mulching. To be most successful, the Homestead Association should include both pre- and post-fire processes in their fire management plan.

Figure 4-8 Portable Dipping Tanks for Fire Protection

4.3 Recommended DHHL Land Use Designations for ʻUalapuʻe

4.3.1 Conservation District Designation

The 2005 Molokaʻi Island Plan recommends designating approximately 78 acres at the upper mauka-most border of the DHHL property as Special District. According to the 2022 DHHL General Plan, a Special District is an area requiring special attention because of unusual opportunities and/or constraints. The intent for this area in the 2005 MIP was to create a natural resource management and subsistence area for the protection of several endangered and/or threatened flora species, coupled with a subsistence forest area for gathering forest and stream resources for cultural and subsistence practices.

However, through conversations with DHHL, the Conservation District is a more appropriate land use designation than the Special District for the most mauka portion of DHHL's ʻUalapuʻe parcel. According to the 2022 DHHL General Plan, a Conservation District is an environmentally sensitive area (e.g. lands with watersheds, endangered species, critical habitats, sensitive historic and cultural sites) with very limited uses. Permissible uses within the Conservation District include: cultural practices, gathering of traditional resources, harvesting of feral ungulates, aquaculture, watershed protection, restoration, and forestry. While the Special District designation could still apply, the Conservation District is more applicable in its intent to protect and manage environmentally historic and cultural sites, and other environmental factors.

Further, this region can also be designated as a hunting safety buffer (which currently does not exist) and subsistence forest area, as it was identified by the community as an area currently utilized for gathering forest and stream resources for cultural and subsistence practices. As mentioned in the AHA Strategic Plan (2019), this area can be reforested with native plants, and to rejuvenate the soil as close to it's natural origin as possible. Soil enrichment activities and recommended native plants for reforestation can be found in the 1990 Master Plan for 'Ualapu'e Ahupua'a. These activities support the East End Policy Statements goal of preserving, protecting, and managing Mana'e's rich natural resources and ecosystems to ensure that future generations may continue to enjoy and protect the natural environment.

Due to their importance as drainageways that exhibit steep and irregular topography, the Ki'inohu, Mo'omuku, and Kahananui gulches in 'Ualapu'e are also recommended for designation as DHHL Conservation District up to the ridge of the gulch, then extended an additional 20 feet as a wildfire buffer. Disturbing the gulches through development could lead to increased erosion and impacts to stream water quality, thus, streams and gulches in the project area should in no way be developed or obstructed. The Conservation District for DHHL's 'Ualapu'e parcel includes areas both near the parcel's mauka border and the areas around the three gulches for a total area of 149 acres *(Figure 4-9)*.

The function of the Conservation District is similar to that of the wao akua, wao kele, and wao nāhele zones. The primary function of the wao akua zone is as a perpetual source population for endemic biodiversity and is accessed only under strict protocol. The primary function of the wao kele zone is to maximize water recharge and is accessed for transit-through via trails. The primary function of the wao nāhele zone is to maximize habitat for native birds, and was accessed mainly by bird catchers and feather gatherers (Winter et al., 2018). The functions of the Conservation District overlaps with those of the Moloka'i Forest Reserve.

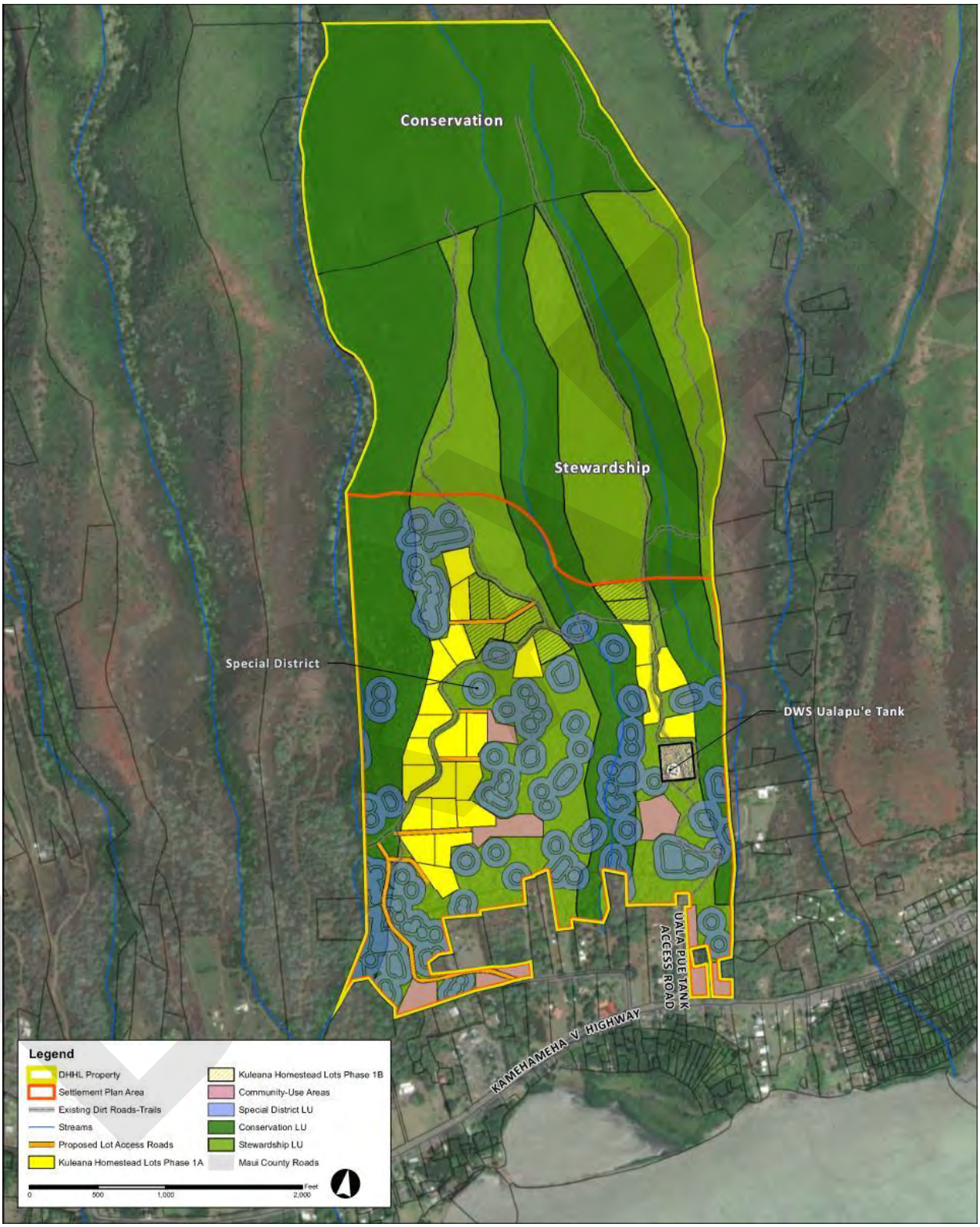
Directly mauka of the Conservation District, the East Moloka'i Watershed Partnership (EMoWP) is working with DOFAW to manage the Moloka'i Forest Reserve. The purpose of EMoWP is to protect and enhance the quality of Hawai'i's rainforest communities. Current land management techniques employed by the EMoWP are protecting the upper forest using a contour fence, reducing goat populations, and establishing a monitoring system to help assess stream flow and the reduction of siltation which both are contributing factors to the integrity of near-shore reef and fishpond ecosystems along the coastline.

'Ualapu'e would benefit from future coordination and partnerships with DOFAW officials and other members of the EMoWP that have an interest in land use activities adjacent to the DHHL boundaries, and establish policy guidelines that design best management practices for this area. These practices would be to ensure that wildlife habitats that are home to endangered and threatened species are protected from human and ungulate-related activities. These practices should include an annual count of available game; maintenance and upkeep of access roads; enforcement of hunting regulations; fire protection; and the upkeep of hunter check-in stations.

Currently, DHHL is not a partner with the EMoWP but given the existing partnerships that do exist for watershed protection, it is strongly recommended that the Department or the homestead association apply to the EMoWP to become a participating member to facilitate it's own natural resource management program (DHHL, 2005). It is recommended that that AHA work with these groups to form a management plan and request a Right-of-Entry from DHHL to restore native vegetation while they wait for the award process to occur.

Controlling threats such as hoofed animals and invasive weeds are key strategies to protecting the best remaining native forest areas and to increase vegetation to the highly denuded, eroding mid-elevation slopes and thus reducing the sedimentation rate that severely impacts the adjoining fringing reefs.

Figure 4-9 DHHL Parcel Land Use Designations



4.3.2 Stewardship District Designation

The 2005 Moloka'i Island Plan also recommended designating approximately 299 acres below the Special District as General Agriculture. The intent for this area was to preserve the land for future uses while making it available to individuals and groups for short-term lease. In the 2022 DHHL General Plan, the General Agriculture land use designation was replaced by the Stewardship land use designation. The Stewardship designation opens these lands for use by beneficiaries or DHHL to provide more immediate benefits to the surrounding community and the Trust. Permissible uses within the Stewardship district include: agriculture, ranching, aquaculture, cultural practices, gathering of traditional resources, game management, watershed protection, restoration, and forestry. These uses may require a general lease, license, or Right of Entry. A Stewardship District for DHHL's 'Ualapu'e parcel is shown with a total area of 85 acres in *Figure 4-9.*

The function of the Stewardship district is similar to that of the wao lā'au and wao kānaka zone. The primary function of the wao lā'au zone is to maximize the availability of timber and non-timber forest products, and the primary function of the wao kānaka zone is landscape augmentation to maximize the availability of food, medicine, and housing (Winter et al., 2018). Though this area will not be made available for housing, these areas can be managed to provide benefits to the community. The additional agricultural use of the Stewardship designation invites further discussion (see *Section 7.5).*

Proposed uses for Stewardship lands could include limited opportunities for diversified agriculture outside of the kuleana homestead (including large-scale and small-scale agriculture and community gardens); establishing portions of the mauka regions as an extension of the proposed subsistence access for hunting and gathering purposes, as well as, cultural practices; and providing the opportunity for watershed protection through forestry and plant restoration. In general, no infrastructure improvements are proposed within this area, although water catchment and incinerating or composting toilets would be allowed. The roads should be maintained in their current unpaved condition.

4.4 Future Natural Resources Management Plan Framework

While this Kuleana Homestead Settlement Plan identifies appropriate zones or land use designations for 'Ualapu'e, future planning efforts are needed to identify specific and detailed management activities that need to occur in each zone. A community working group composed of DHHL beneficiaries including hunters, conservationists, subsistence users, practitioners, and other gathers; and advisor experts in biology, botany, forest management, agroforestry, agriculture, and wildfire could convene to develop a draft Natural Resources Management Plan (NRMP). This working group should consider the areas wao, and Conservation and Stewardship District land use designations, the kapu and kānāwai of the area, community and beneficiary input, relevant plans (See *Section 4.4*), and the relationship between the NRMP area and the Moloka'i Forest Reserve. The following provides a starting point for this working group.

The first kapu of the Honuaiākea Process, Ua ka ua, Kahe ka wai, reveals the need for the restoration of water flows within the ahupua'a. During community and beneficiary meetings, comments and concerns were received regarding stream and native plant restoration, wellhead protection, and potable water. Native plant restoration and protection goals are found in many of the aforementioned plans, and can help to protect watersheds and keep the water flowing to all inhabitants of the ahupua'a. Specific actions that can be pursued include controlling ungulates, fencing for ungulates, planting windbreaks and native plants, and replacing invasive plant species with native ones.

The second kapu of the Honuaiākea Process, Koʻa (ākoʻakoʻa, pūkoʻa), reveals the need for teaching the community and future generations. During community and beneficiary meetings, comments and concerns were captured related to food resources, teaching, sustainability, mālama ʻāina, and gathering and fishing in coastal areas. Hunting activities are conducted in the NRMP area and the Molokaʻi Forest Reserve for subsistence, and provides valuable ecosystem services. Sustainability and intergenerational natural resource management are concepts at the forefront of many of the aforementioned plans. Access to these areas by community is imperative and most beneficiaries believe that the community should have access to these lands. Specific actions that can be pursued include place-based educational programs, protecting natural resources and native habitats, and supporting hunting opportunities in the area.

The third kapu of the Honuaiākea Process, Kui ka ʻina, reveals the importance of the kai. Erosion from 4x4 access trails, ungulates, and construction can impact the environment and practices located makai of the Project area. During community and beneficiary meetings, erosion, run-off, and the impacts of that run-off on the natural resources of the kai and fishponds were mentioned. The 1990 Master Plan for ʻUalapuʻe Ahupuaʻa, 2008 Molokai Future of a Hawaiian Island, and 2009 Molokaʻi Forest Reserve Management Plan are resources that can provide methods for mitigating erosion. Specific actions that can be pursued include planting of hedgerows and checkdams, reforesting, controlling ungulates through hunting and fencing and monitoring, maintaining groundcover, and managing the land.

Ultimately, the NRMP could be adopted formally by the Hawaiian Homes Commission. A Hawaiian Homelands Beneficiary community-based non-profit such as AHA or the homestead association formed after land awards, can then implement the NRMP and manage the Conservation and Stewardship Districts. A community non-profit will enable the community to be directly responsible for the area and enable funding opportunities for the area that would otherwise be unavailable.

4.4.1 Previous Plans for the Protection and Preservation of Biological Sites

Future natural resource management planning should take into consideration previous plans for the protection and preservation of biological sites including, but not limited to, the plans described in this following section.

DBEDT-Master Plan for ʻUalapuʻe Ahupuaʻa (1990). The Plan considers three equally important goals for the ʻUalapuʻe ahupuaʻa: economic planning, care of natural resources, and community needs, and provides specific recommendations for different elevation zones. Especially relevant for natural resource management for the DHHL ʻUalapuʻe parcel are the recommendations found for Zone 2 (125-1600 feet) including the planting of: kukui, maile, koʻokoʻolau, wauke, lama, hala, ʻulu, and ʻuala for subsistence, cultural, and commercial reasons; soil enrichment through composting, mulching, and planting nitrogen fixing plants; and erosion control through plantings of hedgerows and creating checkdams.

Molokai Community-Molokai Future of a Hawaiian Island (2008). A future is envisioned where Molokaʻi is known world-wide as a community committed to the sustainable management of it's land and natural resources. Environmental objectives and key projects include: a) Soil Reclamation – removing soil runoff from the ocean, fishponds and streams, and then restoring the land for agricultural use; b) Green Molokaʻi - calls for the "greening" of the entire island of Molokaʻi, with reforestation and windbreak projects at specific sites for environmental and/or economic reasons, as well as the need for a native plant nursery to provide the plants; c) Watershed Protection for East End Native Forests - This project combines fencing with open access for hunters in areas where landowners are willing to

enter into conservation partnerships. These measures are aimed at protecting the native flora and fauna in the forests from damage by goats, deer and pig, so that the watershed remains healthy; d) Wind Breaks - High winds cause crop damage and loss of water due to evaporation. Windbreaks can be planted along individual lots, and include native trees and trees with secondary market value (such as fruit trees and hardwoods).

County of Maui & Mālama Pono o Ka 'Āina-Mana'e GIS Mapping Project (2008). The Mana'e GIS Mapping Project collected, presented, and analyzed data on the natural and cultural resources in the Mana'e region of Moloka'i for community use in the natural resource planning process. The project provided implications for planning, including that natural and cultural resources should be recognized and protected; subsistence practices are vital to the residents of Moloka'i and their lifestyle, and the main components of the traditional food system in Mana'e should be protected, including the wetland (lo'i kalo and loko i'a), the coastline, and nearshore waters. Development in Mana'e should be directed to areas that can handle it best, in order to protect the sensitive resources located there.

DOFAW-Moloka'i Forest Reserve Management Plan (2009). The objectives of the Plan are to maintain a healthy watershed include protecting forest resources from fire, insects, and disease, and maintain habitat for threatened, endangered, and rare plants and animals. The priorities of the Plan relevant to 'Ualapu'e include: 1) managing the Forest Reserve to protect and promote watershed values by supporting and promoting aquifer recharge and the reduction of soil erosion through maintenance of groundcover, ungulate control, and land management; 2) protecting resources by controlling and minimizing the effects of fire, insects, disease, and illegal activity on Forest Reserve resources through the implementation of a region-specific fire mitigation plan, collecting data for the Hawai'I Fire Danger Rating System, and consulting outside aids; 3) protecting and restoring native habitats by collaborating with research and management agencies to develop management strategies for native species ecosystems, and removing undesirable flora and fauna from remote and/or recognized high quality native areas; 4) managing threatened, endangered, and rare species by collecting population data for native snails and ground nesting seabirds, and maintaining existing plant exclosures and construction of new ones; 5) managing game animals by expanding mammal-hunting opportunities, conducting special hunts as needed, conducting annual animal surveys, and sustaining game bird populations; 6) increasing public access to the Forest Reserve and maintaining existing infrastructure; 7) controlling both incipient and established invasive plants and animals through chemical and mechanical weed control and biological control under appropriate circumstances with input from cooperators and support from biological control research.

East Moloka'i Watershed Partnership-The Pāku'i Watershed Project FEA (2017). The Pāku'i Watershed Project FEA proposed to create a protective fence for the "Pāku'i Unit" to help improve and protect the structure and function of the approximately 2,080 acre Pāku'i watershed, the irreplaceable native Hawaiian forest therein, and the rare and endangered species it supports. The FEA describes management efforts within the fence that the community can consider including in their natural resource management plans: hunting and trapping efforts to control ungulate numbers within the fence, weed removal using an Integrated Pest Management approach, restoring native plants and animals once feral ungulates have been removed, and monitoring vegetation and ungulates.

County of Maui-Moloka'i Island Community Plan Update (2018). The Plan includes the East End Policy Statement, the community's reaffirmation of the importance of protecting Mana'e as a special place for all of Moloka'i as a pu'uhonua (place of refuge), cultural kīpuka (clear place or oasis), and a place essential to 'āina momona for its abundant fishponds, lo'i kalo, rich forests, streams, and springs. The goal for this area is to preserve, protect, and manage Mana'e's rich natural resources and ecosystems to ensure that future generations may continue to enjoy and protect the natural environment. Policies

relevant to ‘Ualaupu‘e’s DHHL parcel include: support control of grazing domestic and wild ungulates, support hunting opportunities for Moloka‘i residents, support harsher penalties for the indiscriminate slaughter of wildlife, support appropriate sewage disposal to protect groundwater and marine resources, support planning that would protect Mana‘e’s unique environment and the natural resources, review and assess Mana‘e’s sewage needs and implement appropriate infrastructure.

Chapter 5: Plan for the Identification, Protection, and Preservation of all Significant Historical and Archaeological Sites

5.1 Methodology as to the Identification of Historical and Archaeological Resources

In 2021, Keala Pono Archaeological Consulting (KPAC) initiated an archaeological reconnaissance survey of a small portion of the project area in support of the proposed 'Ualapu'e Kuleana Homestead Project. A Field Letter documented the presence of eight archaeological site-features discovered in this initial work—presumably traditional Hawaiian sites - including terraces, rock walls, modified outcrops and a mound. One artifact was identified as a traditional Hawaiian stone disc with a pecked, concave depression in the center of one side. It was photographed and left in place.

An Archaeological Literature Review and Field Inspection (ALRFI) by Honua Consulting (Honua) is presented in *Appendix D.* The objectives of the ALRFI were to: 1) document and describe the parcel's land use history in the context of its traditional Hawaiian character as well as historic period changes; 2) identify any historic properties or component features in the study area; 3) and provide information as to the possibility of encountering subsurface historical features during project implementation.

The literature review portion of the ALRFI consisted of previous archaeological research and archival research, which included reference to resources from the State Historic Preservation Division (SHPD) library in Kapolei and the Honua Consulting library and database. On-line materials consulted included Ulukau Hawaiian Electronic Database, Papakilo Database, Hawai'i State Library and Waihona 'Aina database. Hawaiian terms and place names were translated using the on-line Hawaiian Dictionary Soehren (n.d.) and Place Names of Hawaii (Pukui et al. 1974). Historic maps were obtained from the Hawai'i State Archives, Hawai'i Land Survey Division website and UH-Mānoa Maps, Aerial Photographs and GIS (MAGIS) website.

As part of the ALRFI, fieldwork for this project was conducted for approximately three weeks on March 21-25, May 16-20 and June 28-30, 2022, by the archaeological team. The fieldwork was conducted under archaeological permit number 22-26 issued to Honua Consulting by the Department of Land and Natural Resources, State Historic Preservation Division (SHPD) in accordance with Hawaii Administrative Rules, Chapter 13-282. Approximately 52 person-days (416 person-hours) were needed to complete the field work to date and represents one of the most comprehensive studies every completed in the region.

A review of past interviews with 'Ualapu'e residents was conducted. Additionally, seven (7) new ethnographic interviews were conducted for this project, one by KPAC and six by Honua. A summary of those interviews are also provided in this report.

5.2 Ancestral Memory in the Landscape

Hawaiians inherited knowledge of place, knowledge of practices, knowledge of kindship from their ancestors. One report on the use of traditional Hawaiian knowledge in contemporary management practices of marine resource states: "the "ancestry of experience stored in the memories of living Hawaiians is still transmitted largely through non-written processes. It is taught to succeeding generations by telling stories, creating relationships, and establishing personal meaning." Those connections are codified and are readily discernible in this area of Molokaʻi with the extent of place names and other storied traditions that demonstrate how Hawaiians of this place found the means and wherewithal to not just survive but thrive in abundance over 2,000 years prior to European contact.

5.3 Context of Traditional and Post-Contact Landscape

Per the LRFI, ʻUalapuʻe was, and continues to be, well suited for traditional subsistence and agricultural activities. In pre-contact times (pre-1778) the valleys on the southeastern coast of Molokaʻi had a substantial Hawaiian population following a traditional, subsistence lifestyle. This general conclusion is based on the large number of fishponds along the coastline, numerous heiau (traditional places of worship) at commanding locations along the coast and on ridgelines leading up into the mountains, the relatively abundant, narrow ahupuaʻa in the area (implying a relative abundance of food resources) and relatively dense clustering of kuleana parcels (Land Commission Awards [LCAs]) primarily along the coastline and lowlands of ʻUalapuʻe.

This part of Molokaʻi has numerous stream valleys that allowed for rain-fed agriculture in the uplands and irrigated agriculture along the coastal plain, as well as an extensive fringing reef that provided abundant marine resources. This section of Molokaʻi coastline was intensively used for constructing fish traps and large walled fishponds. Based on the distribution of mid-nineteenth century LCAs in the area, the main settlement area of the population at the time was along the coastline of ʻUalapuʻe with loʻi (pond fields) and kula (pasture) lands extending back mauka (inland) along Kahananui Stream to the back of the valley. The numerous heiau in the area indicate it was a chiefly power center with a large Hawaiian population, social stratification, and a division of labor.

Molokaʻi has the most fishponds of any island in the archipelago with over 60 documented along its extensive, south-coast fringing reef (Cobb 1902). Fishponds played a significant role in Hawaiian society not only for food production but also as political tools and status symbols of the high chiefs. Two walled fishponds (loko kuapā) are along the coast at ʻUalapuʻe: Halemahana, which has now been filled in, and the 22.25-acre ʻUalapuʻe fishpond. Both are loko kuapā, a type of fishpond whose main characteristic is a seawall (kuapā, often shorted to pā) as its artificial enclosing feature and which in most cases contains at least one sluice gate (mākāhā). ʻUalapuʻe fishpond has numerous freshwater springs that were favored by mullet and clams (see *Chapter 4).* The west side of ʻUalapuʻe fishpond was ideal for kalo cultivation, while the inland region of the ahupuaʻa would have supported its namesake – ʻuala. These fishponds lie outside of the KHSP project area.

There are three main heiau that have been identified by previous studies. The heiau Puʻukuhe is listed for ʻUalapuʻe by Stokes (1909), but was never found. Two other prominent heiau, Kalauonākukui and Kalauonokukui, are situated on the ridgeline and mark the ahupuaʻa boundary. According to historical documents, these heiau are agricultural heiau dedicated to the akua (diety), Lono. Lono is the akua of many natural processes, including oxygen and atmosphere, and is the akua of agriculture and harvest. The prominence of heiau dedicated to Lono signifies the longstanding relationship with this ʻāina and bountiful agricultural practices.

Other heiau are located in or near to the lower portions of the primary gulches. Community members told of the existence of a heiau dedicated to kapa making; wauke and māmaki were grown in cool, shady areas of the valley in ʻUalapuʻe. It was said that the kapa produced there was stitched together to form kapa moe (sleeping blankets). ʻUala was used to produce a purple dye for this kapa.

ʻUlu maika is a sport akin to bowling, where a round, smoothened rock disc is rolled between two stakes. ʻUalapuʻe was home to the kahua maika (a space designated for ʻulu maika) known as Kaʻakeke. Kaʻakeke began near Kaluaʻaha and went in a straight line to Kahananui stream. The course was a straight groove, much like a ditch. The kahua maika did not utilize stakes like other kahua maika, rather, it was for distance. If the ʻulu maika could be rolled up on the other side of Kahananui Stream to a place called Milimaʻa, that stone was the winner. It is said that Kaʻakeke was a difficult course, and for this field came the proud boast "Pohapoha keiki o Kaʻakeke (The lads of Kaʻakeke make resounding noises)" - perhaps because they were such strong maika throwers. It is a place where chiefs gathered and Kamehameha I visited in 1812. He had evidently been there before, as John Papa ʻĪʻī said: "…the king sailed to Molokaʻi to see again the maika field Kaʻakeke".

In the post-contact periods (post-1778), moʻolelo from the neighboring Kaluaʻaha ahupuaʻa indicates that, in 1794, Kamehameha set up a portion of his retinue from Hawaiʻi Island in the area. The residents grew tired of the occupiers constant demands, and plans were made to poison their ʻuala with ʻauhuhu (fish-poisoning plant). This led to the posioning of all of the Hawaiʻi Islanders except for one who was spared to tell Kamehameha of their fate. Following their expulsion, the Molokaʻi chiefs regained control of their land and moved back into the area (Summers 1971). Similarly, the late kupuna Aunty Zelie Sherwood of Manaʻe (OHA, 2017), spoke of how the hoaʻāina (native tenants) were able to escape the oppressive rule of an Oʻahu chief. They poisoned all of the visible waters, while secretly gathering fresh water from the legendary Loʻipūnāwai, a coastal spring hidden in the center of ʻUalapuʻe fishpond.

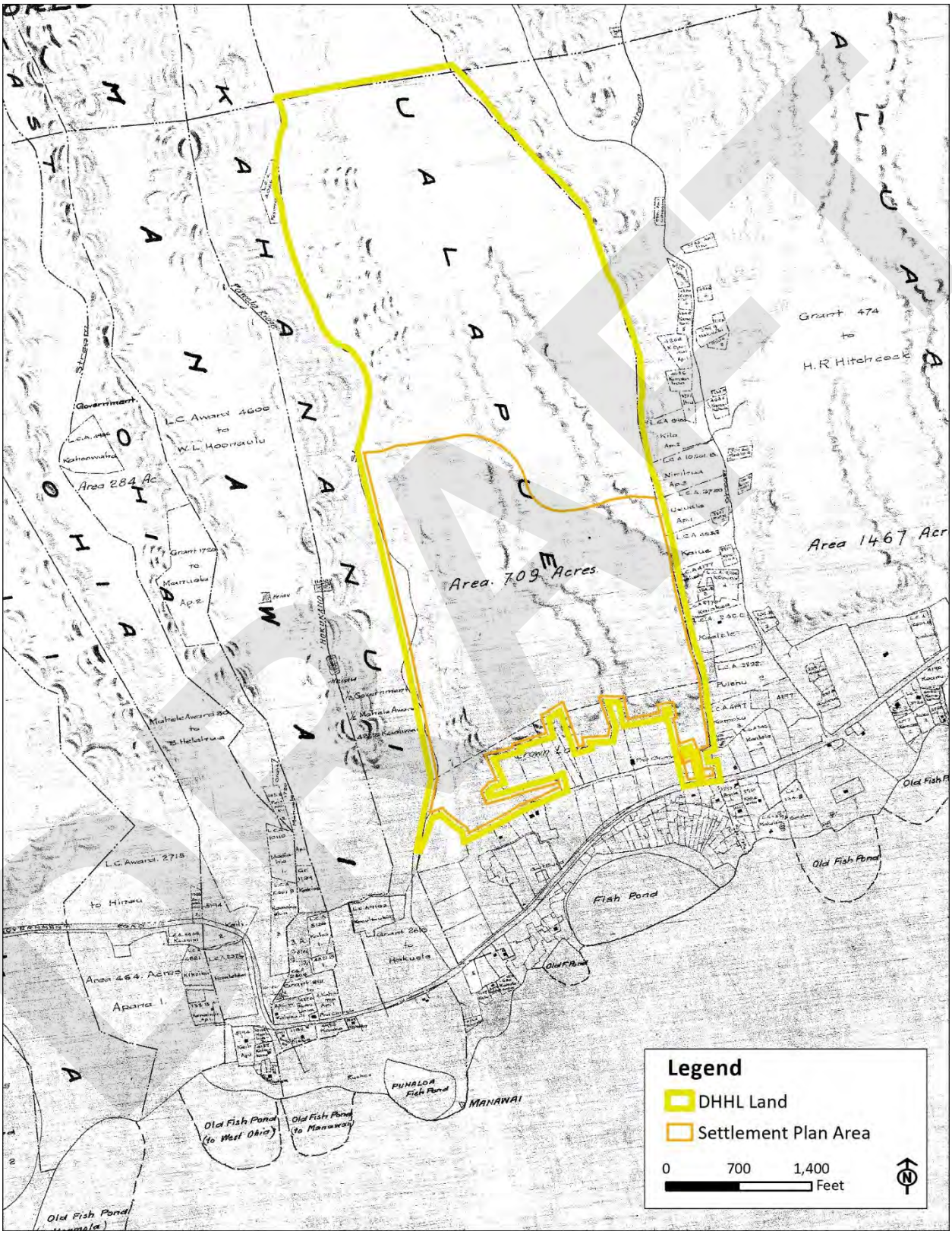
5.4 Distribution of Māhele ʻĀina, Land Grants, and Historic Land Tenure

Between 1847 to 1855, the lands of Hawaiʻi were divided under what was known as the Mahele, a legal and administrative process that held the land interest of the Mōʻī (king), the aliʻi (chief) and konohiki, and the government. This process led to the formal privatization and ownership of land by both native-born tenants and foreigners.

Numerous Land Commission Awards (LCA) were awarded to natives of ʻUalapuʻe who actively lived on and worked their lands; and who could provide testimony and sworn witnesses to prove ownership. LCA documents typically contain information on land boundaries and names of abutting neighbors, land uses and natural and cultivated resources. Patterns of LCA location also generally indicate where the best lands were for subsistence agriculture and settlement. Over 30 LCAs were awarded in ʻUalapuʻe Ahupuaʻa in the lower flatlands around and near ʻUalapuʻe Fishpond, and along the coast in general; these LCA consist of loʻi kalo (irrigated taro fields), kula lands and a few house lots *(Figure 5-1)*.

No LCAs were awarded in the current project area. The remainder of the ahupuaʻa, including the current project area, was initially retained by the Crown for an initial payment of $50 by Kamehameha III in 1847. Starting around 1846, Land Grants (LGs) were established as another means to purchase property from the Government rather than going through the LCA process. No LGs were purchased in ʻUalapuʻe until the mid-1890s and early 1920s.

Figure 5-1 Project Area in Relation to Land Awards (Wall 1917) in ʻUalapuʻe



Additionally, historic maps and records indicated twenty-two (22) lots that were established by the then provisional government around 1894. The purpose of these lots were to accommodate residents relocated from Kalaupapa via land swaps and land grants. Each lot was to consist of a house lot and an associated loʻi kalo around ʻUalapuʻe Fishpond. However, some of these lots were repurposed for other uses including the site of the ʻUalapuʻe Hospital, ʻUalapuʻe Park, and ʻUalapuʻe Cemetery.

From Māhele claims and historic maps, most of the Hawaiian population in ʻUalapuʻe lived along or near the coast. Although the population had declined at the close of the nineteenth century, people were still making a living in communities on the eastern third of the island. Due to its central location, ʻUalapuʻe was chosen as the county seat and steps were taken to expand its community infrastructure. The ʻUalapuʻe Hospital was constructed in 1928 and operated as the county hospital for nearly seven years. However, in 1935, the admininstrative center of the island was moved from ʻUalapuʻe to Kaunakakai, likely due to its more central location and good harbor; this process included the physical re-location of the adminstrative buildings and courthouse to Kaunakakai. The operations of the county hospital also moved to Kaunakakai and the former ʻUalapuʻe Hospital became the Kilohana School.

A water pumping station, a water pipeline right of way and water distribution tanks with an associated road were constructed in the southeastern portion of the project area as early 1937 then later replaced in 1956 with it associated access. The land for the water tank facility was appropriated by the Territorial Government under Executive Order 806. Historical photos show much of the project area already denuded of vegetation, likely from the extensive use as pasture.

Although many of the single-family homes and buildings within or near ʻUalapuʻe were originally constructed in the 1920s, like the former Ah Ping Store, the majority of the homes seen today were built between the 1980s and 2000s. The only residential subdivision in ʻUalapuʻe, the Kilohana Kai condominiums, was built in the late 1990s and the Kilohana Recreation Center was constructed on the park land adjacent to the Kilohana School around that same time.

In 1994, the lands of the project area were awarded to the DHHL as part of Act 395, Session Laws of Hawaiʻi 1988. The land transfer from DLNR to the DHHL was completed in 1999 (DHHL 2019). ʻUalapuʻe has seen relatively little growth in recent time and continues to be a rural community of approximately 393 residents according to 2020 United States Census data. Currently, the project area is mainly undeveloped alien dry shrubland, alien dry forest, and native wet forest.

5.5 Previously Conducted Archaeological Studies

Due to the overall lack of modern development in the project-area vicinity, the triggering requirement to complete a historic preservation review has been absent; therefore, the number of archaeological studies conducted in the general vicinity have been quite limited. The completed studies have included:

- A survey of Keawanui Ahupua'a
- A survey and archaeological monitoring for the Kaluaʻaha Estates subdivision
- A survey of Lots 11 and 12 of the ʻUalapuʻe Lots
- A survey for the relocation of the ATON Light at Kaʻamola Point
- A series of literature reviews, surveys, monitoring and burial treatment reports associated with development at the former D&J Ocean Farms property

- A survey of a private property
- A cultural impact assessment for the East Molokaʻi upland fencing project
- A partial survey of a small portion of the current project area.

The types of traditional Hawaiian sites documented in the project-area vicinity include numerous heiau and fishponds, habitation sites, cultivation/garden site-features, several subsurface cultural deposits, the kahua maika of Kaʻakeke, a traditional Hawaiian water procurement area, and a flexed human burial. The historic sites in close vicinity included stacked rock walls, a possible livestock enclosure, and the Kilohana School which once operated as the county hospital. *Figure 5-2 and Figure 5-3* illustrate the extent of studies and previously documented archaeological sites in and near the project area.

5.6 Summary of LRFI Field Work

The LRFI consisted of a pedestrian survey of portions of the Settlement Plan Phase 1A area (*Figure 5-4*). The standard of practice to conduct a pedestrian survey include setting up a series of transects, or imaginary lines through a natural landscape so that visual observation and measurements can be made. The purpose of the LRFI visual inspection was to identify any surface level historic sites and/or observe any ground disturbance areas for artifacts or exposed cultural deposits.

The survey transects generally proceeded in a north/south orientation with archaeologists spaced out in approximately 10 meters (approximately 32 feet) intervals. Depending on the extent of visibility and terrain, those transects can widen or narrow. Digital photographs recorded area vegetation, topography, and condition of structures or objects that were preliminarily identified as a potential historic or cultural resource. A portion of the Settlement Plan area along the existing road access given the extent of already present disturbance. However, some of this area highlighted patterns of erosion, cattle grazing, and constructed paddocks.

In summary, the LRFI field investigation identified a total of 103 possible historical and/or cultural sites (*Figure 5-5*). This includes 98 sites identified by Honua as well as four (4) sites previously identified by Keala Pono (McElroy 2022) and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui. *Table 5-1* provides a site summary for all of the sites identified during the study.

Most of these sites (61 of 103, or 59.2%) are traditional Hawaiian constructions that date from the pre-contact to early historic period. These include at least 22 habitation sites and a few shelters, and at least one of which includes a possible burial feature. One distinctive and ubiquitous construction style of traditional Hawaiian sites identified at dozens of sites in the Settlement Plan area is use of a windbreak of stacked and/or piled rocks along the northeast/east facing sides of site-features. These windbreaks are clearly intended to block the prevailing trade winds from the northeast/east.

The traditional Hawaiian sites also include one koʻa (fishing shrine) near the center (*Figure 5-6*); and two site complexes interpreted as heiau or possible heiau. These include Honua site #45 and Honua site #47 in the southwestern corner of the project area, and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui. Several rockshelters (with definite human modifications) and possible rockshelters (which need subsurface testing [archaeological excavation] to determine if they are cultural sites) were also identified in Kiʻinohu Gulch.

Figure 5-2 Previously-documented Archaeological Sites In and Near ‘Ualapu‘e

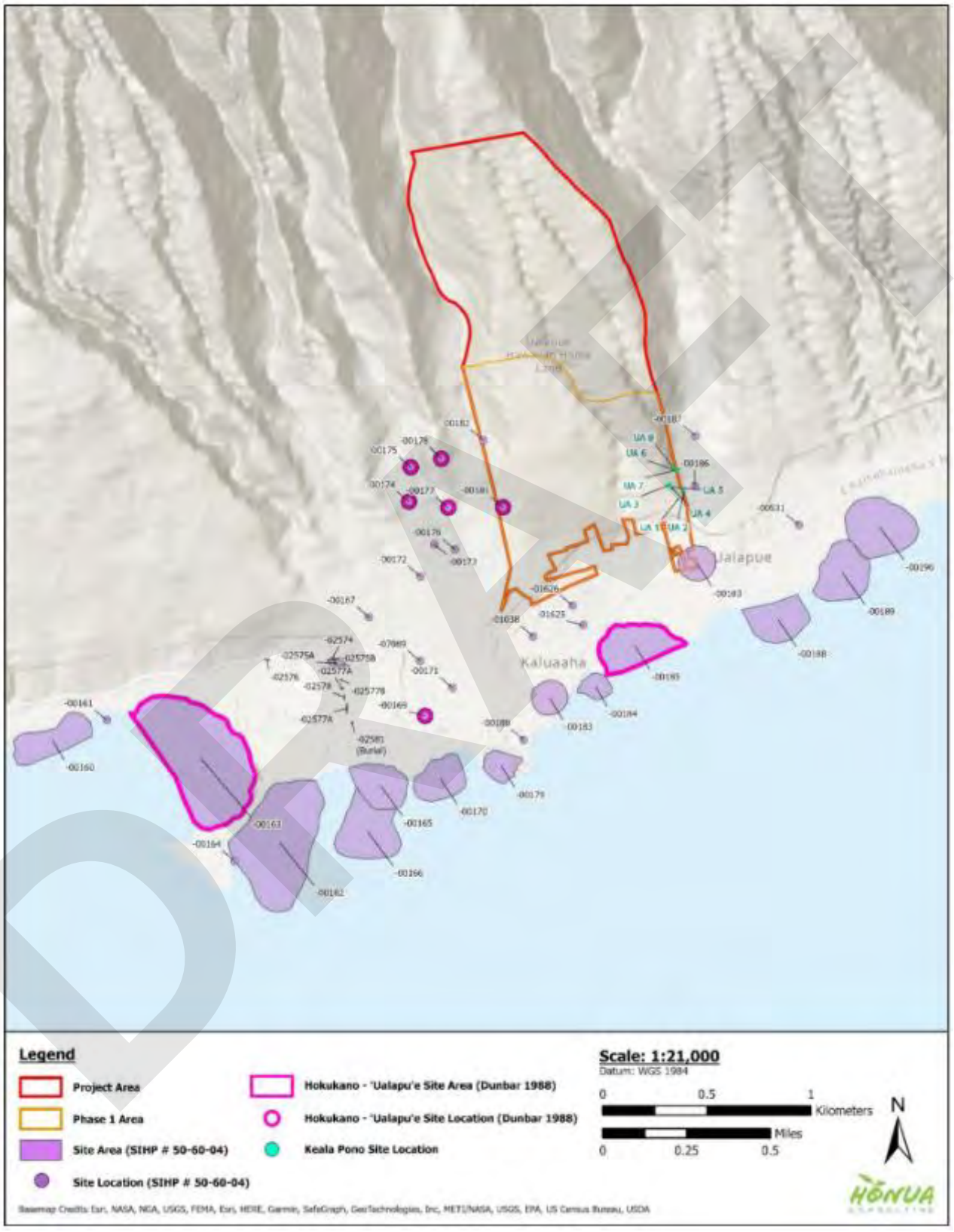


Figure 5-3 Previous Archaeological Surveys In and Near ‘Ualapu‘e

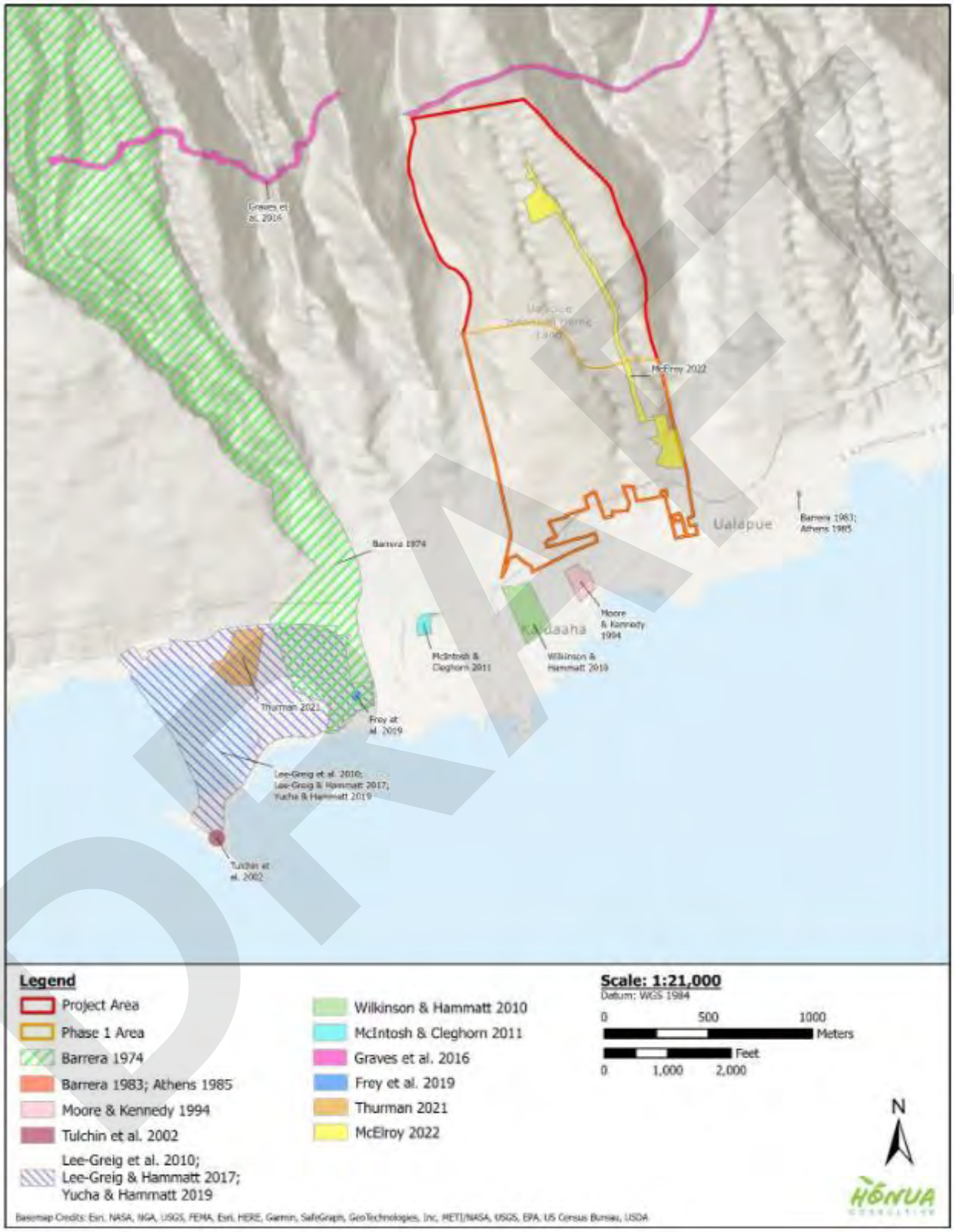


Figure 5-4 Pedestrian Survey Tracts Conducted in the Settlement Plan Area

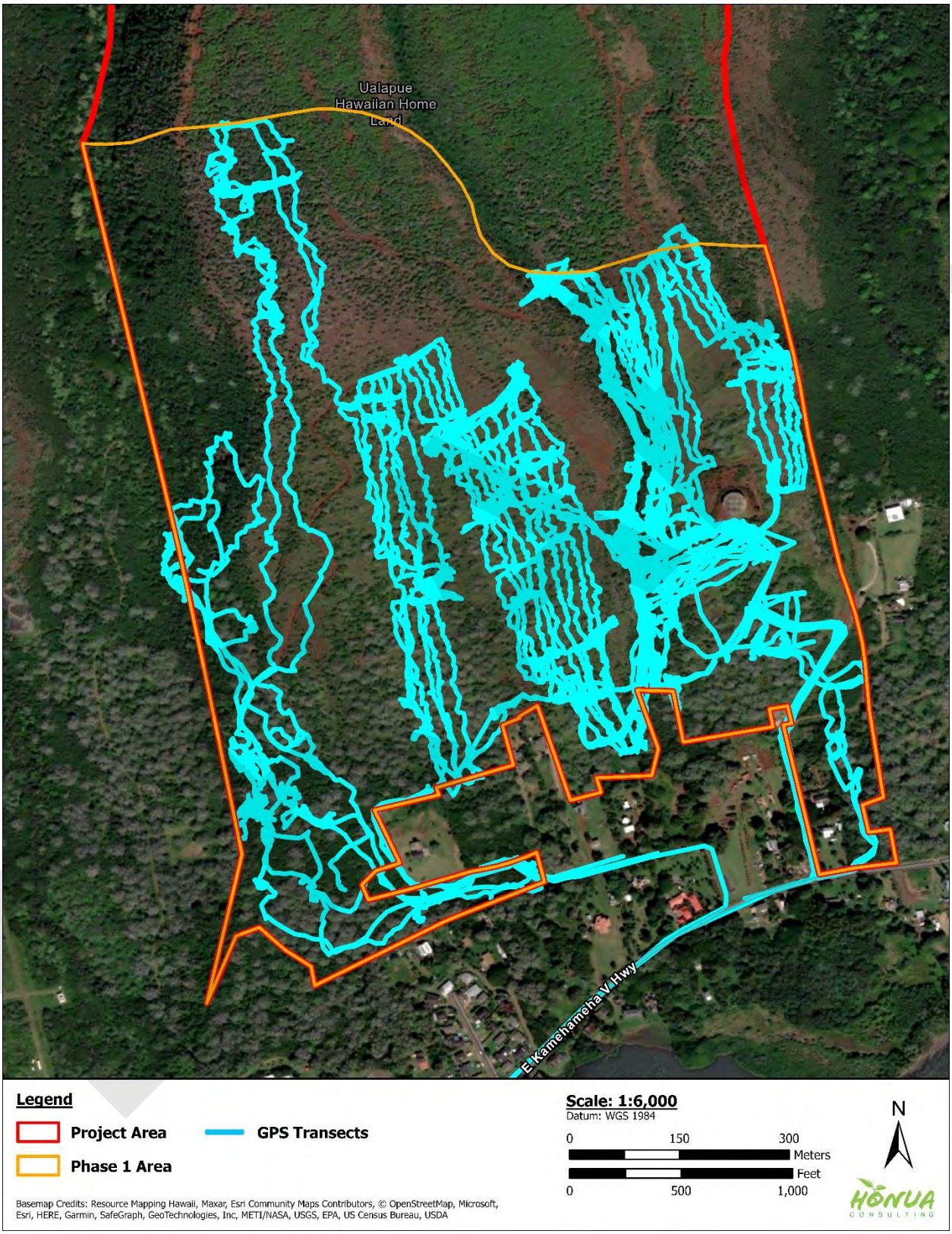


Figure 5-5 Sites identified by Honua Consulting and Keala Pono

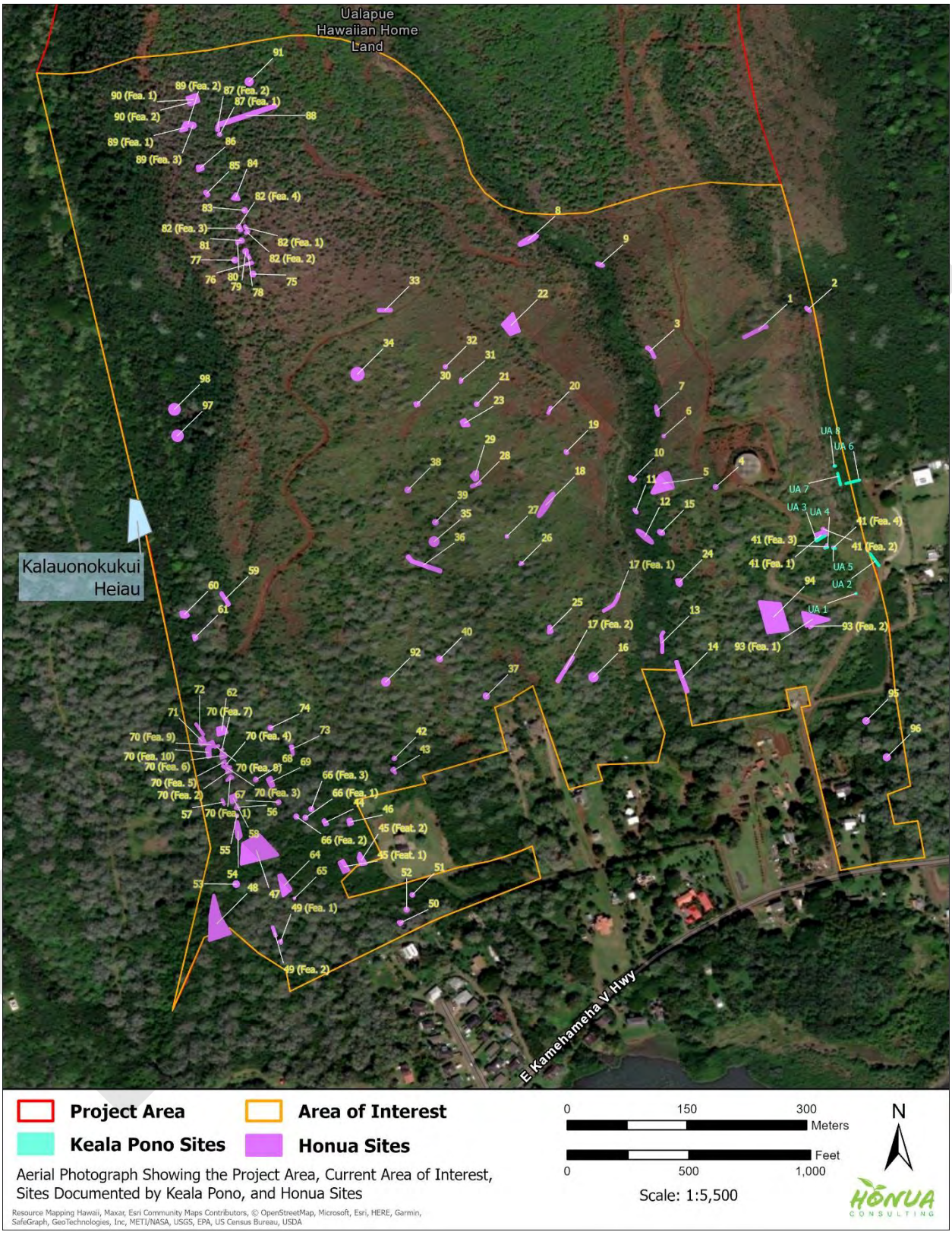


Table 5-1. Archaeological Site Identification and Preliminary Interpretation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
1	1	Terrace/alignment	Cultivation/garden	Pre-contact / early historic	Long, low, cross-slope terrace/alignment
2	1	Modified outcrop	Soil/landscape retention	Indeterminate	Functioned to reinforce / retain upper plateau edge above Mo'omuku Gulch
3	2	Terraces	Cultivation/garden	Pre-contact / early historic	Located at upper edge of Ki'inohu Gulch
4	1	Mound	Clearing mound	Probably historic	Mostly subrounded boulders w. cobbles – no formal structure
5	5	Site complex	Habitation	Pre-contact / early historic	Fea. A = soil-filled platform (house site); site is on edge of plateau area above Ki'inohu Gulch
6	1	Modified outcrop	Soil/landscape retention	Indeterminate	Functioned to reinforce / retain upper plateau edge above Ki'inohu Gulch
7	1	Possible rockshelter	Temporary shelter	Pre-contact / early historic	Single marine shell (*Turbo* sp.) on ground surface within rockshelter
8	1	Possible rockshelter	Temporary shelter	Pre-contact / early historic	Several rocks on ground surface inside rockshelter
9	2	Rockshelter w. small wall at one end	Temporary shelter	Pre-contact / early historic	Short, subangular boulder wall (Fea. B) defines the north end of the site
10	3	Terrace/alignment	Cultivation/garden	Pre-contact / early historic	Located in bottom / floodplain of Ki'inohu Gulch
11	2	Rockshelter w. small terrace in front	Temporary shelter	Pre-contact / early historic	Terrace (Fea. B), 3-4 courses high, retains living floor in front of rockshelter
12	1	Terrace at dry waterfall	Indeterminate	Indeterminate	Atypical / unique feature located under a small, dry waterfall in gulch
13	2	Terrace/alignment	Cultivation/garden	Pre-contact / early historic	Creates level planting area along east side gulch floodplain
14	1	Alignment	Historic boundary line	Historic	Jumbled, relatively poor condition boulder alignment
15	1	Modified outcrop / terrace	Soil/landscape retention or possible garden	Indeterminate	Short section of angular, blocky 2-3 courses high boulder terrace
16	2	T-shaped linear mound	Possible historic boundary lines	Historic	These may also be the base foundation rocks of an old fence line
17	2	Boulder retaining wall/terrace	Soil/landscape retention	Historic	Two long sections appear to have once connected, and were installed to combat soil erosion of hillside
18	2	Modified boulder outcrops	Clearing mounds	Indeterminate	Pair of large boulder outcrops w. several smaller clasts placed on top
19	1	Short wall section	Windbreak – small temporary shelter or garden	Pre-contact / early historic	Function of this windbreak feature should be investigated by archaeological excavation

Table 5-1. Archaeological Site Identification and Preliminary Interpretation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
20	1	Terrace / retaining wall	Soil/landscape retention	Historic	Does not appear to be a traditional Hawaiian structure
21	1	Indeterminate	Indeterminate	Indeterminate	Possible degraded (poor condition) mound or small windbreak
22	2	Terraces (n=2)	See column 6 ("Comments")	See column 6 ("Comments")	Function / age of this pair of parallel terraces should be investigated by archaeological excavation
23	3+	Site complex	Cultivation/garden	Pre-contact / early historic	Rock work is in altered / degraded condition, and, thus, it is difficult to define individual features
24	3+	Modified outcrop w. wall & terrace	Cultivation/garden	Pre-contact / early historic	There is a formalized hole (possibly a drainage feature) in south end of interior floor of this feature
25	2	Terrace w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Fea. A = stacked windbreak creating small level area to W; Fea. B = terrace creating level soil area
26	1	Terrace w. windbreak wall	Cultivation/garden	Pre-contact / early historic	This type of feature is typical of the project area
27	1	Modified boulder outcrops	Clearing mounds	Indeterminate	Large boulder outcrops w. several smaller clasts placed on top
28	1	Terrace	Indeterminate	Indeterminate	Degraded (altered) cross-slope boulder terrace in poor condition
29	3	Site complex w. terraces	Cultivation/garden	Pre-contact / early historic	Fea. A = typical (for this project area) terrace / windbreak combination
30	2	Elevated platform	Fishing shrine (ko'a)	Indeterminate	Fea. A = platform; Fea. B = lower constructed area on platform's east side; site contains several old (degraded) coral fragments in matrices of rock work
31	1	Modified outcrop	Possibly temporary shelter/resting place or clearing mound	Pre-contact / early historic	Use of *in situ* large boulder functions as a "back rest" seat protected from trade winds
32	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
33	1	Terrace	Indeterminate	Indeterminate	Very poor (altered) physical condition
34	2+	Modified boulder outcrops	Clearing mound	Indeterminate	Boulder outcrops w. several boulders placed on top
35	1	Modified outcrop w. windbreak	Cultivation/garden	Pre-contact / early historic	--
36	1	Long boulder wall / terrace	Soil/landscape retention	Historic	Directly associated functionally with a soil berm and drainage ditch heading downslope to southeast
37	1	Modified outcrop w. windbreak	Cultivation/garden	Pre-contact / early historic	--

Table 5-1. Archaeological Site Identification and Preliminary Interpretation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
38	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
39	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
40	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
41	4	Site complex w terraces	Habitation/garden	Pre-contact / early historic	Site 42 includes McElroy's (2022) temporary site #s UA-3, UA-4 & UA-5 Fea. A = soil filled platform (house site); Fea. B = alignment / terrace; Fea. C = walled enclosure Fea. D = possible walled enclosure
42	1	Mound	Indeterminate	Indeterminate	Rectangular rock mound constructed on slope; small boulders on exterior, large cobbles in interior
43	1	Partial enclosure w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Linear mound constructed atop existing boulders paralleling a small drainage; single course alignment between end of wall and drainage; 'ulu maika (gaming stone) observed on drainage side
44	1	Enclosure w. windbreak wall	Habitation	Pre-contact / early historic	Habitation structure has one high wall facing prevailing trade winds
45	4+	Site complex	Habitation or heiau (ceremonial complex)	Pre-contact	Large well-constructed site complex = 2 enclosures w. earthen terrace & paved platform in between; evidence of bulldozing around structure Fea. A = recessed walled enclosure; Fea. B = earthen terrace and paved platform; Fea. C = heavily paved platform; Fea. D = walled enclosure
46	1	Partial enclosure	Indeterminate	Pre-contact / early historic	--
47	6+	Site complex	Habitation or heiau (ceremonial complex)	Pre-contact	Large site complex: at least 6 main enclosures divided into rooms; numerous other rock alignments & mounds; large, stepped wall constructed on a slight slope near a stream
48	2	Walled terraces	Water diversion / agriculture	Historic	2 large walled earthen terraces running parallel to a stream Fea. A = rectangular terrace; Fea. B = triangular terrace
49	2	Enclosure with windbreak & alignment	Habitation/garden	Pre-contact / early historic	Enclosure incorporates existing boulders w. cobbles stacked on top; a piled mound built on crest of gentle slope Fea. A = C-shaped enclosure; Fea. B = alignment

Table 5-1. Archaeological Site Identification and Preliminary Interpretation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
50	1	Platform or terrace	Indeterminate	Pre-contact / early historic	Remnant of paved platform or terrace w. boulders on perimeter & filled w. cobbles; in a graded area between existing housing
51	1	Enclosure	Habitation	Pre-contact / early historic	Remnant of a C-shaped enclosure in a graded area between existing housing
52	1	Mound	Clearing mound or cache of cleared rocks	Indeterminate	Large & medium size cobbles piled in a mound, located in a graded area between existing housing
53	1	Enclosure	Cultivation/garden	Pre-contact / early historic	Cobbles piled on & between existing boulders on side facing prevailing trade winds; remainder is low piled rocks
54	7+	Wall & circular alignments	Cultivation/garden and/or water diversion	Pre-contact / early historic	Wall runs along a diversion channel from stream that has 6-8 circular rock alignments, possibly for planting; large boulders along nearby stream
55	1	Enclosure	Habitation	Pre-contact / early historic	C-shaped enclosure that incorporates existing boulders w. cobbles stacked on top; opens to opposite direction of prevailing trade winds
56	1	Modified boulder enclosure	Indeterminate	Pre-contact /early historic	Cleared area among line of boulders; 2 locations on each side of cleared area have been filled w. cobbles & core filling
57	1	Wall	Water diversion and/or flood control	Historic	Thick well-constructed wall segment running parallel to stream, slightly curved and angled on front and back
58	1	Walled enclosure w. notch	Habitation	Pre-contact / early historic	Rectangular walled enclosure w. notch; comprised of piled cobbles & boulders
59	1	Platform / terrace w. retaining wall	Cultivation/garden	Pre-contact / early historic	Terrace / retaining wall built into slope of gulch running parallel to ridge; wall partially collapsed due to erosion; site surface is covered w. soil
60	1	Enclosure w. windbreak wall	Habitation	Pre-contact / early historic	C-shaped walled enclosure w. high wall on side facing prevailing (trade) winds
61	1	Enclosure	Habitation	Pre-contact /early historic	C-shaped walled enclosure w. high wall on side facing prevailing (trade) winds
62	1	Walled enclosure	Habitation	Pre-contact /early historic	Large well-constructed rectangular walled enclosure between stream and gulch; slab-lined hearth built into interior of structure
63	1	Enclosure	Habitation	Pre-contact /early historic	C-shaped walled enclosure w. high wall on side facing prevailing (trade) winds, w. a small platform constructed on one side

Table 5-1. Archaeological Site Identification and Preliminary Interpretation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
64	1	Walled enclosure	Habitation	Pre-contact / early historic	Heavily overgrown rectangular walled enclosure
65	1	Enclosure	Indeterminate	Indeterminate	--
66	3	Mound & enclosures	Cultivation/garden	Pre-contact / early historic	Located around small drainage w. many large boulders Fea. 1 = mound of cobbles & boulders; Fea. 2 = modified boulder enclosure; Fea. 3 = modified boulder enclosure
67	3	Cleared area	Cultivation/garden	Pre-contact / early historic	Similar to Site 66; consists of 3 or more cleared areas in boulder field, mostly single boulder alignments w. cobbles strewn over top
68	1	Enclosed cleared area	Cultivation/garden	Pre-contact / early historic	Circular cleared area w. rocks piled on existing (natural) boulders
69	1	Walled enclosure	Habitation	Pre-contact / early historic	Large rectangular walled enclosure w. faced & piled boulders around the outside
70	10+	Terraces	Cultivation/garden	Pre-contact / early historic	Numerous multi-stepped terraces in a rocky area adjacent to a gulch
71	1	Walled enclosure	Habitation	Pre-contact / early historic	Rectangular walled enclosure w. a high back retaining wall running parallel to stream & facing prevailing (trade) winds; enclosure opens to the stream side
72	1	Wall	Water diversion and/or flood control	Historic	--
73	2	Enclosure w. attached wall	Habitation	Pre-contact / early historic	Rectangular walled enclosure on rocky slope of gulch; attached wall runs toward gulch
74	1	Alignment	Indeterminate - possible collapsed windbreak	Indeterminate	--
75	2	L-shaped wall w. paved platform	Indeterminate	Pre-contact /early historic	One portion of wall faces prevailing (trade) winds; other incorporates a paved platform
76	1	Terrace	Cultivation/garden	Pre-contact / early historic	Terrace w. a boulder & cobble retaining wall, built on slope
77	1	Mound	Indeterminate	Indeterminate	Collapsed square shaped mound constructed of cobbles & boulders on bedrock outcrop
78	1	Enclosure	Habitation	Pre-contact / early historic	Earthen terrace enclosed by a high backed wall facing prevailing (trade) winds; overgrown
79	1	Platform / terrace	Habitation	Pre-contact /early historic	Platform / terrace on slope w. retaining wall in front; 10 cm diameter hole was present in a basalt boulder comprising one of the corners

Table 5-1. Archaeological Site Identification and Preliminary Interpretation

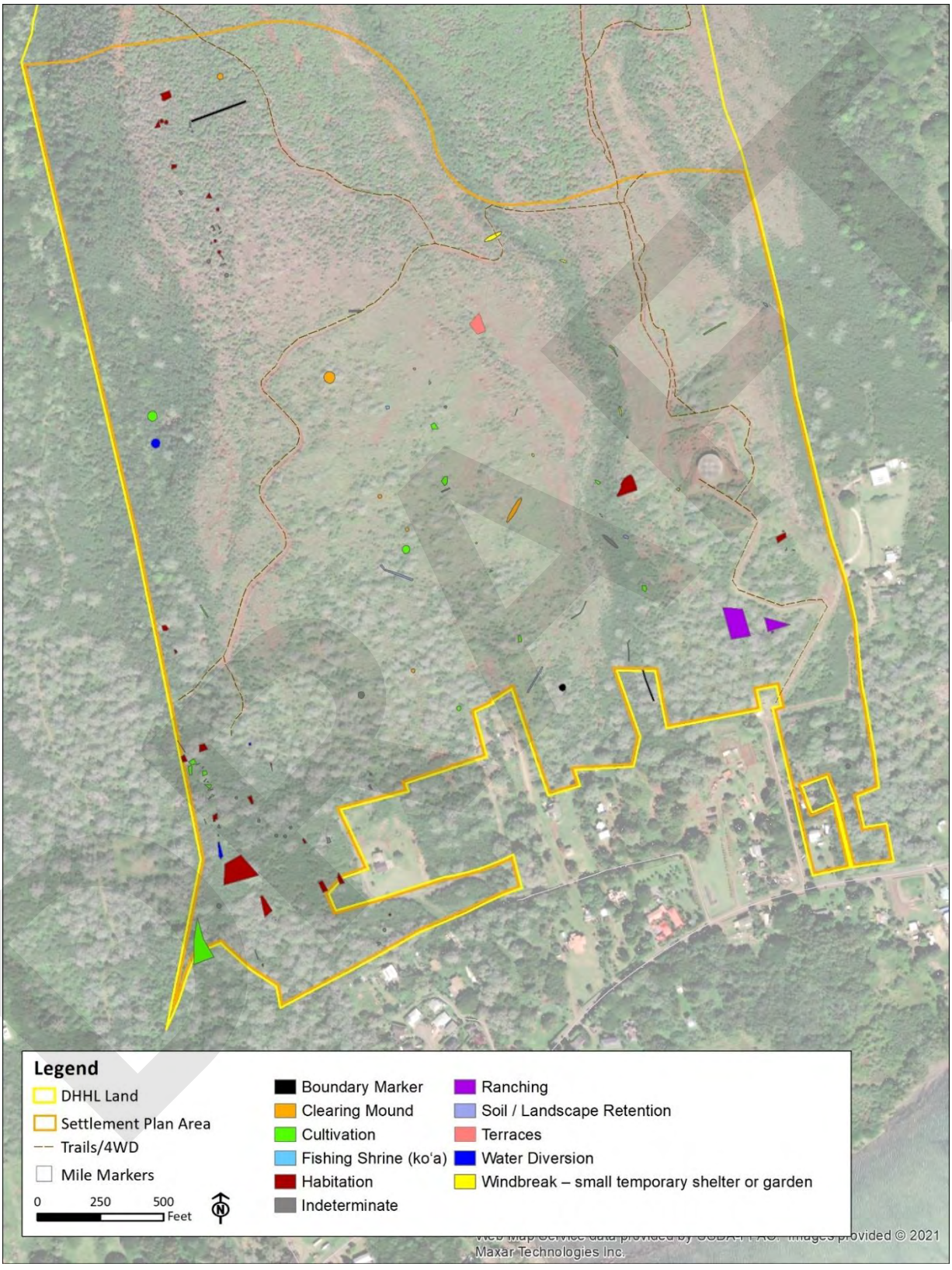
Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
80	1	Modified boulder outcrop – C-shaped Enclosure	Habitation	Pre-contact / early historic	Walled enclosure w. a high back wall facing prevailing (trade) winds; large boulder incorporated into wall
81	1	Platform / terrace	Habitation	Pre-contact / early historic	Square platform / terrace constructed on a slope w. paved upper surface
82	3	Terraces & enclosure	Habitation/garden	Pre-contact / early historic	Set of earthen terraces constructed on slope w. retaining walls on downslope side & small enclosure
83	1	Enclosure w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Enclosure incorporates a boulder outcrop on side of prevailing (trade) winds
84	1	Enclosure w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Enclosure w. a wall blocking prevailing (trade) winds
85	1	Linear mound	Indeterminate	Indeterminate	Linear mound parallel to slope, possible clearing mound
86	1	Enclosure w. windbreak	Habitation	Pre-contact / early historic	Rectangular enclosure w. retaining wall on downslope side; incorporates bedrock & natural boulders
87	2	Mound & alignment	Indeterminate	Indeterminate	Fea A = mound; Fea B = alignment
88	1	Wall or rock berm	Boundary marker	Historic	70 m long piled boundary wall or rock berm
89	3	Site complex	Habitation w. possible burial (platform)	Pre-contact / early historic	Fea. A = terrace w. retaining wall; Fea. B = collapsed, depressed rectangular enclosure; Fea. C = well constructed rectangular platform w. upright slabs around exterior; possible burial
90	1	Partially collapsed enclosure w. windbreak wall	Possible habitation	Pre-contact / early historic	Heavily damaged (partially collapsed) enclosure; once had a high backed wall facing prevailing (trade) winds
91	2	Mound & push pile	Result of road construction	Historic	Mound & push pile near existing trail
92	1	Modified boulder outcrop – windbreak wall	Cultivation/garden	Pre-contact / early historic	Wall constructed of cobbles & small boulders that incorporates large (outcrop) boulder; built perpendicular to prevailing (trade) winds
93	2	Large livestock enclosure	Ranching	Historic	Large rectangular livestock enclosure w. small square terrace on downslope portion; NE corner destroyed by road above Fea A = livestock enclosure; Fea. B = terrace
94	3+	Historic water distribution complex	Ranching	Historic	Rows of raised concrete water tank foundations enclosed by barbed wire fence; retaining wall & an excavated pit are present in the area; and the entrance of a road is present in upslope portion

Table 5-1. Archaeological Site Identification and Preliminary Interpretation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
95	1	Mound	Indeterminate	Indeterminate	Low rectangular paved area w. small boulders on outside & cobbles in interior; in a graded area near existing housing
96	1	Mound	Indeterminate	Indeterminate	Low rectangular paved area w. small boulders on outside & cobbles in interior; in a graded area near existing housing
97	1	'Auwai	Water diversion/garden	Pre-contact /early historic	Curved depressed area running parallel to stream; adjacent to Site 98
98	2+	Terraces	Cultivation/garden	Pre-contact /early historic	Possible agricultural terraces along stream
UA-1	1	Mound	Indeterminate*	Indeterminate*	These temporary site #s refer to site-features identified by McElroy (2022) that are discussed in the previous archaeology section of this report
UA-6	1	Wall	Indeterminate*	Indeterminate*	
UA-7	1	Modified outcrop	Indeterminate*	Indeterminate*	
UA-8	1	Modified outcrop	Indeterminate*	Indeterminate*	
Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182)					See text for discussion

Notes: McElroy (2022) identified eight (8) temporary sites designated UA-1 through UA-8; three (3) of these (UA-3, UA-4 & UA-5) have been incorporated into Honua 41; four (4) of these are within the current project area (UA-1, UA-7 & UA-8) or partially within it (UA-6); UA-2 is not within the current project area. Functional and temporal interpretations for UA-1, UA-6, UA-7 & UA-8 are listed as "Indeterminate*" because McElroy (2022) did not provide specific interpretations, and Honua did not have sufficient time to interpret these site-features in the field.

Figure 5-6 Distribution of Sites Based on Initial Categories



Thirteen (13) sites date exclusively to the late historic period and mostly include ranching features and structures related to water storage and distribution. A substantial number of sites (29 of 103, or 28.2%) are interpreted as indeterminate in terms of their age. Many of these are in poor physical condition due to damage and/or neglect over time, making their temporal interpretation difficult. Some of these (e.g., modified boulder outcrops with rocks placed on top—consistent with being "clearing mounds" or piles) could have been made at various times in the past and are notoriously difficult to accurately date throughout the Hawaiian Islands.

Figure 5-6 highlights the distribution of sites based on type, see Placement of lots were highly predicated on the presence of archaeological sites in the area and the potential for beneficiaries to protect, restore, and potentially adaptively reuse these sites in an appropriate manner to continue certain cultural practices.

Section 4.3 of the full LRFI (Appendix D) provides detailed site descriptions that include preliminary interpretations of function and age. It should be noted that an Archaeological Inventory Survey (AIS) should be conducted in consultation with SHPD and other key stakeholders to further understand the function, association, age, and significance of these sites.

The proposed management strategy share in this section of the Settlement Plan is conservatively predicated on the assumption that all sites identified to date are to be preserved with the potential to be used for specific opportunities of reconstruction, rehabilitation, or restoration, interpretation, and/or appropriate cultural use, inclusive but not limited to place-based learning for cultural/agricultural practices.

5.7 Plan for the Protection and Preservation of Historical and Archaeological Sites

Per administrative rules, the Settlement Plan requires strategic action towards the proper care and stewardship of critical tangible cultural resources, which here in 'Ualapu'e include heiau, agricultural systems, trails, habitation and enclosures, and the care of iwi kūpuna as well as the intangible elements that define an ancestral place inclusive of relevant connections and inherent kuleana across generations are intact and wherein appropriate, resuscitated and perpetuated. Various perspectives permeate as to the definition of appropriate cultural resource management. A western framework considers the landscape as a "geographical area, including both cultural and natural resources, associated with a historic event, activity or person or exhibiting cultural or aesthetic values." In this perspective, management often deploys strategic actions based on a curatorship methodology, where a site is analyzed and an interpretation given, whereupon the range of actions are passive preservation techniques where the elements of use and interpretation are regulated, thereby what is a dynamic element across space and time is held in a static form. Landscape interpretation, in this model, links itself more to the physical integrity and "salvageable" condition of the site (DURP, 2000).

In contrast, a perspective from a Kanaka Maoli worldview amplifies that the totality of the cultural landscape is one that is familial and intimate in its association to a people from a specific space across time. "Hawaiians, as with other traditional cultures, view the significance of a site not merely in terms of architectural features or research potential, but in relation to the mana (supernatural or divine power) afforded to the object, structure, and/or location as a result of its associations with deities or other persons possessing great mana." In that light "cultural significance of a site is best evaluated by those of the culture from which it is derived since cultural significance is not empirically identifiable in the entity itself." (Cachola-Abad, 1992; DURP, 1999). The Hawaiian understanding of land, and the

relationship between land and people, can be understood through renowned 19th century ʻŌiwi scholar, David Malo, who stated, “ma ka noho ana a kanaka, ua kapa ia he aina ka inoa” (Malo 1838). This translates roughly to “it is because people live and interact with a place, that it is called ʻāina.” The idea behind this definition of ʻāina, or “land”, articulates how the concept of nature, environment, and land in a Hawaiian context is interconnected with humanity. This highlights the inherent relationship between people and the environment as one of reciprocity and stewardship (Beamer et al. 2023).

A Cultural Resource Management (CRM) Plan is typically reactive in nature. Often triggered by development and guided by historic preservation as defined by federal and state laws, processes, values, and officials, CRM retains decision-making power within the field of archaeology and with agencies. Alternatively, a study conducted by professionals and traditional cultural practitioners in CRM known as the Kaliʻuokapaʻakai Collective Report (2021) (KCR) suggests another approach, defined as Wahi Kūpuna Stewardship (WKS). As a more appropriate form of cultural stewardship than CRM, WKS is distinguishable in two aspects: 1) the approach to these resources as wahi kūpuna (ancestral spaces and places where kūpuna interacted, which maintain relationships to the past, fostering identity and well-being in the present and for future generations) suggests a genealogical or cultural transference of knowledge and responsibility with people who have and continue to have kuleana for these lands and resources; 2), stewardship in this manner conveys a sense of reciprocity to mālama or care for, as opposed to management, which evokes a relationship where humans are superior to ʻāina and wahi kūpuna. In lieu of a Cultural Resources Management Plan (CRMP), this Settlement Plan proposes a strategic foundation on which a Wāhi Kūpuna Stewardship Plan (WKSP) can be established. The term, wahi kūpuna, is a modern term coined in the 1990s by Native Hawaiian educators, resource managers, and cultural practitioner as a way to reassert a Native Hawaiian perspective and the associated responsibilities to the care and protections of ancestral spaces and places. Wahi kūpuna refers to a physical site, area, or landscape that is significant to Native Hawaiians, past and present and also hold special prominence given the relationship and interconnection of people to place (Kaliʻuokapaʻakai 2021).

5.7.1 Past Cultural Resource Stewardship Recommendations for ʻUalapuʻe

Community feedback affirms that ʻUalapuʻe is a culturally significant ahupuaʻa, requiring a keen understanding of the ʻāina, its history, and its people. Significant areas, burial sites, spirits, and ʻUalapuʻe’s past and present residents are to be respected. It was advised to “tread lightly” around these areas, and come with pure intentions.

In the 2005 Molokaʻi Island Plan, a Special District Area was proposed for Kalauonākukui heiau. The seven-acre Special District area included a buffer zone that extends out from the physical structure of the heiau to a minimum distance of 100’ within the DHHL property. This area outside of the physical boundary is to provide additional measures of passive protection for the heiau, limiting either the range of activities and/or allowances of uses or access. At the time, it was also seen as a means to help establish a community-managed resource area (see *Figure 2-2*). The Special District designation for Kalauonākukui heiau as well as other archaeological sites were intended to preserve the integrity of its cultural space as well as create opportunities for appropriate community-based, cultural groups to engage with this wahi pana for educational purposes, and over time, come to understand the association and linkage with other cultural resources such as ʻUalapuʻe Fishpond that lie outside of DHHL landholdings but are part of a broader cultural landscape.

Potential for the Special District areas included the development of a cultural garden to cultivate resources (such as various kinolau for ho'okupu) appropriate for the heiau functions. The planned area was to consider a staging area whereby community members that take on the responsibility for the long-term care of the heiau could conduct informal talk-story sessions and formal educational forums for visitors to the area.

5.7.2 Approach to the 'Ualapu'e Wahi Kūpuna Stewardship Plan

The basis to developing the 'Ualapu'e WKSP must consider a holistic approach to community and ancestral well-being by:

1. Reestablishing connections that inspire, enrich, and nurture Hawai'i's people.
2. Protecting the places where Hawaiian practices can thrive, so Hawaiian culture can be perpetuated.
3. Using ancestral knowledge to strengthen Native Hawaiian and kama'āina identities and values, community relationships and responsibilities, and how we plan for a more sustainable future for Hawai'i.

The KCR summarizes that health and well-being of the community is obtained through a purposeful commitment to establish a healthy and active pilina (relationships) between people and place, between members of the community and these wahi kūpuna.

An integral tenet of the WKSP is recognizing the relationship between people and place because the people that have evolved within their environments are just as important as the places themselves. James Kent define this as cultural attachment, which is "the cumulative effect over time of a collection of traditions, attitudes, practices, and stories that tie a person to the land, to physical space, and to kinship patterns." (JKA, 2019). Noted Kumu Hula and Ethnographer Kepa Maly furthers this thought: "Native Hawaiians hold a unique breadth and depth of understanding of the landscape(s) to which they are connected. This knowledge reflects generations of engagement and interaction with the landscape. In the Native Hawaiian context, these values – the "sense of place" – have developed over hundreds of generations of evolving "cultural attachment" to the natural, physical, and spiritual environments. In any culturally sensitive discussion on land use in Hawai'i, one must understand that Native Hawaiian cultural knowledge evolved in close partnership with its' natural environment. Thus, Native Hawaiian culture does not have a clear dividing line of where culture ends and nature begins (Maly 2001; Honua Consulting for U.S. DOI, BOEM; 2017).

Specific to the perspectives of Moloka'i, a community-based holistic planning approach to cultural resources and the integrity of cultural values important was documented in *Molokai: Future of a Hawaiian Island* (2008) (MFHI), which amplifies these important aspects of the relationship of people to place as provided in its Cultural Statement:

We seek to hold high and celebrate our culture, a culture based not only upon the relationship between peoples, but more importantly the profound relationship with the 'āina (land). To be "as one with the land" was at the very heart of our culture. This inter-relationship is the central theme of the Kumulipo creation chants, which describe in poetic & cosmogenic form the union of Papa (mother earth) and Wākea (sky father). It is also inherent in the traditional concept of the 'āina (land), which is derived from the words 'ai, to eat or feed, and na, the act of. In addition, many traditional, activities and laws of Hawaiians directly relate to use of the 'āina. Hawai'i was one with nature. Every star, cloud formation, wind and other natural phenomenon was given a name. The 'āina was a living being that would care for generations yet unborn. There were no secrets between the traditional people of

Hawai'i and nature, only the understanding and harmony necessary for survival, intense respect for nature's elements, and daily communication with nature that went far beyond words and vision. Just as we and our culture are endangered, so are our traditional concepts. Aloha is an endangered word. It has been assaulted by commercialism and badly misused. Many dimensions of this plan reflect a desire to practice love, care, and respect. We seek to promote aloha 'āina, the essence of love for the land which sustains us. (Cultural Statement from 2008 Molokai: Future of a Hawaiian Island).

The MFHI calls for the appropriate inventory of key historic sites around the entire mokupuni. Additionally, cultural/educational centers to support initiatives in language, ceremony/protocol, and key traditional Hawaiian practices such as hula/oli, mele, Iā'au lapa'au, cultural arts, lomilomi, and other traditional resource management practices. Specific project actions from the MFHI call for establishing community-managed lifelong learning centers throughout the island. These centers could support a variety of educational and community-based programs to teach skills and values of subsistence living while ensuring important practices tied to place are perpetuated. Wherein appropriate, the opportunities to create and promote job skills and business training programs were also identified. Although the MFHI did not specifically identify 'Ualapu'e specifically, the opportunities that exist with the implementation of this Settlement Plan should align with the MHFI and other community governance policies.

The proposed 'Ualapu'e Wahi Kūpuna Stewardship Plan can help to amplify "the existence of an intergenerational relationship with certain inalienable ancestral responsibilities that at the heart lies a sense of Native Hawaiian identity and well-being for this community." (DHHL, 2022). In this context, wahi kūpuna stewardship is "more than the immediate care and response to the protection of tangible sites and features but also to a continuity of this place as ancestrally relevant over time and generations. The fundamental principal to protect this place where Native Hawaiian practices can thrive in perpetuity must be considered as paramount for this 'āina." (DHHL, 2022). In that manner, the WKSP can be a strategy from which both the knowledge and physical/spiritual/ancestral interaction with not just the resources themselves, but the mana of those generations before that fortifies access, connection, and relevance to place and therein, identity.

5.7.3 Community & Beneficiary Concerns Relative to Wahi Kūpuna Stewardship

Community/beneficiary concerns for the area include: studying place names, ala hele, LCA, iwi, burial sites, respect for the area, how should sites be cared for: fenced for preservation and protected, restored for education and re-use, identification of cultural sites within the wahi pana, future of 'Ualapu'e cemetery, lack of cultural awareness and respect which can lead to damage, damage to sites that haven't been formally identified, will cultural sites be preserved and who will decide which may be demolished, is there a burial settlement plan for this area if/when iwi kūpuna are uncovered, are all cultural sites identified and mapped.

'Ualapu'e has many cultural sites of great importance that should be protected and preserved for future generations. The mauka areas of the DHHL 'Ualapu'e parcel are home to critical flora, fauna, historical and cultural resources that need to be preserved (see *Chapter 4).* Allowances should be made for subsistence hunting in the upland regions.

5.7.4 Compliance Requirements

As the landowner, DHHL would need to authorize the completion of a supplemental Archaeological Reconnaissance Survey (ARS) and the need to strategically conduct an Archaeological Inventory Survey (AIS), to comply with Chapter 6E-8 and -42, Hawai'i Revised Statutes (HRS) and all applicable administrative rules for any project to be conducted by the department or that would require a future State permit or approval with the lessees. For the AIS, subsurface testing (archaeological excavation) would need to be conducted on all of the sites within the Settlement Plan area to evaluate their historical significance from which appropriate mitigation, i.e., preservation, data recovery, etc. would be determined.

Additionally, as DHHL lands are defined as tribal lands under the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, if iwi kūpuna, funerary objects, sacred objects, or objects of cultural patrimony are encountered, its statutory requirements and rules for notification, inventory, consultation, and resolution will apply.

Once implemented, the management and protection of these sites may be the responsibility of the future 'Ualapu'e Homestead Association and/or individual families in which selected sites may be in a certain distance to their lease boundary. Lessees must agree to a non-disclosure of sites beyond informing SHPD and DHHL.

Any future encounters or discoveries of sites undocumented at present or from the AIS would also need to be appropriate monitored and managed per administrative rule requirements and to any agreements that develop towards a governance model and its responsibilities therein.

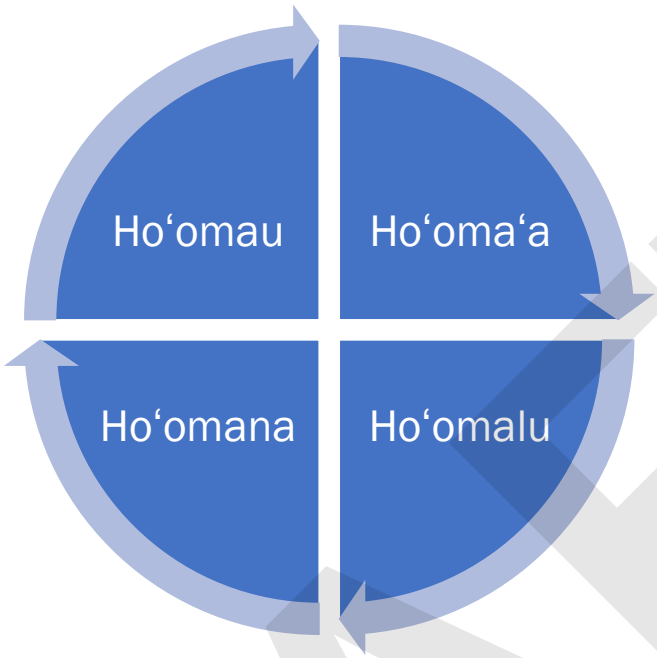
5.7.5 WKSP Strategy

The WKSP Strategy is a framework to reinvigorate an ancestral connection to 'Ualapu'e through four proposed objectives towards proper stewardship. The WKSP Strategy draws inspiration from the 2010 Kamehameha Schools Cultural Resource Management Plan which considered four pōhaku kihi (cornerstones) from which its own goals were derived *(Figure 5-7).* The WKSP Strategy is intended to be a starting point of conversation as it will be the responsibility of the future 'Ualapu'e Homestead Association and its partners, inclusive of neighbors and other community members to define the range of specific actions to be undertaken.

The pōhaku kihi (cornerstones) are designed to create a management strategy that is cyclical in nature. Starting at Ho'oma'a and progressing through Ho'omalu, Ho'omana, and Ho'omau, the process can then be started again Ho'oma'a, to re-instill understanding and traditional practice into the next generation.

Each of the pōhaku kihi are accompanied by implementation actions. These implementation actions are a range of actions to be considered to uphold each pōhaku kihi. The implementation actions need not be sequential in order, rather, they should be selected by relevance to the particular goal or action. These implementation actions can be achieved via partnerships between DHHL, the Homestead Association, and other potential stakeholders from the broader community that includes, but is not limited to, lineal decendents, long-time community members, cultural practitioners, and kumu.

Figure 5-7 WKSP Pōkahu Kihi



The four foundational cornerstones of the WKSP Strategy and proposed implementation actions are discussed below.

- Hoʻomaʻa: To adapt to; to accustom; to practice; to exercise by practice; to gain experience or skill, become accustomed.

  Objective: To become accustomed to the ancestral essence in the landscape; understand spatial and temporal associations of historical context and change through further field study; establish a baseline of community memory and mana through the appropriate invocation of protocol and practices; further document the conditions and changes of sites over time.

  Opportunities or Concerns:

  - With completed ARS, further document the location and disclosure of sites.
  - Promote knowledge cultivation.
  - Lack of a cultural advisory group of individuals from within the community with formal authority. AHA assumes some of that responsibility but unclear as to what they are authorized to do.
  - Recognizing the value of ʻike kūpuna (knowledge of one's traditional past) lies within the memories of an older generation. Define opportunities to record their stories and connections to place. Further opportunities for ethnohistorical research.
  - Sharing knowledge with beneficiaries and communities.

Implementation Actions:

- Further the collection of stories and oratorical data from within the community through conducting more ethnographic interviews with ancestral ties.
- Honor the legacy of those with genealogical ties as part of a "living" inventory that may have its own unique needs for protocols in 'ike gathering and access.
- Further the opportunities of 'āina based research.
- Conduct ethnographic research and translations of primary Hawaiian language newspapers on key geographical place names.
- Develop means to digitally store and manage information access and sharing.
- Complete an Archaeological Inventory Survey compliance strategy with SHPD.
- Consider Reconnaissance Survey for gulches.
- Identify interim space for the care and preservation of koehana (artifacts).
- Formation of cultural advisory council and/or ROE with non-profit organization
- Establish relationship with other culturally based organizations, both indigenous and non-indigenous, to expand resource base.
- Identify sources of funding assistance.
- Create on-site learning opportunities with cultural leadership – develop protocols, listen to the 'āina types of experiences.
- Promote a collaboration related to 'ike management with Malama Pono o Ka Aina that conducted the Manae GIS mapping project.

- Ho'omalu: To bring under the care and protection of, to protect; to keep quiet, still; to preside; to call to order.

  Objective: Protect cultural sites, ancestral legacy, and mana from the immediacy of existing and future threats, either natural or manmade.

  Opportunities or Concerns:

  - Impacts by feral deer or wandering cattle.
  - Human induced threats, i.e., graffiti, removal of rocks, leaving trash such as bottles, cans, etc.
  - Invasive trees and shrubs growing into rock walls, causing erosion issues, dismantling of rocks.
  - Unmanaged conditions of access causing erosion and scouring near and adjacent to sites.
  - Lack of monitors and qualified individuals to assess conditions and changes to sites over time.
  - With completed ARS, the location and disclosure of sites may encourage unauthorized individuals to access and loot these sites.

Implementation Actions:

- Identify and map areas of key threats and appropriate mitigation (avoidance, elimination, minimization to acceptable management threshold) to develop risk minimization plan for wahi kūpuna.
- Identify range of skills, knowledge, and interest for community engagement, i.e., informal site clean-ups, formal training, and certifications).
- Identify what types of additional assistance might be necessary from outside the East End community.
- Consider tiers of prioritization actions by resource type, i.e., burials and heiau are Priority 1; intact habitation, agricultural sites, trails – Priority 2; areas suspect to ongoing issues of soil erosion that may cause future degradation and impact integrity of sites – Priority 3; identified but less intact or pre-existing damage – Priority 4.
- Develop list of priority actions to either temporarily restrict access or conduct limited clean-up activities to environmentally control on-going threats.
- Seek necessary approvals with State agencies to conduct interim preservation and monitoring controls until long-range WKSP can be developed.
- Evaluate solutions for vegetation management, perimeter fencing, signage indicating the presence of wahi kūpuna, annual inspections, and other interventions.
- Promote interactions with other area users, i.e., hunters, gatherers, kilo, who may access the ʻāina for other traditional and customary practices.

- Hoʻomana: To ascribe divine honors; to cause one to have regal authority; to place in authority, empower authorize.

  Objective: Acknowledge the ancestral responsibilities to adaptively utilize cultural sites to reinvigorate the mana of this place; to enhance the connection and therein the identify to ancestral sources; conduct activities to help restore not just the physical condition but to codify appropriate behavior and interaction within the surrounding environment.

  Opportunities or Concerns:

  - Restore knowledge via access and care of sites by agreed-to cultural leaders and/or ʻohana.
  - Restore sites and systems (agricultural, water, ceremonial, habitation) that have the potential to provide a wide range of opportunities for meaningful interaction and engagement that is appropriate and authentic for beneficiaries and broader community.
  - Opportunities for a range of scaled restoration, i.e., individual site or single wall to whole complex) with a variety of community collaborators, professional networks.
  - Creation of wahi kūpuna interpretive materials.
  - Increase community and student training in the care of wahi kūpuna.
  - Working with SHPD and other agencies to decentralize their role and empower more community-based stewardship.
  - Seek to identify individuals and ʻohana with genealogical descendancy ties to these lands and encourage process for reconciliation and inclusion for all future endeavors.

Implementation Actions:

- Develop community restoration strategy that considers minimal effort of cost to restore/maintain including volunteer capacity and training to maintain over time.
- Develop access strategies and due diligence to determine carrying capacity limitations and opportunities.
- Encourage cultural practitioners and educators to gradually introduce appropriate means of place-based learning.
- Restore community 'ike to place by means of adaptive reuse of traditional agricultural areas.
- Seek opportunities to leverage partnerships for additional resources (direct or indirect funding, personnel) with other mission-aligned entities.
- Restoration and access can be in the form of digital portals, i.e., photogrammetry, 3D digital imaging for virtual reality.

- Ho'omau: To make fast, as an anchor in sand or rocks; to keep perpetually in action; to persevere; to continue, keep on, persist, last.

  Objective: Perpetuate ancestral identity and well-being of Native Hawaiian beneficiaries, and the transference of knowledge and skills for subsequent generations to future land stewards.

  Opportunities or Concerns:

  Implementation Actions:

  - Afford those with genealogical ties to the 'āina to be a part of key decision-making relative to stewardship of wahi kūpuna.
  - Identify community leaders that can help identify stewardship and educational opportunities at an appropriate level of engagement with the resources and their current condition.
  - Support stewardship practices to occur on an regular basis (to be determined at annual, quarterly, monthly, weekly thresholds or other culturally defined intervals).
  - Seek opportunities for on-site training within other on-island organizations or broader cultural networks (halau, hui, etc.).
  - Promote opportunities for academic and professional development to expand cultural stewardship career pathways, i.e., on-site skills training to more elaborate field school.
  - Further conversations with community leaders to determine active versus passive management of wahi kūpuna resources.
  - Integrate community stewardship models with on-island workforce capabilities in all aspects.
  - Promote print and digital media repositories and portals to appropriate share 'ike.
  - Promote informal to formal training opportunities among individuals, 'ohana, and organization to advance site-based and koehana curatorship.

5-2. Summary of Current State to Desired State with WKSP Implementation

Focus Element	Objective Statement	Current State	Desired State	Issues/Concerns to Address
Native Hawaiian Identity (NHI)	Wahi kūpuna can provide access to traditional knowledge and wisdom. Provide opportunities to impart a cultural association or attachment between the individual and the environment. Failure to achieve this goal results in cultural alienation, detachment, and irrelevance in our own homeland.	Enhancement of NHI is an assumed associative benefit but no formal engagement with specified areas currently utilized for ongoing cultural practices.	Defining an achievable level of "access" and delineate clear assumptions of opportunities and risks towards NHI enhancement	Who makes decisions as to what type of activity can or should be conducted and with what conditions or parameters in place to ensure integrity of site? How to we measure success? Sense of connection? Sense of well-being? How do we know we have achieved the goal state? "Restoring connections" model identifies four interconnected elements critical for indigenous control and management of cultural heritage: community driven, customary protocols, legal agreements, and landscape management activities.
Community Engagement	Wahi kūpuna empower communities to reconnect to spaces that were deemed important by their ancestors either through direct functional use of resources or understood meaning to their importance without direct human interaction. Failure to achieve this goal disengages, disconnects, detaches kanaka and community from lands and resources.	Most community engagement activities are severely limited if occurring at all. No formal structure in terms of ROEs with AHA or other limited access allowances by hunters with DHHL.	Community homestead association to develop assume governance of resources. Overall goal to assume stewardship and custodian responsibilities inclusive of restoration, access, operational maintenance, and conducting place-based educational opportunities. DHHL active in regulatory review process	Avoid the "instant evaluation" of a wahi kūpuna site – how to further compare examples of area or site types and integrate community knowledge and memories to give a broader "systems" approach to place. "Community" stakeholders (external) – interest group model needs to be replaced possibly by host/guest model that empowers community as steward of their own heritage. How can we empower the broader 'Ualapu'e community to participate, define, and implement wahi kūpuna stewardship projects. How to enable communities to express their identity through ACTIVE engagement in a meaningful manner of their own cultural heritage? Association and cultural attachment through certain activities – environmental and/or human induced threat controls to sites (i.e., erosion, overgrowth, vandalism, etc.)-Asking the

5-2. Summary of Current State to Desired State with WKSP Implementation				
Focus Element	Objective Statement	Current State	Desired State	Issues/Concerns to Address
				question of "how can we work together in managing places important to you?" as a living community seeking to strengthen their own pilina and identity.
Educational Opportunities	Wahi kūpuna are living learning labs that convey the ingenuity of problem solving to address social/human need (physically, emotionally, spiritually, and mentally) within the physical environment.	None at present	Wahi kūpuna are accessed for a range of activities from cultural practitioner defined workshops to Indigenous based field school and living lab. Other Aina Based Learning activities?	Resolved to "core curriculum" opportunities to potential higher/broader order of education that feeds back into NHI. How can we create broader themes and linkages with the aim to protect our wahi kūpuna but ensure its management is not just to "protect the past" but engage and influence the shape of our future? Where does the role of recognized legitimate practitioners play in the advancement of educational learning?
Return on Social Investment (Greatest Impact)	Wahi kūpuna accessible for learning opportunities and positive NHI impact; have minimal to no legal risk; and have potential to create enhance community partnerships for long-term stewardship should be the high tier priority investments		Priorities based upon WKSP annual evaluation with community governance powers to assess/revise WKSP every 5 years.	Avoid the potential tendency to artificially isolate wahi kūpuna from their environmental AND cultural landscape context. What level of resourcing would need to be committed to undertake a more regional/landscape level approach versus individual site management.

This page intentionally left blank.

Chapter 6: Approximate Size and Number of Kuleana Homestead Lots to be Awarded

The 2005 DHHL Moloka‘i Island Plan identified ‘Ualapu‘e as a first priority area for residential development. The 2005 plan included 74, 10,000 sq ft residential homesteads (25 acres), 2.9 acres of community use, 85 acres as special district, and 299 acres as General Agriculture *(Figure 2-2)*. Development would be centered on the lower mauka areas, while the upper mauka areas would serve as a natural resource management area and subsistence forest area. Most of ‘Ualapu’e would remain in General Agriculture to preserve it for future uses. However, the development of residential homesteads was delayed pending an approval for an increase in water allocation from the County of Maui.

In 2019, beneficiaries expressed a desire to move away from the concept of residential homestead development and expressed interest in the development of Agricultural Kuleana Homesteads for ‘Ualapu‘e, in order to obtain immediate access to land and accommodate the socioeconomic status of Moloka‘i beneficiaries. During the 2019 DHHL Moloka‘i Regional Plan process, AHA proposed to the HHC the idea of Kuleana Agricultural Homesteads at ‘Ualapu‘e in lieu of the traditional homestead residences. The 401-acre ‘Ualapu‘e parcel area was envisioned to accommodate 175, two-acre Kuleana Agricultural Homesteads, subject to technical studies for the area. AHA was also interested in preserving and protecting cultural areas, securing minimum infrastructure (e.g., water spigots and roads), and providing Subsistence and Sustainable ‘Ohana Halau startup kits.

In this chapter, in addition to findings from previous literature reviews and input from beneficiaries and the local community, a Land and Resource Evaluation Analysis (LREA) and other planning criteria are applied to determine the approximate size, number and location of the Kuleana Homestead lots.

While the proposed action is relevant to the Settlement Plan area, considerations are made for DHHL ‘Ualapu‘e lands outside of the Settlement Plan Area and for lands in the vicinity of the project area. This reflects an ahupua‘a management approach in which mauka to makai connection is paramount to the health and well-being of the land and its people. An amendment to the existing land use designations for ‘Ualapu‘e will be required to accommodate these new designations.

6.1 Land and Resource Evaluation Analysis

To appropriately plan for and manage the identified environmentally and culturally sensitive areas within the project area, a Land and Resource Evaluation Analysis was completed using publicly available data as well as data collected during the planning process.

For this analysis, thirteen site criteria indicators were selected and “coded” based on a relative sensitivity to determine what portions of the DHHL parcel would be deemed as suitable areas for the various uses. The selection of criteria was dependent on available data as well as community input. Sensitivity of the criteria indicators was measured on a 1 to 10 scale; with a higher impact or greater

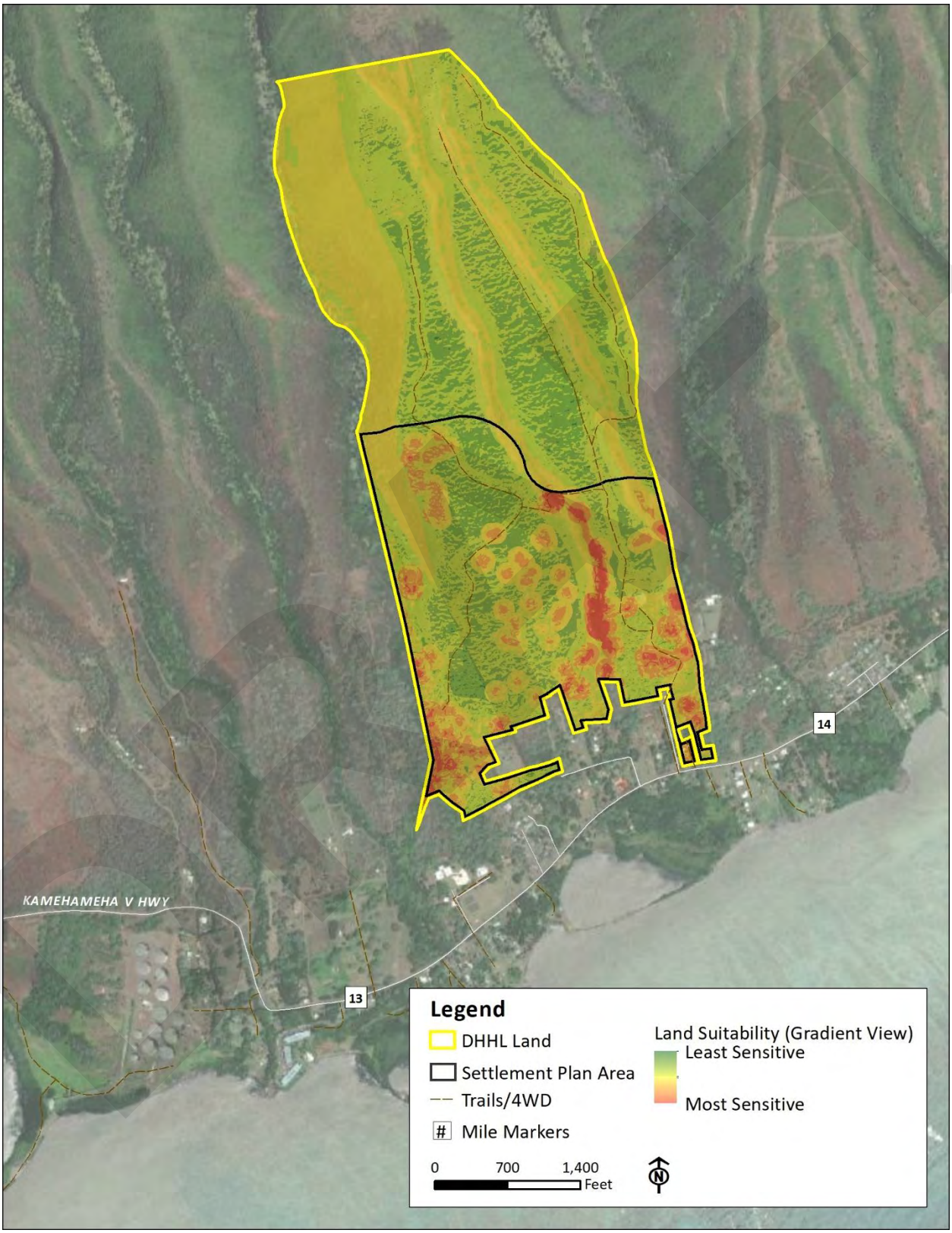
sensitive areas assigned a "1" and those low-impact or less sensitive areas assigned a "10". Each criterion was then assigned a percentage of weighted influence to the analysis. The weight of importance was determined by best management practices, known regulatory controls, and community and beneficiary sentiment and local knowledge. Indicators can not only point out desirable and undesirable site characteristics but can also be compared using quantitative approaches and geospatial analysis techniques. In that regard, a total of seven (7) scenarios were developed. See *Table 6-1.* When modeled through a geographic information system, the Land and Resource Analysis demonstrates that there are patterns within the landscape that required special design considerations to be applied in creating the Settlement Plan *(Figure 6-1).*

Table 6-1. Land and Resource Evaluation Analysis Criteria

Criteria	Value	Influence
Archaeology	Archaeological resources are categorized by the proximity of uses to three concentric buffer zones: • 30 ft. Buffer = 1 • 50 ft. Buffer = 3 • 100 ft. Buffer = 5	35%
Slope and Erosion	Slope is categorized by the range of degree of slope: • 0-15% Slope = 10 • 15-30% Slope = 5 • >30% Slope = 1	10%
Biological Resources	Biological Resources are categorized primarily by typical vegetation: • Developed Land = 10 • Kiawe Forest = 10 • Koa Haole Scrub = 10 • Waiwī Scrub = 8 • Riparian Forest = 3 • Paperbark Forest = 1 • Grass Meadow = 1 • Unknown = 1	5%
Wildfire Risk	Wildfire risk is categorized according to the susceptibility to wildfire: • Risk 1 = 10 • Risk 2 = 8 • Risk 3 = 5 • Risk 4 = 1 • Risk 5 (high) = 1	5%
Rainfall	Rainfall is categorized according to annual inches and potential to provide water for catchment: • 80-100" = 10 • 65-80" = 10 • 50-65" = 10 • 35-50" = 5 • 25-35" = 5	5%

Table 6-1. Land and Resource Evaluation Analysis Criteria		
Criteria	**Value**	**Influence**
CWRM Well Protection and Wellhead Protection Zone	A 1,000-ft buffer was applied around each identified County and private wells in or around the vicinity of the project area. • 1,000-ft. Buffer = 1 There are three Wellhead Protection Overlay Districts with varying levels of wellhead protection: • Zone A = 1 • Zone B = 5 • Zone C = 8	5%
Streams/ Gulches	A 100 ft. buffer was placed around streams and gulches. • 100 ft. Buffer = 1	5%
Flood Zones	There are three flood zones in or around the project area: • Zone X = 10 • Zone AE = 7 • Zone A = 5	5%
Tsunami Zone	There are two tsunami evacuation zones: • Tsunami Zone = 1 • Extreme Tsunami Zone = 1	5%
Roads/ Trails/4WD	A 50 ft buffer was placed around existing roads: • 50 ft. Buffer = 1	5%
Soils	There are 10 types of soil in the project area, with a respective rating based on soil type, characteristic, and potential use: • Alaeloa silty clay = 10 • Hoolehua silty clay = 10 • Kawaihapai stony clay loam = 10 • Kawaihapai very stony clay loam = 5 • Kahanui gravelly silty clay = 5 • Mala silty clay (A) = 5 • Mala silty clay (B) = 5 • Rough broken land = 1 • Rough mountainous land = 1 • Stony alluvial land = 1	5%
ALISH	There is no "Prime" agricultural lands in the project area. Agricultural land types in the area and their ratings are as follows: • "Other" = 10 • "Unclassified" = 5	5%
LSB	The LSB ranks lands from A to E, with A being the highest rated/most productive. The following LSB lands are found in the project area • D = 10 • E = 5	5%

Figure 6-1 Land and Resource Evaluation Map for Beneficiary Settlement



6.1.1 Archaeological Resources

In the LREA, archaeological resources are given the greatest influence (35%) due not only to their connection to the National Park Service Hōkūkano-'Ualapu'e National Historic Landmark complex as one of the most important archaeological and architectural areas in the Hawaiian Islands (NPS 2019), but because of their historical, cultural and spiritual importance to the āina and the 'ohana that live in the area. In the LREA, a proximity relationship is given to an identified archaeological site to provide sufficient buffers (even in concept) to ensure the site's protection and/or to evaluate the synergy of overlap between sites. This gives the opportunity to evaluate the larger scale relationship within the project area beyond each individual site. Distance assignments in this case are not completely arbitrary but are based upon best management practices – there are no set standards or rules. However, a minimum of 30 ft was given for all archaeological sites. A buffer of 50 ft is typically given for heiau and similar sites. The most conservative buffer of 100 ft is typically given for burials. A conservative buffer was applied with three ranges, where 100 ft was considered neutral.

6.1.2 Slope

Steep slopes limit the area for lot selection on much of the mauka portions of the DHHL 'Ualapu'e lands, as slopes greater than 20% are more costly to develop due to difficulty in accessibility for equipment and getting materials to the sites(s). Although not impossible to develop on steep slopes, the difficulty of working and construction on the side of a hill compared to flat ground could require special heavy equipment, making the job more difficult and therefore costly. Therefore, areas with a slope of 15% or less were given the highest suitability rating. In addition, higher erosion rates generally occur in areas with steeper slopes. The criteria of slope and erosion was given a 10% influence.

6.1.3 Biological Resources

Although the remaining criteria still have implications on planning for the settlement area, they are each given an influence of 5%. Of the biological resources identified, 75% of the plant species were introduced and 25% were native. Areas with higher concentrations of non-native species were assigned a rating of 10, or less sensitive, while areas with higher concentrations of native species were assigned a 1, or more sensitive. Wildfire risk is higher in areas that consist of dry vegetation, high wind exposure, and in close proximity to human activity (i.e. roads/trails) where ignition sources are more prevalent.

6.1.4 Water

Although not a requirement for DHHL to provide under Kuleana Homesteads, sources of water for agriculture are an important concern for beneficiaries. Areas of higher rainfall were given a higher rating compared to those with less rainfall. With relation to agriculture, community members are concerned with pesticides, fertilizers and wastewater seeping into the ground and contaminating the 'Ualapu'e well, the only well providing water to the East End. Wellhead protection zones as identified by DOH and Maui County were given the highest sensitivity ratings.

6.1.5 Drainage and Flooding

Due to the flashy nature of Kahananui, Ki'inohu, and Mo'omuku Gulches, a 100 ft buffer was given for each. Flood zones are given ratings of risk according to the annual flood risk. While Zone X has the least risk, Zones A and AE are of higher risk due to their potential to flood. Zones A and AE are not ideal for homesites. Areas within the Tsunami Evacuation Zone and the Extreme Tsunami Evacuation Zone are also not recommended for homesites, and are therefore assigned a value of 1, with greater sensitivity.

6.1.6 Access

Access to the DHHL parcel is important for the community that uses this land for cultural and spiritual practices, gathering, and hunting. A 50 ft buffer was placed around existing roads in order to protect these passageways as well as allow for future maintenance.

6.1.7 Soil

Soil types were given ratings based on their characteristics and highest and best use. Rough mountainous lands are best suited for water supply, wildlife habitat, and recreation – not necessarily homestead sites. These types of soils were given a rating of 1. On the opposite spectrum, with a rating of 10, Alaeloa silty clay is characterized by moderately rapid permeability, medium runoff, and moderate erosion, which is better suited for agriculture and homesites. Agricultural classifications based on the ALISH and LSB evaluations are given a higher rating based on the potential for productivity.

6.2 Lot Selection and Planning Criteria

The plan for settlement and development of the project area is constrained by the physical characteristics of the land. Steeply sloping areas that define the area's natural valleys and drainageways could support native plant restoration which in turn could provide erosion control. As such, these locations will remain undeveloped. This plan is also limited by the desire of the community to protect and care for cultural and archaeological sites.

As outlined in *Table 6-2* below, in addition to the findings from the Land and Resource Analysis, the lotting scheme considered site topography and drainage, accessibility, proximity to water and wells, wildfire risk, proximity to utilities and infrastructure, proximity to natural and cultural resources, and beneficiary preferences for lot size and lot configuration. When evaluating lot configuration schemes, consideration was given to layout designs that could maximize the number of lots to be awarded within the physical and cultural characteristics of the land. Lot size, density and layout was tempered by the need for awarded beneficiaries to share both benefits and burdens of maintenance and improvements, activities and uses adjacent to the lots, and consideration to the future build-out of other DHHL lands in close proximity.

Table 6-2. Kuleana Homestead Lot Selection and Planning Criteria

Criteria	Value
Topography	Less than 15% slopes ideal, up to 30%, away from drainage ways and flood hazards
Proximity to Roadways	Existing dirt roads but manage erosion concerns
Size	1-acre DHHL Kuleana Homestead
Proximity to Water	County of Maui Department of Water Supply, Rainfall, Consideration of Wellhead Protection Overlay Districts
Wildfire Risk	Sited away from fuel sources
Proximity to Natural and Cultural Resources	Sited away from denser areas of intact native forested areas, gulches, and traditional/cultural sites and features
Beneficiary Preferences	Community consensus on lot scheme

The DHHL General Plan (2022) provides 16 possible land use designations for Hawaiian Home Lands (see *Section 3.1).* In summary, after the analysis conducted above, the 401-acre DHHL parcel has been designated as follows: approximately 30 acres as DHHL Kuleana Homestead, 8 acres as Community Use, 85 acres as Special District, 129 acres as Stewardship, and 149 acres as Conservation *(Figure 4-5).* The 'Ualapu'e Kuleana Homestead Settlement Plan area within the DHHL parcel is a 184-acre portion of the total 401-acre DHHL lands in *(Figure 6-2* and *Figure 6-3).* The Settlement Plan creates DHHL Kuleana Homestead lots that will be awarded as Kuleana homestead leases, providing the opportunity for beneficiaries to settle on their lots in the shortest amount of time. The Settlement Plan keeps the former agricultural and pastoral lands in agricultural use and provides opportunities for beneficiaries to return to their agricultural roots *(Figure 6-2).* Areas identified for DHHL Kuleana Homestead are intended for lifestyle purposes and for people who may want to supplement their food resources or incomes with agriculture as a secondary economic activity.

Beneficiary consultation revealed that most prefer individual lots as opposed to clustered lots with shared agriculture. Initially, during the second Beneficiary Consultation meeting (March 2022), respondents to the online poll preferred lots greater than one acre. However, increasing lot size would reduce the overall number of lots and increase the project's cost per lot. This information was presented at the third Beneficiary Consultation meeting (November 2022), where 30% of respondents agreed that a one-acre lot size is a "perfect size", while 20% believe it was "too small." Thus, one-acre subsistence agricultural lots were determined to be the most favorable between beneficiary desires and project cost (see *Figure 6-5* for an example Kuleana Homestead Lot). Beneficiaries also believed the 'Ualapu'e settlement should focus on: the preservation and/or restoration of historic/archaeological sites, improved safety and access, and securing water.

The total Settlement Plan area consists of 184 acres on the makai portion of DHHL 'Ualapu'e lands. Thirty of the 184 acres are designated for DHHL Kuleana Homestead lots, with each lot being one acre *(Figure 6-2* and *Figure 6-3).* The areas for the lots were selected primarily on lands that had manageable but steep slopes up to and around 30%, higher ratings for agricultural productivity, were not located within drainage ways or flood hazards, and primarily adjacent to existing dirt roads used by the community when accessing the DHHL properties. Utilizing existing roadways reduces development costs and minimizes potential impacts to undiscovered natural and historic properties. The lesser-sloped areas were selected to allow for additional safety measures related to wildfire and flooding in the greater-sloped area of the gulches. This east end area of the DHHL parcel is phased first because it is in closest proximity to existing infrastructure including water storage and pump.

Of extreme importance was the location of archaeological sites within the area. Findings of the ARS (see *Section 5.3)* noted areas where minimal to no archaeological sites were found. These were typically attributed to areas that showed signs of erosion, cattle grazing, and constructed paddocks. Lots were assigned in these areas, outside of archaeological buffers. An AIS, which looks in-depth at each site with vegetation clearing and subsurface testing, will be conducted before the actual metes and bounds of the lots are determined. Also, with this phase of implementation, it is anticipated that a Wahi Kūpuna Stewardship Plan, particularly with a designated buffer area and protection zone would be delineated for Kalauonākukui Heiau and other nearby archaeological sites that may include some buffer and physical landscaping elements to protect the site.

Of the total 30 acres that have been allocated for DHHL Kuleana Homestead lots, 23 one-acre lots are proposed for Phase 1A *(Figure 6-2,* in yellow) and 7 one-acre lots are proposed for Phase 1B *(Figure 6-2,* in hatched yellow). Those lots labeled Phase 1B were not part of an archaeological field inspection. Although professional judgement determines that these lots are most likely similar to adjacent lots in their distribution and characteristics of archaeological sites, the area depicted for these lots will be

surveyed prior to the finalization of the Environmental Assessment. If warranted, adjustments to the Settlement Plan will be made based upon this additional survey being completed.

The new homestead community will also include Community Use areas in order to promote community cohesion and agricultural economic opportunities. Lands designated as Community Use are common areas intended for uses such as cultural activities, parks, recreation activities, meeting pavilions, camping areas, public amenities, commercial activities, and community-based economic development (CBED). CBED is a process by which communities can initiate and generate their own solutions to their common economic problems and, thereby, build long-term community capacity and foster the integration of economic, social, and environmental objectives.

The 2005 DHHL Molokaʻi Island Plan designated approximately three acres within ʻUalapuʻe as Community Use. The first Community Use area was comprised of two acres and designated as a cemetery to serve as the future expansion area of the existing ʻUalapuʻe Cemetery. Some grading activity would be required to provide road access and level ground surface, and access to water for landscape irrigation would also be required. Other existing community uses in ʻUalapuʻe include Kilohana Elementary School and the Kilohana Recreation Center and Park Complex.

The second Community Use area was designated as a park and/or community center. Given the richness of cultural and natural resources that exist and the anticipated growth of a new community, community-based initiatives can be considered in creating opportunities for learning, sharing, and sustaining the needs of the community, creating programs for youth or adult camps or other retreat activities that emphasize the relationships between mauka and makai-based ecosystems and wahi pana. Such activities could be linked with the restoration and use of ʻUalapuʻe Fishpond through a partnership between the Department and existing community and cultural organizations that currently mālama the area. It is envisioned that the community center would be the place that much of these activities could be managed in conjunction with providing a meeting space for community functions.

The current Settlement Plan designates approximately eight acres of the Settlement Plan Area for Community Use, separated in distinct areas (see *Figure 6-2,* in pink). The first area consists of three DHHL TMKs: (5) 6-002:001, (5) 6-002:027, and (5) 6-002:036 (refer to *Figure 3-2).* These three properties are located east of ʻUalapuʻe Tank Access Road. A primary concern for these lots is the seasonal flooding described by the residents in these areas (some flooding occurred in November 2023), as it is located at the convergence of two gulches. Any use located here would most likely require some kind of flood diversion improvements, such as berms and swales. Portions of the lots are in Flood Zone A *(Figure 3-12),* which needs a special flood hazard area development permit for being located within a Special Flood Hazard Area (which includes Zone A). Maui County Code 19.62.050 – Administration outlines what is needed for that permit. The lots closest to the road are not in the flood zone, but they are in the tsunami or extreme tsunami evacuation zones, and would also require a special flood hazard area development permit. This area is also in a CWRM well protection zone which requires a 1,000-ft setback. This would not be ideal for homesteading use with wastewater disposal; however, using a compost toilet for wastewater disposal would likely be acceptable. Due to these circumstances, these lots are designated Community Use.

Figure 6-2 'Ualapu'e Settlement Lot Layout

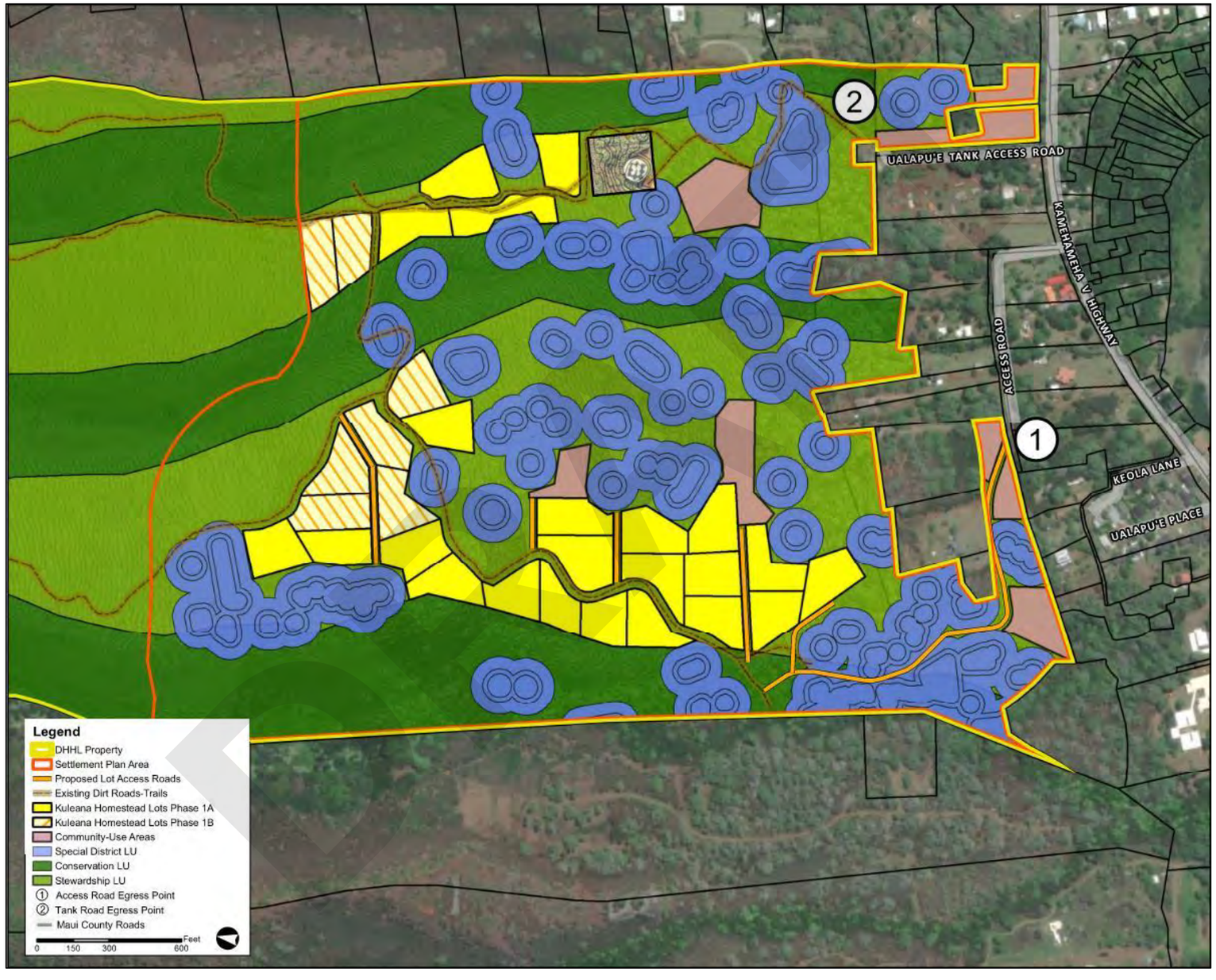


Figure 6-3 ʻUalapuʻe Settlement Lot Layout Overlay

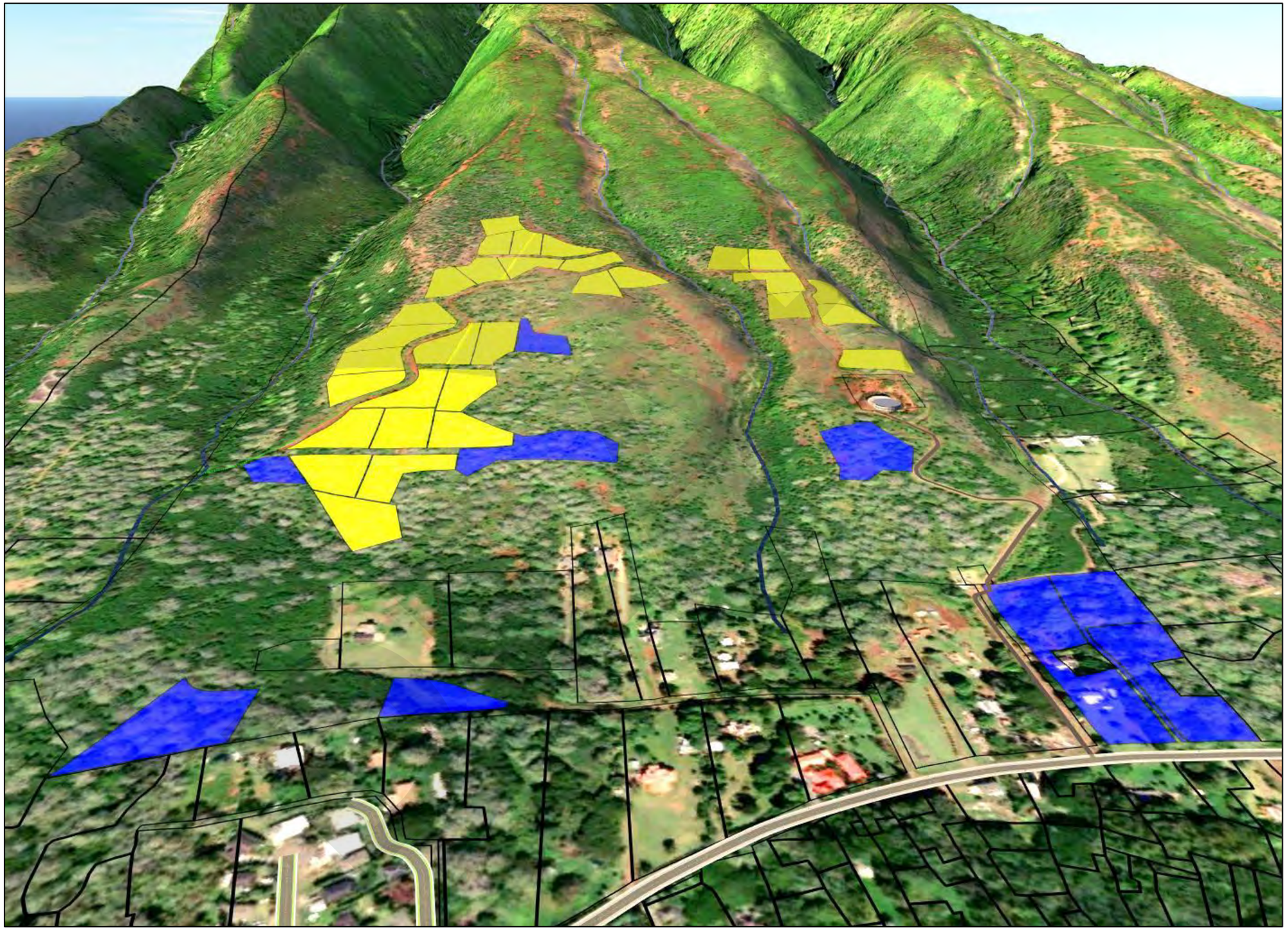
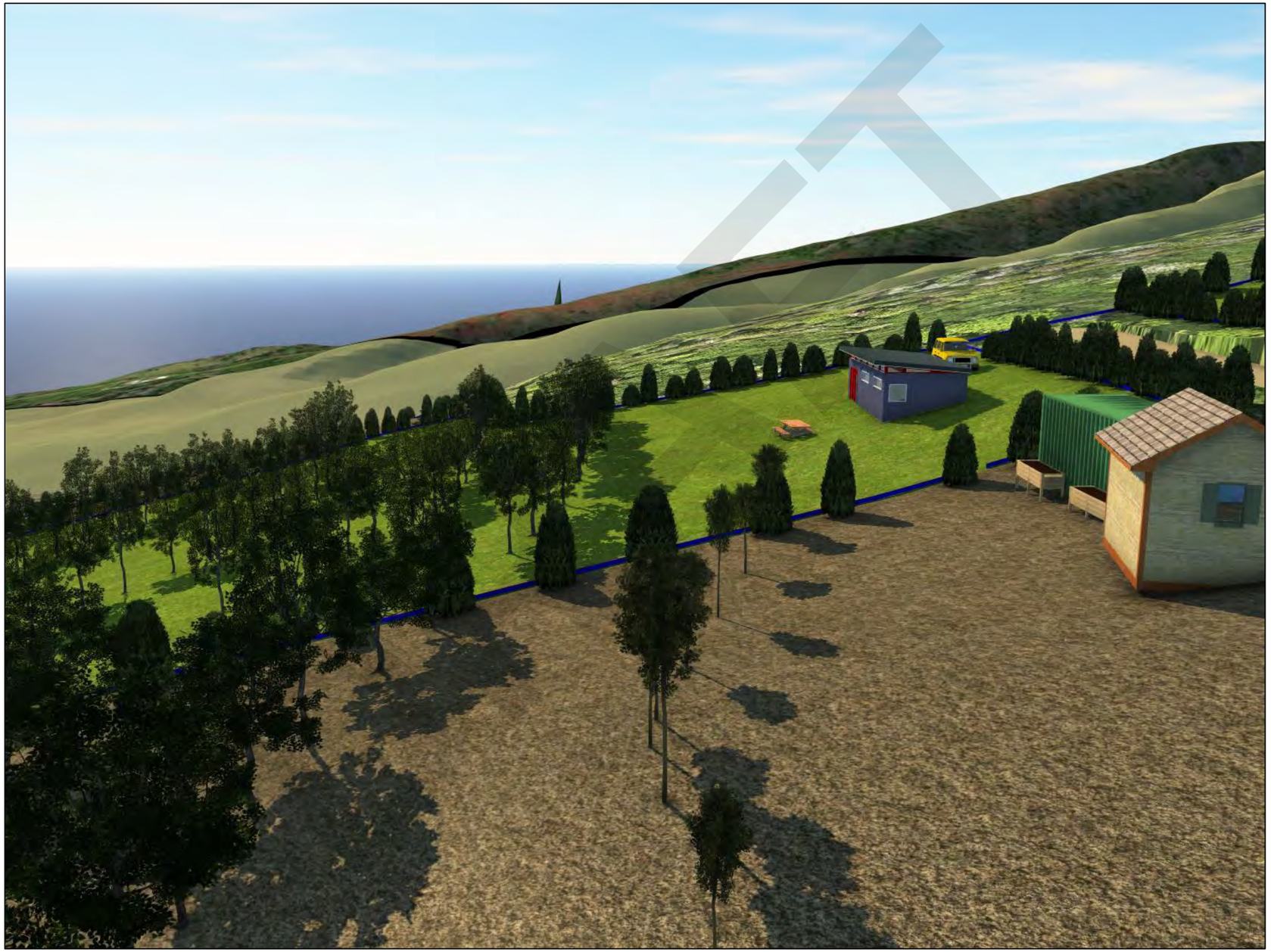


Figure 6-4 Partial Rendering of 'Ualapu'e Settlement Lot Layout (Looking Makai)

Figure 6-5 Rendering of Example ʻUalapuʻe Kuleana Homestead Lot



Located in the center of these lots is a flag lot where the proposed Maui County 'Ualapu'e Fire House will be located. Other suggested uses for this area included a drug rehabilitation and/or mental health center with a community garden (including fruit trees and taro), similar to the current use by Ka Hale Pomaika'i under the DHHL license. Other ideas included a health center for kūpuna and those with special needs, a plant nursery or meeting area.

Another designated Community Use area is located further mauka on 'Ualapu'e Tank Access Road. Community members noted that they would drive up the road and wait along the road near the water tank during tsunami evacuation warnings. Suggestions included constructing a resilience hub at this location for the community's use during storms or other emergencies. This shelter would include bathrooms and a kitchen. At present, Kilohana Elementary is designated as an evacuation site, but is located within the Sea Level Rise zone, the flood zone, and tsunami zone, rendering it inefficient for disaster evacuation.

Five (5) lots on the western portion of property are designated Community Use. These areas could potentially be used for hale, community gathering spaces, potential greenhouse and/or storage areas where classes on natural resource and/or cultural site management could be conducted.

Special District lands are areas that require special attention because of unusual opportunities or constraints. These may include natural hazard areas, areas with cultural or historic value, special view planes and vistas, waterways, and other areas that require in depth planning and analysis. Interspersed in the Kuleana Homestead lots are Special District areas intended to protect archaeological sites and to allow for education and continued cultural practices. Stewardship areas would not be used for homesteading, but for forestry, plant restoration and subsistence agriculture in addition to, and as an extension of, the individual kuleana lots for cultural and subsistence gathering purposes.

Environmentally sensitive areas, such as lands with watersheds, endangered species, critical habitats, sensitive historic and cultural sites, other environmental factors, are designated Conservation, and have very limited uses. Due to the flash flood nature of the gulches, and slope extremes further mauka, the gulch areas are designated conservation. The most mauka portion of the DHHL parcel is also located Conservation, where native plants remain. This area is also adjacent to hunting grounds and critical habitats for plants.

The size and number of DHHL Kuleana Homestead, Community Use and Special District lots have been updated from previous plans for the 'Ualapu'e DHHL parcel *(Table 6-3).* The 2019 MIP recommended Kuleana Homestead for a majority of the property to reflect socioeconomic and water availability changes that had occurred since plans were outlined in the 2005 MIP. Due to updates in the 2022 DHHL General Plan, new land uses were added (DHHL Kuleana Homestead), and the General Agriculture designation was replaced with a new land use - Stewardship. Traditional 10,000 sq ft Residential lots have been reimagined as one-acre lots under the DHHL Kuleana Homestead land use, and mauka lands previously designated as Special District are now Conservation. Due to recent archaeological studies, Special District areas now focus on the protection and re-use of archaeological sites. Community Use areas have been expanded.

Under the DHHL land use system, the 401-acre DHHL parcel is currently designated under the 2005 MIP as Residential, General Agriculture, Community Use, and Special District. An amendment to the existing land use designations at 'Ualapu'e will be required to include DHHL Kuleana Homestead, Stewardship and Conservation *(Figure 4-5). Table 6-3* summarizes the proposed land use allocations for the Settlement Plan Area in relation to previous plans.

Table 6-3. DHHL ʻUalapuʻe Plans and Land Use Designation Acreage			
Land Use	**2005 Molokaʻi Island Plan**	**2019 Molokaʻi Regional Plan**	**2023 ʻUalapuʻe Kuleana Homestead Settlement Plan**
Residential Lots	(74) 10,000 sq ft lots	0	0
General Agriculture	299 acres	0	0
DHHL Kuleana Homestead Lots	0	(175) 2-acre lots	(23) 1-acre lots (Phase 1A) (7) 1-acre lots (Phase 1B)
Community Use	2.9 acres	0	8 acres
Special District	85 acres	0	85 acres
Stewardship	0	0	129 acres
Conservation	0	0	149 acres
Total Acreage	**403.9**	**350**	**401**

6.3 Roads and Erosion Mitigation

Access to the project is provided makai of the property via two access roads branching from the Kamehameha V Highway. The primary eastern Water Tank Access Road currently provides access to a County water tank. The seven Kuleana Homestead Lots proposed towards the east and mauka of the water tank will be provided access through an upgraded existing 4x4 dirt road. The westernmost access road will provide emergency access to the majority of the lots through what starts as an existing 20 ft wide County perpetual non-exclusive access and utility easement road, connecting to a proposed new road on DHHL land that will connect to an existing 4x4 dirt road *(Figure 6-2).* The existing 20 ft wide easement road is a low-volume, dirt road appearing to be wide enough for one-way traffic. Site examination of the road also observed exposed, non-compliant existing water utilities within the existing road easement. A total of 4,000 linear feet of newly graded onsite roads are proposed, and 6,400 linear ft of existing 4x4 road will be re-graded within the Settlement Plan area. Roads will primarily be one-lane, mimicking existing conditions, but allow for flatter areas where vehicles may pass each other.

ʻUalapuʻe serves as the "ice box" for the whole East End of Molokaʻi as other East End ahupuaʻa have restricted access. Access to hunting, gathering, and cultural areas are community concerns. Currently, 4x4 access roads and trails provide access to these areas, and originated by the creation and use of hunters. The road created by DHHL and maintained by the ʻUalapuʻe community homestead association needs to ensure access to these community resources.

The existing one-lane dirt roads exhibit erosion with significant deep ruts. The dirt roads also in the project area appear to serve as access ways for the local deer population, exacerbating erosion potential. These roadways erode the hillslope and contribute to the demise of the local subsistence fisheries on the reef off of ʻUalapuʻe (AECOS, 2022).

In order to achieve sustainable habitation on the hillslope, on-going erosion from the existing roads must be abated. Restoring portions of the existing roads will be unsuccessful due to the severe degradation of the roadway over time and the anticipated continuation of the high erosive hazards. Given the poor conditions of these roads, access should be restricted, at least in areas of severe soil loss. Water bars, revegetation, and wattles (a low structure consisting of stakes interlaced with twigs or branches and other plant material and intended to intercept runoff and filter out soil particulates) should be considered to attempt to restore the land seriously eroded by the roads. Revegetation with native or non-native ground covers that exhibit good matting properties, is drought tolerant, and can thrive on sloping conditions has proven to effectively reduce soil erosion as well.

New roads and the existing 4x4 roads in the settlement plan area will be designed using Natural Resources Conservation Service (NRCS) best management practices (BMPs). Use of these standardized BMPs will protect natural resources and minimize erosion and runoff. It is important to reduce transport of sediments from the hillslopes to the nearshore waters (1) to prevent the continued filling of Loko 'Ualapu'e and (2) to prevent the transport of agricultural chemicals and sediment to nearshore waters.

Generally, these standards consider:

- Locating access roads to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, and to make the best use of topographic features. Designing the layout of roads to parallel the natural contours as much as possible to minimize disturbance of existing drainage patterns and not worsen the existing soil erosion conditions
- Locating access roads where they can be maintained and where water management problems are not created. To reduce potential pollution, position roads as far as possible from water bodies and watercourses. To the extent possible, do not impede overland flow.
- Providing a culvert, bridge, ford, or surface cross drain for water management at every natural drainageway. An erosion-resistant low point or overflow area may be constructed across the access road to supplement drainage capacity. Surface cross drains, such as broad-based or rolling dips, may be used to control and direct water flow off the road surface on low-intensity-use forest, ranch, or similar roads to prevent the formation of deep ruts.
- Providing vegetated ditches to reduce high velocity runoff, as needed, to move water away from the road. Maintain unobstructed flow into the ditches to prevent flows from causing roadside erosion. Road side ditches could also be constructed out of rip-rap, concrete or asphalt material.

After DHHL prepares the unpaved roads, which should be designed to NRCS standards for agricultural roads, beneficiaries will be responsible for the maintenance and upkeep of the roadways inclusive of repairs, re-grading, and installation of culverts to address erosion issues. The roads will all remain as unpaved, compacted gravel roads requiring 4-wheel drive vehicles.

The community organization will be responsible for sharing the cost for maintaining the road. The future 'Ualapu'e Homestead Association will need to commit community funds to periodically grade the road in order to ensure access to their lots. In addition to the grading, the association should budget for minor maintenance tasks, such as gravel fill-in eroded spots, inspecting and clearing drainage ways, pipes or culverts, and maintaining groundcover and plantings on an as-needed basis. Until funding becomes available for substantial road improvements, the association should expect to allocate funds for major maintenance costs, such as repairing areas of significant degradation, replacing or repairing drainage ways, pipes, or culverts, and replanting ground cover that has been

damaged beyond rehabilitation. Major maintenance would occur approximately 1-2 years, or as needed.

6.4 Potential Water Source Options

At this time, and as part of this project, under the provisions of HAR §10-3-30 - Kuleana Homestead Leases, the provision of potable or irrigation water is not required for the issuance of kuleana homestead leases. As such, the lessees will be responsible for providing their own potable water needs.

There is no existing County of Maui or DHHL potable water system serving the project property, although the County of Maui maintains an existing well, the ʻUalapuʻe Shaft and a 1.0-million-gallon tank within DHHL property on leased lands. The County Department of Water Supply water systems serve the existing non-DHHL lots near the highway and regional areas west and east of ʻUalapuʻe. The County Department of Water Supply is pumping at its permitted capacity of 0.25 MGD and is not issuing new water meters off of the ʻUalapuʻe system, limiting development and land use opportunities.

An initial list of potential water source options for awardees who obtain a homestead lease within the ʻUalapuʻe Settlement Plan is compiled below. Multiple water source options could be pursued by individuals and/or by the community. However, further investigation should be undertaken before deciding on a water source option.

Option 1: A tap off the existing DWS water system (Community)

Should additional water allocation be approved (for either DWS or DHHL), a spigot or j-stand with a meter connected to the DWS water supply to fill tanks on truck beds could provide potable water to the Settlement Plan area. A more robust connection to this water source may also consist of a connection and pipeline to a new concrete or steel storage tank at higher mauka elevations via a booster pump to fill the tank from the DWS system. The connection and new tank would then be constructed with a distribution system to the Settlement Plan lots but would be a significant infrastructure project and investment. The lessees may also find it productive to work with the county in the provision and maintenance of those services. This option will only be available if DWS increases their permitted use for the ʻUalapuʻe area.

Option 2: Trucking/hauling in water (Individuals/Community)

Water could be hauled from the DHHL Kalamaʻula or Hoʻolehua homestead by individuals or as a community. The source site is the Kaʻuluwai Well(s) and various concrete storage tanks located at Kaʻuluwai, Hoʻolehua, and Kalamaʻula. Recent requests to DLNR/CWRM have increased the allocation to this Hoʻolehua Water System PWS 230 which may offer opportunities to increase usage and provide bulk water supply to individuals who are willing to haul water to ʻUalapuʻe. A water spigot (like a J-Stand) or something more robust such as a bulk water dispensing station facility, fed from a DHHL-owned and operated water system, could be built under a capital improvement project from DHHL. Water usage would be tracked at the dispensing facility and water charges applied at the discretion of DHHL. The spigot or facility would be best located in Kalamaʻula to reduce the travel distance to ʻUalapuʻe. However, at a minimum, DHHL could potentially set up a J-Stand and meter at their baseyard in Hoʻolehua as a location that is easy to access and control with minimal improvements required.

Water tankers or a tanker service could also be secured by the community to distribute potable water to lessees.

Option 3: Rainwater Harvesting (Individuals/Community)

Rainwater could be harvested from lessee roofs by directing rainwater falling on roofs to water tanks. This harvested rainwater could be treated (e.g. ultraviolet disinfection systems, reverse osmosis) for potable water use. Using rough calculations with a 1,296 sq ft (36x36 package home) roof that is catching water, 7.4 inches of rainfall per month would be needed for a family of 4 using 200 gallons of water per day. This calculates to approximately 90 inches of annual rainfall. Currently, 'Ualapu'e has an annual rainfall that ranges from 35 inches (makai) to 85 inches (mauka). While not a sufficient supply of water on its own, rainfall catchment can supplement other sources of water. Water conservation efforts and reduced water usage also will help to offset reduced supplies.

Rainwater could also be captured in mauka areas on Conservation lands or from roads to supplement community water needs, with large catchment surfaces and a storage tank provided for community use. Ditches could be constructed to direct runoff to depressed areas lined with plastic or concrete. These storage areas could be used by the community for irrigation.

Option 4: Water Re-use (Individuals/Community)

Wastewater from baths, sinks, washing machines, and kitchens (called graywater) could be treated onsite and stored in separate non-potable water containers to be used for drip irrigation. Water treatment systems installed at respective lots will need to meet requirements as provided in HAR 11-20 - *Rules Relating to Public Water Systems* or the *Uniform Plumbing Code* and *County of Maui Plumbing Code*. While reuse of graywater is not specifically regulated by the DOH, the DOH's reuse guidelines should be referred to for water re-use options.

Water could also be captured from the DWS hydrant flushing that occurs nearby. Due to the lengths and layout of its main water lines, DWS needs to occasionally flush the lines by releasing water out of a fire hydrant at the most downstream end of the line. The flushed water at the end of the line is not currently used by anyone and is disposed of. A potential tank to collect DWS water flushing is possible but costly, and it would only be used during periods that DWS requires flushing of its system. The tank would be located at the most downstream section of the area meaning use of the water would require a pump, though the tank could be used to serve a nearby spigot if elevation and flow rates allow.

Option 5: Atmospheric Water Generators (Individual/Community)

Atmospheric Water Generators (AWGs) create potable water by condensing and filtering humid air. These systems purify the air, do not require plumbing or water hook ups, and have individual and community level systems. Solar panels could be used to provide the power required for the AWG.

Option 6: Water from streams (Community)

'Auwai or ditches could be constructed to convey water from mauka natural sources for potential agricultural use. There are claims that upland streams have been diverted, which should be investigated further. Removal of diversions or new diversions would likely require a Stream Diversion Works Permit from CWRM.

Option 7: New source development (Community)

New water source, such as a new well, may be feasible since the current permitted use of the ʻUalapuʻe aquifer is three percent. However, this is an extremely expensive option consisting of well development, pump installations, distribution and storage infrastructure requirements, electrical infrastructure requirements, and the requirement to run as a "public water system" serving greater than 25 people. Finding a location for a well and storage site away from the DWS well would also be required.

6.5 Wastewater Treatment, Storage, and Disposal

As noted above, under HAR §10-3-30 - *Kuleana Homestead Leases,* wastewater utilities are also not provided nor required for the issuance of kuleana homestead leases. As such, the lessees will be responsible for providing their own wastewater disposal needs.

There are no existing County sewer systems near the project property. The project is located above the State Underground Injection Control line. Wastewater in the area is typically treated and disposed of through the use of an Individual Wastewater System (IWS) or cesspools (no longer allowed).

On-site wastewater systems provide effective, low-cost, long-term solutions for wastewater disposal as long as they are properly designed, installed, and maintained. Wastewater systems for homestead lots and the community common areas will be planned in accordance with *HAR §11-62 – Wastewater Systems*. An individual wastewater system (IWS) consists of two components: 1) treatment (septic of other active treatment system), and 2) disposal (infiltration or reuse). Examples of IWS include: septic tanks, absorption beds, incinerator toilets, and composting toilets. Each awardee would be responsible for obtaining and managing the IWS for their own property. While a wastewater treatment works (WWTW) may be feasible for this development, the cost to install would be significant to capture wastewater from each lot and convey it to the treatment plant, and the burden to maintain the system would be placed on each lessee. As the project proposes less than 50 units, a WWTW is not required.

Infiltration of treated effluent can be utilized if it is not considered an injection well, and if designed in compliance with *HAR §11-62* using infiltration trenches, absorption beds, or ponds. Wastewater reuse (e.g. subsurface irrigation of areas surrounding the wastewater treatment center) can be utilized if designed in accordance with the Department of Health (DOH) Wastewater Branch's *Guidelines for the Treatment and Use of Recycled Water* (*Wastewater Systems* and *§11-23 Underground Injection Control)*. Wastewater can be a valuable resource for rural communities. In addition to easing the strain on limited freshwater supplies, the reuse of wastewater can improve the quality of streams by reducing the effluent discharges that they receive. Wastewater may also be reclaimed and reused for crop and landscape irrigation.

As previously mentioned, wastewater disposal through infiltration will not be allowed near the DWS ʻUalapuʻe shaft and within the 1,000-ft wellhead protection setback.

A cluster system approach is another alternative for wastewater management. Cluster systems are a cooperative wastewater treatment organization that collects wastewater from a small number of homes, usually 2 to 10, and transport it via an alternative sewer to a pretreatment land absorption area with no surface discharge of effluent. An absorption field includes several perforated pipelines placed in long, shallow trenches filled with gravel. The pipes distribute the effluent over a sizable area as it seeps through the gravel and into the underlying layers of soil. Cluster systems have lower development cost and offer less complex operation and maintenance than conventional centralized

sewage treatment systems. Any type of communal treatment system will be subject to review by regulatory authorities. The homestead association and lessees would be responsible for developing and maintaining the cluster wastewater system.

Beneficiaries may also utilize composting toilets if designed in accordance with HAR §11-62-35 Other Individual Wastewater Systems. A composting toilet is a type of dry toilet that treats human waste by a biological process called composting. Specific design requirements shall be reviewed and approved by the director on a case-by-case basis (until the community develops its own codes and permitting process that is approved by the HHC).

Additional wastewater from agricultural and pastoral activities must also be managed to ensure compliance with NRCS guidelines. All agricultural waste shall be handled in a manner that is compliant with HAR §11-62 and the State of Hawai'i DOH Guidelines for Livestock Waste Management. A NRCS farm plan or conservation plan may be required and would be the responsibility of the lessee.

6.6 Solid Waste Management

Homesteaders will be responsible for their own solid and liquid waste disposal. Trash and solid waste must be collected and removed and disposed of at approved DOH sites. No on-site dumping will be allowed. Wherein feasible, recycling and potential food waste and green waste composting could be established and managed on individual lots and/or in shared community spaces.

This page left blank intentionally.

Chapter 7: Preliminary Conceptual Proposals for Community Management and Economic Development

The Kuleana Homestead Program is intended to rehabilitate Native Hawaiians by providing opportunities for self-sufficiency and self-determination. This section of the 'Ualapu'e KHSP aims to identify a framework to incentivize social, cultural, and economic investments that are relational-based with the 'āina, but also predicated upon human ingenuity and innovation that have persisted across generations in pursuits of stewardship excellence in resource management. The strategy herein essentially outlines a framework that, when applied, evaluates possible grassroot economic opportunities that either already exist within or near 'Ualapu'e or have been identified as a desired state or outcome through beneficiary consultation or broader community sentiment.

Per the 2030 Agenda for Sustainable Development as established by the United Nations Department of Economic and Social Affairs, the "eradication of poverty in all of its forms and dimensions" is a challenge but requires some attention as an "indispensable requirement for sustainable development." The World Bank Organization describes poverty as such:

"Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty has many faces, changing from place to place and across time, and has been described in many ways. Most often, poverty is a situation people want to escape. So, poverty is a call to action…a call to change the world so that many more may have enough to eat, adequate shelter, access to education and health, protection from violence, and a voice in what happens in their communities."

In this context, one desired state to emerge from this planning process is for the homestead community of 'Ualapu'e to have an opportunity to generate a means of self-sufficiency. This can be described as a value of "production" that lends to specific returns of optimal health, safety, and economic well-being at an individual, 'ohana, and community level. The objective is to effectively extinguish any potential influences of poverty.

7.1 Cosmogony and the Science of Sustainability

As a part of the KHSP, Sustain Hawaii completed a Community Economic Assessment *(Appendix E)* that aimed to describe a quantifiable systems-based framework that when applied: 1) integrates Hawaiian epistemology, methodology and/or values, principles, practices and perspectives; 2) is founded upon the laws of thermodynamics to optimize the health of the land, air, water and use of energy (ecological); 3) utilizes a model to determine the level of entropy and types of satisfiers of goods and services (socio-cultural); and 4) uses thermos-economics or embodied energy accounting and true

cost pricing models to internalize all economic externalities (e.g. pollution, valuation of ecological services).

As presented in the Community Economic Assessment, the cosmogonic origins of Kanaka ʻŌiwi foundationally define the intimate spiritual relationship between kanaka and ʻāina. The establishment and maintenance of that connection through cultural practices further assert an inherent ancestral relationship between person and place. This can be described as a source of "internal sovereignty" of the self from which the purpose and declaration of the HHCA can be aspired. When applied to the United Nations Sustainable Development Goals in this lens, an approach to be considered is to define a healthy state of the kaiāulu (community-level well-being), where the aspects of ola (individual well-being and life) are interdependent on the health of the ʻāina (the biosphere) *(Figure 7-1).* This model, based on a community-scale, healthy food system moves away from the western sectorial approach to development, where social, economic, and ecological development are separate and often exclusive issues. The focus for this Settlement Plan is shifting from the environment as divorced, to a Hawaiian perspective where the ʻāina is a precondition and foundation for ola, kaiāulu, and sustainability.

Figure 7-1 Community Scale for a Healthy Food System Based Upon UN SDGs

The epistemological basis then for community management must be reflective as to the interdependencies that exist between person, place, and an assemblage of traditional and contemporary practices – the latter being a range of activities agreed to by a society by which a place-based way of life has evolved such that current and future socio-cultural, ecological, and economic needs can be fulfilled. For this to be achieved, the core principles of aloha ʻāina and mālama ʻāina must continue to guide the range of stewardship practices to ensure the reciprocity of energy and nourishment between people and place is achievable and maintainable across generations.

Concomitantly, the "Science of Sustainability" defines natural ecosystems having many independent biogeochemical cycles operating as a part of the system. A biogeochemical cycle is comprised of

natural pathways by which essential elements of living matter is circulated through organisms in water, land, or the sky. All nutrients are therefore consumed in any given ecosystem by living organisms (e.g., carbon, nitrogen, oxygen, phosphorus, and sulfur). If these nutrients sources are not recycled, then the law of entropy concludes that the living organism will decay and eventually reach a state of maximum entropy, or death.

In contrast, syntropy is the complementary opposite of entropy. While the latter governs thermodynamic transformations which dissipate and "release energy at the expense of complexity, syntropy governs life" through the accumulation and organization of energy. For example, the sun constantly delivers energy to the Earth in the form of light and heat, from which a wide range of ecosystems and organisms within utilize for their own survival, but also provide abundance in their processes to accumulate and redistribute energy. Plants that utilize photosynthesis to grow and contribute to stability of a given ecosystem as a source of needs – either as sustenance in the form of food or fuel or continuance in the form of seed or fertilizer. This process is an example of the First Law of Thermodynamics that energy is never destroyed. This export of entropy or import of excess energy from one system to another is syntropy and is a pathway towards optimal health.

Similarly, human needs are fundamentally few, and finite as opposed to "wants," which can be infinite and insatiable. Needs are a constant and can be simply categorized as physical (subsistence, protection), emotional (affection, leisure), intellectual (learning, understanding, creation), and spiritual (identity, meaning). In this context, human needs are an ecosystem system of itself. As applicable to this assessment, the idea to pursue "unlimited wants leading to endless production and acquisitiveness" is "antithetical to Hawaiian socioeconomic thought and practice. What is far more consistent with the full range of Hawaiian behavior and values is exactly the opposite array of economic factors – that is to say, relative abundance and limited wants." The concept of relative abundance is to ensure the availability of resources for the advancement and survivability of society as a whole (Kanahele: 324).

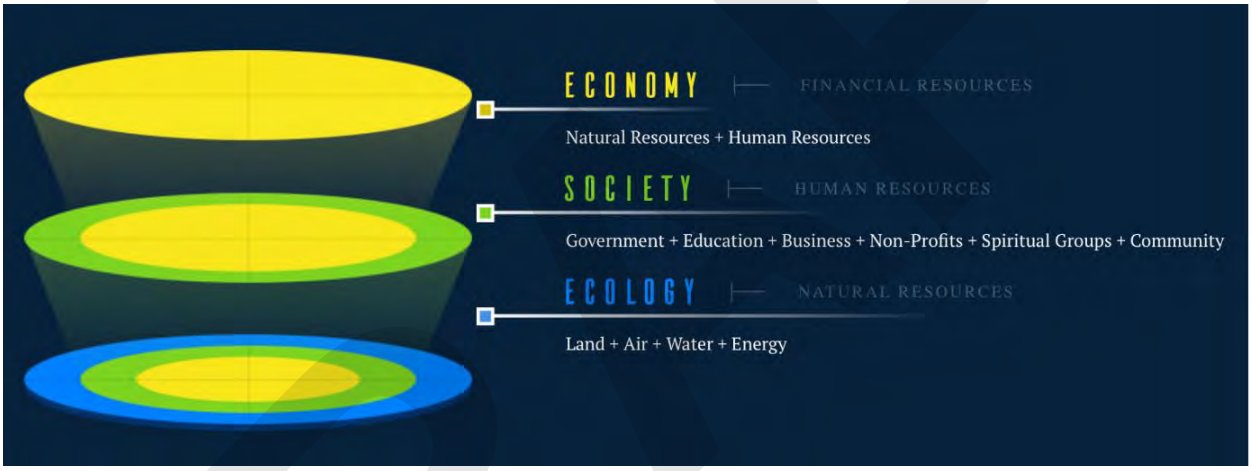
For purposes of this study, the basic approach is to meet the needs of the present generation while also maintaining relative abundance for future generations. To achieve this, there must be an intentional directive to evaluate a range of actions that achieve maximum syntropic state of return for optimal health.

7.2 Sustainable Economics

Sustainable economics often correlates to a triple bottom line – which includes people, place, and prosperity with the latter often measured in economic returns but for 'Ualapu'e must include ecological and socio-cultural benefits. As illustrated below in *Figure 7-2,* the economic model must begin with the relative abundance and wellness of local ecology and the natural resources therein: land, air, water, energy. In this community, social and economic characteristics should be identified within the kinship network that already prevails by means of "subsistence production, distribution, and consumption of resources" – which includes areas used for hunting, fishing, and other gathering practices. In parallel, understanding and respecting "spiritual orientation, conformance to social customs and traditions, community obligations, and reciprocity" should also be factored in the consideration of that production model. In this context, "production and labor constitute a pattern of living rather than simply a means of making a living or a source of food or cash income. Therefore, community economic activities cannot be calculated in monetary terms alone, or in caloric energy terms, but must be accounted for in terms of their contribution to the overall quality of life of the community." (Minerbi et al: 153).

The health and abundance of the cultural environment inclusive of both the natural and human social "capital" is the most important and fundamental priority for the local Moloka'i community. Natural resources and the syntropic state of the living environment are the critical "capital" asset. The word "culture" is derived from the idea to "cultivate" our human condition through the established customs and practices with the natural environment. One definition in Hawaiian language for culture is mo'omēheu, which literally means the succession of customary practices, i.e., "the path most traveled, that was handed down" from generations before. Economic self-sufficiency in this context is nested in the idea that we must consider a range of actions that prioritizes the physical-ecological needs of the environment; the psychological-sociocultural needs of the individual, the family, and community; and then considers the economic returns in natural, human, and financial capital *(Figure 7-2).* Relative abundance in any of these dimensions would warrant a syntropic distribution of intellectual and financial capital back into the dynamics of the homestead community and the broader extent of Moloka'i as a whole.

Figure 7-2 Sustainable Innovation for Conservation, Green Building & Ecosystem Restoration



A fundamental shift to a community economic approach must consider a healthy, i.e., "syntropic and regenerative" culturally derived economy that promotes and enhances positive returns that can be reinvested back into the various tiers of the system to be regenerative while effectively and optimally eliminating any negative by-products, such as pollution, toxicity, or embodied energy.

One of the challenges facing 'Ualapu'e along with the area's other rural communities is to define an "economic" role for itself that yields opportunities of self-reliance and self-sufficiency that directly tie to measurable outcomes and inextricable ties of increased health and wellness to the internal sovereignty of the individual, family, and community as a whole and external to the living environment of this wahi. To accomplish this, a needs-based local economy must either be enhanced where present or wherein appropriate, be created and established. The intentionality of self-sufficiency for the future homesteading at 'Ualapu'e must meet three basic objectives:

- A framework of community governance must be clearly defined to understand the relationships, linkages, and responsibilities to how resources are to be allocated. Community governance must ensure the proper management of various economic, cultural, and subsistence-based activities with a primary emphasis that any and all community resources are protected, inclusive of defining conservation limits and providing kapu for regenerative growth.

- Community based economics must consider the extent of abundance relative to subsistence needs being primary. The model must consider how to define and redirected back into resource management strategies as paramount while yielding sufficient income generation at the individual homestead and collective community level for basic living standards to be met and to secure future investment for operations, maintenance, repair, and restoration costs.
- The success of this community depends on the extent of "social capital" it will generate. Specifically, it is both the capacity and willingness of the community to cooperate and coordinate through an agreed upon vision and "voluntarily practiced norms, within which mutual assistance and collective actions are possible." In this context, social capital within 'Ualapu'e as "an intentional community is a created asset."

7.3 Food Production, Economy, Plans and Policies

In the Hawaiian ahupua'a system, food production was the metric for healthy land, water, and people. Food was cultivated and harvested throughout the ahupua'a and agricultural abundance signified a healthy, resilient community. Aloha 'āina and mālama 'āina practices, mo'omēheu, ensured that future generations would be able to partake in the abundance of the land.

Current economic metrics describe a different community (see *Chapter 3),* one with unemployment rates, poverty rates, and number of households receiving food stamps/SNAP higher than Maui County. Standard economic indicators may signify a community in distress; however, Moloka'i has a significant subsistence economy, which provides a vital and viable substitution for many imported goods. This key sector in Moloka'i's hidden economy is important to food sustainability and self-sufficiency. Matsuoka et. al (1994) finds that subsistence is a very important source of food for residents on Moloka'i. Among the native Hawaiian families surveyed, 38% of their food was acquired through subsistence activities and among all respondents, 76% ranked subsistence as very important and somewhat important to their own families (DBEDT, 1994). The Mana'e GIS Mapping Project (2008) indicates that subsistence practices are vital to the residents of Moloka'i and their lifestyle. Thus, the main components of the traditional food system in Mana'e should be protected, including the wetlands (lo'i kalo and loko i'a) the coastline, and nearshore waters.

Since the 2002 DHHL General Plan, the agricultural applicant list grew substantially, but no new agricultural or pastoral developments were completed as the HHC and Department focused on developing residential housing opportunities. Today, agricultural homestead lots have the longest waitlists on all islands except O'ahu (DHHL, 2022).

On Moloka'i, DHHL has partnered with the University of Hawai'i College of Tropical Agriculture and Human Resources (CTAHR) Extension program to support beneficiaries. The objective of the program is to grow the number of successful homesteaders in agricultural enterprises by increasing their knowledge and training in commercial and subsistence agricultural production, best management practices, marketing, and financial and business skills. DHHL is developing an Agriculture Program Plan to increase beneficiary capacity in farming, which recommends education and training in site planning, basic carpentry and trades, and basic agricultural skills (DHHL, 2022).

In the Moloka'i Island Plan (2005), the community provides "'Ualapu'e is a special place…planning for this area should consider the ahupua'a as one working system from mauka to makai." A majority of lands in 'Ualapu'e were proposed for General Agriculture in the 2005 MIP, which could be used for diversified agriculture, subsistence hunting and gathering, and cultural resource management, with the potential for income-generating activities such as tropical foresty, eco-education, or adventure touring. In the 2022 DHHL General Plan, the General Agriculture land use designation was replaced by the Stewardship land

use designation. Permissible uses within the Stewardship district include: agriculture, ranching, aquaculture, cultural practices, gathering of traditional resources, game management, watershed protection, restoration, and forestry. In Beneficiary Consultation #2 (March 2022), attendees were asked which income-generating activities may be suitable for ʻUalapuʻe. Most desired was an agricultural/aquacultural food hub, followed by a community kitchen. Eco-tourism was ranked the least desired, showing a clear preference for income-generating activies rooted in agricultural production.

In the Molokaʻi Regional Plan (2019), AHA provided information regarding their vision for ʻUalapuʻe, which included the identification of Community Educators and Partnerships critical for the success of training and educating beneficiaries. Potential partnerships include CTAHR, the Nature Conservancy, Molokaʻi Land Trust, Maunaloa Garden, Maʻana, Hui Naʻauao, Department of Interior (DOI), and Hawaiian studies and language kumu (teachers). These partnerships would contribute to community wellness by increasing beneficiaries' knowledge on invasive plants, wind breaks, native plants suitable for ʻUalapuʻe, erosion control, farming techniques, landscaping, fishpond restoration and preservation, self-determination and self-governance, and Hawaiian language.

The Manaʻe East End Policy Statement in the Molokaʻi Island Community Plan (2018) outlines the goals and objectives for future development as stated by East End residents. Of these six goals, five are agriculturally related: 1) regenerate former taro lands to production, 2) use of fishponds for traditional and modern aquaculture, 3) develop restoration methods for fishponds, 4) encourage growth of agriculture, and 5) locate agriculture-aquaculture operations to beneficially utilize entire location. The importance of mauka to makai connection in the ahupuaʻa is paramount to the wellness, health, and resilience of our Hawaiian communities. As stated by the policy statement, "the inter-connecting of the land with the natural environment, the resident and the well being of his survival played a major role in the past for Manaʻe residents. The embodying concept of aloha āina with regards to traditional land is ever more important today in light of impending loss of the resource to economic and development pressures."

The Molokai Future of a Hawaiian Island (2008) document synthesizes past community plans to articulate a clear vision for the island's future. This vision is guided by four Hawaiian proverbs: Molokai Nui A Hina (Molokai, Great Child of Hina), Molokai 'Āina Momona (Molokai, Land of Plenty), Molokai Pule O'o (Molokai, Land of Powerful Prayer), and Molokai Nō Ka Heke (Molokai is the Greatest!). The document envisions small businesses (including cooperatives) and individual entrepreneurs building the economy with agricultural (including kalo, ʻuala, fruit trees, and native plant nurseries) and aquacultural (including East End fishponds) cornerstones; governing lands using traditional land management methods, such as the 'Aha Moku System and 'Ahupua'a system; and cultural and community learning centers providing children and their families with various educational opportunities--job skills, business training, and 'āina stewardship.

The Kuleana Homestead Program is intended to rehabilitate native Hawaiians by providing opportunities for self-sufficiency and self-determination. Under the Program, raw land is offered to beneficiaries to live on, grow food to sustain their family, and utilize for economic purposes. This land includes individual lots, community use areas, and areas for community management (see Chapter 4). Beneficiaries are responsible for maintaining their own lots. Additionally, infrastructure such as water, sewage, and electricity is not provided, and beneficiaries are responsible for the maintenance and upkeep of the homestead tract's rights-of-way, management of wildfire risks, and the preservation of significant historical and biological resources. As such, lessees will be required to become active participants in the Kuleana Homestead Association to develop rules and agreements for community-based management.

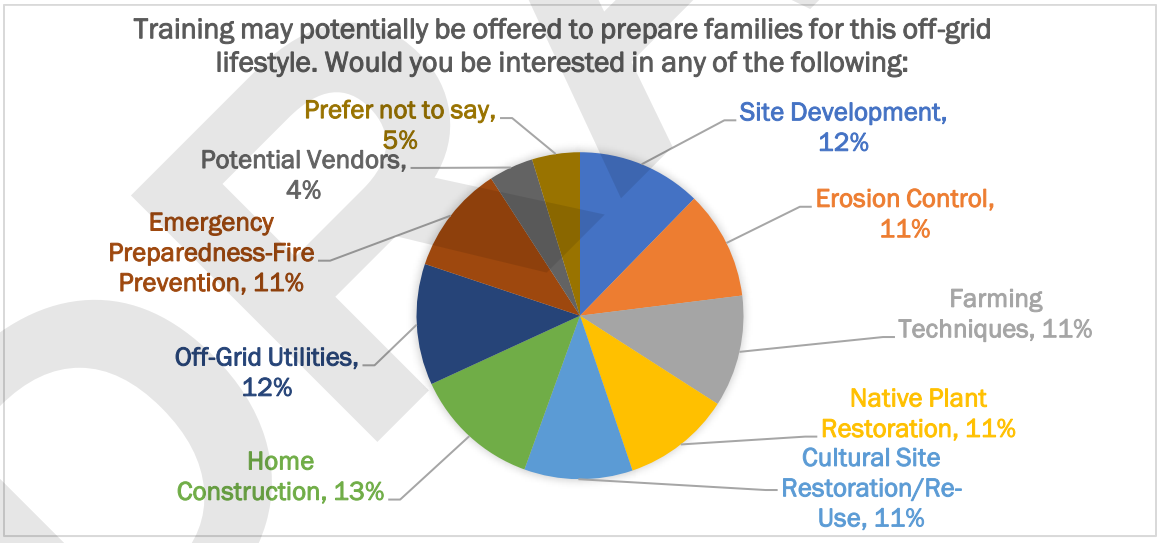
The DHHL Kuleana Homestead Program created Draft Procedures and Policy Considerations for Community Management/Economic Development including: 1) Participation in community workdays and community projects; 2) Community management of natural and cultural resources in the area provide opportunities to restore sites and restore ecosystem functions; 3) Management responsibilities provide opportunities to build knowledge and skills; 4) Management responsibilities could be related to economic development; 5) Pursue community-based economic development activities

7.3.1 Proposals for Education

The incoming 'Ualapu'e Kuleana Homestead beneficiaries need to receive training and education related to their kuleana of the area, such as biological and cultural resource management, and hunting. Education can help to increase, restore, or obtain skills for individual growth and self-determination and governance. The Honuaiākea Process yielded a kapu centered around succession through teaching: Ko'a (āko'ako'a, pūko'a). *Succession. Teaching the community and next generations the traditions of gathering of fish, gathering of community, providing nutrients to people and fish.*

In beneficiary consultation meeting #3 and follow up surveys, participants were asked what topics for training they would be interested in to prepare for off-grid living *(Figure 7-3).* Home Construction was the most popular topic for training, followed by Site Development, Off-Grid Utilities. However, all topics, except for 'potential vendors' received substantial interest.

Figure 7-3 Training Preferences for Off-grid Living



AHA's strategic plan identifies a number of skills they they'd like to see restored to their beneficiaries: budgeting, farming, fishing, repairing, maintenance, trading or bartering, gathering rights, accountability and responsibility as stewards of the land; and community needs that they'd like to address including: health, education, housing, social services, kupuna care, keiki care, business, employment, culture and arts. AHA aims to achieve their strategic plans goals through partnerships with other organizations.

DHHL is developing an Agriculture Program Plan to increase beneficiary capacity in farming. Programs will range from training in beginning farming to more advanced programs for commercial agriculture. In the meantime, Sustʻāinable Molokai could be engaged with to provide beneficiaries with agricultural training, Their Ag Experience Program, Hoʻomāhuahua, provides: 1) On-site learning opportunities for island residents to gain hands-on experiences alongside established Molokai growers and producers, 2) Future farmers the knowledge and skills to grow crops, as well as marketing and distribution, value-added products, and creating locally-sources healthy meals, and 3) An opportunity for participants to learn about the island food systems and their role within it, gaining career readiness. These educational trainings can take place in a community Resilience Hub.

7.3.2 Resilience Hub

The Hawaiian Islands have historically been subjected to a variety of environmental hazards. Changes in the Earth's climate are predicted to increase the intensity and frequency of extreme weather events in the future, further increasing the risks of a major disaster event. As an isolated island in the Pacific, evacuation to a neighboring state to escape impact or seek shelter is not an option. If Hawaiʻi's airports or harbors are significantly damaged, access to assistance and supplies could be delayed. Individuals and families must rely on a minimum of two weeks of their own emergencies supplies and resources. A high hazard exposure, coupled with ʻUalapuʻe's numerous physical and social vulnerabilities, underscores the necessity to anticipate and prepare for future disaster events.

Vulnerability, in the disaster context, is a person's or group's capacity to anticipate, cope with, resist, and recover from the impact of a hazard. The elderly and the least advantage often suffer the greatest disaster losses and have the most limited access to public and private recovery assets. Socioeconomically disadvantaged individuals often lack access to the knowledge and resources to engage in self-protective activities. Education and literacy can also influence access to information on disaster risks and risk-education measures. Considering the historic marginalization of Native Hawaiians and an average beneficiary age of 61 years, the ʻUalapuʻe Settlement must take proactive measures to protect vulnerable individuals and strengthen community resilience.

The relative remoteness and limited infrastructure of the proposed ʻUalapuʻe Settlement Plan Area creates a need for meaningful community engagement to plan for and protect against potential hazards. A Resilience Hub is a potential use that could be developed on land designated for Community Use within the Settlement Plan Area. As defined by the Urban Sustainability Directors Network (USDN), Resilience Hubs are community serving facilities that support residents and coordinate resource distribution and services before, during or after a hazard event. They are intended to equitably enhance community resilience while improving local quality of life. They are a smart local investment with the potential to reduce burden on local emergency response teams, improve access to health improvement initiatives, foster greater community cohesion, and increase the effectiveness of community-centered institutions and programs.

For lessees living in the Settlement Plan Area, a Resilience Hubs can provide an opportunity to build local community power and leadership. It can provide the resources beneficiaries need to enhance their own individual capacity while also supporting and strengthening the homesteading community. Instead of being led by Maui county government, it would be supported by local government and other partners but led and managed by the homestead community members.

A Resilience Hub could serve several functions for the residents in ʻUalapuʻe including:

- Community center and gathering space

- Training/education classrooms
- Emergency shelter for lower 'Ualapu'e residents within the tsunami evacuation zone
- Energy storage (batteries/fuel tanks)
- Wifi hotspot and charging station
- Storage for emergency equipment (food, water, ice, medical supplies, generators, fuel, maps, tools, portable water tanks)
- Emergency communication systems (HAM radio)
- Temporary medical center
- Helipad for firefighting and air-evacuation

7.3.3 Community Medical Services

One of the suggested uses by the community for this area included a drug rehabilitation and/or mental health center with a community garden (including fruit trees and taro), similar to the current use by Ka Hale Pomaika'i under the DHHL license. Other ideas included a health center for kūpuna and those with special needs, a plant nursery or meeting area.

7.3.4 Agriculture

Subsistence or sustainable agriculture was a consistent theme throughout beneficiary meetings. Sustainable agriculture can take place on individual settlement lots and on community management and access areas. The Settlement Plan identifies two areas for community management and access—Stewardship District and Conservation District lands. The natural resource management plans (NRMPs) for these areas are discussed in Chapter 4. However, agricultural uses are allowed under the Stewardship District land use designation and are discussed in combination with the potential agricultural use of individual lots.

The Stewardship land use designation opens these lands for use by beneficiaries or DHHL to provide immediate benefits to the surrounding community and the Trust. Permissible uses within the Stewardship district include: agriculture, ranching, aquaculture, cultural practices, gathering of traditional resources, game management, watershed protection, restoration, and forestry. The function and uses of the Stewardship designation are similar to the wao lā'au and wao kānaka zone. The wao kanaka zone allowed for (but did not mandate) field agriculture, aquaculture, habitation, recreation, and/or temple worship. The wao lā'au zone allowed for the management of a highly-tended forest via an integrated agroforestry (native and introduced plants) regime (Winter et al., 2018).

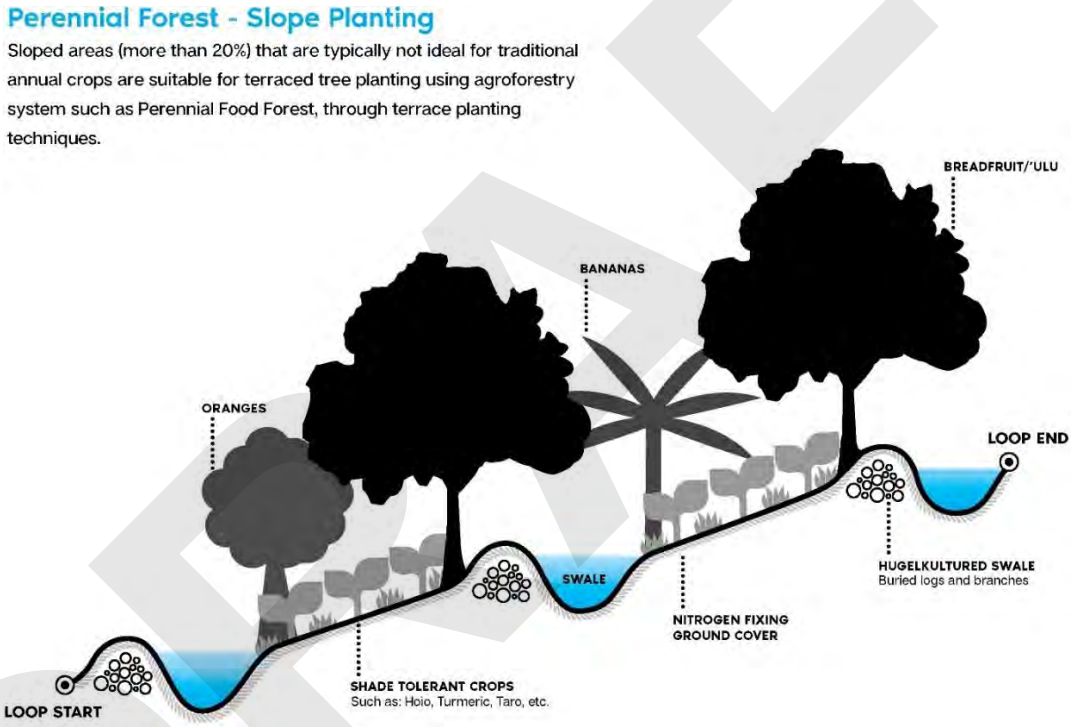
Agroforesty can take place on individual lots and Stewardship lands. Agroforestry can provide very high food production, biodiversity reestablishment, evapotranspiration enhancement, and supply its own green fertilizer through pruning. The 1990 Master Plan for 'Ualapu'e ahupua'a identifies kukui, ko'oko'olau, wauke, lama, hala, and 'ulu, as trees that can provide subsistence, cultural, and commercial benefits in the Stewardship district area. An 'ulu-based food forest (with 'ulu as an overstory, bananas as an understory, and various other plants (e.g. maile)) could produce different value-added foods and products while attracting greater biodiversity and a healthier and more stable ecosystem.

Sloped areas (more than 20%) are typically not ideal for traditional annual crops. The land could, however, conceivably be used to cultivate native plants that are important for various cultural

activities. Soil on the slopes could be stabilized and embankments created for growing specific crops utilizing terraced planting techniques *(Figure 7-4).* Potential agroforestry methods that could be implemented for Stewardship lands at ʻUalapuʻe may include, but may not be limited to:

- Alley cropping: Cultivating food crops with a long-term tree species to provide both food and in the long term, high value lumber.
- Indigenous/Tropical Forest Farming: Specialized native and tropical food crops that require cooler temperatures, and varying degrees of sunlight, can be cultivated under the canopy of certain tree species through this method of agroforestry.

Figure 7-4 Perennial Forest – Slope Planting



In preparation of the area for agroforestry, invasive trees may need to be removed. These invasive trees can be turned into biochar; a productive soil amendment.

Subsistence or sustainable agriculture can take place on individual lots and Stewardship lands. Creating a regenerative home garden on individual lots can yield affordable, healthier, tastier, traditional food, while providing exercise and stress relief. Maintaining a vegetarian diet of 2,300 calories per person requires approximately .44 acres per person. This includes fruits, grains, and vegetables. Both the namesake of ʻUalapuʻe (sweet potato mound) and the 1990 Master Plan for ʻUalapuʻe ahupuaʻa suggest that ʻuala is a suitable crop for the area. The area is also considered very dry or moderately dry (see Chapter 3). Common indigenous Hawaiian dryland crops included ʻuala, dryland taro, ʻuhi (*Dioscorea* spp; or yam), kava (*Piper methysticum*), ti, kō sugarcane (*Saccharum officinarum*), arrowroot (*Tacca leontopetaloides*) (Kurashima et al., 2019). Crops can also be grown

as understories in agroforestry systems. If a surplus of food can be grown, beneficiaries may also supplement their incomes with the agricultural products grown on their lots.

7.3.5 Agricultural Cooperative

A community non-profit entity to manage the natural resources of Conservation and Stewardship lands was discussed in *Chapter 4*. This community non-profit could partner with a community agricultural cooperative to manage the community agricultural areas of the Stewardship lands. An agricultural cooperative is an organization in which a cluster of small farms work together as a business by sharing resources and helping each other to produce and sell their crops, thus strengthening their market power. Cooperatives can also be created for fishing, fishponds, product development, and reforestation. The aspect of family-style groupings working together in cooperatives is similar to traditional lifestyles of the Hawaiian community. Cooperatives can create the critical mass of activity needed to develop a business climate and can be the vehicle to develop a new economy based on traditional activities. (Wyban, 1990).

7.3.6 Food Hub

When agricultural activities increase sufficiently, there likely will be a need for facilities to process and store products. The United States Department of Agriculture defines a food hub as "a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products." A food hub would help facilitate agricultural product collection, processing, and distribution; fill the gap between production and consumption; and generate jobs and revenue. A flour mill for 'ulu, kalo and 'uala is one example of a food hub.

7.3.7 Commercial Kitchen

Commercial kitchens can be used to turn agricultural products into packaged foods or value-added products. A professional commercial kitchen offers optimal operational efficiency and compliance with local rules and regulations. Food and value-added goods could then be distributed to wholesalers or sold locally at an onsite farmers market.

7.3.8 Farmers Market

Farmers markets reconnect communities to their food system. They create an opportunity where farmers can simultaneously sell fresh, local food and serve as food educators, revitalizing the way consumers shop and eat. They are places where farmers and neighbors meet to socialize and exchange ideas around cooking, nutrition, culture, and agriculture.

7.3.9 Cottage industry

A cottage industry is a small manufacturing business carried out from a person's home. Under HAR 11-50-3, people are allowed to have "Homemade Food Operations," home kitchen used to produce goods to sell directly to consumer. However, only certain types of foods are allowed to be produced and sold, the products must be labeled with specific information and the operators must obtain DOH approved food safety training.

This page left blank intentionally.

Chapter 8: Settlement Timetable to Commence After the Award of Lots

The timeline for settlement is currently dependent upon the completion of the HRS 343 compliance and the adoption of the final settlement plan. As such, the settlement timeframe is yet to be determined.

This page left blank intentionally.

Chapter 9: References

AECOS, Inc. 2022. *A natural resources assessment for DHHL 'Ualapu'e Kuleana Homestead Settlement Plan, 'Ualapu'e, Moloka'i*

Ahonui Homestead Association. n.d. *'Ualaupu'e Kuleana Homestead Subsistence Project & Cultural Resource Management.*

American Community Surveys. 2020. 5-Year Estimates Data Profiles.

Beamer, Kamanamaikalani et al. 2023. *Island and Indigenous systems of circularity: how Hawai'i can inform the development of universal circular economy policy goals.* Ecology and Society. Accessed online: https://ecologyandsociety.org/vol28/iss1/art9/.

Chimner, Rodney A., et al. "Current Extent and Historical Expansion of Introduced Mangroves on O'ahu, Hawai'i." *Pacific Science*, vol. 60, no. 3, 2006, pp. 377–84, Accessed online: https://doi.org/10.1353/psc.2006.0013.

City and County of Honolulu Climate Change Commission. 2018. *Climate Change Brief*.

City and County of Honolulu Climate Change Commission. 2022. *Sea Level Rise II*.

County of Maui Department of Water Supply. n.d. *Wellhead Protection Strategy for Maui County, Molokai Chapter Draft.*

County of Maui Department of Water Supply. 2011. *Lana'i Island Water Use & Development Plan.*

Department of Hawaiian Home Lands (DHHL). 1993. *Proposal for Expanding DHHL's Programs.*

DHHL. 2005. *Moloka'i Island Plan.* Prepared by Group 70 International.

DHHL. 2011. *Kahikinui Regional Plan.* Prepared by Group 70 International.

DHHL. 2019. *Moloka'i Regional Plan.*

DHHL. 2022. *General Plan.*

East Moloka'i Watershed Partnership. 2017. *Final Environmental Assessment and Finding of No Significant Pāku'i Watershed Project.* Prepared by the Nature Conservancy, Moloka'i Program.

Federal-State Task Force on the Hawaiian Homes Commission Act. 1983. *Report to United States Secretary of the Interior and the Governor of the State of Hawaii.* Accessed online: https://www.doi.gov/sites/doi.gov/files/fed-state-task-force-on-hhca-aug-15-1983.pdf

Handy and Handy. 1972. *Native Planters in Old Hawai'i: Their Life, Lore, and Environment.*

Hawai'i Climate Change Mitigation and Adaptation Commission. 2017. *Hawai'i Sea Level Rise Vulnerability and Adaptation Report*. Prepared by Tetra Tech, Inc. and the State of Hawai'i

Department of Land and Natural Resources, Office of Conservation and Coastal Lands, under the State of Hawai'i Department of Land and Natural Resources Contract No: 64064.

Hawai'i Wildfire Management Organization. 2016. *Moloka'i Community Wildfire Protection Plan.*

Hoakalei Cultural Foundation. 2014. *The Kuleana Act of 1850.* Accessed online: http://www.hoakaleifoundation.org/documents/kuleana-act-1850

IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 3–32, doi:10.1017/9781009157896.001.

Keala Pono Archaeological Consulting, LLC. 2018. Cultural Impact Assessment for the Proposed Veteran's and Resident's Center, Ho'olehua Ahupua'a, Kona District, Island of Moloka'i, Hawai'i.

Keala Pono Archaeological Consulting, LLC. 2021. Draft-Cultural Impact Assessment for 'Ualapu'e Kuleana Homestead in 'Ualapu'e Ahupua'a, Kona District, Moloka'i.

Kurashima, N., Fortini, L., & Ticktin, T. 2019. *The potential of indigenous agricultural food production under climate change in Hawai'i*. Nature Sustainability, 2(3), 191–199. Accessed online: https://doi.org/10.1038/s41893-019-0226-1

Malama Ka 'Āina Hana Ka 'Āina Community Association. 1987. *Subsistence Homesteads, A Community Management Plan for Department of Hawaiian Home Lands Keaukaha Tract II.* Palapala Ink.

Malama Ka 'Āina Hana Ka 'Āina King's Landing Community Association. 2022. *The Story of the Department of Hawaiian Home Lands and the Hawaiian Beneficiaries of King's Landing.* Accessd online: https://malamakaainahanakaaina.com/landback-journey

Malo, D. 1838. *Ka Moolelo Hawaii: Hawaiian Antiquities*. Lahainaluna: Mea Pai Palapala no ke Kulanui.

Maui County Department of Water Supply. 1982. *Molokai Island Water Systems Plan.* Prepared by Belt, Collins & Associates.

Maui County Department of Water Supply. 2022. *Moloka'i Water Plan Preliminary Draft.* Prepared by Townscape, Inc.

Minerbi, Luciano. n.d. Indigenous Management Models and Protection of the Ahupua'a.

Moloka'i Land Trust. 2023. *The Mokio Preserve.* Accessed online: https://molokailandtrust.org/the-mokio-preserve/

National Aeronautics and Space Administration. *Interagency Sea Level Rise Scenario Tool.* Accessed online: https://sealevel.nasa.gov/task-force-scenario-tool

National Park Service, U.S. Department of the Interior. 2019. *Hokukano-Ualapue Complex, HI.* Accessed online: https://www.nps.gov/places/hokukano-ualapue-complex.htm

Nishimoto, Warren. 1989. *Oral History Interview with William M. Akutagawa, Jr.* December 12, 1989. Kaunakakai, Moloka'i. Tape No. 19-1-1-89.

Office of Hawaiian Affairs. 2017. *Traditional & Customary Practices Report for Mana'e, Moloka'i.* Traditional Subsistence Uses, Mālama Practices and Recommendations, and Native Hawaiian Rights Protections of Kama'āina Families of Mana'e Moku, East Moloka'i, Hawai'i. Prepared by Akutagawa, Malia; Harmonee Williams; Shaelene Kamaka'ala, J.D.; and Native Hawaiian Rights Clinic.

Royal Order of the Crown of Hawai'i. 2023. *Royal Family of Hawaii Official Website: Crown Lands.* Accessed online: https://www.crownofhawaii.com/crown-lands

SMS Affiliations and Associations. 2017. *Non-Traditional Awards Evaluation.*

State of Hawai'i, Department of Business, Economic Development & Tourism. 1994. *Moloka'i Task Force Final Report*.

State of Hawai'i, Department of Land and Natural Resources. 2009. *Moloka'i Forest Reserve Management Plan*.

State of Hawai'i, DHHL. 1993. *Approval of Proposed Land Use Plan for Kahikinui, Maui.*

State of Hawai'i, Department of Transportation, Highways Division. 2014. Ecological Zones and Native Planting List. Prepared by SWCA, Environmental Consultants.

State of Hawai'i, Office of Hawaiian Affairs. August 7, 2019. Minutes of the Office of Hawaiian Affairs Board of Trustees Moloka'i Community Meeting.

Stokes, J.F.G. 1909. *Heiau of Molokai*. Bernice P. Bishop Museum. Typescript.

Summers, Catherine. 1971. *Molokai, A Site Survey.* Pacific Anthropological Records Number 14. Department of Anthropology, Bernice P. Bishop Museum, Honolulu.

Task Force. 1993. *Proposal for Expanding DHHL's Programs.* Task Force Report to The Department of Hawaiian Home Lands.

University of Hawai'i at Mānoa Water Resources Research Center. 1992. *Aquifer identification and classification for Molokai: Groundwater protection strategy for Hawaii.*

University of Hawai'i, Department of Urban and Regional Planning Practicum Class. 1993. *Moloka'i Fishpond Master CDUA Project.*

US Census Bureau. 2020. *American Community Survey 5-year estimates.* Accessed online: https://data.census.gov/cedsci/table?q=maui%20county&g=1400000US15009031700&tid=ACSST5Y2020.S0601

Winter, Kawika B. et. al. 2018. *The Moku System: Managing Biocultural Resources for Abundance within Social-Ecological Regions in Hawai'i.* Sustainability 2018, 10,3554; doi:10.3390/su10103554

Wyban, Carol Araki. 1990. *Master plan for 'Ualapu'e ahupua'a: blending tradition & technology*.

Young, Peter T. 2016. *Images of Old Hawai'i: Claims to the Crown Lands.* Accessed online: https://imagesofoldhawaii.com/claims-to-the-crown-lands/

Appendices

Appendix A

Beneficiary Consultation and Community Meeting Notes

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT. GOVERNOR
STATE OF HAWAII

WILLIAM J. AILA, JR
CHAIRMAN
HAWAIIAN HOMES COMMISSION

TYLER I. GOMES
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

Meeting Notes

ʻUalapuʻe Kuleana Homestead Project
Beneficiary Meeting #1 (virtual)
October 14, 2021 – 6:00 PM – 7:00 PM

For more information, please contact:
Email: dhhl.planning@hawaii.gov
Website: https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/

CONFERENCE REPORT

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

TO:	Department of Hawaiian Home Lands (DHHL)		
FROM:	G70		
DATE:	October 14, 2021	**LOCATION:**	Virtual
PROJECT:	DHHL ʻUalapuʻe Settlement Plan	**PROJECT NO:**	221047-01
SUBJECT:	ʻUalapuʻe Informational Beneficiary Meeting #1	**NO. OF PAGES:**	6
THOSE PRESENT:	(G70) Kawika McKeague, Barbara Natale, Ryan Char, Piʻilani Smith (DHHL) Andrew Choy, Gigi Cairel, Cedric Duarte, Mona Kapaku, Paula Aila, Juan Garcia, Sara Okuda, Atina Soh, Shelly Carreira, Commissioner Zachary Helm	**Participants**: 75	

SUMMARY:

Cedric Duarte started the meeting. Aunty Iwalani Kadowaki led the pule.

Cedric introduced Kawika McKeague, who introduced the G70 team. Cedric went over zoom housekeeping, chat and raise hand functions. He then honored Prince Jonah Kūhiō Kalanianaʻole and reminded us of the vision to bring people back on to the land.

Andrew Choy then discussed the DHHL planning system process. Gigi Cairel reviewed the Molokaʻi Island Plan (2005) and Molokaʻi Regional Plan (2019-2020). ʻUalapuʻe residential homesteading was identified as a high priority project in the Molokaʻi Island Plan. This residential project has been on hold due to high costs to put in the infrastructure. The Molokaʻi Regional Plan was updated and approved by Hawaiian Homes Commission (HHC) on February 18, 2020. The ʻUalapuʻe Kuleana Homestead Project was proposed by beneficiaries then identified as a regional plan priority project. The Ahonui Homestead Association stepped up and volunteered to be the community partner for this project and thus is listed as the community champion for this project. The Regional Plan underwent beneficiary consultation for 15 months (beginning November 2018).

Kawika opened a conversation with a discussion on kuleana (right, privilege, concern, responsibility) and hoʻokuleana (to entitle, give a responsibility). He shared the Molokaʻi waitlist demographics:

- Agriculture (1,100)
- Residential (837)
- Pastoral (207)

Kawika covered what the kuleana homestead entails, and the responsibilities of DHHL. HHC determines which waitlist to use to make kuleana awards, and the department is required to provide metes and bounds descriptions of lots, and an unpaved right of way to the awarded lots. Gigi compared the kuleana and conventional leases. Kuleana is faster process to get people on the land, but comes with limited infrastructure (i.e. road and metes and bounds) with more responsibility on the lessee. A conventional lease takes much longer, as the department needs to develop the infrastructure.

Barbara covered the role of G70 in the process. G70 will help facilitate discussions between DHHL and interested applicants in order to develop the ʻUalapuʻe Settlement Plan. Hawaiʻi Administrative Rules (HAR) §10-3-30 outlines the contents of the Settlement Plan. Barbara also covered the Hawaii Revised Statutes (HRS) Chapter 343 Environmental Assessment (EA) and its components, including subconsultant work currently being done. Consultant studies include cultural/resource management, water/roads, and erosion. She shared the ʻUalapuʻe timetable,

then conducted a poll. Barbara then shared the results of the poll (50 of 77 participants responded):

1. **Are you a beneficiary?**
    a. Yes: 78%
    b. No: 22%
2. **Which waitlist are you on? (Some respondents on multiple waitlists)**
    a. Residential: 40%
    b. Agriculture: 60%
    c. Pastoral: 10%
    d. I don‘t know: 6%
    e. None: 26%
3. **Approximately how long have you been on the waitlist?**
    a. 0-10 years: 34%*
    b. 10-20 years: 18%
    c. 20-30 years: 28%
    d. 30-40 years: 12%
    e. 40-50 years: 4%
    f. 50-60 years: 0%
    g. 60+ years: 4%

*There was no “None” option for those who indicated they were not on the waitlist, so they may have selected this option

4. **Is ‘Ualapu‘e a place that you see as one for you and your family to be homesteaders?**
    a. Yes: 50%
5. **Is Kuleana homesteading something you would be interested in?**
    a. Yes: 42%
    b. Need more info: 26%

Cedric discussed general updates on other DHHL Lot Development Projects. The Department is moving forward with the planning phase, HRS 343 EA and subdividing process for 58 lots in the Nā‘iwa Agriculture Subdivision; and planning phase and HRS 343 EA for the Kalama‘ula agriculture lots. These developments are for the existing lessees. DHHL is. Moving forward with the planning phase and HRS 343 EA for Ho‘olehua agriculture lots, which will be offered to agriculture applicants.

Cedric provided the email (dhhl.planning@hawaii.gov) and website (https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/) to contact DHHL.

Cedric then opened the zoom for questions and discussion.

Chat/Questions/Comments/Discussion:

- **--: Is there any way that you would be “removed” from the land/lease?? If you not doing your kuleana, if you not using your land?**
    - Cedric: Yes. Each lessee will sign a homestead lease that will have conditions. If lessee is out of compliance with the lease, it constitutes a lease violation. Non-use of land is a major lease violation.

- **Leila Kealoha: Will DHHL eventually put in infrastructure?**
    - Gigi: No. Per the rules, DHHL is only obligated to put in un-paved road access to the homestead area. Through the planning process, infrastructure options will be discussed further.

- **Mahina and La‘a Poepoe: This would potentially be the largest subdivision development in the history of Mana‘e with resulting impacts to the lives of all who live here. I would recommend an EIS?**
    - Kawika: There‘s a long reason why we’re not doing an EIS, but short reason, significance criteria. In our experience on the past two Kuleana Homesteading

planning processes, the EA versus an EIS was a good threshold to engage the investigation and, of course, as you start that investigation, if things come up that then warrant a more thorough detailed analysis, because you have something of substance where the project is going to have a irreparable impact, it then does require us to go into an impact statement. It's also driven by the definition of the project which here the project is being defined as the homesteading settlement plan which is defining the metes and bounds of the homesteading.

- **Andrew Fries: Are those photos available for us to see?**
  - Gigi: DHHL will work with our consultants on this and see if we can post on the DHHL website/‘Ualapu‘e project page.

- **Mahina and La‘a Poepoe: How will the impacts to the wider community be assessed?**
  - Kawika: The EA looks at cumulative impacts as well.

- **Mahina and La‘a Poepoe: For ‘Ualapu‘e, can you expand on the water and sewage options that you will offer considering no infrastructure provision?**
  - Gigi: We are just starting the planning phase. No options yet. There will be technical studies to be done, and we‘ve been receiving comments/ideas from beneficiaries themselves. Such options will be listed in the Kuleana Settlement Plan which beneficiaries have opportunity to review and comment on before it goes to Commission approval.

- **Walter Ritte: County has their water well on your land, you need to get water to the beneficiaries. Water is one of the most important needs.**
  - Andrew: We will be looking at potential water options. We are well aware of the potential to collaborate with the county and potentially bring water from the County's source to help to provide water to the homestay community, but we need to do further study and have further communication with the County on collaborating with them. The County Department of Water Supply has initiated its update of its Water Use and Development Plan, and if you can share similar sentiments in that planning process, it would help to guide the company's policy and how it allocates its financial resources to developing infrastructure that might help to support the Department's mission.

- **Mahina and La‘a Poepoe: Have Kuleana leases been awarded, such that infrastructures like water, sewer, and electrical have not been provided?**
  - Blossom Feiteira: Yes. Kahikinui on Maui was the first Kuleana homestead. The Department will not invest funds into lands that are too costly to develop. The kuleana program was designed to get beneficiaries on the land faster, and for those who want to live off grid. This means an unimproved lot, no water, power, or sewer. You get to develop a plan that you‘re comfortable with, but if you decide to take one of these lots, you are on your own. You can‘t access a conventional mortgage loan because it‘s not a county approved subdivision, and you won‘t have the basic infrastructure. In Kahikinui, broadband and telephone was provided through an agreement with Sandwich Isles Communication. Kuleana homesteading was an idea that came from kūpuna who wanted to go home to Kahikinui. The younger generation worked closely with the department to establish the kuleana homestead. One year after returning to Kahikinui, those kūpuna passed.

- **iPhone: So basically going have 800+ families camping?**

- **Mahina and La‘a Poepoe: The natural grade of the mountain is steep, how will erosion runoff be managed and contained considering heavy grading will likely be required?**

  - Gigi: This will be explored as part of the Planning Process, through our consultants and the technical studies.

- **Mahina and La‘a Poepoe: Seems like a hands off approach by DHHL, how does DHHL maintain oversight and compliance of development activities?**
  - Cedric: It would be through the DHHL homestead lease terms and conditions. That would be DHHL‘s primary tool. But I do want to highlight that DHHL didn't get here alone. We got here through the regional planning process with the community over about a year and a half and several meetings.

- **K. Hirata: As a cultural claimant/descendant of Ualapu‘e and a Kuleana Landowner descendant in East Molokai, an EIS needs to be done, not just an EA.**
  - Andrew: Our mission is to return native Hawaiians to the land, and we want to make sure that we are also good stewards of the land. If you can tell us about particular resources or impacts that you are concerned about that you'd like us to take a look at and address, that would be very helpful to our process.

- **Mahina and La‘a Poepoe:The well that services the entire district is in the immediate area and is a wellhead protection area, how will you ensure that the wellhead will not be contaminated by agricultural inputs, potential sewage, and other contaminants?**
  - Gigi: GREAT questions. I‘ll refer to DHHL consultants to see how we can address this.

- **Leila Kealoha: There was a statement made about how the Kuleana lessees would create their own association. Does this mean DHHL will recognize the association and back them in their endeavors? This is not the case in other homestead associations across the state. How will DHHL recognize and support the association?**
  - Gigi: The Administrative Rules do identify that a kuleana homestead association will exist for any kuleana homestead. So, for example, Kahikinui has an association that has a specific purpose - it is to manage the homestead and the common areas, and all awarded lessees are automatic members of the association. The Department will be assisting and helping to set that up initially, however we won't know who the lessees are for at least a few years from now, until the lessee has signed the lease.

    The associations are private nonprofit organizations, so they're not affiliated with the department at all. I'm not real sure about the other part of the question of, is the department going to back them up. DHHL really doesn't have that kind of relationship with the associations.

  - Blossom: I can just tell you this after years of working with the Department and homestead communities, your relationship with the Department of Hawaiian Home Lands and the Hawaiian Homes Commission is your relationship and how you build that is up to you. It isn't a matter of the department recognizing you, it's about you recognizing yourself as a community of beneficiaries, and that establishes your relationship with the Department and the Commission.

- **Earl Kawa‘a: Is G70 studying the place names to better understand and inform the EA process? There needs to be literature surveys and in-person interviews. You need to talk to the people who‘s geneaology is there at that place and have community meetings with those people first. Do the research well so that it‘s there for the next generation.**
  - Kawika: G70 works with Keala Pono Archaeological Consulting who has folks on Moloka‘i that will be doing that research. We're just starting, so we have not yet done the research. But we realize the importance of looking at place names, rain names, wind names and how that informs the spatial and time element of not just

our ancestor’s interpretation of place but informing us in terms of traditional ecological knowledge that we can utilize to understand this place a little bit better.

- **Fries Ohana: What is the total usable land? How many acres - is that information available?**
    - Andrew: At this point we don’t have that number. We need to study the land to see where it is appropriate to put homestead, and where it is not appropriate to put homestead.

- **Walter Ritte: One of the things that this kind of homesteading is going to need is access mauka to makai. Mauka get food and makai get food. There's a State fishpond - ‘Ualapu‘e fishpond - that nobody has a lease to; the Department might want to try and organize some kind of right-of-way with the State of Hawai‘i so there is access to the ocean.**

- **Earl Kawa‘a: There is an ala hele that goes from mauka to makai that you folks have to find out where it is. The only way to do that is probably through mele, probably through ole and probably the older generation going to know that.**

- **Keani Rawlins-Fernandez: If someone on the waitlist receives a Kuleana Lot lease, is that person removed from the waitlist to get a residential lot and/or ag lot?**
    - Cedric Duarte: So, as we go through this process, the first thing that the Department is going to need to do is work with the Hawaiian Homes Commission to determine which waiting list we’ll be using. So if it's determined that this is, for example, all subsistence agriculture lots where you have the option to put a dwelling, that would then remove that beneficiary for both an agricultural list and the residential list. But we're still a little early in the process. When it comes time to determining the waiting list, we will be having this conversation with the community, so that we can take a recommendation to the Hawaiian Homes Commission on which waiting list we would be addressing with this particular project. In Kahikinui for the pilot project, that was the Maui island pastoral list.

CORRECTION: If Commission approves using the Agriculture waitlist, and Kuleana Agriculture leases are offered in ‘Ualapu‘e, then your application on the Agriculture waitlist will be cancelled. If you are also on a residential waitlist, your application will remain on the residential waitlist. Further, if you do sign a Kuleana Ag lease, and build a dwelling on your Kuleana Ag lot, that then becomes your primary residence. In this case, your application will be cancelled from the residential waitlist.

- **Earl Kawa‘a: I made a sort of joke about the ala hele with regards to the night marchers, but you don't want to build on that path. We don't want our families to be in that line and get hurt.**
    - Kawika: Understood - we'll take that into account and even visual relationships, triangulation relationships, and space relationships in between. We anticipate there to be a lot of important sites.

- **Kawehi Soares: This is for the supposed Na‘iwa subdivision coming up.The name "Na‘iwa" subdivision by Pu‘u Kanaio should be replaced with Ho‘olehua. It's not in Na‘iwa but in the Ho'olehua (2) Ahupua‘a. The name on the map is incorrect.**
    - Cedric: Yes, we've heard that and, as we proceed forward with the development of that area and we start to get the infrastructure put in with the lessees, I think there may be an opportunity to correct the naming there.

- **Fries Ohana: I just wanted to be really clear. So, for instance, if somebody was awarded, they would have just the land and whatever resources, and would basically have to use their own resources to build a house. And if somebody wanted utilities, they would have to fund that completely or is it not even possible.**

  - Cedric: Correct, you'd have to fund all of the building completely. If you do choose to build a dwelling, health and safety codes apply. As for utilities, that would require individual solar panels, water catchment, water tank, septic tank, etc. - those would be responsibilities of the lessee. The Settlement Plan will provide possible building and utility options that the lessees can use.

- **Fries Ohana: So it's not set in stone that you would even live there in some of these places, some of these might just be strictly agriculture and you couldn't actually build a dwelling.**
  - Cedric: Part of this planning process is to identify appropriate areas for dwellings and agriculture. We have to understand what the land looks like and what's possible before those decisions can be made.

- **Keani Rawlins-Fernandez: If a beneficiary is awarded a kuleana lot lease, would their successors then inherit that lease?**
  - Cedric/Gigi: Yes! As long as the successor(s) are listed. Often times, lessees forget to name the successor(s).

- **Keani Rawlins-Fernandez: These kuleana lot leases would be treated the same as residential/ag/pastoral leases as to successorship and other designation?**
  - Gigi: YES! Same. 99 year lease, successor designation, etc.

- **Mahina and La‘a Poepoe: I would caution everyone to understand what you‘re getting yourselves into at ‘Ualapu‘e. It‘s steep. There‘s one straight direct road. If you drive on that road today, you would slide all the way down. Caution what you‘re getting into. Touch the soil of the place. This is just a precaution for those who have never touched the soil of ‘Ualapu‘e.**
  - Cedric: That's a really good comment, and at least in the beginning the department can make some of those photos available for those who have not seen the area to get a somewhat better understanding of what you're sharing. Then as we move forward with more understanding of the place that the lessees really need to understand what they're getting themselves into.

The meeting ended approximately at 8:01pm.

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT. GOVERNOR
STATE OF HAWAII

WILLIAM J. AILA, JR
CHAIRMAN
HAWAIIAN HOMES COMMISSION

TYLER I. GOMES
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

Meeting Notes

ʻUalapuʻe Kuleana Homestead Project
Community Meeting #1 (virtual)
December 1, 2021 – 6:00 PM – 7:30 PM

For more information, please contact:
Department of Hawaiian Home Lands
PO Box 1879, Honolulu HI 96805
808.620.9500

Email: dhhl.planning@hawaii.gov
Website: https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/

CONFERENCE REPORT

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

TO:	Department of Hawaiian Home Lands (DHHL)		
FROM:	G70		
DATE:	December 1, 2021	**LOCATION:**	Virtual
PROJECT:	'Ualapu'e Kuleana Homestead Settlement Plan	**PROJECT NO:**	221047-01
SUBJECT:	Community Meeting #1	**NO. OF PAGES:**	7
THOSE PRESENT:	G70: Kawika McKeague, Barbara Natale, Pi'ilani Smith, Ryan Char DHHL: Gigi Cairel, Cedric Duarte, Andrew Choy, William Aila Jr., Zachary Helm, Mona Kapaku , Juan Garcia, Shelly Carreira SHPD: Andrew McCallister	Community Participants: 77	

SUMMARY:

The first community meeting for the 'Ualapu'e Kuleana Homestead Project was held virtually via Zoom on December 1st, 2021. The zoom was opened at 5:40pm and the meeting began at approximately 6:02pm.

Cedric Duarte started the meeting. Commissioner Zach Helm started with a pule. Chairman Aila made a few announcements. If you have a disagreement with the process, please contact DHHL: by phone 808.620.9500; by letter DHHL, PO Box 1879, Honolulu HI 96805; send an email to DHHL.Planning@hawaii.gov; or attend a meeting like the meeting tonight.

Cedric announced that this is the first community meeting, and the goal is to present the project to the wider community. Agenda includes opening pule, introductions, review agenda, purpose and outcomes, the 'Ualapu'e Kuleana Homestead Project, questions/discussion, next steps, and closing. He then discussed zoom housekeeping and etiquette and the legacy of Prince Jonah Kūhio Kalaniana'ole.

Andrew Choy discussed the DHHL Planning Process. It is through the island plans in which the Commission determines land use designations. Gigi discussed the Moloka'i Island Plan, and the Regional Island Plan, in which 'Ualapu'e Kuleana Homestead was determined as a high-priority project.

Cedric introduced Kawika McKeague, who introduced the G70 team and prompted a discussion on Kuleana Homesteading. He turned it over to Gigi, who discussed the settlement sequence. This is an agricultural land use, so a residential structure is optional.

Kawika discussed the Kuelana Homestead Settlement Plan and its contents, including the role of subconsultant studies. He then explained how the information gathered will play a role in the Environmental Assessment. He discussed the work currently done and the situational context with the larger community. Expected outcomes include the Settlement Plan, the state-required Environmental Assessment, and possible land use revisions from the Moloka'i Island Plan. He then shared the planning timeline from December 2021 to February 2023.

Cedric then opened the floor for discussion, addressing first the chat questions. He then turned to those with raised hands, then to those on phone. Once questions were addressed, Cedric ended the meeting at approximately 7:48pm.

Questions/Comments:

La'a Poepoe: Was the alleged incident mentioned confirmed to be an intentional hostile act?

Cedric: Right now, it's too early to say if the incident was intentional or not, we're letting law enforcement conduct an investigation and we'll go from there.

Mahina Poepoe: Are you able to tell us how many individuals prioritized this as "high priority" or #1?

Andrew: As part of the Moloka'i Island Plan process in 2005, the department conducted a survey, and the survey is included in the back of the Island Plan. Behind Ho'olehua, which is mostly settled already with agricultural homestead lessees, 'Ualapu'e was the next most preferred choice for agricultural lessees to settle.

Khirata: For clarity, please explain, how does DHHL and beneficiaries identify what is considered a "high priorty" project land for development?

Andrew: As part of the Island Plan, we do conduct a survey to see what the preferences are of our waitlist applicants for a particular island and where they would like to live and settle. That's one of the factors the Department uses to prioritize what areas to develop over the lifespan of the Island Plan. Some other factors are the cost to develop as well as suitability for siting homesteads in a particular area.

Mahina Poepoe: What does that mean about determining "what waitlist" can you choose only waitlisters who are currently already living on Molokai or are originally from Molokai?

Gigi: DHHL has 3 waitlists—residential, agriculture, pastoral. It is up to the beneficiary which waitlist(s) to apply for. Per Rules, only the Hawaiian Homes Commission, can approve which waitlist(s) to use for a Kuleana Homestead Project. Where the beneficiary is originally from for where they currently reside has no bearing. DHHL is required to go by date of application.

Mahina Poepoe: G70 visited the site in November, I'm curious what their initial feedback is regarding the proposed development and considering the grade of slope and the road conditions?

Ryan Char: Site is very steep. Hard to walk trails, some in switchback that can be managed a little better. Erosion has become a problem here. Will need to see how erosion and access will be managed, drainage infrastructure to keep water away from roadways. Would help with road maintenance. Many BMPs and mitigation that will need to go along with siting the lots.

Mahina Poepoe: If residential structures not required for ag, are encampments allowed? Ezup, tents, pallet structures, etc.?

Gigi: Health and safety codes apply, and any rules the homestead association has will apply as well. Generally, any structure needs to be filed with the DHHL office as a lot improvement.

Malia Akutagawa: Will the chat be made part of official public testimony?

Cedric: It is. It's part of this meeting.

Malia Akutagawa: I am from 'Ualapu'e where my grandmother's land is located across from Kilohana School. This is our ahupua'aand my family and I exercised our hunting, gathering, and fishing rights here. I am concerned with the sheer number of lots proposed. We are already impacted with subdivision development here. Our limu and fishing grounds have been impacted. This area also has a lot of archaeological site and quite honestly can be spooky with

many spirits up in the mountain. Some people have become pupule from colleting artifacts and pohaku improperly. This is not an ideal place to build homes because of the spiritual nature of this place. Additionally I am not sure where you are going to get water. We have been seeing over the last several decades prolonged drought. The springs and stream have dried up, affecting our limu beds, crab grounds, fishponds, and ability to gather things like pepeiao. This project would likely worsen conditions. The impacts are such that an Environmental Impact Statement is warranted due to significant impacts, rather than doing an Environmental Assessment with anticipation of a FONSI. While your DHHL strategic planning took 15 months, people from 'Ualapu'e were not consulted. It isnot enough that applicants eligible for Hawaiian Homestead to be part of the planning process, but also the people of 'Ualapu'e before vetting these lands for Hawaiian Homestead.

-These heiau are spooky and comprise an entire kino. There is a heiau in the ocean. Once a month we would hear drums.

-What are the impacts to those of that ahupua'a, rights, resources etc? (Ka Pa'akai Analysis)

-The people from 'Ualapu'e are not maha'oe. I'm concerned with the grading.

-Its best to do an EIS. Especially if DHHL is the accepting authority, it's like a self rubber stamp.

iPhone: Why does the name of this project include "Kuleana Land Project"? It almost is almost insinuating you folks are using "Kuleana Lands" as a subject in a Hawaiian Homes project. It sounds like a play on words which can be very confusing.

Cedric: Specifically, the project is 'Ualapu'e Kuleana Homestead Project. That is the title of what we're looking at. As Kawika had mentioned earlier, when it comes to Hawaiian Home Lands and Kuleana Homesteads, it's codified in the administrative rules that oversee the program. It's a very specific thing that's separate from Kuleana Lands.

Liko Wallace: Dont recall if you mentioned how many residential, agricultural, and pastoral lots are included in this area?

Cedric: We are early in the process and determination of lots hasn't been determined yet.

Earn Dunnam: I am from Kalua'aha and I agree with Malia.

Iphone: I am from Kalua'aha and also agree with Malia!

Shaeralee: I am concerned with how minimal the help would be from DHHL.

iPhone: Any disruption in Mana'e will affect the entire Mana'e Community.

Tammy: I agree with Malia.

Kamaile MacLoves: I agree with Malia.

KHirata: The consensus from Mana'e families is that an Environmental Impact Statement be done. I agree with Malia! Mahalo piha Malia! Keo

Mahina Poepoe: So legislative action is needed to change the name from Kuleana to something else?

Cedric: This is codified in the Hawaii Administrative Rules (HAR), so it would be a rule amendment process. This would require governor's approval to initiate. It would be an 18-24 month process to change the administrative rules. Usually to change administrative rules, other

agencies just conduct public hearings. The Department of Hawaiian Home Lands, conducts beneficiary consultations in addition to public hearings. So to change administrative rules, at least on the DHHL side, takes a little longer, but it is possible.

Iphone: This settlement plan is detrimental.

Mahina Poepoe: I don't support this project and don't see any way I will support it in the future. I am from Mana'e. I wanted to talk about water. Scarcity is expected to increase. The wellhead protection area is on the mountain, which exposes the water to pollutants. The well is a skimming well, so there isn't a lot of water. Condensation drippings cant sustain a household. Water delivery by truck is unsustainable. Agriculture can't happen without a supply of water. What happens to the deer when you force them out of the mountain? I'm concerned about illegal obtaining of water (i.e from school, hydrants, etc.). There is better, more hospitable land on Molokai that you can provide infrastructure.

Cedric: Thank you Mahina. I think that is the purpose of tonight's conversation, to allow community to have voice in this conversation. I think all of us would like to have better lands within the Hawaiian Home Lands inventory for native Hawaiians to homestead on. While we do have other lands, many of the lands in Na'iwa Homestead and Kalama'ula, they've been spoken for and they are a part of future development plans as well. So this isn't the only project DHHL is working on, we are working on other improvements on the island in order to address the waiting list; the commission and department have a difficult task to utilize the lands within our inventory to address the needs of the native Hawaiian community, as well as balance that with the needs of many of you who are participating in this conversation.

Kekoa Wong: Will there be any disruptions to the Kaluaaha lands?

Kawika: It is still too early to say. We'll put it on our radar.

Peter Pale: I oppose this project. Will email my mana'o.

Kelly Kawaa: I support making land available for Molokai Kanaka but 200 is absurd. If this settlement does happen it needs to be less than 10 and be available to Molokai Kanaka first. There is great concern regarding erosion and access to the area.

Cedric: We're still early in the planning phase to determine number of lots and sizes. We have to allow the consultants and engineers to complete the work mentioned before.

Malia Akutagawa: I am also helping with the Molokai Climate Change Action Plan. Our community just went through district meetings with a review of sea level rise maps. Essentially much of Mana'e will be under water, including our coastal road. Access to these lots are going to be problematic especially if it means cutting a new road more Mauka through a lot of cultural sites.

Karen J Cohen: Is there a possibility that after the info gathering, etc, that this homestead settlement could be tabled?

Cedric: [See Below]

iPhone: Will our voice have any say? Or is this just a formality?

Cedric: This is not a formailty. We are having conversations with the beneficiaries and the community. We are going to gather the information and compile for HHC.

Shayna Kawamura? My family owns land in 'Ualapu'e, what will happen to my families land with this project.

Cedric: As we move forward, there will be maps of where development may (or may not) occur. The lands will only be looked at if they're in DHHL inventory.

Shaeralee: DHHL is going to have to give more help to awardees if they want the development to work without causing huge problems.

Cedric: So noted.

Shaeralee: Kalamaula ag hasnt even gotten any help for years.

Cedric: For next year's legislative session, DHHL has submitted a request for funding to do planning for the Kalama'ula Ag Lots. Much of the work that we do is dependent on whether or not the State of Hawai'i provides adequate funding for the program to do planning meetings and conversations like this ahead development, then ultimately getting construction funds to put in infrastructure in areas where appropriate. With regard to Kalama'ula Ag Lots, we definitely would call any beneficiaries on the waiting list to support DHHL getting funding to do planning for Kalama'ula Ag Lots.

Peter Pale: Is it still in the planning to move Kapaakea ohana more mauka?

Andrew: there is a planning process for south shore erosion planning for Molokai. It began in 2018. Had to rethink outreach approach due to COVID. We are examining mitigation measures but it is not ready yet. Maybe by 2022.

iPhone: How long was this planning going on? Seems like years already and you ready to open up one new homestead?

Peter Pale: With that being said thinking Kapaakea more logical for awardees?

Mahina Poepoe: There are people who want to participate but do not have the technological capacity. How can they participate?

Gigi: every community meeting there is a phone option for people to call in. Phone-in option is posted on the meeting announcement.
Cedric: We try to be as open as we can. There's an email address; if email is too challenging, you can call use through our contact center. I can put the phone number in the chat as well if people want to call. We want to hear from the community, we can take old-fashioned letters as well. People can call, email, or write us a letter. Contact DHHL at 808.620.9500; Mailing address DHHL, PO Box 1879, Honolulu HI 96805; Email DHHL.Planning@hawaii.gov.

Cora Schnackenberg: I wanted to mahalo DHHL and the expertise in handling the studies. I know you will do transparent research to address our community concerns. Change is difficult, but I support this project. Our kupuna have died on the waitlist and our people live in over-crowded housing with families. Easy to catch COVID. We're also the highest unemployment community within the state. Our resources will be depleted, if our Hawaiian people on the waitlist have the ability to live on the land, then so be it. I do support this and all your concerns will be answered.

Kelly Kawa'a: What does DHHL's timeline look like regarding any development? Is DHHL open to a different kind of sustainable development?

Cedric: This is a subsistence agricultural project, so a dwelling isn't necessary, it could just be for consultation. Just within the planning process it can take around 2 years.

Pūlama Lima: Just to clarify, the waitlist isn't just specifically for Moloka'i residents, correct? Will this be open to the general DHHL waiting list?

Cedric: The waitlist that will be used is for applicants who are interested in homesteading on Moloka'i. There may be applicants who are on the waitlist for Moloka'i who wish to return home but are residing elsewhere.

Pūlama Lima said Mana'e is the fabric of the area. While I want to support putting native Hawaiians on the land, it will affect the entire Mana'e district. How can we get on the list for talk story? Yes, there is a CIA requirement but we are also trying to understand more about the wahi. Need to field verify sites in order to understand the impact on cultural practices. I understand Keala Pono is doing talk-story sessions, specifically Maka. I am wondering how some of the 'Ualapu'e residents can get on that consultation list, and also, if the talk-story is part of the CIA and EA process, or is it just precautionary steps you folks are taking as a planning firm?

Kawika: It's both. We always try to utilize 'ike kūpuna. There is a CIA requirement as part of an eventual EA, but instead of waiting for a refined or defined project, we want to understand this wahi. There was a process by which we circulated and asked for names to come forward, but I have to circle back with Maka. For those that want to participate or say something specific, probably through the means Cedric provided. We'd be happy to take that information and give that to Maka, and have him make the appropriate contact.

Andrew McCallister: Please have your archaeological firm follow up with my office regarding their survey strategy.

Judy Caparide: I feel so bad for our own people. It makes me cry, you cannot take nothing with you. Gotta leave the best for the people left. This is for the generation to come. This is not to destroy or steal. It takes hard work to put everything together. How can it be? Gotta love somebody because God loves us and gave it for free.

iPhone: How sustainable can this project be if it you just think about it individually?

Earl's S21 Ultra: When is the next meeting? Seams like nobody knows when the meetings are, needs to b made more public.

Gigi: there was a slide in the presentation with the next few meetings. Meeting dates will also be posted on DHHL website. For now, we are planning January 2022 (date TBD), for next meeting

Shaeralee: I live right next to this planned project, and I see the effects of what comes down from the mountain first hand. The erosion is VERY bad.

KHirata: Besides, Andrew McCallister, is there anyone else from the Hawaii State Historic Preservation Division, on this meeting?

Malia Akutagawa: I would like to say that as a state agency, it is not about being a popularity contest. The Hawai'i State Constitution and judicial decisions demonstrate how to weigh the concerns of different stakeholders. As I said earlier, Ka Pa'akai standard is applicable here

Mahina Poepoe: So you would impose this even if the broader mana'e community was against it? Depending on the waitlist/beneficiary feedback as well. I see that as setting up for a really bad situation for social conflict.

Lori Buchanan: Can the department give Molokai beneficiaries an update on ALL Projects "in the que" for Molokai on a next call or separate call just for Molokai Island Updates. Department please a meeting for Molokai updates..."Hoolehua Scattered Lots", Kalamaula, Kalaupapa, Naiwa, Water developments, Hoolehua graveyard and others?

Gigi: FYI -- at every April Hawaiian Homes Commission meeting, an overall update on DHHL development projects is provided at the evening community meeting. The recording is available on the DHHL website, HHC page. In the past, it was an in-person community meeting held on Molokai. For April 2020 and 2021, it was done virtual and recording available on DHHL website

Karen J Cohen: Are you also taking into account the possible negative consequences to the Aina that's makai to this proposed settlement?

Shari L. / Molokai: Mahalo everyone for speaking out so boldly. Ka Hale Pomaika'i has been at "ground zero" for the past 18 years and are continuing to bless our Mana'e community with our organic produce, all free to our community here. The picture you see is our farmed aina that not only feeds us but helps our 'ohana and friends who struggle with staying sober find health and purpose. We will definitely miss being here. Mahalo for the many fruitful life-saving years we have been blessed to serve Moloka'i. All are cherished.

iPhone: We thinking about our future generations. It's a different time anake. We gotta protect what we get left.

CONFERENCE REPORT

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

TO:	Department of Hawaiian Home Lands (DHHL)		
FROM:	G70		
DATE:	March 2, 2022	**LOCATION:**	Virtual (Zoom)
PROJECT:	ʻUalapuʻe Kuleana Homestead Project	**PROJECT NO:**	221047-01
SUBJECT:	Beneficiary Consultation #2	**NO. OF PAGES:**	4
THOSE PRESENT:	G70: Kawika McKeague, Barbara Natale, Piʻilani Smith, Ryan Char, DHHL: Gigi Cairel, Cedric Duarte, Andrew Choy, Sara Okuda (LDD), Solana Tutop	Participants: 32	

SUMMARY:

The second Beneficiary Consultation for the DHHL ʻUalapuʻe Kuleana Homestead Project took place on March 2, 2022. The meeting was hosted virtually on Zoom and began at approximately 6:00pm. Credic Duarte opened the presentation and Andrew Choy provided the pule.

Cedric discussed the agenda for the meeting as well as zoom housekeeping etiquette. He turned it over to Andrew, who discussed the DHHL planning process. Gigi Cairel discussed the history of the ʻUalapuʻe Kuleana Homestead Project in the Molokai Island Plan (2005) and the Molokai Regional Plan (2019). The ʻUalapuʻe Kuleana Homestead project (Subsistence Agriculture) is a beneficiary-driven project.

Kawika provided the background of the DHHL Kuleana Homestead Program. It's a designation for available, unimproved homelands that is suitable for lessees who wish for immediate access to the land for subsistence uses. The lessee must participate in the Kuleana Homestead Association and help maintain rights-of-way and lots. The HHC determines which waitlist to use, and DHHL is to provide metes and bounds of lots and an unpaved rights-of-way to the awarded lots.

Gigi described the differences between the Kuleana Homestead and Conventional Homestead leases. Kuleana leases offer a "fast-track" to get on the land, offers an unimproved lot, and more responsibility is placed on the lessee. Gigi covered the settlement sequence: the project is currently in the planning stages, which includes community outreach, Kuleana Homestead Settlement Plan (KHSP), Environmental Assessment (EA), and Land Use Amendments (if any). Barbara Natale broke down the project timeline in detail; this is the second of four beneficiary consultations.

Barbara began the first round of mentimeter questions:

1. **Do you have a pilina (connection) to this ʻāina?**
    a. 'Ae (Yes)
    b. 'A'ole (No)
2. **What do you hope to see/learn tonight that would help create that pilina?**
3. **What is your favorite haliʻa aloha (memory) of ʻUalapuʻe?**
4. **Did you participate in any of the following plans of the ʻUalapuʻe Community?**
    a. 2005 Molokaʻi Island Plan
    b. 2019 Molokaʻi Regional Plan

Barbara then discussed the planning process, including relationship to prior research/studies and connections to the moku of Manaʻe. She discussed Land Commission Award history in ʻUalapuʻe. The project is on State land and will not affect private LCAs. Barbara discussed existing conditions of the project area, including: rainfall, tsunami and sea level rise, soils, topography, accessibility, and natural and cultural resources.

Barbara turned it over to Kawika who discussed technical work completed to date, including: aerial surveys, biological assessment, and the Honuaiākea Process. Aerial Surveys provide high-resolution imagery to assess terrain, erosion, and vegetative cover conditions. The biological assessment provides that the project area is mainly comprised of invasive flora and fauna, with pockets of native species. Deer and ungulate fencing in targeted areas is one of the recommmended actions for biological management, reflected in both the Regional Plan and the biological assessment.

The Honuaiākea Process comes from the Edith Kanakaʻole Foundation. It analyzes mele, oli, moʻolelo, and kaʻao unique to a wahi (place) to formalize kapu and kānāwai. In this process, kapu are the resources crucial for ecosystem stability and community survival whereas kānāwai are the actions needed to maintain said resources. This process yielded three kapu, each with two associated kānāwai:

- **Kapu 1: Ua ka ua, Kahe ka wai.** *Water needs to flow to all inhabitants of the ahupuaʻa. Mauka forests hold the water then flows down to inhabitants.*
    - **Kanawai: Kūʻula uka, kūʻula kai.** *Growth must happen up uka as it does in the kai.*
    - **Kanawai: Hina-ulu-Ohiʻa**. *The moon controls the growth of our forests as it controls the movement of water in the ohiʻa.*

- **Kapu 2: Koʻa (ākoʻakoʻa, pūkoʻa).** *Succession. Teaching the community and next generations the traditions gathering of fish, gathering of community, providing nutrients to people and fish.*
    - **Kanawai: Kiʻauʻau.** *Coming together and being prepared. Reach a place of healing and reconciliation to move forward as a lāhui.*
    - **Kanawai: Hina-puku-iʻa.** *Feeding community members with ʻike, food security, kuleana, skills, and traditions that allow them to give back to the ʻāina.*

- **Kapu 3: Kui ka ʻina.** *Growth and birth cycle of the marine life of the shore break and kai koholā are free to proceed without hindrance.*
    - **Kanawai: ʻAi-ʻai.** *Managing abundance for this era and future generations. Sustainability through practice, practice based on community tradition and knowledge of place.*
    - **Kanawai: Pupuhi ke kukui malino ke kai.** *The process to see below the surface, observation is key to understanding your coastline. Also a reference to managing externalities and external powers.*

Forthcoming work includes archaeology, cutural and historic resources, potential water sources, public access and safety, and economic and community-based uses.

Barbara hosted the second set of mentimeter questions:

5. **In three words (or a simple sentence), what are some of the major concerns you have regarding this area?**
6. **What physical characteristics of ‘Ualapu‘e are most important to you?**
7. **What cultural or spiritual characteristics of ‘Ualapu‘e are most important to you?**
8. **How do you want to contribute / give back to this place and its resources?**
9. **20 years from now, what do your keiki’s keiki see in ‘Ualapu‘e?**

Barbara continued by discussing the Settlement Plan, selection/planning criteria for lot settlement, and evaluating lot schemes. She discussed the agricultural options of various lot sizes (e.g. 1/5 acre, 1 acre, 5 acres, etc.). She then hosted the last set of mentimeter questions:

10. **Rank from highest to lowest what you feel the ‘Ualapu‘e Settlement should focus on?**
    a. improve site safety and access
    b. maximize the number of subsistence ag lots
    c. preservation of significant historical and archaeological sites
    d. reforestation and erosion management
    e. community based economic development
    f. securing potable water
    g. securing non-potable ag water
11. **Is 1 acre (the size of a football field), be suitable for your subsistence agriculture homestead needs?**
    a. Good size
    b. Too small
    c. Too large
12. **Which image best represents your vision for agricultural activity at ‘Ualapu‘e?**
    a. Backyard Subsistence Agriculture
    b. Large Community Cooperative
    c. Small Community Cooperative
    d. Shared Traditional Agriculture
13. **Which is your preferred settlement layout?**
    a. Individual Lots
    b. Shared Agriculture
    c. Clustered Homes with Individual Agriculture
    d. Clustered Homes with Shared Agriculture
14. **What do you envision as the best use for the area designated as Community Use?**
15. **Prior plans have identified several potential income generating opportunities that may be suitable for ‘Ualapu‘e. What is your preferred option?**
    a. Commercial Kitchen and Farmers Market
    b. Agriculture and/or Aquaculture Food Hub / Co-op
    c. Green Energy
    d. Woodworking Mill
    e. Cottage Industries: garment or craft production
    f. Eco-tours
    g. Other not listed
16. **What additional questions/comments do you have for DHHL?**

Cedric provided the email (dhhl.planning@hawaii.gov) and website (https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/) and encouraged attendees to submit their concerns/questions/comments to DHHL.

Chat/Questions/Comments/Discussion:

- **Ocean Kaowili:** What is the timeline to award?

  - **Response:** We are currently in the Planning stages of the Project, which includes the completion of the Settlement Plan and Environmental Assessment (EA). The Planning process is estimated to be complete in February 2023 with HHC approval of the Settlement Plan and EA. Following the Planning stages is development, then awarding of lots.

- **Cora Schnackenberg:** Will these lots be only for ag?
  - Yes, these lots will be for subsistence agriculture, which can include the development of a home on behalf of the lessee.

- **Keomailani Hirata, MIBC East Molokai Rep:** Before LCA/Mahele, Ualapu'e was a living and breathing ahupua'a. If you bring up LCA, then you need to do research of the Ahupua'a, to include before LCAs.
  - **Response:** Comment noted. Ahupua‘a and historical land use tenure will help to inform the Settlement Plan and EA.

- **mahina:** All of these examples are on flat land... and you still have no water to support ag. These would require intensive grading.
  - **Response:** Comment noted. Topography and water availability are critical criteria in the determination of lot and settlement layout and will be explored during the Settlement Plan process.

- **UncoMango Stephens:** 3 acre lot is size for truly substantial lifestyle, and won‘t need a Farm plan, so immediate occupancy is more possible.

- **mahina :** I would appreciate options that allow to answer “none”. It would be beneficial to capture the voices of those who do not support the project.
  - **Response:** Comment noted. Additional options will be explored in future surveys.

- **Yolanda Tanielu:** I would prefer Individual Lots. Learn a lot with the Covid..

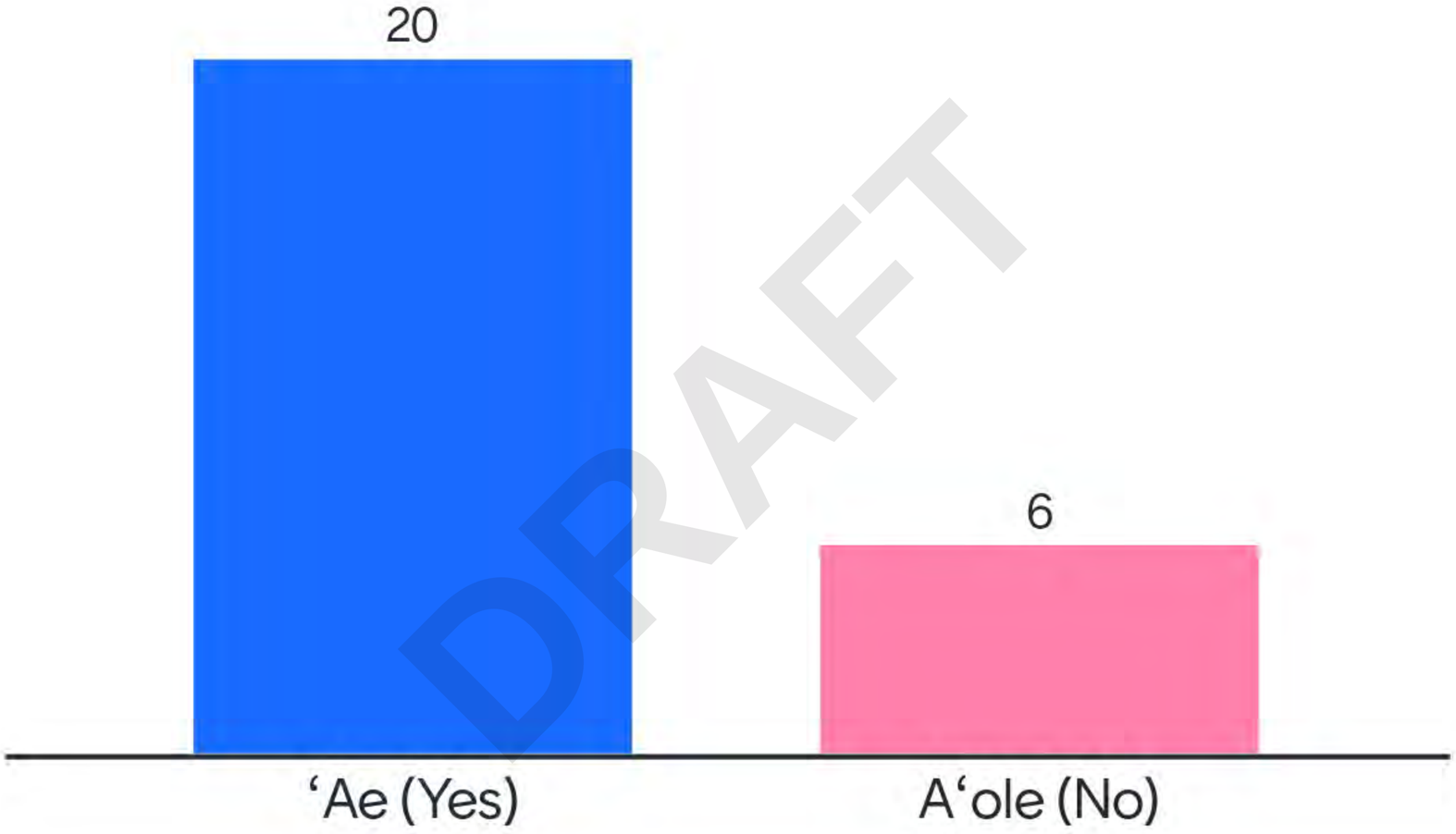
- **Keomailani Hirata, MIBC East Molokai Rep:** What is meant by community use? everyone that lives in the Ahupua'a or just DHHL leasees?
  - **Gigi Cairel:** Aloha. For this project, "Community use" designation is an area that the Kuleana Homestead Association would manage. So, it is up to the Association to develop the policies, procedures, who the users are, rent/fees to use the space/facility, etc. on how best to manage the "community use" space. Hope this helps address the question. Mahalo.

- **Keomailani Hirata, MIBC East Molokai Rep:** Molokai Island Burial Council, who are consultants to State Historic Preservation Divison, has not been contacted yet. We should be consulted before the EA.
  - **Response:** MIBC will be contacted during the EA process.

The meeting ended at approximately 8:00pm.

Do you have a pilina (connection) to this ʻāina?

Mentimeter



What do you hope to see/learn tonight that will help create that pilina?

Mentimeter

How do I get involved with the Kuleana Association?

Timeline to award through kuleana process vs traditional?

Understand how future homesteaders can become stewards of the land and resources.

How we can fix's that mountain, reforest that mountain with Hawaiian plants and fruit tree

How does the significant site affects the lots? Or Would the study be shared?

To able to get on the land and farm and leave to our future generations.

Understanding the award process for this lands

What size will the lots be?

protecting the existing pilina that exists among Mana'e residents by ending the potential for this DHHL development to occur in Ualapu'e.

What do you hope to see/learn tonight that will help create that pilina?

Mentimeter

I would like to see our Molokai People on the land

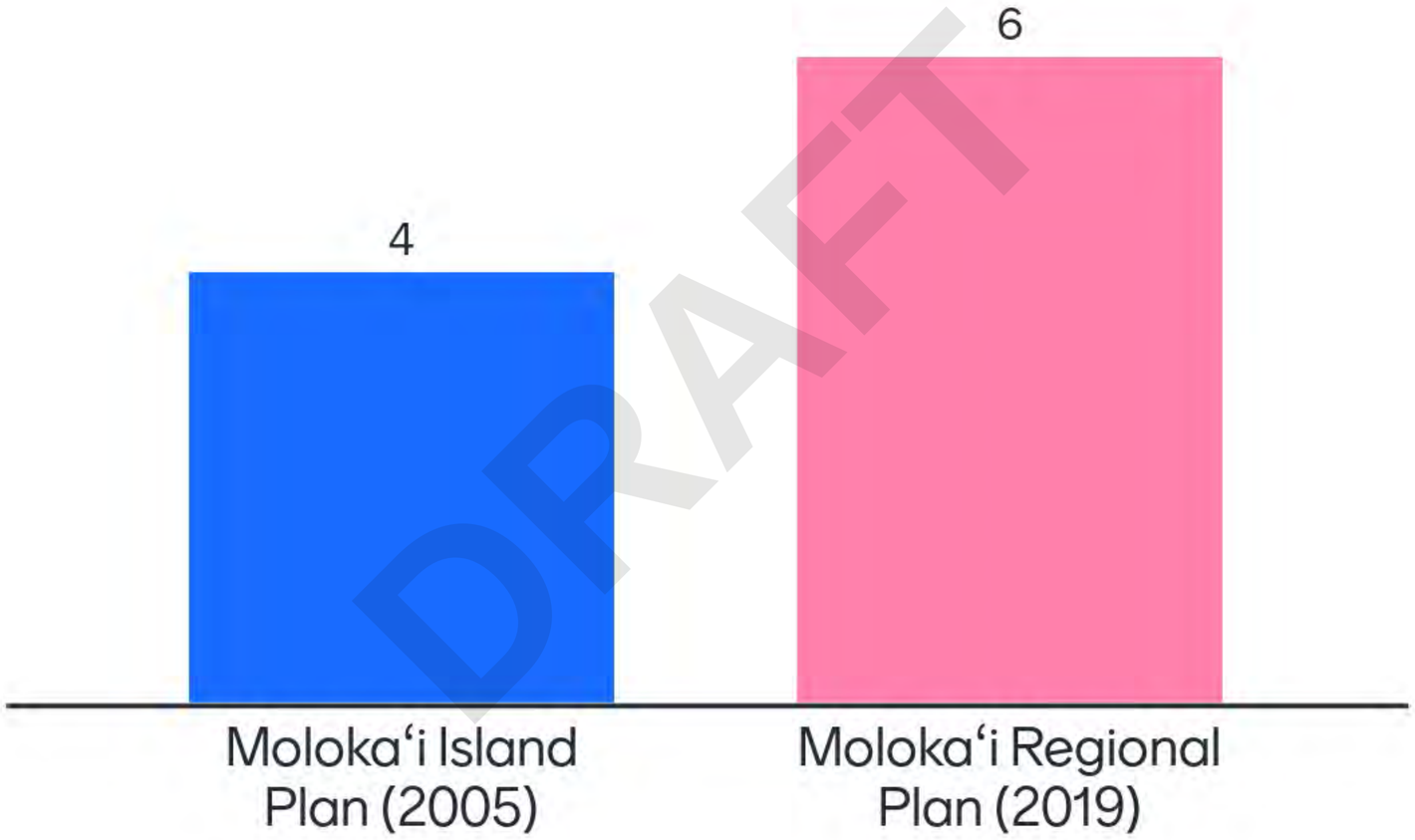
Will everyone have the same sized lot?

11

What is your favorite hali'a aloha (memory) of 'Ualapu'e? (In 3 words or less)

Did you participate in any of the following plans for the ʻUalapuʻe community?

Mentimeter



In three words (or a simple sentence), what are some of the major concerns you have regarding this area?

Mentimeter

What physical characteristics of ʻUalapuʻe are most important to you?

Mentimeter

Gulchs for Water and Potential for Use

undeveloped nature of the area. unaltered landscape. No buildings, no rubbish, open viewplanes.

Soil hillside road accessibility

Hazard living and evironmental conditions

Become steward of the land

Maintain the beauty, the food resources, and sustainability for food.

Kilohana elementary school

Tranquility of that aina

the diversion of water at the top of Ualapuʻe

What physical characteristics of ʻUalapuʻe are most important to you?

Mentimeter

Destroying our mana and connecting to the aina by development

Flat, safe land for kūpuna

11

What cultural or spiritual characteristics of ʻUalapuʻe are most important to you?

Mentimeter

all of them

To have the Opportunity to Learn,Live and Malama Pono da Aina and each other.

Culturally, this area is the icebox for Ualapuʻe. And also one of the last areas on Molokai that could be an actual Ahupua"a.

Iwi

Always to respect the signficant areas.

Coming with pure intentions - being mindful and aware of iwi, heiau, and other significant sites

Respect for burial sites and the spirits that still live there.

History and culture of the whole Ahupuaʻa. As Kanaka maoli our connection is to the aina, that is where we come from.

Respect Ualapue and understand whot u are living in

11

What cultural or spiritual characteristics of ʻUalapuʻe are most important to you?

Mentimeter

Native landscape. thriving ahupuaa

opportunity to restore both characteristics to Molokai by obtaining lease

11

How do you want to give back / contribute to this place and its resources?

Mentimeter

Community unity

Do not develope this aina!

Create the Ualapue association

Show that Ualapue is meant to be ag land and not residential land.

Much Love and Aloha in all aspects, We were Created to Malama Pono the Aina and Each other with

Continuing to malama the aina from mauka to makai and making sure the people who hold these leases do the same

by opposing this project.

Restore native plants within the dwelling areas. Malama the areas, to protect, to maintain, and to share and develop community garden.

Having the Wai feed the Kuleana through Punawai and Awai with correct composition of dirt to feed the watwer table as well as the Kuleana

11

How do you want to give back / contribute to this place and its resources?

Mentimeter

Native landscape. Thriving ahupuaa

ʻĀina, kaiaulu, and lāhui restoration

11

20 years from now, what do your keiki's keiki see in ʻUalapuʻe?

Mentimeter

Life... on our ancestral land

A thriving farm with substantial living.

A flourishing aina full of sustainable agriculture feeding our people

cultivate the land, cultivates the spirit of ohana, cultivates the essence of aoao

Being able to Live and stay on Aina as our Kupuna's did:)

A home

Restored native landscape with no buildings, houses, encampments, vehicles.

I pray they will see what my Kupuna was seeing in their time, along with some of todays Manaʻo

Maintaining the aina, continue the teaching reforestation, support the community within, and the surroundings.

12

20 years from now, what do your keiki's keiki see in ʻUalapuʻe?

Mentimeter

If you develope the aina, you always TAKE our culture and history away! So 20 years from now, we going lose a part of us as Kanaka maoli

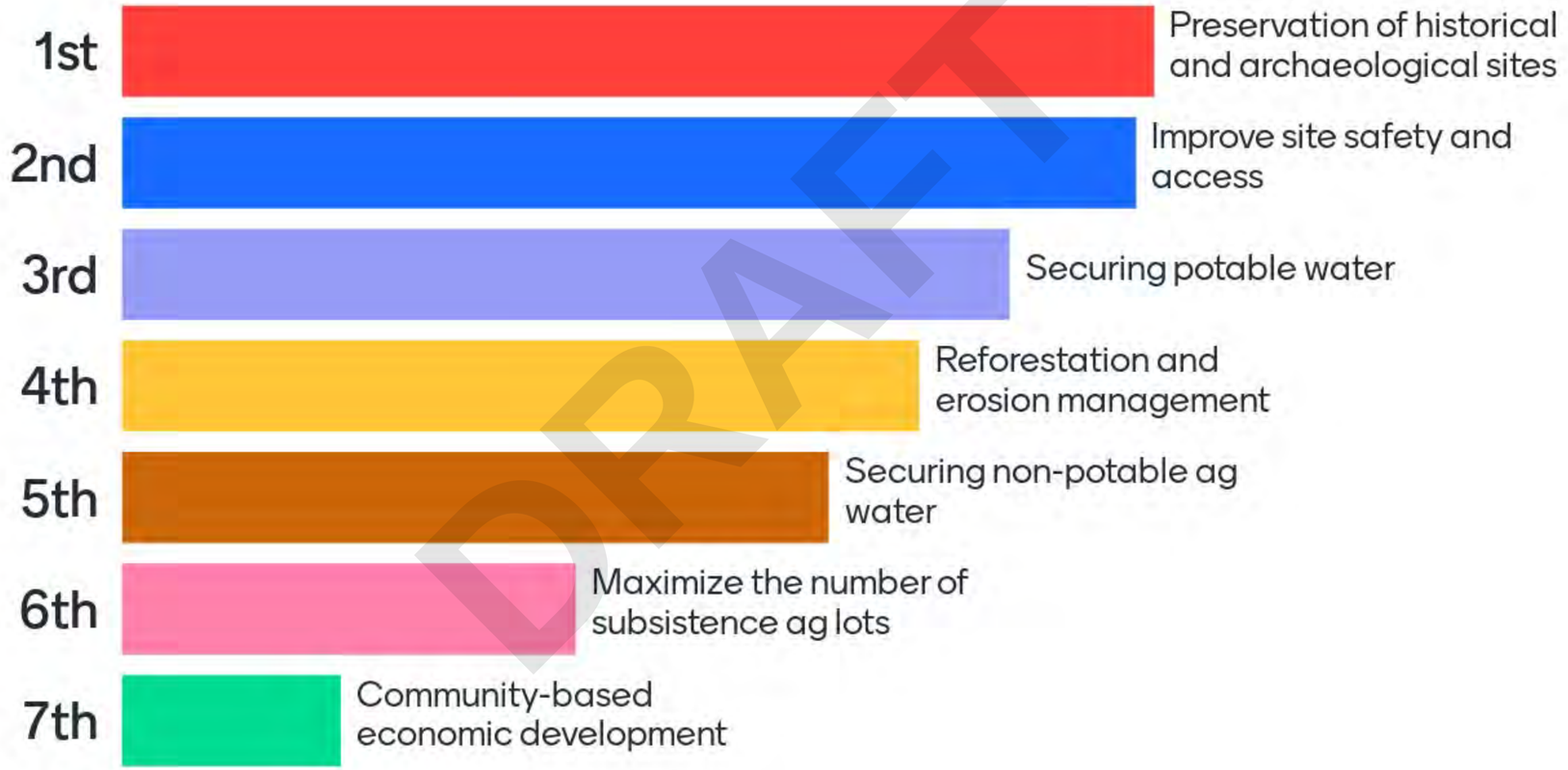
The ability to truly live the life as a kamaʻāina - the kama must be on the ʻāina

Love everyone

12

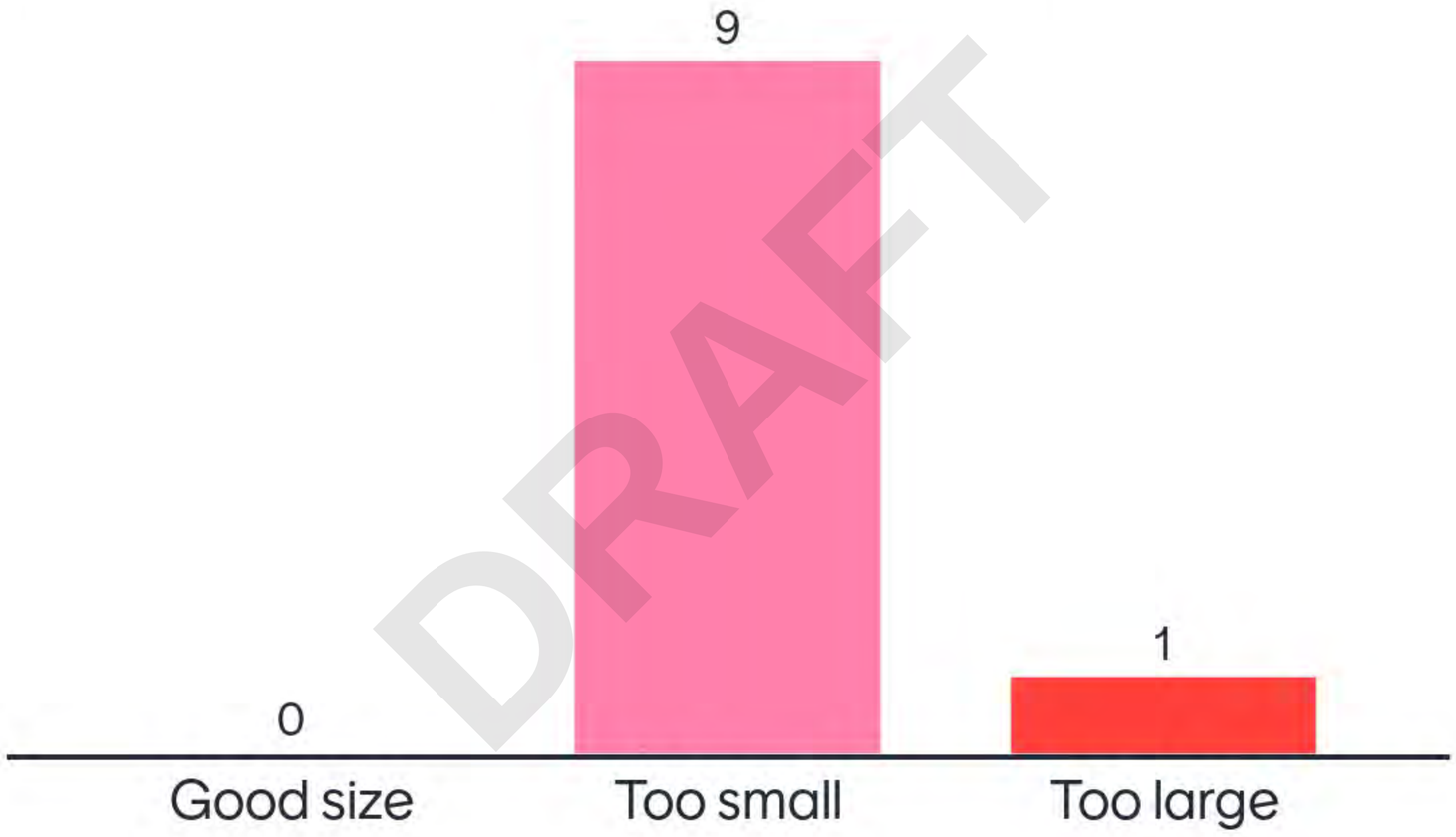
Rank highest to lowest what you feel the ‘Ualapu‘e Settlement should focus on:

Mentimeter



Is 1 acre (the size of a football field), suitable for your subsistence agriculture homestead needs?

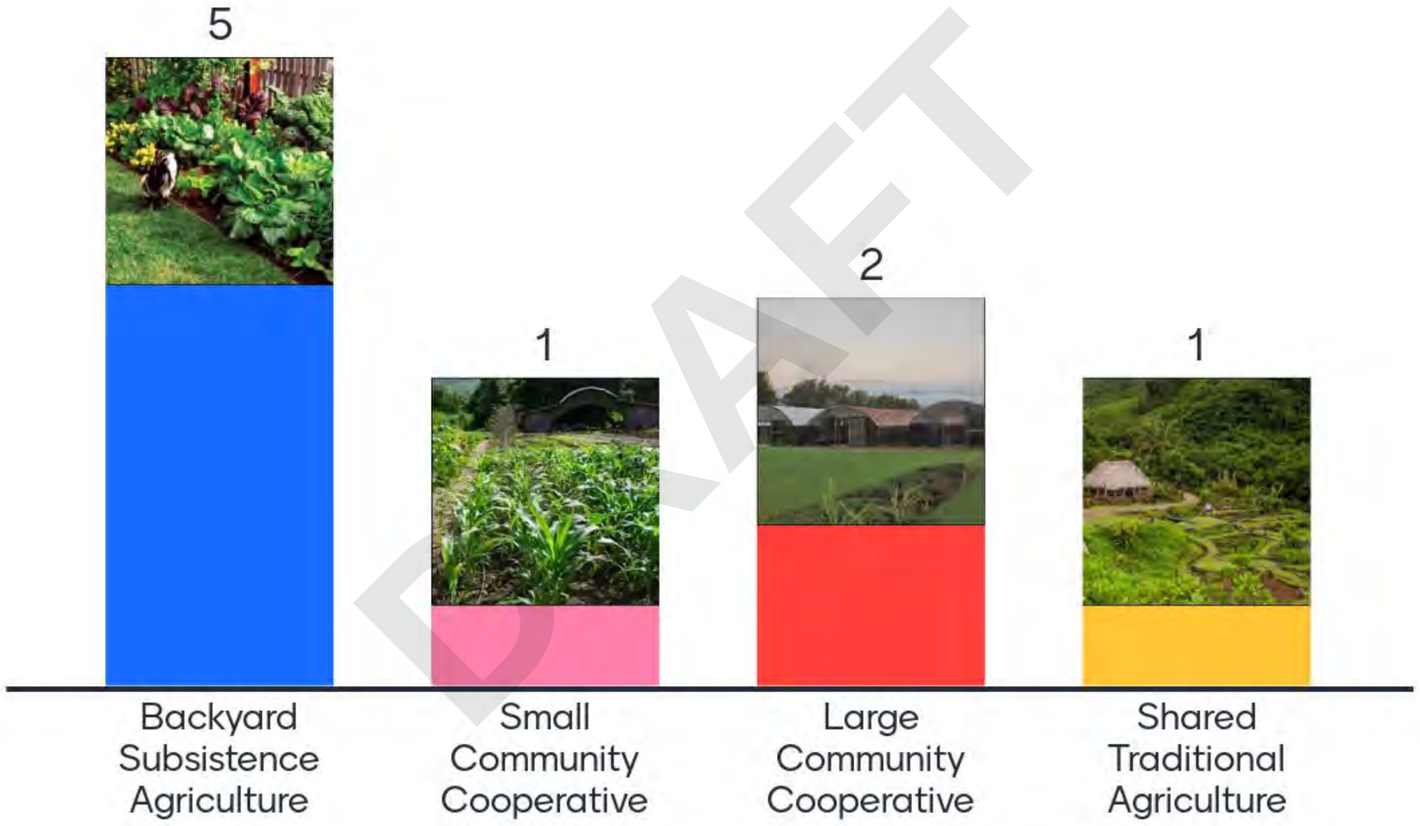
Mentimeter



10

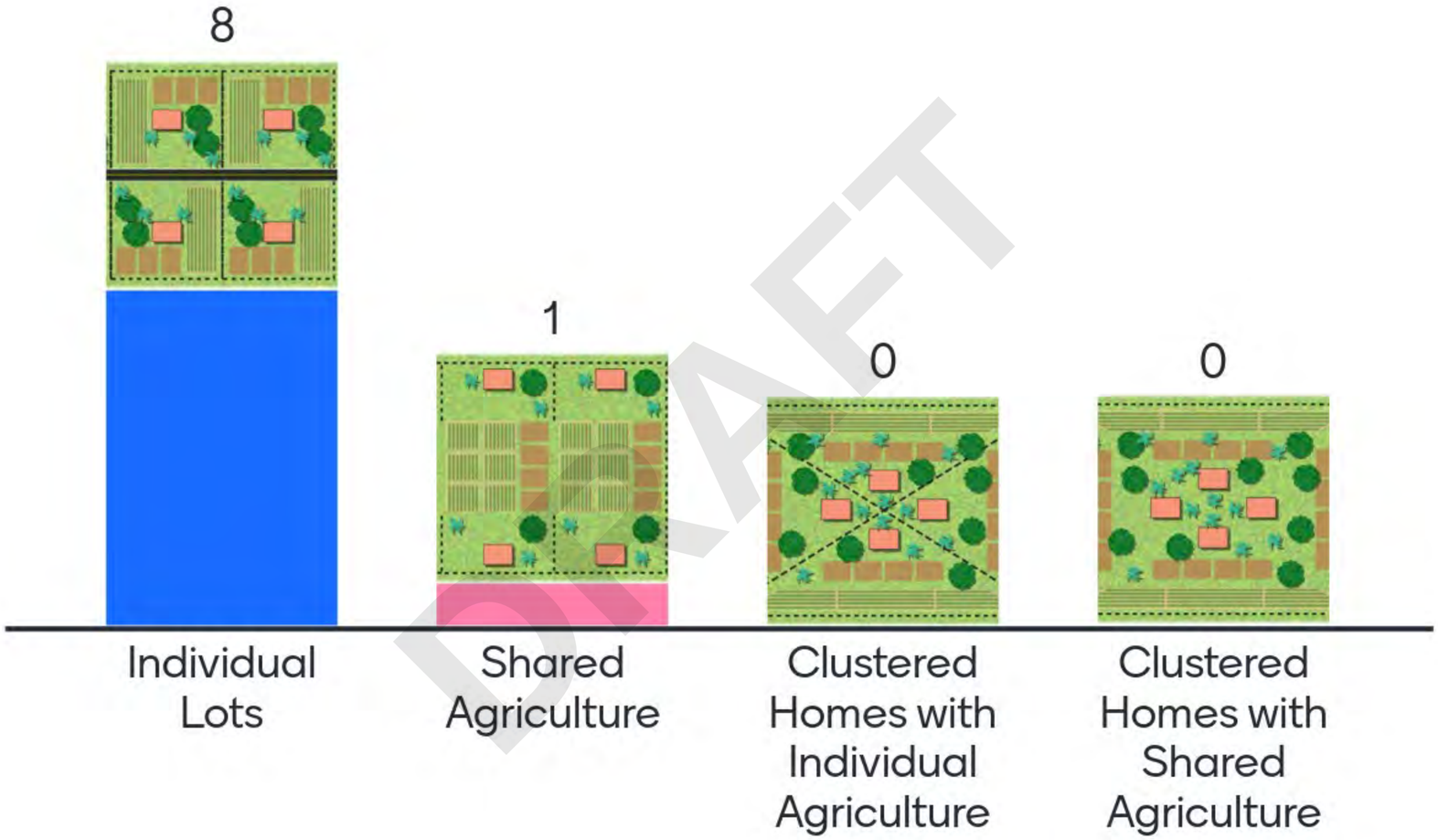
Which image best represents your vision for agricultural activity at ʻUalapuʻe?

Mentimeter



What is your preferred settlement layout?

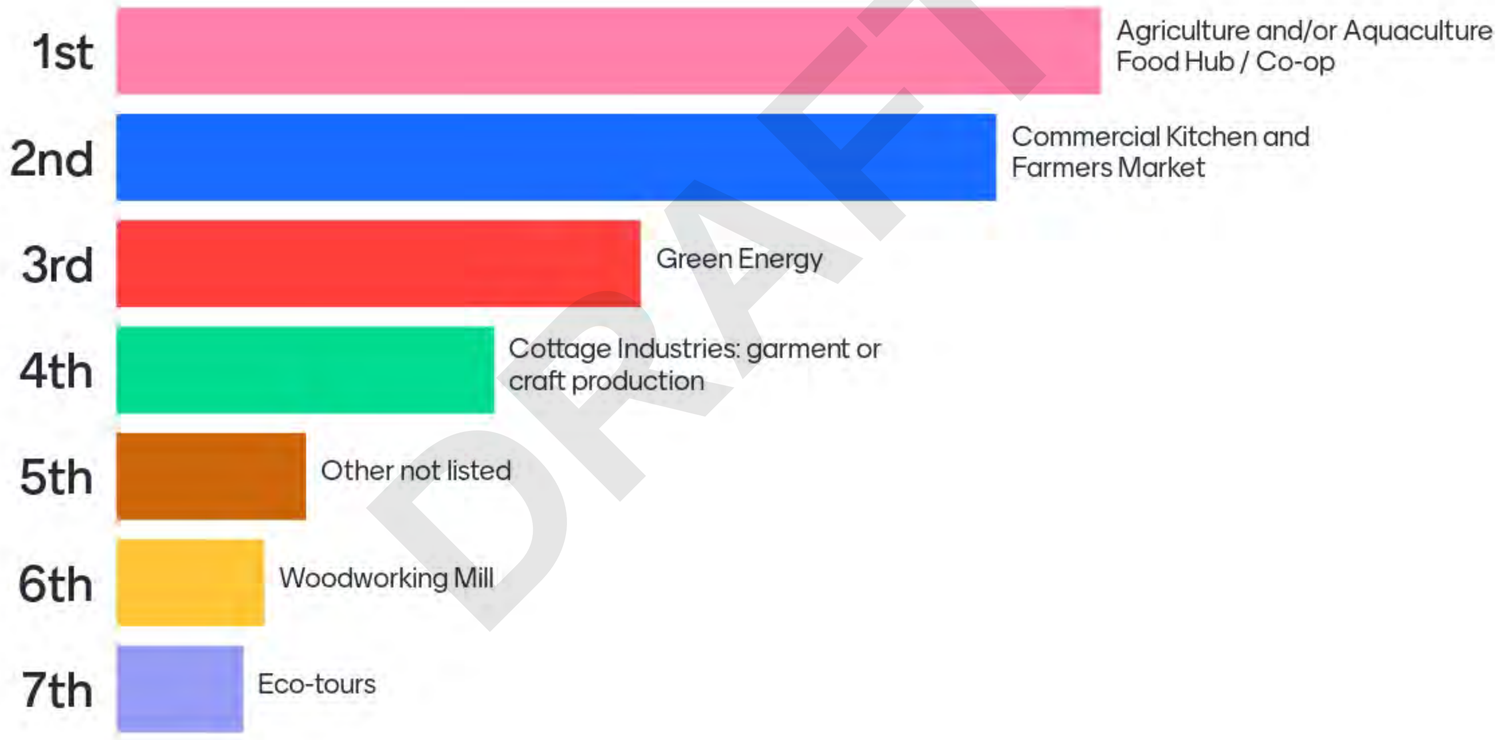
Mentimeter



What do you envision as the best use for the area designated as Community Use?

Prior plans have identified several potential income generating opportunities that may be suitable for ‘Ualapu‘e. Please rank your preferences.

Mentimeter



What additional questions/comments do you have for DHHL?

Mentimeter

Mahalo Nui Loa for all of your Mana'o, Time, and Education provided:)

Partial Commercial CBD farming and partial Solar farming

grading the lands to zero grade for farming, living etc. Civil engineering to remove hazard condition areas.

When we have more time I'll write.

it was mentioned about multiple lists early on. Are there multiple lists? If so, what are the differences?Timeline for awards for kuleana vs traditional?Can I obtain a copy of the island / regional plan?

If this doesn't follow through, when can we focus on the unused/abandoned lots? Also, why can't we divide the 40 acre plots in Hoʻolehua and maximize the amount of kānaka on the ʻāina?

Are DHHL going to award more lots later

If I have a pre-approval letter from a lender to build a home , would that helped to be awarded

How are we able to respond to last nights questions from the dhhl agriculture waitlisrers meeting. For 1)Charles A. PELEKANE JR AND GAVIN JKI PELEKANE TAMASHIRO. EMAIL pat.tamashiro@yahoo.com

10

CONFERENCE REPORT

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

TO:	Department of Hawaiian Home Lands (DHHL)		
FROM:	G70		
DATE:	April 13th, 2021	**LOCATION:**	Virtual
PROJECT:	‘Ualapu‘e Kuleana Homestead Settlement Plan	**PROJECT NO:**	221047-01
SUBJECT:	Community Meeting #2	**NO. OF PAGES:**	9
THOSE PRESENT:	DHHL: Gigi Cairel, Cedric Duarte, Andrew Choy, William Aila Jr., Paula Aila, Shelly Carreira G70: Kawika McKeague, Barbara Natale, Ryan Char, Kai Akiona-Ferriman, Kiralee Ramos SHPD: Andrew McCallister CWRM: Neal Fujii	Community Participants: 106 This number includes DHHL and G70 staff	

SUMMARY:

The second community meeting for the ‘Ualapu‘e Kuleana Homestead Project was held virtually via Zoom on April 13th, 2022. The zoom was opened at 5:45pm and the meeting began at approximately 6:02pm. Although participation varied throughout the course of the meeting, at its highest, there were approximately 106 participants.

Cedric Duarte opened the meeting and Andrew Choy started with a pule. Cedric then introduced Chair Aila.

Cedric shared a short agenda for the meeting and emphasized that the Department is here to talk about the ‘Ualapu‘e Kuleana Homestead Settlement project. The presentation will be similar to the presentation provided at the first community meeting held on December 1st, 2021. This meeting is primarily to receive feedback from the community. The Department re-emphasized that the project is in the early phase of its planning efforts and the Department will be reviewing the planning process for the potential homestead project at ‘Ualapu‘e. Throughout the planning process, the Department alongside G70 will be assessing the feasibility for a subsistence agricultural homestead in ‘Ualapu‘e and what potential environmental, social, and economic benefits and impacts such a homestead could bring to the community.

Notably, Cedric mentioned this meeting was originally intended to be a beneficiary meeting, however, the meeting was extended to the greater community. Meeting notices were provided to those who are on the DHHL waitlist for a subsistence agricultural homestead, an existing DHHL lessee, or a Moloka‘i resident, as well as residents of the Mana‘e community.

Cedric and Andrew both spoke upon the planning processes that the Department undertakes to fulfill the Department’s constitutional mission. Cedric elaborated about the plans DHHL has crafted and enacted to guide the Department’s work on the Island of Moloka‘i which includes the Moloka‘i Island Plan (MIP) (2005) and the Moloka‘i Regional Plan which was last updated in 2019. Meeting attendees were informed that the MIP identifies land usages for Department owned lands on the island of Moloka‘i, helping

guide Departmental work on each island. Regional Plans such as the Moloka‘i Regional Plan are crafted with input from beneficiaries. Gigi Cairel shared that a series of six in-person meetings were held on the island of Moloka‘i in preparation of the updated 2019 Moloka‘i Regional Plan. The updated 2019 Moloka‘i Regional Plan identified the ‘Ualapu‘e Kuleana Settlement Plan as a top priority project.

Cedric elaborated and explained the differences between Kuleana Homestead Leases versus Conventional leases with the ‘Ualapu‘e Kuleana Homestead Settlement Plan identified as a top priority project. Cedric highlighted lessees accepting of a Kuleana Lease must be willing to live on the land and take care of their community with other lease holders. The Department will provide an access road and metes and bounds of each lot, but it is up to lessees to maintain their lots and homestead community.

For the Department to award Kuleana Homestead leases, the Department must prepare a Settlement Plan, an Environmental Assessment, and any land use amendments to the MIP. The Hawaiian Homes Commission will then need to review and approve the Settlement Plan, the Environmental Assessment, and amendments to the MIP to determine whether the plan will be approved and implemented. Cedric further elaborated that the ‘Ualapu‘e Kuleana Homestead Settlement Plan is in the early phases of the planning process where information for the Environmental Assessment and Settlement Plan is being collected.

The Department and G70 are in the consultation process with the community to understand the area of ‘Ualapu‘e and the potential benefits and impacts a homestead community would have in the area. Several surveys of the settlement area are currently in production to evaluate the environmental, cultural and historical conditions of the potential settlement area and what could potentially happen if a homestead were to be developed in ‘Ualapu‘e. The Department recognizes that ‘Ualapu‘e has environmental characteristics that may serve as potential barriers for the development of a homestead. Moreover, ‘Ualapu‘e has a history with resources that connect the people of Moloka‘i to those that came before them and the area of ‘Ualapu‘e is special. The Department looks to work with the community to include them in the planning process for the ‘Ualapu‘e area.

Cedric asked Kawika to speak upon the Environmental Assessment. Kawika further explained that the Environmental Assessment would be assessing the environmental, social, economic, cultural and historical, and archaeological benefits and impacts a subsistence agricultural homestead in ‘Ualapu‘e would have. As of April 2022, about half the area has been surveyed and the remaining settlement area will be surveyed in May 2022. Once the surveys are completed, the Environmental Assessment will be compiled, and the Department will be able to understand and evaluate the feasibility of a subsistence agricultural homestead in ‘Ualapu‘e.

Wrapping up the presentation, a poll was shared asking attendees to identify whether they were either:
a) On the Wait List (35%)
b) A DHHL Lessee (19%)
c) General Public (45%)

Meeting attendees asked if the poll may be further broken down to decipher between Moloka‘i residents, residents of Hawai‘i, and potential Kuleana homesteaders.

Several comments and questions were left in the chat during the presentation. Cedric began to address the comments and questions left in the chat. The following section includes a summary of the comments and questions addressed.

Comments and Questions in the Chat

Malia Akutagawa: I would just like to mention as I did at the last meeting, I am concerned that limited to no outreach has been done for the actual families of ‘Ualapu‘e. Even just the neighboring ahupua‘a from ‘Ohia, Manawai, Kahananui, and Kalua‘aha. I don‘t see the Kalipis, Kapunis, Ka‘auwais, Bicoys, laea family, Place ‘ohana. I feel like I might be the only one from ‘Ualapu‘e. Why is this?
Cedric: There were roughly 4,000 people who were contacted with information of this community meeting. If there were people that should have been contacted, but did not receive notification of the community meeting, Cedric asked Malia if she could share contact information. Malia shared her email address.

Lori Buchanan and La‘a Poepoe both asked questions relevant to the process of amending the Moloka‘i Island Plan and any other amendments that would be included as part of the planning process for the ‘Ualapu‘e Kuleana Homestead Settlement Plan.
Cedric and Andrew both elaborated on the process of amending the Moloka‘i Island Plan, explaining Hawai‘i Administrative Rules Chapter 10-4-54. There are three types of amendments: Comprehensive, Interim, and Repository. Andrew explained for the proposed ‘Ualapu‘e Settlement Plan, it is anticipated an ‘Interim’ amendment will be made as this amendment process includes beneficiary consultation. Ultimately, the Hawaiian Homes Commission will approve of the proposed amendments.

Cedric further shared that the Moloka‘i Island Plan is intended to guide the Department in meeting its mission and identifies land uses and policies for the benefit of beneficiaries on the Island of Moloka‘i. However, the Department is going through the planning process of assessing the feasibility of a Kuleana Homestead at ‘Ualapu‘e. The Department is looking at the tract of land and the characteristics of the plot of land and what beneficiaries would like to see. Based on the assessment, the amendments are forthcoming.

Lori Buchanan: Wondering how DHHL plans to provide oversight and enforcement of this self-governing subdivision/settlement plan...mahalo, commenting for the record
Cedric: The intent and purpose of the Kuleana Homestead program is to empower and allow beneficiaries to manage the lots they are awarded and manage their homestead community. Lessees will be responsible for managing their homestead association. Although the Department cannot enforce rules upon the association, DHHL may provide support for the association. For example, Cedric explained that for the Kahikinui Homestead on the island of Maui, the Department provided administrative support to keep trespassers and cattle away from the homestead. Ultimately, management of the homestead will be up to lessees.

Alaska laeas: Everything is gonna erode right down into our property at the bottom
Cedric: The Department is aware that the plot of land designated for the planned Kuleana Homestead contains slopes and is not easily accessible. However, as part of the planning process, the potential for erosion that may impact areas makai of the planned Kuleana Homestead will be analyzed.

Sarah Waialae Chun: Seems you giving us oplala land which I have been on this list for 37 years! Wow DHHL sure did push Kamala ali’i wikiwiki! I still waiting
Cedric: The Department is aware that the lands under their jurisdiction are rural in nature. The plot of land proposed for the ‘Ualapu‘e Kuleana Homestead is designated as Class C lands. Additionally, many of the plots of land awarded to the Department are not serviced by water or wastewater services, and to this day many Department-owned tracts are still not equipped with nor provide water or wastewater services.

M. Healani Sonoda-Pale: Please change the name of the project its confusing for Kuleana land owners.
Cedric: This is the name of the program under the Administrative Rules, an amendment to the Administrative rules would need to be undertaken if the program were to be renamed.

La'a Poepoe: So far this is only the second open community meeting, the rest have been beneficiary meetings.
Cedric: This is the second community meeting for the planned ‘Ualapu‘e Kuleana Homestead Settlement Plan. Prior to these two community meetings, a total of six (6) community meetings were held during 2018 through 2019 in support of the Moloka‘i Regional Plan. Normally, for Kuleana Homestead projects, meetings are held with the Department and beneficiaries. However, for this meeting, the Department extended the meeting to the community at-large.

Emma Ulalia and many of the attendees inquired about the status and findings of the assessments and who is conducting the assessments in support of the EA.
Cedric, Gigi, and Kawika elaborated on comments relating to the technical studies. Kawika shared that G70 will be putting together the Environmental Assessment with many subconsultants who are experts in their respective fields. Subconsultants for this Environmental Assessments include: Resource Mapping Hawai‘i, AECOS, Honua Consulting, Hawaii Wildfire Management Organization, and Sustain Hawai‘i. The technical studies have not been finalized yet, but once the surveys and studies are completed, findings will be shared with the community. Cedric further explained that this is not the last meeting, there are many more meetings and information will be forthcoming.

Iaeas: You guys should really talk to the families that actually live in the area, this is not gonna sit well with my Ohana that have lived there for many generations
Cedric: The Department continues to mailout notifications of meetings to get as many participants as possible. This includes Kuleana landowners and LCAs.

Ui Mokiao: Ualapu’e fishpond... water quality issues?
Cedric: Yes, the Department is aware of the fishpond in ‘Ualapu‘e and as part of the planning process, the fishpond will be further analyzed and taken into consideration when planning for the ‘Ualapu‘e Kuleana Homestead. As previously discussed, the Environmental Assessment measures the potential benefits and impacts of the planned Kuleana Homestead to the Moloka‘i community and the surrounding environment.

Lori Buchanan : Has there been any discussion within the department on potential land exchanges more appropriate for this type of settlement?
Cedric: The Department is always open to private landowners who want to add land to the homeland trust.

Malia Akutagawa: You should add hoa‘āina/ahupua‘a tenants. We have priority rights

Cedric: The Department operates under the Hawaiian Homes Commission Act in the State of Hawai‘i with a mission to get Native Hawaiians back on the land.

Tammy: I live in Kalua’aha, Tammy Dunnam. I never received a letter
Cedric provided his email address and asked if Tammy can email him to be included on the mailing list. Cedric also announced, if anyone else would like to be added to the mailing list to be notified of future meetings, to please email him.

La'a Poepoe: did you mail meeting notices to general public or to DHHL beneficiary list? I had to print and post your flyer at the Mana‘e store for you.
Cedric thanked La‘a for posting the flyer at the Mana‘e store. Cedric restated that this meeting was intended to be a beneficiary meeting, however, was extended to the greater Moloka‘i community. Prior to the next community meeting, the Department will try to get flyers posted around the community, as the Department wants residents of Moloka‘i to take part in the planning process. Cedric invited Kawika to speak further on the outreach process for this meeting. Kawika explained that G70 tried to identify everyone from Kahananui to Kopikoloa from property tax records. In total, there were approximately 2,500 letters mailed out.

Emma Ulalia: Who made the decisions on the plans for this land use policy for Molokai? DHHL team?
Cedric and Gigi both answered this question. Gigi explained that the Moloka‘i Regional Plan was crafted by beneficiaries. From 2018 to 2019, a total of six (6) meetings were held to update the Moloka‘i Regional Plan. Each meeting was well attended. Cedric further explained that Regional and Island plans must be approved by the Hawaiian Homes Commission for enactment.

M. Healani Sonoda-Pale: Approximately 70 Kuleana lots in this Ahupua‘a
Cedric shared that: The Department is still in the process of assessing the feasibility of a Kuleana Homestead in ‘Ualapu‘e. The number of lots in this homestead has not been finalized yet.

Pulama H and M. Healani Sonoda-Pale both questioned and commented on the chosen location of the Kuleana Homestead at ‘Ualapu‘e and why another location on Moloka‘i is not being assessed.
Cedric again explained: The ‘Ualapu‘e Kuleana Homestead was identified as the top priority project in the Updated Moloka‘i Regional Plan.

Keani Rawlins-Fernandez : @Gigi - I attended those regional plan meetings and beneficiaries who attended told you the update process was flawed. You only allowed those who attended the last meeting to choose the priority projects. Cora rallied people to attend to make this ‘Ualapu’e project the number one priority project. This is the result of a flawed regional plan update process.
Cedric and Gigi both addressed this comment: Cedric first addressed that the Department is driving this planning process and as much as possible is trying to make this an open planning process for all those who wish to be involved. This isn’t a perfect process, but the Department is trying their best. Cedric noted that this is one of the many Department projects for the island of Moloka‘i and the planned ‘Ualapu‘e Kuleana Homestead project will not address the entire homestead waitlist; there will be future opportunities for the community and the Department to work together.

Gigi further shared that as part of the planning process for the updated Regional Plan, a formal 30-day public comment period was provided before the Regional Plan was submitted to the Hawaiian Homes Commission.

laeas: if dhhl knows all the bad that can potentially go wrong if this project happens then why is it still moving forward? all these specialist never lived a day in the life in this area
Cedric responded saying: We’re still early in the planning process. The Department is analyzing the total impact and feasibility of a Kuleana Homestead in ‘Ualapu‘e. The Department will thoroughly address the impact of the Kuleana Homestead and share the findings with the community. This plot of land is under the jurisdiction of the Department, and therefore the Department is mandated to go through the planning process.

Kawika shared that not all of us (attendees and project team) hold ‘ike everywhere. For many of the project team members, including the subconsultants, many of us bring our expertise to the area and our abilities to listen to the people and the environment. However, bringing in expertise does not entail that the project team and specialists are coming in with answers to squander onto the community. The project team looks to facilitate and work with the community to bring their ‘ike to life.

M. Healani Sonoda-Pale: We all agree that Hawaiians should get homestead but with the 600 million you getting this year buy land on the west side for Homestead
Cedric explained: The Department submitted shovel ready projects to the legislature. The planned ‘Ualapu‘e Kuleana Homestead project was not part of the funding packaged to the legislature, nor were land acquisitions tied to the funding.

Emma Ulalia: REQUEST: Please add to the agenda a thorough transparent proposed plan on water management connected to this proposed plan
Cedric responded saying: Yes, as part of the Environmental Assessment and planning process, a water management plan will be crafted.

Kamalu: Ualapue is part of an extensive historic heiau complex. It is a significant cultural site. Every study, assessment, field and literature review done has recognized and recommended identification of cultural elements within the wahi pana and this needs to be done BEFORE disruption to the ‘aina.
Cedric shared: I believe everyone in attendance will agree that ‘Ualapu‘e withholds cultural and historic resources and such resources will be and should be identified before any construction begins.

M. Healani Sonoda-Pale: Contact all heirs of all Kuleana lands.
Cedric responded saying: The Department is conducting as much outreach to as many people as possible.

John Russel Phifer: will the lease holders be Molokai people?
Cedric answered this question explaining: The planned ‘Ualapu‘e Kuleana Homestead will not tackle the entire waitlist. Leases will be offered to beneficiaries approved by the Hawaiian Homes Commission, those who identify 50% or more as Native Hawaiian and identified Moloka‘i as their desired place of residence.

Malia Akutagawa: I am concerned that this planning process is more about informing and checking a check box. It seems a foregone conclusion that the plan for ‘ualapu‘e will go through.

Cedric addressed this comment explaining: The Department is conducting their best efforts to consult with all those who are interested and want to be involved in the planning process and is not jumping towards decisions without working with the community.

Keani Rawlins-Fernandez provided a few comments and questions pertaining to the Moloka‘i Regional Plan stating:
The regional plan update process needs to be more inclusive in allowing people to vote to recommend priorities.

Many of those who attended most of the meeting informed staff that we could not attend the last meeting to vote and asked that staff allow for other method of voting, to be more inclusive. Staff refused.

When will DHHL start the next update of the Molokai regional plan process?

Cedric, Andrew and Gigi spoke to these comments and questions. Gigi shared she appreciates the feedback for the regional planning process. Andrew shared that regional plans are updated solely based on the amount of funding the Department receives. Currently, there are 22 other regional plans that have been identified for an update. An update to the Moloka‘i Regional Plan cannot be accurately projected at this time.

'Opu'ulani Albino: The area is a considerate focus of historic and cultural importance. As a cultural consultant I am extremely concerned for the area and would have you consider the area KAPU! What is the engineering consultation report of this area?
Cedric responded informing that: As part of the planning process, an engineering report will be included, and results will be shared with the community once the report is finalized.

Raymond Naki : I just emailed the East End Policy Statement that is recognized by Maui County and government agencies. Basically, nothing can be passed without the East End community approval. When are you going to meet with the East End community? In person so all Kupuna can attend
Cedric responded: The Department will continue to consult and meet with the community as part of the planning process.

At 7:30PM, Cedric opened the floor to discussion from attendees. A total of four attendees voiced their comments. The section below includes a summary of the comments that were shared.

Keomailani Hirata:
A descendant from east Moloka‘i, she shared that she was at the last Commission of Resource Water Meeting held on March 15. At the meeting, she shared that on the agenda was the Commission discussing the request from the Department to reserve water from the only well serving east Moloka‘i for the planned ‘Ualapu‘e Kuleana Homestead. She noted that the amount of water requested from the Department is more water than the amount of water currently serving the east end of Moloka‘i. She further explained that the Department is requesting water for an agricultural homestead, however, she was confused to why the Department is requesting a reserve for water as water provision is not included in the Kuleana Homestead process. As a resident from east Moloka‘i, she explained east Moloka‘i contains pristine farm land, but current residents do not farm at large scales, residents farm for themselves and this is because water is so scarce in east Moloka‘i, and large scale farming is not sustainable.

If Keomailani did not attend the Commission on Water Resource Management Meeting, she would not have known of the Department’s request. She explained that the Department should have consulted with the community first and understand how scarce and how important of an issue water is in east Moloka‘i. To current and existing residents, it is not right for the Department to go before the Commission without speaking to the residents. She recognized the Department as a developer, comparing ways in which the Department will disrupt the existing balance of the land and the people.

Cedric responded saying:
The Department is continuing to look to travel to east Moloka‘i speak and understand the constraints current residents face. The Department is here to work with the community and work through these tough discussions

La‘a/Mahina Poepoe:
Mahina shared her concerns with a “fast tracked” process as it may lead to piecemeal development. Mahina also requested the results from the technical studies that are being conducted in support of the Environmental Assessment. She recognized that the ‘Ualapu‘e area contains many cultural and archaeological significant features and questioned how an Archaeological Inventory Survey will not be warranted. She noted an Archaeological Inventory Survey costs millions of dollars, and asked when the Department will realize this is fiscally irresponsible? She also voiced concern over the process lands are delivered under the Department saying the process is segregated, some may be Hawaiian, but not Hawaiian enough.

Cedric, Andrew, and Kawika responded:

Cedric first stated that the Department is going through the planning process to understand the constraints of this potential project. More information will be forthcoming.

Kawika then explained that about half the site was surveyed for archaeological sites. Approximately 48 sites were documented, however this is only half the site. Identifying what is at the surface is the first step. Identification will lead to further archaeological work to understand the importance of the identified features.

Andrew then spoke to the process and explained that the Department is not fast tracking any of the planning procedures or practices for the Kuleana Homestead project in ‘Ualapu‘e. He ensured meeting attendees that the Department is fulfilling their due diligence to assess the feasibility of a Kuleana Homestead.

Cora Schnackenberg:
Cora clarified that it’s a common practice that water reservations be completed for trust lands.

Andrew responded saying that it is common to go through water reservations and try to provide water where possible. However, the Department looks to work with the Commission of Water Resource Management to protect water resources and ensure sustainable requests follow guidelines from the Commission.

Eric Korpi:
Shared and prepared a presentation voicing questions and comments with the planned ‘Ualapu‘e Kuleana Homestead. He shared concerns over the cultural and historic sites, wildfire risk, and water serving the project site.

Cedric thanked him for sharing and preparing the information and that such information will be provided in the Environmental Assessment.

Cedric closed the meeting at 8:00PM thanking everyone for attending and re-stated the Department works to withhold the mission of the Hawaiian Homes Commission and serve the people of Moloka‘i.

CONFERENCE REPORT

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

TO:	Department of Hawaiian Home Lands (DHHL)		
FROM:	G70		
DATE:	October 20, 2022	**LOCATION:**	Kilohana Recreation Center
PROJECT:	‘Ualapu‘e Kuleana Homestead Settlement Plan	**PROJECT NO:**	221047-01
SUBJECT:	Community Meeting #3	**NO. OF PAGES:**	8
THOSE PRESENT:	DHHL: Andrew Choy G70: Kawika McKeague, Barbara Natale, Pi‘ilani Smith, Ryan Ringuette Honua Consultants: Trisha Kehaulani Watson, Matt Sproat	Community participants: 75	

SUMMARY:

The third community meeting for the ‘Ualapu‘e Kuleana Homestead Project was held at Kilohana Recreation Center, ‘Ualapu‘e, Moloka‘i. Maps of different technical studies and analyses, as well as historical maps, were placed on the walls and on top of tables. The meeting began at 6:00pm and ended at approximately 8:15pm. The sign-in sheets near the entrance of the Recreation Center recorded 75 participants. The meeting began with a presentation by DHHL, Honua consulting, and G70; followed by verbal testimony from meeting participants. Refreshments were provided.

Kawika McKeague opened the meeting, introduced those presenting to the community, and the purpose for the community meeting. The purpose of the third community meeting was to provide a project update, primarily concerning the archaeology in the project area. Kawika then introduced Andrew Choy from DHHL.

Andrew started the presentation by thanking Prince Kūhiō, and providing a brief history of Prince Kūhiō’s role in forming the DHHL. He then described the history of the Kuleana homestead settlement plan, beginning with the Kahikinui project in the 1990s. A group of beneficiaries from Kahikinui, Maui advocated DHHL to find a way to put them on the land. The efforts of the Kahikinui beneficiaries caused DHHL to adopt administrative rules that provide lessees with immediate access to land and entrusts them with a lot of kuleana. He then described parts of the Kuleana Homestead Settlement plan. He mentioned that they don’t have the size and number of lots yet, but they do have a lot of technical information for reaching that point that will be explained at this meeting. He then passed the meeting back to Kawika.

Kawika re-emphasized the importance of planning for the preservation of historical, archaeological, and biological sites. He welcomed feedback on the findings shared at the meeting. He described the technical studies that have been done to date and referenced the maps on the walls. He then turned the meeting over to Kehau Watson.

Kehau described the maps in the room. Honua is still doing research in the area, and there is not a proposed action yet. She described the prior work Honua had done to date (e.g. talked with the community, and looked at past studies). She further described the findings of past studies. After talking with the community in March, Honua realized they would need to come multiple times to do pedestrian surveys as there were many sites. She then described the pedestrian surveys and the results of the surveys. There were 96 sites, with some sites having multiple features. They found one historic artifact, a 1942 bottle. Many sites have been impacted by road construction, erosion, and clearing and fencing for cattle. She described one site in further detail. She reiterated that their surveys were preliminary, and any potential project would require a much closer look through an Archaeological Inventory Survey, among other steps.

Kehau then described the interviews that Honua conducted, and other resources that describe the area. To fully conduct a Cultural Impact Assessment, Honua would need to know what the actual project is. Their findings on the ground are consistent with those other resources and interviews.

Kawika commented that G70 is committed to starting from an archaeological foundation and a cultural understanding of the place to guide the planning process. He described how the aerial survey revealed how erosion affects the fishpond. If there was a project action, G70 wouldn’t want to only think about the site, but also how it will affect the fishpond and other areas.

Using publicly available information and the information collected, G70 conducted a land resource evaluation analysis. 16 different pieces of information were “coded,” based on sensitivity. High impact or sensitive areas received a “1”; low impact or least sensitive areas received a “10”. He further described the coding for archaeological sites: 30 foot (ft) buffers receive a 1, 50 ft buffers receive a 3, and 100 ft or more receive a 5. These codes are based on G70s experience working with archaeologists and SHPD. He welcomed community feedback on the coding. He then described the coding for the other pieces of information:

- **Biology** - there were pockets of native plants, especially those in the streams should be cared for and protected. Maybe clippings can be taken and grown in a greenhouse to re-plant the area, as those plants have figured out how to survive there. There were 56 types of plants identified, 75% introduced species, 25% native.
- **Slope** - anything that is 0-10% is primarily flat. A lot of the site is 25%, so actions will be needed to reduce erosion.
- **Wildfire Risk** – G70 worked with Hawai‘i Wildfire Management Organization (HWMO), located in Kona. Factors considered in their fire risk assessment: human induced, like flicking a cigarette out the window; wind; gulches and slopes; lack of water; lack of fire response time; invasive grasses. High wildfire risk is everything colored in orange. Most of the property has medium wildfire risk. Example actions to reduce wildfire risk were given.
- **Rainfall** – this was considered in terms of use for homestead, agriculture, or native reforestation. The data used is just an average and G70 is aware there is a drought.
- **Well Protection** - DOH has specific rules for protecting the freshwater there. The blue area is the well with a 1,000 ft buffer, a sensitive area. Community feedback is welcome on the buffer area. Kawika further described considerations for protecting the well.

- **Streams and Gulches** - anything inside of 100 ft is considered a high sensitive zone.
- **Flood Zones** - are established by the Federal Emergency Management Agency (FEMA). Flood zones cover a little of the bottom area of the project. Not much can be done in these areas because there are restrictions to any type of construction in a flood zone.
- **Sea Level Rise (SLR)** - considered SLR of 3.2 ft. SLR is happening more rapidly than originally thought. At this point, SLR does not affect DHHL property, but it does affect makai areas which should be kept in mind.
- **Roads, Trails, Other Transportation Networks** - a 50 ft buffer was set around trails to protect the roads and ensure right of access, as many people access the land to hunt and gather.
- **Soils** - there are about 11 types of soil in the area. The soil study was done in the 1970s to describe erosion rate, suitability for agriculture, etc. Coding to soils was applied based on aptitude for settlement and agriculture.
- **Agricultural Lands of Importance to the State of Hawaii (ALISH)** - “Prime” is best for agriculture, “Unclassified” land is better than “Other” land.
- **Land Study Bureau** - scale of most productive lands, from A-E with A being the most productive land for agriculture. The project area is mainly D&E rated lands. D would be most conducive for agriculture.
- **Land Use** - there are state and county land use designations that the project will need to abide by. DHHL also had their own land use designations (e.g. conservation, community use) for the site that will need to follow. DHHL’s land use designations may change, as they are updating their General Plan.

All this information is then weighted (archaeology received 33%, slope received 11%, and everything received 4% each) and put together. This revealed high sensitive areas and low sensitive areas—places we’re interested in. Resources need to be considered first before we can think about what can be supported. This is where we are at tonight. Our next step will be to take the feedback from tonight and come back with a resource and lot plan at the next beneficiary meeting; hopefully, before the end of the year. Kawika then outlined the steps until project conclusion. Andrew recognized Zachary Helm, DHHL commissioner for Moloka‘i.

Kehau began and moderated the testimony portion of the meeting. Those testifying were given two minutes to speak at the microphone in the center of the floor. Names were called based on when they signed in and whether they indicated they wanted to testify. After all those that stated they wanted to testify on the sign-up sheets were called, it was opened up to anyone else that wanted to comment. The following is a summary of comments presented:

Dickenson Stone:

- Moloka’i first
- Slope, erosion, cattle are of concern
- People can be put up there
- Is there an alternative site or Plan B if this site doesn’t work out?
- Some of those archaeological structures are from cattle
- Some prime lands are in the flood zone.
    - There are already people living in the flood zone.

Gussie Dudoit:

- Living off raw land is difficult
- Molokaians take care of each other
- The DHHL process is lengthy. She’s been on the waitlist since she was 18 years old. Some people cannot wait that long.
- Her husband and grandparents are from ‘Ualapu‘e, and was getting excited because of the project’s location. However, she doesn’t think this will work for her and her family because she is older, and will wait for another DHHL lot to open up.

Phil Stephens:

- Neighboring ahupua‘a’s are private. ‘Ualapu’e is the “ice box” for the area.
- If done correctly, roads can be built to mitigate erosion.
- There is a way to restore water correctly to the wells.
- It’s hard to live off grid, especially for kupuna
- Lots of sites are cattle-related

La‘a Poepoe:

- What do you need to do to stop this project?

Zaida Place:

- Do we want homesites that high up the mountain? Do we want to set that precedent?
- Water is their main concern

Andrew: We’re thinking of agricultural lots, not residential. Also, not looking at the top of the site.

Linda Place:

- This place should be preserved because so much has already been lost; this area has a high amount of cultural sites.
- Look into properties we can buy, that we can move into.
- The plan should be given up and the property instead used for education
- If they want to farm, give them farm lots.

Mahina Poepoe:

- People were misled about the project from the beginning
- Recommends re-opening the prioritization process
- DHHL is not required to provide water for the project
- Wellhead protection is very important:
    - Ualapu’e is a skimming well
    - Other water contamination is happening in places around the state (e.g. Red Hill)
- The community that moves in shouldn’t stomp on the existing community
- What are the impacts beyond the ahupua’a. Are the new residents going to affect resources, economic issues.
- How can you keep going when there’s that many sites? Access to sites should be provided
- DHHL can spend their money better
- This project may bring blight to the community
- This area is not Kahikinui

Walter Naki:

- Friends and family on both sides of the aisle
- Fire study is good because the mountain has burned before
- Watershed is a concern
- What is the impact to the existing community?
- All for the project being for Hawaiians
- Traffic impacts, fire control, and water is of concern

Dartagnan Bicoy:

- Uses the area to hunt
- Don’t overthink the project
- These lots are not for us, but for future generations
- If you help one Hawaiian family it’s worth it
- Hawaiians for Hawaiians
- The project could follow the natural contours, and be set up for minimal impact.
    - Impact largely depends on the people who move there
- The lifestyle is going to limit who moves up there
    - Sounds like legally camping on your own land
    - His grandsons would jump at the opportunity to camp on their own land
- If project gets killed, must have something else in place for those on East End

Andrew: ‘Ualapu‘e is the only DHHL land on the East End.

Yolanda Tanielu:

- Has homestead in Ho‘olehua. Had to leave East End to live there because that’s where homesteads were.
- Believes that she should be able to get her own house on her own land, and shouldn’t have to pay for someone else’s
- Many had to leave their homes
- This area raised hunters, fishermen, and future generations to get educated, make something themselves, and then come back and take care of those back home
- Stop talking about the project and JUST DO IT
- She’s waiting for agricultural land
- If she gets a lease she will feel blessed. If she doesn’t, it’s ok, give it to someone who does.
- If the project is killed, find other land in Moloka‘i’s East End for East End families

Lt Col Kahiwalani:

- From Occupied Forces Hawai‘i.
- The goal of the Occupied forces is to repatriate kanaka back to the jurisdiction of the independent nation, the sovereign state, of Hawai‘i
- DHHL is state, and not working in the best interest of Kanaka Maoli
- Said that Andrew said these lands were less than suitable, she doesn’t believe Hawaiian beneficiaries deserve those kinds of lands.
- Gave Andrew a declaration of a state of war
- Commander Lilikoi met with a Lieutenant with the US Navy special warfare’s unit, and signed a declaration state of war stating Hawai’i is an independent nation in a state of occupation by the United States of America.

- LCA awards, Kuleana lands, are all available as they exercise their jurisdiction over this country
- Empowerment should be going to your own homelands and stewarding and protecting your own ‘aina
- Concerned by East water being taken to supply the entire island
- To truly steward means to truly take up your space as Kanaka Maoli
- Wants DHHL to know there is a self-proclaimed army

Zhantell Dudoit Linda:

- “Do not let this project divide us”
- Concerned who will be providing fire mitigation and emergency services
- Concerned that the map shows possible areas for residential areas. Since the map is public, concerned that private properties can look at putting residential properties where it wouldn’t be suitable at the top of the map
- Need to spend more time educating people about the Kuleana project. Some people testifying that are upset are unclear about what the Kuleana project is and it is causing friction in community. Part of DHHL’s responsibility is to not cause conflict in the community.
- If mitigation efforts require infrastructure, how does this fit within the Kuleana designated project?
- Is there a mechanism for Kuleana projects to turn into residential lease projects or will it remain in Kuleana in perpetuity?
- If unforeseen adverse effects are caused by the project, does DHHL have mitigation plans in place to help fund the mitigation efforts or relocate the people on the project?
- What will access look like to the lower sensitive areas?
- Does the 2023 Plan acknowledge that this may not be a suitable site and can a strategic analysis be done on other lands?
- Can DHHL engage in land swaps with other government agencies?

Cora Schnackenberg:

- Too many people on the waitlist, which is the reason why she got started on the project
- ‘Ualapu‘e has plenty of water. 2/3 of the water that comes from the mountain belongs to Hawaiian’s first before Maui County
- This project will help keep their schools open, and give people from Moloka‘i get a place to come to
- Community meetings for the project began in 2019 and have continued until now
- Full transparency is key!
- This project is not for residential, but for Kuleana homestead—off-the-grid living

Leimana Naki:

- There were 6 associations on Moloka’i trying to get kanakas on the land. The 6 associations didn’t want ‘Ualapu‘e to be used for the beneficiary waiting list.
- 1993-94 executive order was used to obtain the project’s land in ‘Ualapu’e
- All the lands here are LCA
- In the East End Policy, need consensus from 200 families in this community to do this project.

Keomailani Hirata:

- Only one DHHL representative present, which is disrespectful.
- Land is no small legacy, it’s generational

- Not enough resources for development. Resources need to be restored before bringing in more people.
- Cannot allow division of community
- Does not agree with the project.

Hina Hirata:

- Kupuna will have difficulty living off-grid
- What about those people who have moved away, but come back for the award?

Joshua Kalua:

- The project team needs to talk to the people of that area

Deldrine Manera:

- ‘Ualapu’e is a special place
- Only have people from Moloka‘i live there
- Where are we going to bury kupuna?
    - What is the future of ‘Ualapu’e cemetery?
- No more limu ele‘ele, pipipi; the ‘aina has changed, but not the love for ‘Ualapu‘e.

John Pfifer:

- Go back to the drawing board
    - Doesn’t think project is for the community. Having outside people and houses is not a good solution for the community.
    - He is for the area to be used for restoration or education—must do something about the land.

Walter Ritte:

- Likes the concept of living off-grid, BUT
    - DHHL’s kuleana is to make the entire ahupua’a self-sufficient.
    - Bringing outsiders in is concerning, it should be Moloka’i people.
- Ualapu’e provides water for Mana‘e. Erosion is a concern, and the reef and loko I’a are filled with mud. Erosion can be addressed by slowing the water (e.g. socks, dams, gulches).
- The top of ‘Ualapu’e is full of invasives. The Hawaiian forest is needed back to capture the water

Janet Blakeslea:

- How large will the lots be?
- How deep are the existing wells?
- Is the existing water table stable for wells?

Judy Caparida:

- Moloka‘i: You live the life
- Can find a way to survive

Kahaku Poepoe:

- Not for this project until Moloka‘i residents come FIRST
    - Others don’t know how to live on Moloka’i
    - People from Moloka‘i know how to live there

- Homesteading comes with lots of precautions
- Not enough water to support all the people
- Erosion from roads during rain

Meeting ended at approximately 8:15pm.

Emailed project questions and answers. Questions are **bolded,** answers are *italicized*.

Emailed questions received by G70 from Eric Korpi on October 21, 2022 (maps provided by Mr. Korpi are included as **Appendix A**):

- **There was extensive discussion from your panel favoring development on/around the area identified as "lower impact" for development (red circle in Map 1 & Map 2 of attached Ualapue Maps). This concept was supported by, among other factors, the data you displayed showing minimal cultural/archeological sites in the "lower impact" area (Map 3). HOWEVER, per your own data showing where your archeologists physically surveyed, they never even walked in the "lower impacted" area (map with blue lines on all three slides for comparison).**

  We’ve attached our raw gps data (Figure 1) from the survey for reference. Due to the project location, satellite positioning, weather conditions, etc., the data can be skewed in accuracy or positioning. In this case, we have a number of straight vectors that tells us our gps units were receiving interrupted connections to the satellites and overlapping lines which tells us in the field accuracy was greater than 5 meters. For reporting, we remove these unit’s information for clarity. Due to these limitations, GPS tracking is used primarily as a proof of effort rather than exact surveying locations.

- **If this area was not physically surveyed, how are you able to ensure that this area truly is of "lower impact" for settlement?**

  The purpose of the survey was to get a comprehensive understanding of the cultural resources that may be present in the project area. By no means was the intention of this survey to find every site. Honua did no subsurface excavations or major vegetation clearing. What we did find was a significant amount of sites and by comparison, within the project area itself, the team determined lower impact areas. The area being discuss followed the access road which showed signs of erosion, cattle grazing, and constructed paddocks. This factors contributed to minimal to no surface archaeology. An Archaeological Inventory Survey, which does look in-depth at each site with vegetation clearing and subsurface testing, will be conducted. This would definitively determine what type of impacts to cultural resources the project would have.

- **Map 4 depicts areas of fire risk. Does this depict the risk those areas pose with current conditions (undeveloped)?**

  Yes.

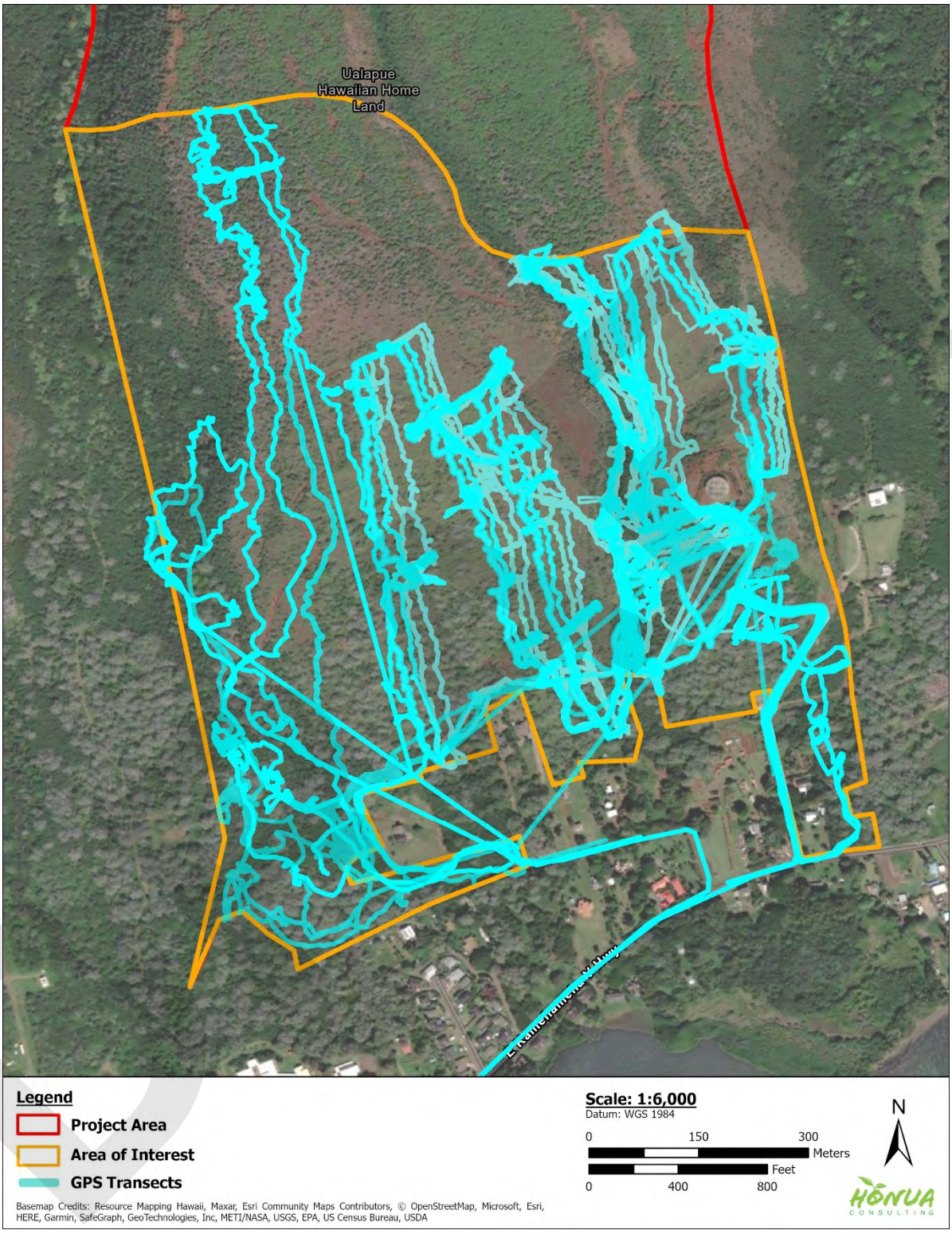


Figure 1. ‘Ualapu‘e Raw GPS Data Points (Includes Interrupted Satellite Connection)

- **If so, will this map be updated when the settlement plan is released to show fire risk associated with any changes associated with that settlement plan?**

  No, however recommendations will be made for how the community can reduce fire risk.

Additional questions received by G70 from Eric Korpi on October 21, 2022 via email attachment (see **Appendix B**):

- **Are <u>all</u> cultural sites on/near Ualapue DHHL land identified? Mapped? By who?**

  All cultural sites are not yet mapped. Per our presentation, an additional Archaeological Inventory Survey (AIS) will be conducted by DHHL for the areas identified for potential native Hawaiian settlement. The AIS may find additional cultural sites.

  - **Will <u>all</u> Cultural sites in Ualapue be preserved? Who will decide which may be demolished?**

    Cultural sites will be evaluated on a case-by-case basis. The State Historic Preservation Division will make a determination regarding the appropriate treatment of cultural sites per HRS 6E and its administrative rules.

- **Is there a Burial Settlement Plan for this area if/when Iwi Kupuna are uncovered?**

  All Iwi Kūpuna found will be governed by Hawaii Administrative Rules 13-300 – Rules of Practice and Procedure relating to Burial Sites and Human Remains. In addition, because of the unique status of Hawaiian Home Lands, DHHL is also subject to complying with the federal Native American Graves Protection Act (NAGPRA).

- **What fire mitigation/prevention plans does DHHL propose for this project?**

  One of the first things that will have to happen is to clear the roads and create firebreaks. There will need to be community-based and roadside fuels management, as well as prevention education to reduce accidental ignitions. These are the best prescriptions of all, after some basics are met (adequate escape routes, water availability, etc).

- **Will DHHL be liable for any damage to existing private property, injuries, deaths due to fire originating on or in connection with the Ualapue Kuleana Homestead Settlement?**

  Lessees will be responsible for their actions.

- **Will this project move ahead despite the lack of an efficient and reliable water system?**

  DHHL is not required to provide water for Kuleana Homesteads.

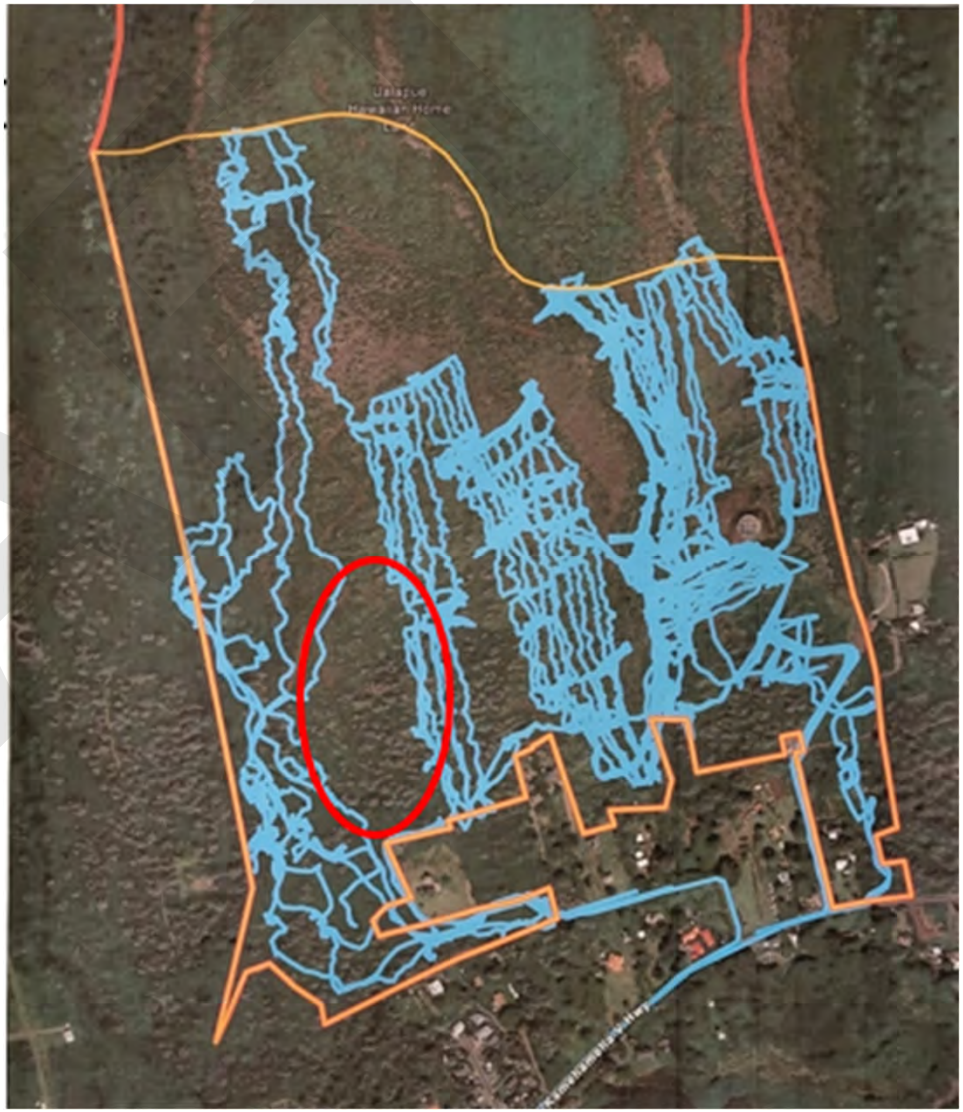
- **Will DHHL be liable for any contamination to the Ualapue Well (only source of potable water on east Molokai) originating from or in connection with the Ualapue Kuleana Homestead Project?**
    - **Agricultural runoff such as Fertilizer, Pesticide, Herbicide, Animal Waste, fire damage, etc...**

  DHHL will provide the lessees with regulatory information for what kinds of activities are allowable within the Wellhead Protection Zone. Lessees will be responsible for their actions.

Appendix A

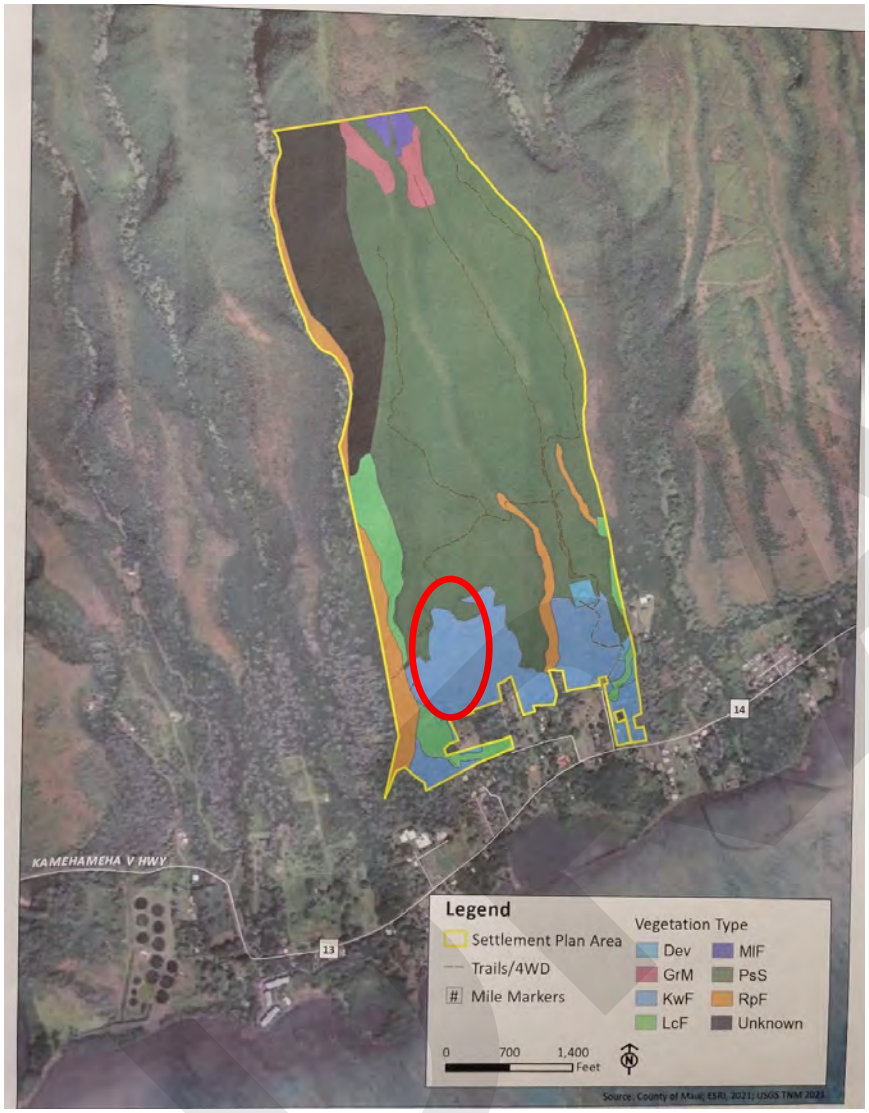
The following pages submitted by Mr. Eric Korpi via email on 10/21/2022

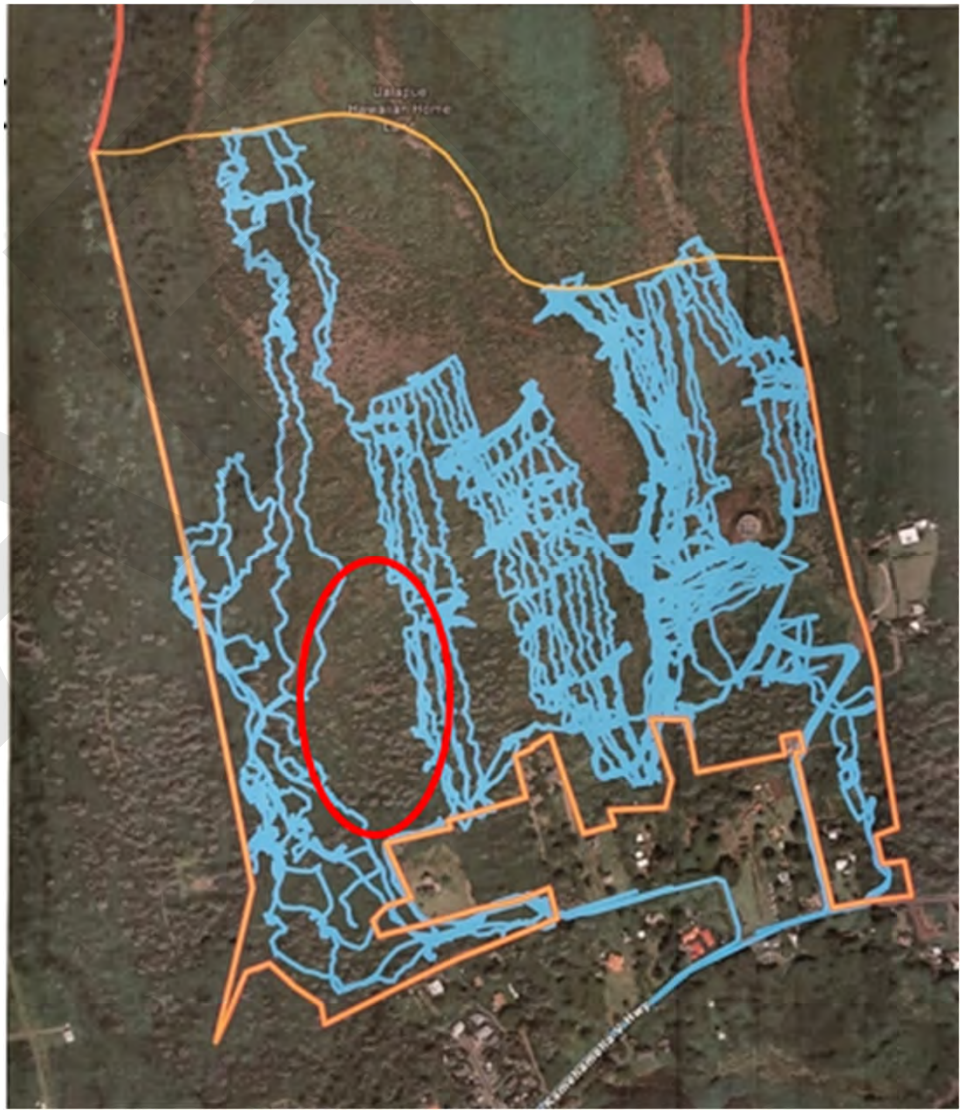
MAP 1



Submitted by Mr. Eric Korpi via email on 10/21/2022

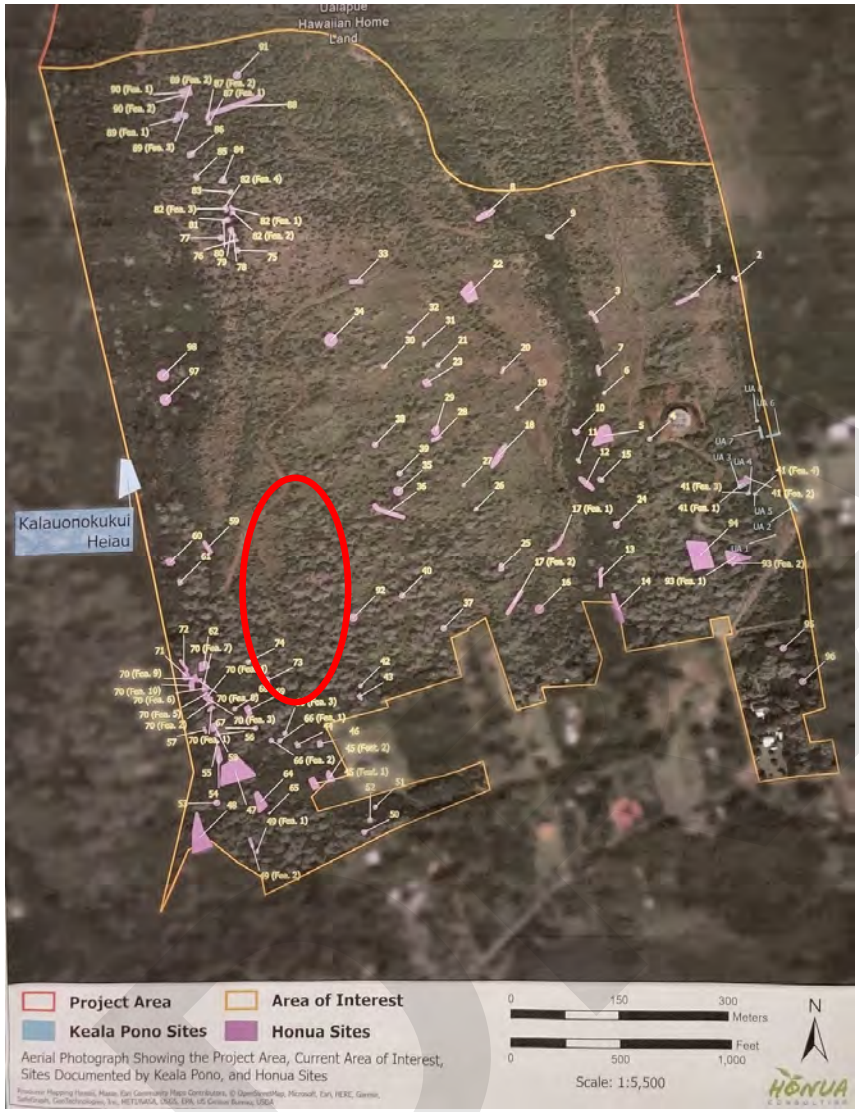
MAP 2

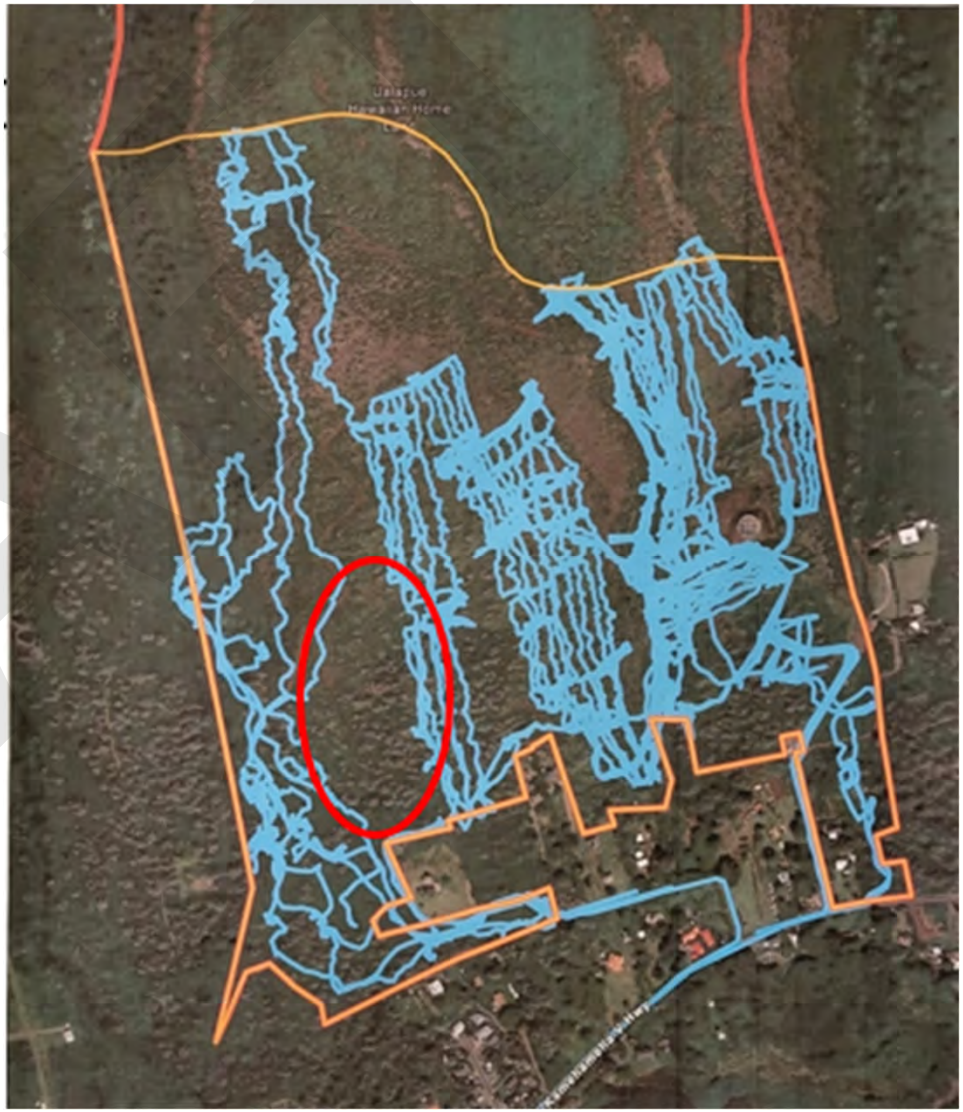




Submitted by Mr. Eric Korpi via email on 10/21/2022

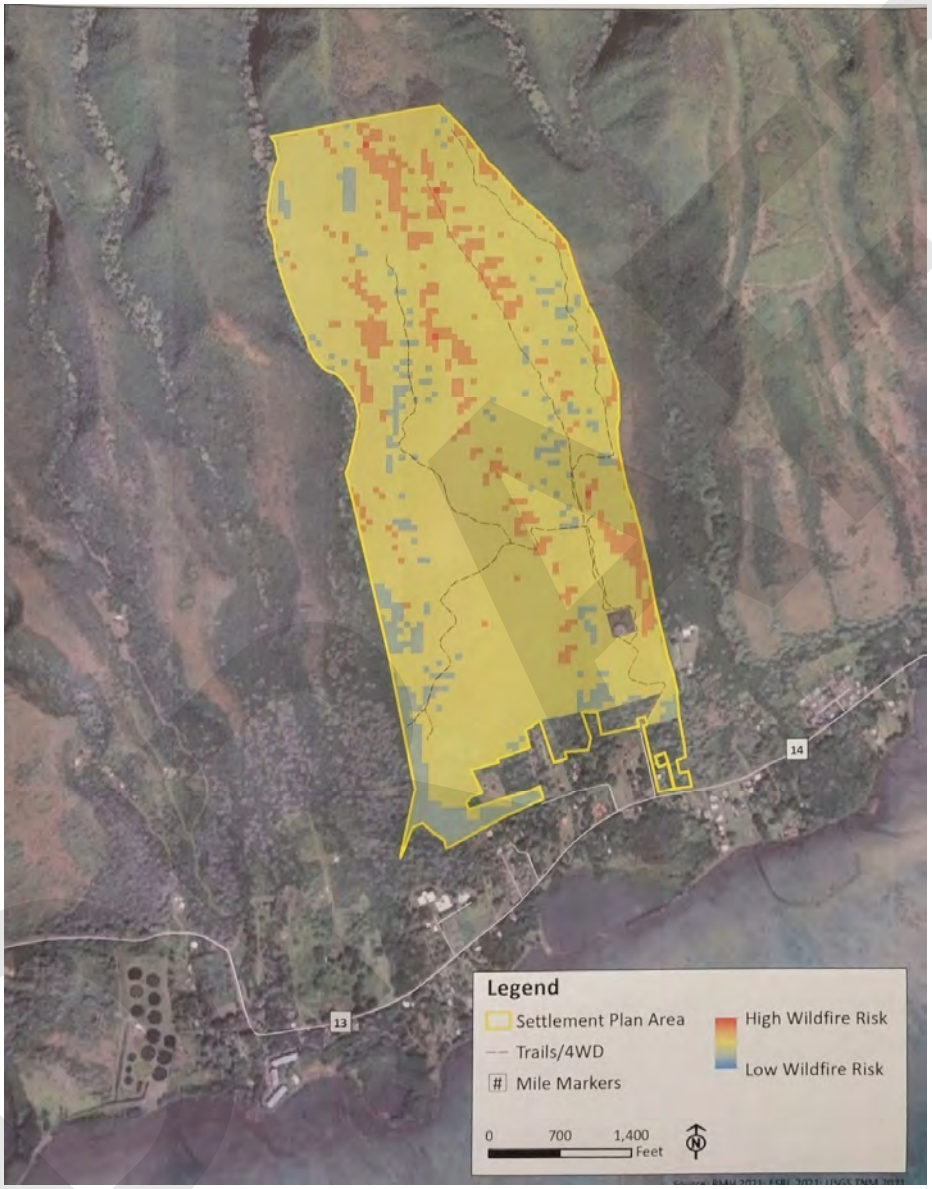
MAP 3





Submitted by Mr. Eric Korpi via email on 10/21/2022

MAP 4



Submitted by Mr. Eric Korpi via email on 10/21/2022

Appendix B

The following pages submitted by Mr. Eric Korpi via email on 10/21/2022

Cultural Sites

1. Are all cultural sites on/near Ualapue DHHL land identified? Mapped? By who?
2. Will all Cultural sites in Ualapue be preserved? Who will decide which may be demolished?
3. Is there a Burial Settlement Plan for this area if/when Iwi Kupuna are uncovered?

DHHL HAWAII ADMINISTRATEV RULES §10-3-30 Kuleana homestead leases

(4) Plan for the identification, protection and preservation of all significant historical, archaeological, and biological sites.

https://dhhl.hawaii.gov/wp-content/uploads/2021/09/HAR-10-3-30-Kuleana-homestead.pdf

Submitted by Mr. Eric Korpi via email on 10/21/2022

Cultural Sites

Kalauonakukui Heiau is part of the Hokukano-Ualapue Complex which is listed as a "significant Historical Site"

- "The District of Kona (*on Molokai*) contains more *heiau* and fishponds than any other comparable area in the Hawaiian Islands, and the engineering advancements, religious and political power structures, and economic control that developed on Molokai are well represented at this site."

https://www.nps.gov/places/hokukano-ualapue-complex.htm

- "Even given the social, economic, political, and environmental conditions of Hawai'i today, and particularly on Molokai, one cannot ignore the relative integrity of the East End's cultural resources. There are numerous archeological sites, many yet to be surveyed..."

https://www.mauicounty.gov/DocumentCenter/View/8220/Molokai-Community-Plan-2018?bidId=

Submitted by Mr. Eric Korpi via email on 10/21/2022

Cultural Sites

- “Some Moloka'i residents feel there is a lack of awareness and respect for the importance of Molokai's cultural and archeological sites by locals and visitors alike, which often leads to intentional or unintentional damage. There is also concern that some sites not formally identified are being damaged or destroyed by unregulated ground altering activities, land development, and all-terrain vehicle use.”

https://www.mauicounty.gov/DocumentCenter/View/8220/Molokai-Community-Plan-2018?bidId=

- Support the conservation and preservation of archaeological sites, both large and small.

https://dlnr.hawaii.gov/shpd/

Submitted by Mr. Eric Korpi via email on 10/21/2022

FIRE

1. What fire mitigation/prevention plans does DHHL propose for this project?
2. Will DHHL be liable for any damage to existing private property, injuries, deaths due to fire originating on or in connection with the Ualapue Kuleana Homestead Settlement?

8.5.2 Detached One- and Two-Family Dwellings.

Fire hydrants shall be provided for detached one- and two-family dwellings in accordance with both of the following:

(1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 600 ft

(2) The maximum distance between fire hydrants shall not exceed 800 ft

www.NFPA.org

https://safe.menlosecurity.com/doc/docview/viewer/docNE9E7F5391080f08b939f9834980d9b6ab0582df4a1f6009e32c5ebee86126b9e9a0716bae3fc

Submitted by Mr. Eric Korpi via email on 10/21/2022

FIRE

1. HAR-10-3-30

   (g) A lessee of a kuleana homestead lot shall be subject to all applicable state codes, county ordinances, and departmental rules and policies governing land use, building, health, and safety unless and until the kuleana homestead association's building, health, and safety codes and permitting process become effective for that particular tract. The kuleana homestead association for that particular tract, in consultation with a licensed architect, registered in the State, may develop, adopt, and enforce its own zoning, building, and permitting process on the condition that standards contained in state health codes and health and safety sections and provisions contained in the Uniform Building Code are met and that a licensed architect, registered in the State, is willing to certify all building plans as part of the community developed permitting process. No kuleana homestead association developed zoning, building, health and safety codes and permitting processes shall be effective unless and until they are approved by the commission.

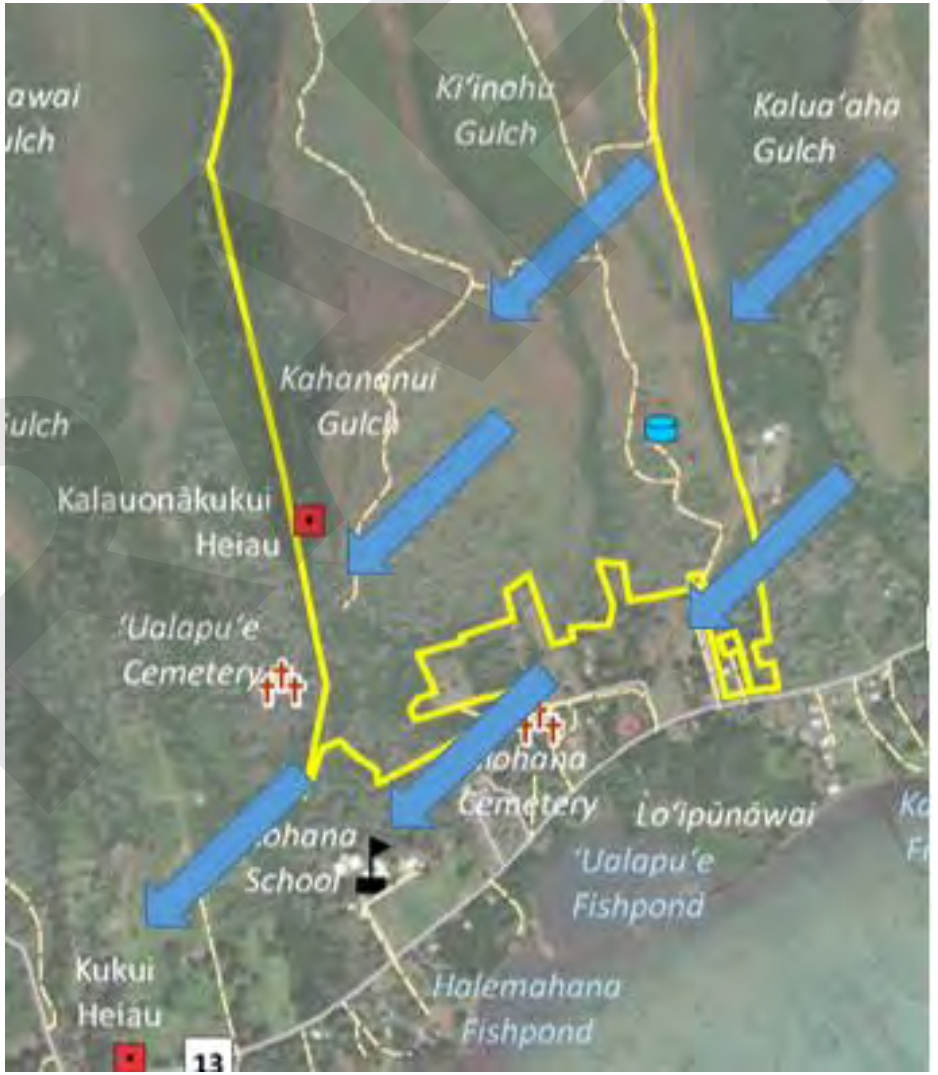
https://dhhl.hawaii.gov/wp-content/uploads/2021/09/HAR-10-3-30-Kuleana-homestead.pdf

Submitted by Mr. Eric Korpi via email on 10/21/2022

FIRE

Emergency service access/evacuation route post windstorm.

Submitted by Mr. Eric Korpi via email on 10/21/2022



Persistantly strong Tradwind blows from Ualapue Kuleana Homestead site directly towards Kilohana elementary school, Ualapue well/watertank, Kilohana cemetery Kilohana Kai neighborhood, Ualapue cemetery, Kalauonakukui Heiau, Kukui Heiau, multiple private homes.

Fire is most likely to blow directly at those sites.

FIRE

Does this single lane path appear able to handle fire trucks and other emergency vehicles?

Can this entrance/egress handle vehicles for regular traffic? During emergencies?

Is there a traffic management plan for this area?

Submitted by Mr. Eric Korpi via email on 10/21/2022

Water for the Manae Community

1. Will this project move ahead despite the lack of an efficient and reliable water system?
2. Will DHHL be liable for any contamination to the Ualapue Well (only source of potable water on east Molokai) originating from or in connection with the Ualapue Kuleana Homestead Project?
   - Agricultural runoff such as Fertilizer, Pesticide, Herbicide, Animal Waste, fire damage, etc…

State:

Pursuant to the Hawaii Constitution, Article XI, sections 1 and 7,

"water is a public trust resource, held in trust by the State for the benefit of the people, for both present and future generations."

https://lrb.hawaii.gov/constitution#articlexi

Submitted by Mr. Eric Korpi via email on 10/21/2022

Water For DHHL

DHHL:

"Water Flow Invigorates Waiwai- Water is essential to life, and for us to thrive on our 'aina. Water enables us to grow food, provide sustenance for our families, and ensure self-sufficiency. Access to an efficient and reliable water system is critical to preserving our lifestyle."

https://dhhl.hawaii.gov/wp-content/uploads/2020/02/Molokai-Regional-Plan-Update-Final_02-18-20_HHC.pdf

Submitted by Mr. Eric Korpi via email on 10/21/2022

Water Usage

1. What water source shall beneficiaries rely on to live on this land?

- 250 gallons average daily home usage (domestic) per Maui BOW.

https://www.mauicounty.gov/faq.aspx?qid=119

  - Domestic 250 gpd x 365 days = 91,250 gallons per year (gpy)
  - 91,250 x 450 Manae Residents = 41,062,500 gpy

- Per 2019 Maui Water Use Development Plan, DHHL domestic use requires at least 300 gallons per day (gpd)
  - DHHL AG is 3,000 gpd per acre.

https://www.mauicounty.gov/DocumentCenter/View/116105/WUDP-FINAL-DRAFT-ENTIRE-PLAN-March-2019?bidId=

Submitted by Mr. Eric Korpi via email on 10/21/2022

Water Usage

- Manae = 41,062,500 gpy

- DHHL domestic 300 x 365 = 109,500 gpy per home
  - 109,500 x 20 DHHL lots = 2,190,000 gpy — 5.3% increase
    - 109,500 x 74 lots = 8,103,000 gpy — 20% increase
      - 109,500 x 175 lots = 19,162,500 gpy — 47% increase

- DHHL AG 3,000 x 365 = 1,095,000 gpy per acre
  - 1,095,000 x 20 DHHL Ag lots = 21,900,000 gpy per acre — >50%
    - 1,095,000 x 74 = 81,030,000 gpy per acre — >200%
      - 1,095,000 x 175 = 191,625,000 gpy per acre — >466% !!

Submitted by Mr. Eric Korpi via email on 10/21/2022

Rain Catchment

Manae = 35-80” of rainfall yearly average (2011-2021)

https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/

Climate Molokai - Hawaii and Weather averages Molokai (usclimatedata.com)

Oct-Apr 2021=16.25”

https://www.weather.gov/images/hfo/hydrosum/molan_2021_hooilo.gif

Submitted by Mr. Eric Korpi via email on 10/21/2022

Rain Catchment

- 1,000 sq' roof x 80" annual rainfall (max avg in last 10 years)= 49,840 gpy

Rainwater Harvesting 101 | Your How-To Collect Rainwater Guide (watercache.com)

- Domestic 250 gpd x 365 days = minimum 91,250 gallons gpy NO CAN
- DHHL domestic 300 gpd x 365 = minimum 109,500 gpy NO CAN
- DHHL AG 3,000 x 365 = minimum 1,095,000 gpy per acre

DEFINITELY NO CAN

Submitted by Mr. Eric Korpi via email on 10/21/2022

Questions Recap

1. Are all cultural sites on/near Ualapue DHHL land identified? Mapped? By who?
2. Will all Cultural sites in Ualapue be preserved? Who will decide which may be demolished?
3. Is there a Burial Settlement Plan for this area if/when Iwi Kupuna are uncovered?
4. What fire mitigation/prevention plans does DHHL propose for this project?
5. Will DHHL be liable for any damage to existing private property, injuries, deaths due to fire originating on or in connection with the Ualapue Kuleana Homestead Settlement?
6. Will this project move ahead despite the lack of an efficient and reliable water system?
7. Will DHHL be liable for any contamination to the Ualapue Well (only source of potable water on east Molokai) originating from or in connection with the Ualapue Kuleana Homestead Project?
   - Agricultural runoff such as Fertilizer, Pesticide, Herbicide, Animal Waste, fire damage, etc…

Submitted by Mr. Eric Korpi via email on 10/21/2022

Costs

DHHL HAWAII ADMINISTRATIVE RULES §10-3-30 Kuleana homestead leases

- In determining whether a tract should be set aside for award as kuleana homestead lots, the commission shall consider the following:

(2) Excessive cost to develop the tract for any reason including: the physical characteristics of the land, the distance of the land from existing electrical, water, waste water disposal, communications, and other utility systems;…

https://dhhl.hawaii.gov/wp-content/uploads/2020/02/Molokai-Regional-Plan-Update-Final_02-18-20_HHC.pdf

Submitted by Mr. Eric Korpi via email on 10/21/2022

History of Ualapue Homestead Project

1. 2018 - Ualapue was placed as top priority DHHL project due to it's residential zoning.

https://dhhl.hawaii.gov/wp-content/uploads/2020/02/Molokai-Regional-Plan-Update-Final_02-18-20_HHC.pdf

2. April 2021 - "we heard the beneficiaries loud and clear that they want Residential housing on Molokai. They want houses."

G70 hired in 2020 to complete EA and settlement plan

19 April 2021 DHHL Molokai Homestead Associatons meeting

3. Oct 2021 - "First priority is for Residential Areas. (Ualapue) Unable to move forward due to water and infrastructure costs."

https://dhhl.hawaii.gov/po/molokai/ualapue-kuleana-homestead-project/ Oct 14 2021 Meeting: Minute 12

4. 2021 - Ahonui requests to have DHHL island plan amended, re-designating Ualapue property from Residential to Kuleana Homesteads.

5. After this re-designation, is this project still DHHL's top project on Molokai despite it being extremely different than the wishes of Molokai's DHHL waitlisters?

- Per DHHL HAWAII ADMINISTRATEV RULES §10-3-30 Kuleana homestead leases In determining whether a tract should be set aside for award as kuleana homestead lots, the commission shall consider the following:
  - (4) Applicant interest or proposals identifying tracts of land;

Submitted by Mr. Eric Korpi via email on 10/21/2022

DHHL Liability

Hawaiian Homes Commission Act Amendment 10-7-37 Civil action.

- Any violation is grounds for the association, any lessee, or lawful interest holder to commence a civil action for damages, injunctive relief, or both, and an award of court costs and reasonable attorney's fees in both types of action. The department shall not be party to any civil suit related to the violation of or noncompliance with the bylaws, any rules lawfully adopted by the association, or any covenant, condition, and restriction set forth in any recorded document. [Eff and comp] (Auth: HHC Act §222) (Imp: HHC Act §207.5)

https://dhhl.hawaii.gov/wp-content/uploads/2018/04/Proposed-Rules-DCCRs-Multi-Family-Rentals-Kupuna-Housing-Full-Text.pdf

Submitted by Mr. Eric Korpi via email on 10/21/2022

DHHL Liability

§26-35.5

- (b) Notwithstanding any law to the contrary, no member shall be liable in any civil action founded upon a statute or the case law of this State, for damage, injury, or loss caused by or resulting from the member's performing or failing to perform any duty which is required or authorized to be performed by a person holding the position to which the member was appointed, unless the member acted with a malicious or improper purpose…
  - (3) Is caused by or is the result of the member's failure to perform an act required or authorized to be performed by a person holding the position to which the member was appointed so as to effect a malicious or improper purpose.

http://www.capitol.hawaii.gov/hrscurrent/Vol01_Ch0001-0042F/HRS0026/HRS_0026-0035_0005.htm

Submitted by Mr. Eric Korpi via email on 10/21/2022

CONFERENCE REPORT

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

TO:	Department of Hawaiian Home Lands (DHHL)		
FROM:	G70		
DATE:	November 30, 2022	**LOCATION:**	Virtual
PROJECT:	ʻUalapuʻe Kuleana Homestead Settlement Plan	**PROJECT NO:**	221047-01
SUBJECT:	Beneficiary Consultation #3	**NO. OF PAGES:**	6
THOSE PRESENT:	G70: Kawika McKeague, Barbara Natale, Ryan Char, Piʻilani Smith, Kai Akiona-Ferriman DHHL: Andrew Choy, Gigi Cairel, Cedric Duarte, Sara Okuda, Solana Rosa Tutop	Zoom Participants: 17	

SUMMARY:

The third Beneficiary Consultation for the ʻUalapuʻe Kuleana Homestead Settlement Project was held virtually via Zoom on November 30, 2022. The meeting began at approximately 6:04pm.

Cora Schnackenberg provided the pule. Kawika welcomed the participants and provided a brief overview of the meeting. He began with the meeting purpose, which is to receive DHHL waitlist applicant feedback on the initial lot layout for the ʻUalapuʻe Kuleana Homestead Project.

Piʻilani conducted the first round of polling:

1. **Are you an Applicant, Lessee, Both, or Other?**
    a. Applicant (4/10, 40%)
    b. Lessee (0/10, 0%)
    c. Both (1/10, 10%)
    d. Other (5/10, 50%)
2. **Where are you from?**
    a. ʻUalapuʻe (2/10, 20%)
    b. Manaʻe (5/10, 50%)
    c. Molokaʻi (1/10, 10%)
    d. Other (2/10, 20%)
3. **What topics you would like to learn more about? (Select all that apply)**
    a. Slope and Erosion (4/10, 40%)
    b. Subsistence agriculture (7/10, 70%)
    c. Archaeological sites (4/10, 40%)
    d. Water availability (8/10, 80%)
    e. Individual Wastewater Systems (5/10, 5%)
    f. Possibilities on one acre (0/10, 0%)
    g. Community use spaces (1/10, 10%)
    h. Community access to hunting, gathering, cultural areas (4/10, 40%)
    i. Community impacts (5/10, 50%)

Andrew Choy provided an overview of the Hawaiian Homes Commission Act and the role of Prince Jonah Kūhiō Kalaniana‘ole.

Kawika provided the background of the DHHL Kuleana Homestead Program. It‘s a designation for available, unimproved homelands that is suitable for lessees who wish for immediate access to the land for subsistence uses. He also clarified that the DHHL Kuleana Homestead Program is separate and distinct from kuleana lands. Kawika described the differences between the Kuleana Homestead and Conventional Homestead leases. Kuleana leases offer a “fast-track” to get on the land, offers an unimproved lot, and more responsibility is placed on the lessee.

The HHC determines which DHHL waitlist to use, and DHHL is to provide metes and bounds of lots and an unpaved rights-of-way to the awarded lots. The lessee must participate in the Kuleana Homestead Association and help maintain rights-of-way and lots.

Kawika reviewed the concerns provided by beneficiaries, as well as those from the Mana‘e community. Concerns shared by both beneficiaries and community members include water and waste disposal, slope and erosion, cultural and historical sites, and access for hunting and cultural practices. He then presented the land and resource evaluation, which utilizes 15 categories of weighted significance criteria to identify sensitive areas within the project site.

Ryan Char presented a summary of the inital lot layout. In essense, the project is primarily looking at 58 acres located at the lower portion of DHHL‘s 400 acres of land. Although there was an initial preference for lots over 1 acre, it becomes more expensive per lot if lots are larger and less in number.

The lot layout uses existing roads so that the DHHL makes minimal new roads, thus keeping costs down. The primary road would come up the Ualapue Tank Access Road. A secondary lower portion road would connect to an existing public road. The roads would also help to intercept water and either redirect water to the gulches or be used for homesteading purposes.

The lot layout considered the location of the archaeological sites and implemented buffers around the sites. Sites could potentially be re-used, but that option will be re-visited later in the process after consultation has taken place with the State Historic Preservation Division (SHPD). There are 1,000 ft setbacks for the ‘Ualapu‘e well and a private well, therefore lots are not proposed in these setback areas. These areas can be used for lots, however, it would require additional scrutiny with regard to subsurface sewage disposal.

Kawika discussed the possibilities of homesteading on one acre, and the possibilities of Community Use/Special District spaces. There are a range of potential uses in the Community Use areas such as potential communal gardening, if awardees find that a one-acre homestead is not enough to meet their needs. Community Use areas could also be used for Resilience Hubs in case of emergency. Ryan then presented various topographic renderings of one-acre homestead lots with 1,500 sf buildings for visual representation of how this settlement would look like within the existing community.

Ryan continued the presentation by discussing roads and erosion control. Roads can serve as erosion control using swales, drains, dips, etc. Maintenance is critical for successful erosion

control, and it will be critical that the land is under management and utilizes some of these best management practices and stabilization (e.g. contour farming/terrace farming).

According to archaeological finds, some of these areas were used for small farming, and that use can potentially be replicated. Water would need to be directed by the way roads are engineered. Ryan then covered potential water options. Catchment is still a possibility, even with limited rainfall. Lastly, Ryan discussed potential wastewater options, including individual wastewater systems (IWS), incinerator toilets, composting toilets, and greywater reuse.

- **Chat comment by Lori Buchanan:** Where the residential lots are proposed there is "hardpan". Similar to several sites on Kahoolawe, West Molokai and other areas throughout the state. Hardpan is very degraded and not suitable for farming. Restoration efforts to mitigate hardpan is extremely labor intensive, extremely costly and will take a very long time to mitigate/restore. To date, millions of dollars has been spent on hardpan mitigation on Kahoolawe with little success.
    - **Andrew:** Looking at the soils is something that we can re-examine as we move forward in this process. The EA process will require a Soils section, where we can take a further look into the soil in the area. We definitely want to make sure that we put our beneficiaries in a good position to be successful.
    - Based on the number of sites, we know that there was a lot of settlement in the area. We need to continue to study those sites and how they were used to understand what can be done in this area.

- **Chat comment by Lori Buchanan:** The same "patterns" and conceptual plans were used in Kawela Plantation subdivision and failed to perform as planned and the result is tons of silt unto the fringing reef in Kawela….just sharing
    - **Ryan:** It would be interesting to know if the Kawela Plantation design was actually implemented and maintained throughout the life of the project. We can definitely look at that as well.

- **Chat comment by Lori Buchanan:** There is no greywater reuse approved by DOH.
    - **Ryan:** We do think that that will be changed as the Department of Health looks to update rules, therefore this is something we want to consider as a potential option in the future.

Pi‘ilani started the second round of polling:

1. **What do you think of the initial lot size?**
    a. Too Large (1/6, 16%)
    b. Too Small (0/6, 0%)
    c. Perfect Size (5/6, 83%)
2. **What do you envision for Community Space uses?**
    a. Communal garden spaces, composting areas (2/6, 33%)
    b. Resilience area with an open pavilion, composting toilets (3/6, 50%)
    c. Other (1/6, 16%)
3. **How should cultural/archaeological areas and sites be cared for?**
    a. Fenced for preservation and protected (1/6, 16%)
    b. Restored for education and re-use (3/6, 50%)

c. Allowed to remain in current condition (least cost) (2/6, 33%)

4. **Should the community have access control – gates?**
    a. Yes, gates at entries to the community with approved access (1/6, 16%)
    b. No, it is land open to all homesteaders and community (5/6, 83%)
    c. Yes, but gates should be open at all times and closed only if absolutely needed (0/6, 0%)
5. **Would 4x4 vehicular access to the site be acceptable to you or is a graded, paved access road preferred? (cost implications)**
    a. I can drive an off-road vehicle and deal with roads that may be washed out or in disrepair until the homestead community fixes the roads (1/6, 16%)
    b. I can drive an off-road vehicle and deal with roads that may be washed out or in disrepair but only for a day or two (3/6, 50%)
    c. I need drivable access at all times using a standard vehicle. Emergency vehicle access is critical for me (2/6, 33%)
6. **Does the provision of access to piped water (either to fill tanks or to each lot) define this project?**
    a. Yes a storage tank, fed by DWS, and supply to lot (1/6, 16%)
    b. Yes a spigot in Ualapue (4/6, 66%)
    c. Yes a spigot in Kalama‘ula (0/6, 0%)
    d. No, I will provide my own water (1/6, 16%)

- **Chat comment by Lori Buchanan:** Can you add the option of "none of the above" to every poll question....this poll is not helpful for me to provide feedback thank you. I cannot participate in a one-sided poll.
    - **Kawika:** Duly noted. We cannot change the poll in live-time, but can keep this in mind for the future.

- **Verbal comment by Pat Tamashiro:** What is meant by #4 community access?
    - **Ryan:** In terms of hunting access, cultural protocol, gathering, etc.

- **Chat comment by Mahina Poepoe:** What funding has DHHL allocated for this project so far? Is there a project cost to end of project and allocation?
    - **Andrew:** The contract was about $400,000 for initial planning, only up to design. For design and construction costs – the department will need to find funding for construction. There is currently no funding for this. The department first needs to determine those costs and then find the funding for it.

Kawika discussed next steps, presenting a timeline of the project thorough the next community meeting (early 2023) and the Kuleana Homestead Settlement Plan (2023). Andrew said this timeline completes the planning phase.

- **Chat comment by Lori Buchanan:** And the $400k budget covers all of that?
    - **Andrew:** Yes. It covers the subconsultants and the planning process through the Environmental Assessment.

- **Chat comment by Lori Buchanan:** For the future can we have a better schematic of the process.
  - **Andrew:** Yes. We can definitely do that.

Pi‘ilani started the third and final poll.

1. **Training may potentially be offered to prepare families for this off-grid lifestyle. Would you be interested in any of the following?**
   a. Site development (5/6, 83%)
   b. Erosion control (6/6, 100%)
   c. Farming techniques (4/6, 66%)
   d. Native plant restoration (5/6, 83%)
   e. Cultural site restoration / re-use (5/6, 83%)
   f. Home construction (5/6, 83%)
   g. Off-grid utilities (5/6, 83%)
   h. Emergency preparedness – fire prevention (5/6, 83%)
   i. Potential vendors (3/6, 50%)
2. **Do you feel the community has the resources, ability, and means to provide long term maintenance and repair of roadways?**
   a. Yes (1/6, 16%)
   b. No (1/6, 16%)
   c. Yes, but needs support from DHHL (4/6, 66%)
3. **Would you be willing to wait for the provision of water or a paved road if it meant it would take DHHL longer to award the land?**
   a. Yes (2/6, 33%)
   b. No (4/6, 66%)
4. **If offered, would you accept a 1-acre kuleana homestead lot as laid out in the initial lot layout for the ‘Ualapu‘e Kuleana Homestead Project?**
   a. Yes (5/6, 83%)
   b. No (1/6, 15%)
   c. Undecided

- **Chat comment by Mahina Poepoe:** For some of these questions, I think you would need to ask the actual awardees. Like for question 2**.**

Kawika then opened the floor to beneficiary feedback, questions, comments and concerns.

Lori Buchanan: Please consider not doing pre set polls in the future.

Cora Schackenberg: There was another group that focuses on Fire Prevention [Hawai‘i Wildfire Management Organization]. I would like to see their suggestions. I think the terraces that Andrew mentioned...I would like to know where they are. I‘m interested in types of plants for wildfire**.**

- **Kawika:** One of our partners is the Hawaii Wildfire Management Organization, based in Hawaii Island. They provide fire services in gathering data, analyzing spread, etc. They’ve been part of our conversations and there will be a report that gets integrated.

Mahina Poepoe: Will the next community meeting be in-person?

- **Kawika:** Yes. The next meeting is slated for early 2023 and will be in-person

Yolanda Tanielu: Fences. If I do get awarded, I will put a fence. It‘s for safety reasons. If my neighbors going plant their pakalolo or whatever, thats their business. I don‘t want them to come into my yard, take the gas out of my tank. These are things I learned in Ho‘olehua. We have an autistic child, so it‘s for safety. My next door neighbor filled up his gas and now no more. For those of us that are parents, the safety is for our family. I don‘t open the gate for anyone but family. My house is in the middle with the fence all around. I have grandkids. I don‘t want them pulling other peoples plants. I dont want people to scare my family. In our days, we get all kine troubles. Gun shooting. The other thing I‘m worried about is the pigs and the deers with the fence. Do we have the right to shoot it?

- **Kawika:** Mahalo for sharing those thoughts. What resonates is the care, security and wellbeing of your ‘ohana. It’s going to take the formation of this community to build relationships with each other, with ‘āina.

Pat Tamashiro: Yolanda is right, we have issues all over Moloka‘i.

Cora provided a pule to close out the meeting. The meeting ended at approximately 7:45pm.

To increase participation, the above survey was emailed as well as physically mailed with a self-addressed, stamped envelope to agricultural applicants following this meeting. Including the online participants, a total of 73 surveys were answered. The following table shows the answers for the 73 surveys answered.

QUESTION	BENEFICIARY CONSULTATION #3 (10 Reponses)	MENTIMETER (26 Responses)	PAPER SURVEY (37 Responses)	TOTAL
1. Are you an Applicant, Lessee, Both, or Other?				
Applicant	4	17	26	**47**
Lessee	0	1	5	**6**
Both	1	4	4	**9**
Other	5	4	0	**9**
Prefer not to say	0	0	2	**2**
2. Where are you from?				
ʻUalapuʻe	2	1	3	**6**
Manaʻe	5	0	2	**7**
Molokaʻi	1	12	18	**31**
Other	2	9	14	**25**
Prefer not to say	0	4	0	**4**
3. What topics would you like to learn more about? (Select all that apply)				
Slope and Erosion	4	17	14	**35**
Subsistence Agriculture	7	14	21	**42**
Archaeological Sites	4	14	19	**37**
Water Availability	8	17	28	**53**
Individual Wastewater Systems	5	12	20	**37**
Possibilities on One Acre	0	13	22	**35**
Community Use Spaces	1	8	17	**26**
Community Access to Hunting, Gathering, Cultural Areas	4	10	20	**34**
Community Impacts	5	12	12	**29**
None of the Above	0	1	5	**6**
4. What do you think of the initial lot size?				
Too Large	1	0	2	**3**
Too Small	0	6	9	**15**
Perfect Size	5	7	10	**22**
Prefer not to say	4	10	14	**28**
5. What do you envision for community use spaces? (Select all that apply)				
Communal garden spaces, composting areas	2	12	20	**34**
Resilience area with an open pavilion, composting toilets	3	10	15	**28**
Other	1	11	2	**14**
Prefer not to say	4	0	8	**12**
6. How should cultural/archaeological sites be cared for? (Select all that apply)				
Fenced for preservation and protected	1	16	20	**37**
Restored for education and re-use	3	10	24	**37**
Allowed to remain in current condition (least cost)	2	9	6	**17**
Other	0	4	1	**5**
Prefer not to say	4	0	5	**9**

QUESTION	BENEFICIARY CONSULTATION #3 (10 Reponses)	MENTIMETER (26 Responses)	PAPER SURVEY (37 Responses)	TOTAL
7. Should the community have access control - gates on main roads? (Select all that apply)				
Yes, gates at entries to the community with approed access	1	8	9	**18**
Yes, but gates should be open at all times and closed only if absolutely needed	0	4	16	**20**
No, it is land open to all homesteaders and community	5	7	15	**27**
Other	0	0	1	**1**
Prefer not to say	4	3	3	**10**
8. Would 4x4 vehicular access to the site be acceptable to you or is a graded, paved access road preferred? (Cost implications)				
I can drive an off-road vehicle and deal with roads that may be washed out or in disrepair until the homestead community fixes the roads	1	2	3	**6**
I can drive an off-road vehicle and deal with roads that may be washed out or in disrepair but only for a day or two	3	1	2	**6**
I need drivable access at all times using a standard vehicle. Emergency vehicle access is critical for me	2	14	25	**41**
Prefer not to say	4	5	9	**18**
9. Does the provision of acess to piped water (either to fill tanks or to each lot) define this project?				
Yes a storage tank, fed by DWS, and supply to lot	1	12	22	**35**
Yes a spigot in ʻUalapuʻe	4	5	11	**20**
Yes a spigot in Kalamaʻula	0	1	6	**7**
No, I will provide my own water	1	0	1	**2**
Prefer not to say	4	4	11	**19**
10. Training may potentially be offered to prepare families for this off-grid lifestyle. Would you be interested in any of the following?				
Site Development	5	14	20	**39**
Erosion Control	6	12	16	**34**
Farming Techniques	4	13	18	**35**
Native Plant Restoration	5	12	17	**34**
Cultural Site Restoration/Re-Use	5	10	19	**34**
Home Construction	5	16	19	**40**
Off-Grid Utilities	5	12	21	**38**
Emergency Preparedness - Fire Prevention	5	12	17	**34**
Potential Vendors	3	4	7	**14**
Prefer not to say	0	4	11	**15**
11. Do you feel the community has the resources, ability, and means to provide long-term maintenance and repair of roadways?				
Yes	1	2	0	**3**
No	1	8	13	**22**

QUESTION	BENEFICIARY CONSULTATION #3 (10 Reponses)	MENTIMETER (26 Responses)	PAPER SURVEY (37 Responses)	TOTAL
Yes, but need support from DHHL	4	11	20	**35**
Prefer not to say	4	1	5	**10**
12. Would you be willing to wait for the provision of water or a paved road if it meant it would take DHHL longer to award the land?				
Yes	2	7	14	**23**
No	4	11	15	**30**
Prefer not to say	4	4	8	**16**
13. If offered, would you accept a 1-acre kuleana homestead lot as laid out in the initial lot layout for the ʻUalapuʻe Kuleana Homestead Project?				
Yes	5	7	19	**31**
No	1	4	3	**8**
Undecided	0	9	7	**16**
Prefer not to say	4	2	7	**13**
14. Do you have additional questions/comments for DHHL?				
		What is the time line for this area?	Please leave ʻUalapuʻe alone it is very sacred to our kupuna and ancestors. And give back whats ours without a high cost (Kananakaʻs)	
		Lots need to be larger. DHHL is taking too long!	Projected availability?	
		When will this be available?	1. No more delays for awarding of land.	
		Been waiting to long, not much years left	DHHL is doing their best to meet the needs of all individuals, but, it is not always easy. Donʻt give up! Your efforts are appreciated. Adams ʻOhana.	

QUESTION	BENEFICIARY CONSULTATION #3 (10 Reponses)	MENTIMETER (26 Responses)	PAPER SURVEY (37 Responses)	TOTAL
		Prince Kuhio's legacy is to put his people on the land. Long over due...why put his picture in your DHHL offices when you are not adhering to his legacy. Hila Hila....He is looking down and not happy. Liliuokalani's says standfast as HAWAIIANS!!	To many hawaiians have passed away never getting on Hawaiian Homestead Lands, and list keeps getting longer!	
		Not at this moment	75% Hawaiian blood should be first in line beside the waiting list.	
		No build up there!	Mahalo	
		Aloha and Mahalos for all you folks do at DHHL	No	
		It's exciting to see this project slowly take shape And covering each important matter n concern One step at a time to ensure success from the Beginning to end 👍		
		Close the Project it's not safe for Kupuna ! And they do not have the finances to make the improvement. Look at the results of Hoolehua there's still people for no water or electric.	It's very simple, too much red tape and stall tactics. Give the Hawaiians what's rightfully theirs!	
		None	Yes	
		Appreciate what DHHL doing for all the applicants on the waitlist. Only way we can move ahead is to help each other in a smoothly and honestly way. Just half an acre is good for each family the world is expanding and so is the next generation!	Please recommend me farming at anahola for thirty years, Plumeria, coconut trees, puakenikeni, bird of paradise, sell product to family lei stand Honolulu, and community. Grew grass for erosion 3.8 in cultivation. I know the work involved.	
		none	Hurry up before more Hawaiians die	

Appendix B

Honuaiākea Process, 2021

Edith Kanakaʻole Foundation

Kapu and Kānāwai from Honuaiākea Process for ʻUalapuʻe Development

By: **Ipo & Kunani Nihipali, Leimana Naki, ʻIwalani Kadowaki, Kahu David Kaupu, Gigi Cariel, Julie-Ann Cachola, Kawika McKeague & Barbara Natale**

Facilitators: Kialoa Mossman, Huihui Kanahele-Mossman & Thomas Pi'ilani Smith

Introduction:

During the weekend of November 20th and 21st, 2021, members of the Edith Kanakaʻole Foundation (EKF) facilitated a Honuaiākea session with members of the Molokaʻi community, members of the G70 Planning group, and members of the Department of Hawaiian Homelands, in an effort to incorporate ancestral knowledge into Hawaiʻis community development planning process. Honuaiākea is a community planning framework that uses ʻoli (chants), mele (songs), and kaʻao (stories/fables) interpreted through the eyes and experiences of community members and those who practice in those areas to understand the important resources that are crucial for ecosystem stability and community survival (kapu) and the actions the actions needed to maintain said resources (kānāwai). This is done by using a Grounded Theory framework to analyze the observations made and recorded by Native Hawaiian ancestors in a way that is understandable and digestible by the general public. This framework allows for new theories to emerge as long as it's grounded in data. For the Honuaiākea process, the ʻoli, mele, and kaʻao is that data that allows for new theories to emerge. The kapu and kānāwai assist community members, officials, scientists, and businesses alike to not only recognize crucial resources, but to build a community around those crucial resources to ensure their protection and perpetuation into the future.

The term Honuaiākea comes from the kaʻao of Hiʻiaka-i-ka-poli-o-Pele as Pele's cousin Ka-uhi-ʻīmaka-o-ka-lani retold the story of how Pele came to Hawaiʻi from her homeland in Kahiki on a waʻa named Honuaiākea. This waʻa did not only carry Pele however, it also carried a huge portion of her ʻohana who all worked together to make it to Hawaiʻi and it was here they found their purpose and became deified elements of Hawaiʻi's natural ecosystem. Like the canoe that carried Pele and her ʻohana to Hawaiʻi, this process aims to be a collaborative effort that carries people

with various perspectives and talents to a community where those talents and perspectives can work in harmony with the natural environment to create an eco-friendlier community that is rooted in Native Hawaiian identity. Essentially this process helps to reveal community values through ʻoli, mele, and kaʻao translated and analyzed by the community for community use.

The reasoning for the collective gathering of community members from Molokaʻi, EKF, G70, & DHHL members was to try and incorporate the Honuaiākea process into the planning stages for the ʻUalapuʻe Kuleana Homestead Settlement Plan (KHSP). Located on the southeastern end of Molokaʻi, this settlement plan consists of an evaluation of 389 of the 412 acres of unimproved lands owned by DHHL. The project site is located mauka of Kamehameha V Highway and is highlighted by sloped terrain (11-20%) from its mountainous regions scattered between Kahananui, Kiʻinohu, and Moʻomuku Gulches. The 389 acres have been designated for General and Subsistence Agricultural, and Special District land use. The KHSP created by this collaborative effort will be utilized for residential purposes as well as to ensure proper care and protection of vital archaeological and biological resources.

The 2005 Molokaʻi Island Plan proposed development of residential homesteads in ʻUalapuʻe which consists of 25 acres for residential homesteads and 3 acres for community use in the lower mauka area, 85 acres of the upper mauka areas as Special District (around the upper mauka boundary, and the Kalauonākukui Heiau), and approximately 300 acres in the mid-mauka areas as General Agriculture. The Special District around the upper mauka area will serve as a natural resource management and subsistence area.

In 2019, the ʻAhonui Homestead Association (AHA), a group of homestead waitlisters on Molokaʻi, were at odds with DHHLs vision for ʻUalapuʻe. AHA was founded in 2019 to address the frustrations of Native Hawaiian beneficiaries with DHHL. This group seeks to further serve, protect and preserve the interest of Native Hawaiian beneficiaries of the Hawaiian Homelands trust and to address community needs in health, education, housing, social services, kūpuna (elders) & keiki (child) care, business, employment and culture. In order to achieve this goal, AHA proposed the development of Kuleana homesteads for ʻUalapuʻe in lieu of traditional residential homesteads (DHHL Regional Plan Update 2019). The Kuleana Homestead Program is one that allows the

community to develop their own community, however, that also comes with the burden of developing one's own infrastructure in return for availability and early access to unimproved land. To ease their burden, AHA seeks to secure minimum infrastructure (i.e. roads and water spigots) for the project area.

In the summer of 2021 G70 was contracted by DHHL to create the KHSP and to perform an HRS 343 Environmental Assessment. As such the KHSP must include a description of the kuleana homestead land tract, the size and number of kuleana homestead lots to be awarded, location of community center and common areas, settlement timetable to commence after the award of lots, and concepts for community management and economic development of adjacent DHHL landholdings. Another major aspect that must be included into the KHSP is the plan for the identification, protection and preservation of all significant historical archaeological and biological sites. A presentation featuring EKF's Kialoa Mossman on the subject of Honuaiākea persuaded members of G70 to include Honuaiākea process into the KHSP to assist with that very aspect (the identification, protection, and preservation of all significant historical archaeological and biological sites) as described by the ʻoli and kaʻao passed down for centuries from early Native Hawaiian ancestors.

Process:

The Honuaiākea process consists of 3 different parts: the pre-session, the session, and the formulation of Kapu & Kānāwai. The pre-session refers to the planning portion of the Honuaiākea session and it involves determining the general topic, gathering relevant source material, and convening the group. The general topic for this particular Honuiākea session was ʻUalapuʻe, so the members of EKF and G70 worked together to gather relevant source materials for the area. The relevant source materials came in the form of one kaʻao and one ʻoli. The kaʻao came from the story of *Kūʻula-kai* composed by Moke Manu and translated by Moses Nakuina and was chosen for its references to Molokaʻi as well as its reference to the practice of loko iʻa which are prominent features in the ahupuaʻa of ʻUalapuʻe. The second source material chosen for the session was the ʻ*oli Kīʻauʻau* from *the story of Kū-a-Pakaʻa* who lived in the area of ʻUalapuʻe and enticed the aliʻi Keawenui-a-Umi to land on Molokaʻi and take Kū-a-Pakaʻa with him on his journey. This ʻoli is valuable as it lists the type of resources and practices that were observed in ʻUalapuʻe at the

time. It was also selected in collaboration with G70, who has attached a portion of this ʻoli to the KHSP. Both of these materials can be found in the Appendix I. While G70 assisted EKF with discovering relevant source data, G70 was also working with DHHL and the ʻAhonui Homestead Association to convene a group of people who have knowledge of either the area of ʻUalapuʻe or the practices being mentioned in the ʻoli and kaʻao. There were over 40 people asked to attend but due to the constraints of a virtual meeting, only 10 people were able to participate over the short period of time. Though the turnout for the initial Honuiākea process was not as large as anticipated, there can always be more Honuiākea sessions held down the line where more community members are able to analyze ʻoli, kaʻao, and mele from the perspective of the people who live and work that land.

With the group convened and the relevant source data obtained, it was time to move on to the Honuiākea session. On November 20th, 2021 - November 21st, 2021, members from the Molokaʻi community, G70, EKF, and DHHL came together over Zoom to analyze ʻoli, kaʻao and mele. The sessions were led by the facilitators from EKF, who gave a brief introduction and overview of the Honuiākea process. This introduction also included examples of how to kilo (observe) and how to makawalu (Interpreting/Analysis). Kilo is the art of observing one's environment over time through practice or through ancestral memory. Kilo is crucial for creating ʻoli and mele, but it is equally important for understanding what Hawaiʻis kūpuna (ancestors) experienced during a time of abundance. Makawalu is the art of analyzing ʻoli, kaʻao, and mele. This is done by breaking down names of deities to assess their function in the natural world. For instanced the name Kū-moku-hāliʻi has often been associated with a god of the forest, however, if we were to makawalu the name we see that Kū- means to stand, stop, halt extend, and reach, moku- means to stand, set apart, a section of land, and -hāliʻi is to spread out. So by combining all these definitions, we can now surmise that Kū-moku-hāliʻi is a reference to a large forested section of land.

Once everyone understood the process, the group began diving into the first reading material, the kaʻao of Kūʻula-kai. Each individual read the kaʻao for about 20 minutes before reconvening and breaking out into smaller groups. In these small groups, participants were asked three questions:

1. What were your initial thoughts and reactions?
2. What natural processes are present in the kaʻao?

3. What are the different practices?

The notes from each small group discussion can be found in Appendix II. After the small group discussions, we reconvened once again and synthesized everyone's notes and combined any similar themes and ideas that stemmed from the discussion. This synthesis made it easier for the group to look back at important concepts from the kaʻao to create kapu and kānāwai later in the process. The next day, we repeated this process for the *ʻoli Kīʻauʻau* but because of lower participant turnout, we stayed as one group instead of doing smaller breakout rooms during the analysis portion. Everyone read through the *ʻoli Kīʻauʻau* individually at first, but to analyze the material, participants were asked to go through it line by line to pull out the overall context of the ʻoli from the perspective of the ʻUalapuʻe community. Notes were taken and synthesized until the group had what it needed to create kapu and kānāwai.

The formulation of the kapu and kānāwai is the last step of the process and the main tool for communities to control their spaces. The kapu are the resources that community members and the natural environment alike cannot survive without and kānāwai are the guidelines or management tools that must be used to maintain the kapu. They are created using the notes and synthesis from each ʻoli and kaʻao analyzed by the group to pinpoint what resources were crucial for the overall ecosystem health. Without the analysis portion, the kapu and kānāwai present in the ʻoli and kaʻao might never appear. The kapu and kānāwai are also the main tools for communities to explain to landowners and project managers what their responsibility is to that community and the overall ecosystem.

Findings:

The following kapu & kānāwai were formulated from the group's findings. As mentioned above, kapu are the resources that community members and the natural environment alike cannot survive without, kānāwai are the guidelines or management tools that must be used to maintain the kapu. The kapu must be managed according to kānāwai lest those resources be lost forever, making it a struggle for the community living there. These kapu and kānāwai however are not all that exists for the area, these are just what this group was able to find given the time constraints. This is also meant to be a living document that can and should be added to as more resources become available.

<u>Kapu 1: Ua ka ua, Kahe ka wai</u> - from the oli Kīauau line 9, from Kūʻula first paragraph

***Water needs to flow to all inhabitants of the ʻahupuaa*, Ma uka forests hold the water, then flows down to our inhabitants.**

<u>Kānāwai</u>

- **Kū-ʻula-Uka, Kū-ʻula-Kai** - Growth must happen up uka as it does in the kai. Forest must be restored to provide clean water to the kai environments else the entire ecosystem is unbalanced.

- **Hina-ulu-Ohiʻa** - The moon controls the growth of our forest as it controls the movement of water through the ohiʻa. With the spreading of this forest, water is allowed to be filtered and cleansed through the layers of forest and slowed to supply aquifers.

<u>Kapu 2: Koʻa (ākoʻakoʻa,pūkoʻa)</u> - from the story of Kūʻula kai and the oli kīauau line 19

Succession, Teaching the community and next generation the traditions, gathering of fish, gathering of community, providing nutrients for people and fish

<u>Kānāwai</u>

- **Kiʻauʻau**- Coming together, and being prepared, so that we reach a place of healing and reconciliation and find a way to move forward as a lāhui.

- **Hina-puku-iʻa** - Feeding the community members with ʻike (Knowledge), food security, kuleana (responsibility), skills, and traditions that allow them to give back to their ʻāina (environment).
  (*Hui heiau o ualapuʻe - this was mentioned in the discussion of this kapu and Kānāwai)*

<u>Kapu 3: Kui ka ʻina</u>- from ʻoli Kiauau line 14

Growth and birth cycle of the marine life of the shore break and kai koholā are free to proceed without hindrance.

<u>Kānāwai</u>

- **ʻAi-ʻai** - Managing for abundance for this era and for future generations. Sustainability through practice, practice based on community tradition and knowledge of place.

- **Pupuhi ke kukui malino ke kai** - The process to see below the surface, observation is key to understanding your coastline. Also a reference to managing externalities and external powers.

<u>Conclusion</u>:

At EKF, members believe that the answers to many of the problems we face in Hawaiʻi can be found in our ʻoli, our mele and our kaʻao left to us by the kūpuna who came before us. Honuiākea is just one way of tapping into those rich resources left to us by our kūpuna, to better inform Hawaiʻis plans to build our communities in meaningful ways. This process is also crucial for conservation and resource protection in Hawaiʻis communities as this document highlights important resoureces and what collaborative actions are needed to maintain said resources. Lastly, this group hopes to perpetuate Native Hawaiian knowledge and culture by creating a living document using ʻoli, mele, and kaʻao as its foundation. Using a collaborative approach between agencies such as the Ahonui Homestead Association, DHHL, G70 and EKF, and by having the community create their own community guidelines based in hundreds of years of data, we hope that the ʻUalapuʻe Kuleana Homestead will not just be a community, but an example for every landowner and community to follow.

Resource List

- Fornander, A. (1918). The Legend of Kū-a-paka‘a. In T. Thrum (Trans.), *Hawaiian Antiquities & Folklore* (Vol. V, pp. 98–101). essay, Bishop Museum Press.
- Manu, M. (2006). *Ku‘ula Kai*. Hawaiian Fishing Traditions. http://www2.hawaii.edu/~dennisk/texts/kuulakai.html.
- Mossman, K. (2020). *Honuiākea*. Google. Retrieved from https://docs.google.com/presentation/d/1Y2yxM22orBCvJ6XVFFmj-4mxBJoyk1078MphgWhnSzw/edit#slide=id.g10346be836f_0_0.
- Mossman, K. (2020) *Honuaiākea: Incorporating Kapu and Kānāwai into Hawai‘i Planning through Grounded Theory (GT) and Ancestral Ecological Knowledge (AEK) Systems.* University of Hawaii at Manoa, Honolulu, HI. P. 2-24.
- Natale, B. (2021). (working paper). Memorandum: ‘Ualapu‘e General Info. Honolulu, HI: G70.

Appendix I -Kaʻao Kūʻula-kai, and ʻoli Kīʻauʻau

ʻOli and Mele Packet for Honuaiākea Session

Ualapuʻe, Kona, Molokaʻi

11/20-11/21, 2021

Kū‘ula Kai

Moke Manu

Translated by Moses Nakuina

K**u**‘ula-kai and his wife Hina-puku-i‘a lived at Leho‘ula in the land of Aleamai, H**a**na, Maui.1 Nothing is known of their parents, but tradition tells us that K**u**‘ula, his wife Hina, their son ‘Ai‘ai, and K**u**‘ula-uka, a younger brother, lived together for a time at Leho‘ula; then the brothers divided their work between them, with K**u**‘ula-uka choosing farming, from the seashore to the mountain-top, and K**u**‘ula-kai choosing fishing, from the pebbly shore to the ocean depths. After this division of labor, K**u**‘ula-uka went up to the mountains to live and met a woman known as La-ea – also called Hina-ulu-‘**o**hi‘a, a sister of K**u**‘ula’s wife Hina-puku-i‘a. These two sisters had three brothers named Mokuh**a**li‘i, K**u**p**a**‘aike‘e, and K**u**-pulupulu-i-ka-nahele, who were the ancient gods of the canoe-making priests – n**a** akua ‘aum**a**kua o ka po‘e kahuna k**a**lai wa‘a.2

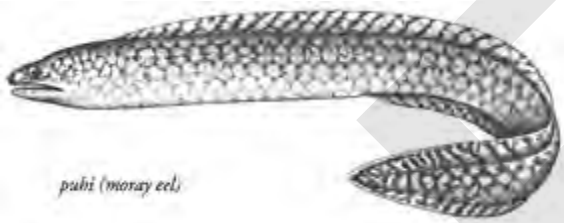
K**u**‘ula had a human body, but was possessed with mana kupua, or supernatural powers, in directing and controlling the fish of the sea. While K**u**‘ula and his wife were living at Leho‘ula, he devoted all his time to his chosen vocation of fishing. His first work was to construct a fishpond handy to his house, but near the shore where the surf breaks, and he stocked this pond with all kinds of fish.3 Upon a rocky platform, he also built a house, which he called by his own name, K**u**‘ula, to be sacred for the fishing kapu. Here he offered the first fish caught to the fish god, and because of his observances, fish were obedient (laka loa) to him; all he had to do was to say the word, and fish would appear. This was reported all over H**a**na.

Kamohoali‘i, the ali‘i, was then living at W**a**nanalua, the land on which Ka‘uiki Hill stands. When he heard about the fishpond, he appointed K**u**‘ula as his head fisherman. From this well-stocked pond, the ali‘i’s table was regularly supplied with all rare varieties, whether in or out of

season. K**u**‘ula was his mainstay for seafood and was consequently held in high esteem by Kamohoali‘i. They lived without any disagreement for many years.

During this agreeable period, K**u**‘ula’s wife gave birth to a son who was named ‘Ai‘ai-a-K**u**‘ula. The child was brought up properly according to the customs of those days. When he was old enough to take care for himself, an unusual event occurred.

A large puhi called Koona lived at Wailau, on the windward side of the island of Moloka‘i.



puhi (moray eel)

This eel was worshiped by the people of Wailau, and they never tired of telling about the mighty things their god did, for example, that a big shark came to Wailau and gave it battle, and during the fight the puhi caused a part of the rocky cliff to fall upon and kill the man**o**. A cave was thus formed, with a depth of about five fathoms; and that large opening is there to this day, situated a little above the sea and close to the rocky fort where the well known Kapepeekauila lived.4 This puhi then left Wailau and came to live near Aleamai, in H**a**na, in a sea cave called Ka-puka-ulua (“The ulua hole”), some distance out from the ‘**a**lau rocks; it came to break into and rob the pond that K**u**‘ula had built and stocked with fish.

K**u**‘ula was surprised to see his pond stock disappearing, so he watched all day and night, and at last, about daybreak, saw a large puhi come in through the makai wall of the pond. Then he knew the puhi was taking his fish and began devising a way to catch and kill it; but after he consulted with his wife, they decided to let their son ‘Ai‘ai try to capture and kill the thief. When ‘Ai‘ai was told about the puhi, he sent word to the people of Aleamai and the people of Haneo‘o to make two ropes several hundreds of fathoms long from hau tree bark. When the ropes were ready, two canoes went out, one from Aleamai and one from Haneo‘o, with ‘Ai‘ai-a-K**u**‘ula in one of them. He had put two large stones in the canoe and carried with him a h**o**keo, or fishing-gear gourd, containing a large fishhook called Manaiakalani.5

When the canoes had proceeded far out to sea, ʻAiʻai determined their position by landmarks; then looking down into the water and finding the right place, he told the paddlers to stop. He stood up in the canoe, took one of the stones in his hands, and dove into the water. The stone took him down rapidly to the bottom, where he saw a big cave opening right before him, with ulua and other deep-sea fish scurrying about the entrance. Certain that this was the hole where the puhi lived, he surfaced and climbed into his canoe, and after resting for a moment, he opened the h**o**keo, took out the hook Manaiakalani, and tied the hau ropes to it. He took a long stick and placed at the end of it the hook baited with a preparation of coconut and other substances attractive to fish.6 Before taking his second dive, he told those on the canoes that if he succeeded in hooking the puhi, he would give the ropes several quick jerks. Then he picked up the other stone, dove down into the sea again, and placed the hook in the cave while murmuring a few incantations in the name of his parents. When he knew the puhi was hooked, he gave the ropes several quick jerks. He surfaced shortly and climbed into one of the canoes. The two canoes paddled toward shore, each trailing a rope behind. He told those in the Haneoʻo canoe to paddle to Haneoʻo and H**a**moa and tell the people there to pull in the puhi; he told those in the Aleamai canoe to paddle to Lehoʻula and tell the people there to do the same. The two canoes set forth on their courses to the landings, and after going ashore, the crews gathered crowds of people at H**a**moa and at Lehoʻula to pull in the puhi, as ʻAiʻai had instructed.

ʻAiʻai ascended Ka-iwi-o-pele Hill and motioned to the people of both places to pull in the puhi. It was said the Aleamai people won over the much greater number from Haneoʻo, and they landed the puhi on the p**a**hoehoe stones at Lehoʻula. The people tried to kill the prize, but without success till ʻAiʻai came and threw three basalt stones (ʻal**a**) to kill it. The head was cut off and cooked in an imu. The bones of its jaw, with the mouth wide open, are seen to this day near shore, washed by the waves. (A rock formation resembles an open jaw.)

Kamaʻ**a**ina of the place say that all ʻal**a** near the imu in which the puhi was baked do not crack when heated (as they do elsewhere) because of the imu heating of ʻAiʻai's time. It is so even to this day. The iwikuamoʻo, or backbone, of this puhi is still lying on the p**a**hoehoe – a rocky formation, about thirty feet long exactly resembling the backbone of a puhi.7

The killing of this puhi made ‘Ai‘ai famous among the people of H**a**na. Its capture was the young boy’s first attempt to follow his father’s vocation, and his knowledge of fishing surprised the people.

After this event, the kahu of the slain puhi came over from Wailau, Moloka‘i, to investigate because the puhi’s spirit had visited him one night in a dream and told him that his ‘aumakua had been killed at H**a**na. Arriving at W**a**nanalua, the kahu became friends with one of the retainers of Kamohoali‘i, the ali‘i of H**a**na, and lived there a long time serving under the ali‘i, during which time he learned how the puhi had been caught and killed by ‘Ai‘ai, the son of K**u**‘ula and Hina-puku-i‘a. After learning this, he sought to kill the three of them in revenge.

This Moloka‘i man went one day to K**u**‘ula, without orders, and told him the ali‘i had sent for fish. K**u**‘ula gave him an ulua, with a warning: “Go back to the ali‘i and tell him to cut off the head of the fish and cook it in the imu, and to cut up and salt and dry its flesh in the sun to preserve it, for ‘This is H**a**na, the starved land; H**a**na of the scarce fish; the fish of Kama; the fish of Lanakila.’ (‘Eia o H**a**na la he ‘**a**ina aupehu; o H**a**na kéia i ka i‘a iki; ka i‘a o Kama; ka i‘a o Lanakila’).”

The man returned and gave the ulua to the ali‘i, whoasked him, “Who gave you the fish?” and the man answered, “K**u**‘ula.”

Then the Moloka‘i man saw his chance for revenge, so he told the ali‘i: “Your head fisherman told me to come back and tell you your head should be cut off and cooked in the imu, and the flesh of your body should be cut up and salted and dried in the sun.”

Hearing this, the ali‘i was so angry with K**u**‘ula he ordered the Moloka‘i man to go and tell all the konohiki and people to go up into the mountains immediately, gather firewood, and place it around K**u**‘ula’s house, for K**u**‘ula and his wife and child should be burned to death.

The ali‘i’s order was carried out by all the konohiki and people, except those of Aleamai, who refused to obey the ali‘i’s order, because K**u**‘ula had always lived peaceably among them. On days when they had no fish, he had supplied them freely.

When K**u**‘ula and his wife saw the people of H**a**na bringing firewood and placing it around their house, they knew they were in trouble, so K**u**‘ula went to a place where taro, sweet potatoes, bananas, sugar cane, and some gourds were growing. He asked the owner for three dry gourds and was told to take them. He took the gourds to his house and discussed with his wife his plan for the evil day to come. He told his son their house and his parents’ bodies would be burned, but not to fear death or trouble himself when the people came to shut them in. After some thought, K**u**‘ula remembered giving the ulua to the ali‘i’s retainer and was sure this retainer was to blame for this attack against himself.

He turned to his son and said: “Our child, ‘Ai‘ai-a-K**u**‘ula, if our house and our bodies are burned, look for the smoke when it goes straight up Kaiwiopele Hill. That will be your path out of the burning house – follow it till you find a cave where you will live. Take this hook called Manaiakalani5 with you; also this pearl shell fishhook for called Kahuoi; this leho (a cowry shell lure for catching octopus) called Leho‘ula 8; and this small sandstone from which I got my name, K**u**‘ula-au-a-K**u**‘ulakai. This stone is the progenitor of all the fish in the sea. From this time forth, you will be the one to establish all the K**u**‘ula (stone altars for rites to attract fish and cause them to multiply) and the ko‘a lawai‘a (fishing grounds) 9 in the sea throughout the islands. Your name and the names of your parents shall be perpetuated through all generations to come. I hereby confer upon you all my power and knowledge. Whatever you desire, call on us and ask it in our names, and we will grant it. Soon we will leave this place and go into the sea to abide there forever; and you, our child, shall live here on land without worrying about anything that may happen to you. You will have the power to punish with death all those who have helped to burn us and our house. Whether ali‘i or maka‘**a**inana, all must die; now, let us calmly await

our calamity." ‘Ai‘ai agreed to carry out all his father's instructions, from first to last, as a dutiful son.

Then the ali‘i's people came one day and caught K**u**‘ula and his family and tied their hands behind their backs, the evil-doer from Moloka‘i being there to aid in executing the ali‘i's cruel orders resulting from his deceit. K**u**‘ula and his family were taken into their house; he was tied to the pouhana (end post supporting the ridgepole), his wife was tied to the kai waena (middle post) of the house, and the boy, ‘Ai‘ai, was tied to one of the pou o manu (corner posts). Then the people went outside, barricaded the doorway with wood, and set the wood on fire. Men, women, and children watched the burning house with deep pity for the family within, and tears were streaming down their cheeks as they remembered K**u**‘ula's kindness during the time they had all lived together. The people didn't know why they had been ordered to burn this family and this house.

Before the fire was lit, the ropes which bound the captives had dropped from their hands. When the fire was raging all about the house and the flames were consuming everything, K**u**‘ula and his wife gave their last message to their son and left him. They departed from the house as quietly as the last breath leaves the body, and none of the people standing there saw from where, or how, K**u**‘ula and his wife left. ‘Ai‘ai was the only one that retained physical form. His parents' bodies were transformed by some miraculous power and entered the sea, taking with them all the fish swimming in and around H**a**na, as well as all the seaweed, crabs, crawfish, and the various kinds of shellfish along the seashore, even the ‘opihi-k**o**‘ele at the rocky beach. All the i‘a was gone. This was the first stroke of K**u**‘ula's revenge on the ali‘i and the people of H**a**na who obeyed his mandate; they suffered greatly from the lack of seafood.

After K**u**‘ula and his wife left the house, the three gourds exploded, one by one, from the heat, and all those watching the burning house believed the explosions were the bursting bodies of the three people inside. The flames shot up through the roof of the house, and the black smoke hovered above, then turned toward the front of Kaiwiopele Hill. The people saw ‘Ai‘ai ascend through the flames and walk upon the smoke toward the hill till he came to a small cave that opened to receive him.

As ‘Ai‘ai left the house, it burned fiercely, and ‘Ai‘ai called upon his father, as his father had instructed, to destroy by fire all those who had caught and bound the family and set the house on fire. As he finished his appeal, he saw the rippling of the wind on the sea and a misty rain coming with it, increasing as it came till it reached Leho‘ula, where it fanned the blazing fire so that the flames reached out into the crowd for those who had obeyed the ali‘i and the man from Moloka‘i who had caused the trouble, and consumed them all. Strangely, all those who had refused to participate in the burning of K**u**‘ula and his family, though closer to the burning house, were uninjured. The tongues of fire reached out only for the guilty ones. Their charred bodies were left to show the people remaining the second stroke of K**u**‘ula’s vengeance. Because of this selective destruction of the fire, some of the people doubted K**u**‘ula and his wife had died, and much disputation arose among them on the subject.

After ‘Ai‘ai walked out through the flames and smoke to the cave, he stayed there through the night. The next morning, he left his hook, his p**a**, his leho, and his sandstone in the cave and walked to the road at Puilio, where he met several children amusing themselves by shooting arrows; one of the children befriended him and invited him home. ‘Ai‘ai accepted the invitation, and the boy and his parents treated him well, so ‘Ai‘ai remained with them for some days.

While ‘Ai‘ai was living there, the parents of the boy learned of the ali‘i’s order for all the people of H**a**na to go fishing for h**i**n**a**lea. The people obeyed the royal order, but when they went down to the shore with their fishing baskets,10 they looked around for ueue, the usual bait, which was to be pounded up and put into the baskets, but they could not find any, nor any other bait material; nor could they see any fish in the sea. “Why?” they wondered. Because K**u**‘ula and his wife had taken away all the fish and everything pertaining to fishing.

Finding no bait, the people of H**a**na pounded up limestone and placed it in the baskets and swam out and set them. They watched and waited all day, but in vain, for not a single h**i**n**a**lea was seen or caught. When night came, they went home empty-handed and came down again the next day, only to meet with the same result. The parents of the boy who had befriended ‘Ai‘ai were in this fishing party, in obedience to the ali‘i’s orders. Seeing them go down daily to Haneo‘o, ‘Ai‘ai asked what was going on and they told him; so ‘Ai‘ai told his friend to come with him to the

cave. There ‘Ai‘ai showed him the stone fish god P**o**haku-muone and said, “We can get fish with this stone without much work or trouble.”

Then ‘Ai‘ai picked up the stone and they went down to Leho‘ula, and setting it down at a point facing the pond which his father had made, he repeated these words: “**E** K**u**‘ula, my father; **e** Hina, my mother, I place this stone here in your name, K**u**‘ula, which action will make your name and mine famous. I place my friend in charge of this K**u**‘ula stone, and he and his offspring hereafter will do and act in all things pertaining to it in our names.”

Then he explained to his friend the duties and observances related to the stone and the benefits to be derived from them for influencing each kind of fish, as his friend desired. This was the first establishment of the ko‘a K**u**‘ula on land – a place where a fisherman is obliged to offer his first catch to K**u**‘ula and Hina by taking two fish and placing them on the K**u**‘ula stone. Thus the boy ‘Ai‘ai first put into practice the fishing oblations established by his father at the place of ‘Ai‘ai’s birth; but he was able to do this only through the mana kupua of his parents.11

When ‘Ai‘ai had finished calling on his parents and instructing his friend, he saw several persons walking along the Haneo‘o beach with their fishing baskets and setting them in the sea, but catching nothing. ‘Ai‘ai suggested he and his friend go over to witness this fishing effort. When they reached the people fishing, ‘Ai‘ai asked them, “What are those things you placed in the sea?” They answered, “Those are baskets for catching h**i**n**a**lea, a fish our ali‘i craves; but we can’t get any bait to catch the fish.”

“Why not?” asked ‘Ai‘ai.

“Because K**u**‘ula and his family are dead, and all the fish along the beaches of H**a**na have been taken away.”

Then ‘Ai‘ai asked them for two baskets and told his friend to take the baskets and follow him. The two boys went to a little pool near the beach, and setting the baskets in it, ‘Ai‘ai called on his parents for h**i**n**a**lea.

As soon as he finished calling, the fish came in such great numbers that the pool was overflowing with them. ‘Ai‘ai now told his friend to go home and tell his parents and relatives to come with baskets so they could gather the fish and carry the catch home. The boy’s relatives should have the first pick, and the owners of the fishing baskets should have the next pick. His friend went quickly and brought his parents and relatives as directed. ‘Ai‘ai then took two fish and gave them to his friend to place on the ko‘a K**u**‘ula they had established at Leho‘ula. ‘Ai‘ai also told his friend that before sunset on that day, they would hear Kamohoali‘i, the ali‘i of H**a**na, had choked to death on a fish.

After ‘Ai‘ai and his friend had made their offering at the ko‘a K**u**‘ula, his friend’s parents arrived at the pool where the fish were gathering. The parents were told to take all they desired, which they did, returning home happy for this liberal supply of fish obtained so effortlessly. The owners of the fishing baskets were then called and told to take all the fish they wished for themselves and for the ali‘i. When these people saw the great supply, they were glad and very surprised at the success of the two boys. The news of the reappearing fish spread throughout the district, and the people flocked to Haneo‘o in great numbers. They gathered h**i**n**a**lea to their satisfaction and returned home rejoicing. Some of those who had given ‘Ai‘ai the fishing baskets returned with their bundles of fish to the ali‘i. When the ali‘i saw so many of the fish he craved, he became excited and grabbed one, intending to eat it raw (the usual way of eating h**i**n**a**lea), but the fish slipped down his throat and got stuck there. His retainers tried to reach in and take it out, but they were unable to, and before sunset Kamohoali‘i died.

The death of the ali‘i completed K**u**‘ula’s revenge. The evil-doer from Moloka‘i and those who had obeyed the ali‘i‘s orders had been destroyed, and ‘Ai‘ai had triumphed over all his father’s enemies.

NOTES

This story of K**u**‘ula-kai originally appeared in Thrum’s Hawaiian Annual in 1901 and was reprinted in Thrum’s Hawaiian Folk-Tales in 1907. The story was translated and condensed by Moses K. Nakuina from an account in Hawaiian by Moke Manu, a legendary storyteller of Hawai‘i. Moke Manu, born in 1837, is mentioned in a series of articles on “Fishing Lore” by A.D. Kahaulelio, which appeared in the newspaper Ku‘oko‘a in 1902. Manu’s father was a tax assessor in H**a**na.

A similar but shorter version of the tradition of K**u**‘ula-kai appears in Hawaiian, with English translation, in Fornander (Appendix 2, “An Account of Fishing,” 107-109). K**u**‘ula (“red K**u**”) was a fisherman who was possessed by the god K**u** and given power over fish. (The color red was sacred to the gods, and reddish things became sacred to K**u**‘ula.) K**u** (“upright” or “erect”), associated with male power, is often paired with Hina (“prostrate”), a goddess associated with female fecundity, growing things, and the moon and setting sun (Beckwith 12-13). Kamakau says K**u**‘ula, “a great fisherman of ancient times,” was “the main ‘aumakua [god] of fishermen,” but not the only one. Other ‘aum**a**kua included “Hinahele, to whom the ‘ohua fish in the sea were said to belong; K**a**nemakua, one of the forms of [the god] K**a**ne in the sphere of fishing, who ‘possessed’ (noho maluna) a man by the name of K**a**nemakua in ancient times; ‘the coconut shell of Kapukapu,’ ka p**u**niu o Kapukapu; and, for some fishermen Kinilau, and for others, Kaneko‘a. There were a great many fishing ‘aum**a**kua, each related to his descendants, and each raised above [all others] by his own descendants” (The Works 61). Malo says the gods worshiped by fishermen “were various and numerous, each [fisherman] worshiping the god of his choice.” (208). “K**a**neaukai” in Thrum’s Hawaiian Folk Tales (250-54) tells the story of a fishing god who instructs two kahuna (priests) in setting up a rock and a piece of wood sacred to him at Waimea Bay on O‘ahu to insure the supply of fish. Some of these fishing gods, like K**u**‘ula-kai, were of local origin – actual Hawaiian fishermen deified; others, like Kinilau (Tinirau in Tahiti and New Zealand, Tingilau in Samoa), were worshiped as fishing gods on other Pacific islands and were brought to Hawai‘i by early settlers.

K**u**‘ula-kai and Fishponds

In Moke Manu’s version of the tradition of K**u**‘ula-kai, K**u**‘ula-kai is called the Hawaiian god of fishing.

A couple of puzzling questions emerge from this designation. First, K**u**‘ula-kai is unheard of as a fishing god in the rest of Polynesia. K**u** was traditionally a war god. Kanaloa was the god of the ocean and the patron of fishing in the Marquesas and Society Islands (Tanaoa, or Ta‘aroa). How then did K**u**, in the form of K**u**‘ula-kai, become the main god of fishing in Hawai‘i?

From Moke Manu’s version we learn that nothing is known of K**u**‘ula-kai’s genealogy, suggesting that perhaps he was a maka‘ainana, or commoner. After his untimely death, he became deified as a fishing god. Thus he is a local addition to the Hawaiian pantheon of gods, not a god brought by settlers from the South Pacific. He is associated with fishponds, a Hawaiian innovation not found in other islands of the Pacific.

Fishponds were a relatively late development in Hawaiian culture. Based on references to fishponds in traditions from the 14th to 19th century, William Kikuchi speculates that fishponds appeared in the Hawaiian Islands sometime prior to the 14th century. Based on the genealogy of chiefs who had fishponds built, Patrick Kirch says the earliest ponds may have been built in the 14th century. Kirch places this development in what he calls the expansion period of Hawaiian culture, from 1100 to 1650 A.D. During this period:

a. The Hawaiian population grew into the hundreds of thousands.

b. Food production expanded with the development of irrigation works, dry-land field systems, and fishponds.

c. Class divisions widened, with the ali‘i class coming to dominate the maka‘**a**inana, or working class and gaining proportionately more wealth and power.

As Kirch writes “Success in warfare provided opportunities for increasingly powerful chiefs to annex conquered lands and to place the control of ahupua‘a units in the hands of junior ali‘i” (306). He suggests that religion was also changing with the elaboration of the K**u** cult and the building of larger heiau.

The culminating figure in this rise of ruling chiefs was Kamehameha, whose war god was K**u** ka‘ili moku (“K**u**, the island-snatcher”), a manifestation of the war god K**u**. This war god is said to have been brought to Hawai‘i by P**a**‘ao during the 12th or 13th century and passed down to Kamehemeha through Liloa and ‘Umi.

Given these developments, the relationship between the god K**u** and fishponds becomes clearer. Only powerful chiefs who could command many workers could have built and maintained the largest of the fishponds. In Thomas Wahiako’s version of the K**u**‘ula tradition (Beckwith 20-22), the pond at Leho‘ula beach is said to have had walls twenty feet thick and ten feet high with an opening to let fish enter and exit. Kamakau says that some of the fishponds would have required thousands of workers to build and maintain. Kikuchi notes that the large fishponds eventually served as status symbols for chiefs, because they allowed the chiefs to enjoy “select fish on call.” “Fishponds became symbols of chiefly right to conspicuous consumption and to ownership of land and its resources” (299).

Since the power of the chiefs came through their god K**u**, the fruits of their conquests – i.e., land and fishing rights, as well as innovations in production of food such as fishponds which added both to their food supply and their status, also became associated with the mana of K**u**.

K**u**‘ula-kai was perhaps an honorific name given to the man who built the first fishpond. His power of invention as well as his power to attract fish are seen as deriving from K**u**. The offshore fishing grounds called ko‘a, which also came to under the ownership of ali‘i and were attached to ahupua‘a were said to have been established by K**u**‘ula-kai’s son ‘Ai‘ai. Through the power of K**u**, ‘Ai‘ai was able to locate these fishing grounds; or he established them by placing in the ocean stones which attracted fish. Puniaiki, the grandson of K**u**‘ula-kai became successful at aku fishing, another activity associated with the ali‘i class because it required canoes, paddlers, and equipment.

In Moke Manu’s story, the name K**u**‘ula is given not only to a god of fishing, K**u**‘ula-kai, but a god of farming as well, K**u**‘ula-uka. While K**u**‘ula-uka, the brother of K**u**‘ula-kai, never became widely accepted as a god of farmers, the farmer going into the forest to cut wood and fashion it into an ‘o‘o, or digging stick (the main implement for farming) prayed to K**u**. And K**u** also became the god of another upland activity – cutting trees for canoe-building. Thus in Moke

Manu's account, K**u**'ula-uka is said to be a brother-in-law of the canoe-building aum**a**kua, who have names beginnning with K**u**. Kamakau mentions six K**u** gods as gods of canoe-building.

This association of K**u** with the upland forest is a uniquely Hawaiian development. Peter Buck notes that elsewhere in Polynesia, K**a**ne rules the forests and is the god of canoe-building and carpentry. Buck wrote in 1964, "It is therefore evident that the Hawaiian ancestors confused the functions of the two gods and erroneously transferred the functions of K**a**ne to K**u**." But was this confusion, or part of coherent political and religious developments that took place in Hawai'i after K**u**-ka'ilimoku was introduced to Hawai'i. As the ali'i took control of the forest lands and built large canoes for interisland travel and for fishing, it seems natural that the god that gave the ali'i the power to take control of the forests through conquest should also rule the forests.

Whether this was the case or not, we can see that what was originally a war god became a deity of peaceful arts as well, such as fishing, farming, and canoe building. There are prayers to K**u** asking for rain, suggesting that K**u** was also becoming a god of rain and fertility. K**u**'s association with the digging stick, the main and only implement of Hawaiian farming, suggests that K**u**'s domain was beginning to include farming. K**u** is associated with two food plants, the breadfruit and the coconut, which Handy believed to be late introductions to Hawai'i (Native Planter), and which would link the god with the migrations of the 12th-13th century, the period when K**u**ka'ilimoku is said to have come to Hawaii.

A similar phenomenon of war god becoming god associated with agriculture occurred in Tahiti with the war god 'Oro. Handy notes in Polynesian Religion that 'Oro, "after gaining a position of political ascendancy as a war god, absorbed the functions of Ro'o, or Lono, the god of peace and agriculture. In Tahiti, "the god Oro came into such favor as to supercede the original patrons of the chiefly families, Ta'aroa and T**a**ne, and in the late pre-European history of this island, Oro is found to be simultaneously the ferocious war lord, the recipient of the peacetime harvest offerings, and the patron of the dancers and singers whose activities were intended to forward fertility in nature. Therefore, there can be no question but that Oro in historic times in Tahiti was fulfilling the same functions as harvest and fertilizing god as did Rongo in New Zealand, and Lono in Hawai'i" (109).

To conclude, the god K**u**, originally worshipped as a war god, continued to be so worshipped; but his mana also became applied to peacetime activities as well – to building things and making the land productive. K**u** became associated with fishponds, and other aspects of fishing such as offshore fishing grounds and aku-trolling. Fishing altars along the shores of the islands were called K**u**ʻula. K**u** also became associated with forests, canoe-building, and some aspects of farming.

Of fishponds, Kamakau writes, there were many on "Oahu, Molokaʻi, and Kauaʻi, and a few on Hawaiʻi and Maui. This shows how numerous the population must have been in the old days, and how they must have kept the peace for how could they have worked together in unity and made these walls if they had been frequently at war and in opposition one against another? If they did not eat the fruit of their effort, how could they have let the awa fish grow to a fathom in length; the ʻanae to an iwilei, a yard; the ulua to a meter or a muku (four and a half feet); the **a**holehole until its head was hard as coral (Koʻa ka lae); and the ʻoʻopu until their scales were like the uhu? Peace in the kingdom was the reason that the walls could be built, the fish could grow big, and there were enough people to do this heavy work" (Works 47).

1. Lehoʻula and ʻAleamai as well as other places in H**a**na mentioned in this story can be located on the map on page 136. The names of these gods associated with H**a**na translates as follows:

K**u**ʻula-kai: "Red K**u** of the sea"

Hina-puku-iʻa: "Hina gathering seafood"

ʻAiʻai: "Eat food"

K**u**ʻula-uka: "Red K**u** of the uplands"

Hina-ulu-ʻ**o**hiʻa: "Hina of the ʻ**o**hiʻa growth"

2. These three brothers, like K**u**ʻula himself, are manifestations of the god K**u**, the male generating force associated with forests, trees, and plants; Beckwith gives their names as (K**u**)mokuh**a**liʻi ("K**u** island spreader"), K**u**p**a**ʻaikeʻe ("Adze eating crookedness"), K**u**-pulupulu ("K**u** kindling in the forest") (12-16). The sister La-ea, or Hina-ulu-ʻ**o**hiʻa ("Hina of the ʻ**o**hiʻa

growth," also called Lea), was also considered an ʻaumakua of canoe building, as was another brother, K**u**-ka-ʻ**o**hia-laka, whose story appears in the introduction to this collection.

3. K**u**ʻula's fishpond is believed by some to be the first in Hawaiʻi. According to a kama**a**ina from H**a**na, the fishpond was located at Lehoʻula near the base of Kaiwiopele Hill; he recalls that during his childhood, the walls of a fishpond were visible beneath the surface of the water, but when we looked for the walls, we couldn't see any, the walls perhaps having been washed away by the strong surf of the area. For descriptions of fishponds, see Appendix 1, "Hawaiian Fisheries" (105-106); Kamakau's The Works of the People of Old (47-50); and Summers' Hawaiian Fishponds.

4. A reference to the rocky fortress of Kaupeepee on the steep promontory of H**a**ʻupu, between Pelekunu and Waikolu valleys on the north shore of Moloka'i, west of Wailau. See Kalakaua's The Myths and Legends of Hawaii (69-94) for the related legend.

5. Manaiakalani, "Come from heaven," is also the Hawaiian name of the Polynesian constellation Maui's Fishhook (the constellation called Scorpio in the West).

6. Kenneth P. Emory, in Material Culture of the Tuamotu Archipelago, describes the use of a baited hook mounted on a stick to catch eels in the Tuamotus. The hook was attached to a stick so that the fishing line would not be severed by the eel's bite. In shallow water, this stick could be inserted into an eel hole by someone standing on the reef; in deeper water, a diver had to insert the stick into the eel's hole, and a partner, "in a canoe above, held the line, on which he would haul as soon as the eel had taken the hook." The eel was clubbed to death after it was brought into the canoe (205-6). Appendix 2, "An Account of Fishing" (110) describes a similar implement in Hawaiʻi – a hook placed at the head of a stick used for fishing for eels in clefts between rocks.

7. The backbone can still be seen in the p**a**hoehoe at Lehoʻula. A rock formation at Kamalino on the southwestern side of Niʻihau is also said to be the backbone of an eel – a great eel called Puhiʻula ("Red eel") caught there and cut into four pieces by Pahaunui and Pahauiki, two fishermen of Maui (Tava and Keale 75-6).

8. Kahuoi, the pearl shell aku lure, or p**a** h**i** aku, is named for a chief. Kamakau tells the story of the p**a**: "On the north side of the church of Kau-maka-pili in Honolulu, there once was a kuahu altar for the fishing lure, the p**a** h**i** aku, that belonged to Kahuoi. This was a very famous lure; when it was shown, the aku would fill the canoe. At that time the harbor of Kou was not entered by ships; the aku and 'ahi fish came in there." When Kahuoi goes fishing for uhu at H**a**na, Maui, the p**a** is stolen from him by P**u**'olo-k**a**lina (Tales 8). For an illustration and descriptions of the p**a** h**i** aku, see page 43 and Appendix 1, "Hawaiian Fisheries," 98; see "Hawaiian Fisheries," 93-94, for a description of the leho'ula and its use.

9. A ko'a is a deep sea mound where fish gather to feed and where they can be caught in great numbers. Appendix 2, "An Account of Fishing" describes a ko'a for k**a**hala (amberjack): "The ko'a is a place of great enjoyment by all the k**a**hala. The ko'a is about the size of a small village with houses standing and people gathering in crowds" (115-116). Walter Paulo and Eddie Ka'anana, two fishermen of Miloli'i on the Big Island, describe the ko'a for '**o**pelu (mackerel) in Miloli'i as being a couple of hundred yards long about a quarter of a mile offshore in 150-200 feet of water. The ko'a are spaced a quarter to half a mile apart, and different families of Miloli'i feed and fish for '**o**pelu at different ko'a.

10. See "Kalamainu'u" for the story of the origin of the h**i**na'i h**i**n**a**lea (basket for trapping h**i**n**a**lea). See Appendix 1,"Hawaiian Fisheries" (95), for a description of the h**i**na'i ho'olu'ulu'u, used to catch h**i**n**a**lea.

11. According to Handy, this offering was made to thank the fishing god for his help in securing fish, to give the god a share of the catch to insure future supplies, and to lift the kapu from the rest of the fish so that they could be consumed by mortals (Polynesian Religion 298-300).

1. **What are the natural processes?**
2. **What are the practices?**

Legend of Ku-a-Paka'a (Fornander V) 1918-1919

1. Kiauau! Kiauau! Kiauau! 2. E au mai, e au aku, 3. E lei ka moana. 4. Kalaihi ka lani, 5. Kupilikii ka honua, 6. Kalo-pau ka malama, 7. Ku ana lepe, noho ana lepe, 8. Kau ka iwa he la makani, 9. Ua ka ua, kahe ka wai. 10. Pii ka opae, ku ka halelo. 11. Ehuehu kai, noho ka moi, 12. Ki kai hua ka anae. 13. Maloo kai o na hee, 14. Kui ka ina, lou ka wana, 15. Puha ka honu i ka makani. 16. Aeae kai noho ka manini, 17. Puupuu ke a kahuli ka uoa, 18. Uliuli kai holo ka mano, 19. Moana koa hi kahala, 20. Pupuhi ke kukui malino ke kai, 21. Kaka ka ia o ka uhu; 22. A loaa ia mua, o mumu, o wawa 23. Haule iho, he malua ka ua, 24. He pelu ka makani, 25. Haualialia Kaunakahakai, 26. He ihu hanu ko Kawela, 27. Kania wawa i kupukupu, 28. Hoe make i ka lae o Lehua, 29. Ualapue, Kaluaaha, Molokai. Fornander vol. V (1918) p. 98-101	1. Kiauau! Kiauau! Kiauau![1] 2. The tide flow in, the tide flows out 3. The ocean surrounds 4. The sky is stormy 5. The earth is distressed 6. Kaloapau is the month 7. The fringe will rise, the fringe will fall 8. The 'iwa is suspended its a windy day 9. The rain rains, the water flows 10. The shrimp climb, The jagged rocks stand 11. The sea is animated, the moi live 12. The sea spits the mullet lay their eggs 13. The octopus sea is dry 14. The 'ina spike, the wana hook 15. The honu blows out to the wind 16. The manini live in the rising sea 17. The schooling of alo'ilo'i, turning of uouo 18. The mano swims in the deep blue 19. The ocean ko'a is where to catch Kahala 20. Blow out the kukui on the calm sea 21. Net the fish like the Uhu 22. Catch the front, the mumbling sound, the, of tumultuous sound 23. The sea breeze rain falls, 24. The wind folds over 25. Brief reminiscence of Kaunakahakai 26. Kawela blows through the nose 27. The tumult sounds and grows 28. Paddle to Lehua point 29. Ualapue, Kaluaaha, Molokai

[1] Encourage with oli or song as was custom when great number of workmen were drawing their canoes from the forest to the seashore

Appendix II- Notes and Synthesis

Hounuaiākea Notes for Ualapuʻe Homesteads

- Participants
    - Molokaʻi Residents
        - Participants
            - Aunty Ipo and Uncle Kunani Nihipali
            - Uncle Leimana Naki
            - Aunty Judy and Aunty ʻIwa Kadowaki
            - Kahu David Kaupu
        - Observers
            - ʻApelila
            - Few Others
    - Planning Personnel
        - DHHL
            - Gigi Cariel
            - Julie-Ann Cachola
        - G70
            - Kawika McKeague
            - Thomas Piʻilani Smith
            - Barbara Natale
- Agenda
    - Introduction
    - Moʻolelo of Kuʻula Kai and ʻAiʻai
        - Individual Reading
        - Small group analysis
        - Large group synthesis
    - ʻOli Kiʻauʻau
        - Individual Reading

        - Small group analysis
        - Large group synthesis
    - Formation of Kapu and Kanawai

Examples

- KŪMOKUHĀLIʻI
    - Kū - stand, stop, halt, extend, reach
    - Moku- stand, set apart, a section of land
    - Hāliʻi - to spread out
        - A large forested section of land
- HINAPUKUIʻA
    - Hina - fall horizontal, moon
    - Puku - gathering, grouping
    - Iʻa - fish
        - The mahina process that gathers fish
- HINAULUOHIʻA
    - Hina
    - Ulu - grow
    - Ohia- ohia tree, forest
        - The mahina process that causes ohia growth

- ʻAIʻAI
    - ʻai -eat, consume, grasp, edible
    - The process of catching and consuming
- KŪPAʻAIKEʻE
    - Kū - stand, rise, elevate, stop, reach extend upright
    - Paʻa - holdfast, to make tight, adhering
    - Keʻe - crooked, stone adze.
        - The chipping of ohia trees for kiʻi

Questions from Kaʻao

1. **WHAT ARE THE NATURAL PROCESSES?**

2. **WHAT ARE THE DIFFERENT PRACTICES?**

Notes from Kuʻula-kai Kaʻao

Group 1

Immediate thoughts on the Kaʻao

- Julie: Today got more out of it than yesterday
    - Storyline goes from mythical to common
    - Switching back and forth into those spaces
    - Ultimate role models
        - Type of person I want to be
    - Innovation
        - Do whatever they can do with what they have
        - Use the materials thats available to build up what they have
    - Places
        - Some places exist and some don't
        - Mixture of reality and the mythical again
    - Family lines
        - Hina and Ku
        - kuleana
- Nihipali‘s
    - Aunty Ipo
    - Names
        - Ku‘ula- kai
            - Building of the fishponds and the mana‘o behind that
            - Family group up on the aku boats
            - ‘Ahu was always for giving back
            - Sacredness of having the ku‘ahu
            - Praise the ‘akua and ‘aumakua
            - Only fish what you need
            - Knowing what to fish
            - Fishing traditions
            - Huna where you going
            - Seen the ‘ahu
            - Pule and mele you would
    - Uncle Kūnani
        - Taken us away from these stories when growing up
        - So to our disadvantage
        - In a discussion
        - Navy seals wanted to move in to Hale o Lono to practice
        - Stale mate
        - Ko‘a and Ku‘ula that were overlooked
        - We want to do this
        - People not considering our lands
        - Kuleana
        - ‘Ai-‘ai

- **What are the natural processes?**
    - Everything in the kai is related to the uka
        - Limu iwa
        - Limu kele
        - Everything come from the ocean first
        - It flows like a harmony
    - Hina
        - Procreation/Waliwali
        - Fluid
        - Growth
        - First birth
    - Hina-puku-iʻa
        - Coral reefs
        - Fish progeny
        - Protective
        - House for fish
    - ʻai-ʻai no
        - Food
        - Next generation
        - Benefit from having a past generation
        - Different
        - Continues the tradition
        - Showed him the techniques
        - Community development
        - Epitome of leadership.
- Puhi
    - Driving fish
    - Commission in the ocean
        - Heʻe fighting puhi
    - Diving for Lobster
        - Ula antennae are signs if puhi are in the puka

1. What are the practices?
    - Kuʻula
        i. Sacrifice of giving
        ii. Give Hoʻokupu
            1. You mahalo to iʻa for its life
            2. Not spiritless
            3. The families first capture of the fish would
            4. Two fish given to kuʻula

a. Mohai aloha

iii. Mahi‘ai

1. Not comfortable with selling any of it
2. Grow food but gives it to everyone
3. Wai is so important
4. Ku-Ulu – tree story.

NOTES FROM GROUP 2

-Spatial delineation, and spatial divisions
-Puhi - external forces of nature that can affect the wellness and abundance of our natural resources
-alii-kuula relationship or the dissolution of relationship- community building, the collective human interrelations, establish a baseline for those relationships and
Kuleana, past keep building on it
‘ai‘ai kept it going, moving the tradition forward
Community and individual needs , kuleana homestead working together and with everyone

The practice of kaula - resource of Hau is needed, resources that are needed to continue community practices; the bait made with niu there fore niu is needed, multiple connections

How we come together as a collective separate perspectives and working together

Water is important
--ie the reservoir and resources such as the aquifer
--ko‘olau waters
--Rivers of ualapue and moloka‘i -
Kahawai
Muliwai
Water resources
Many external forces in the Ualapu‘e area and the discussion of water - who can we depend on for the water, many agencies involved

Synthesis of Ku‘ula Ka‘ao

- **Natural Processes**
    - Water
    - Marine life reproduction

    - External forces
    - Life cycle
        - Succession
    - Balance
- **Practices**
    - Fishing Traditions
        - Lokoiʻa
        - Kūʻula
    - Mohai Aloha equal exchange
    - Kuleana
        - Passing on of knowledge and tradition
        - Continuance of practices
        - Aloha for people and community
        - Reconciliation
    - Management of Resources
        - Resources & Access
            - Water
            - Land (for food and for living)
            - Community Resources

<u>Notes from ʻOli Kiauau</u>

- Season (time of year)
    - Reacts to the moon phase
    - Everything coming out due to the dark
        - Coming out of the darkness
        - Trying to step into ao
    - Affirmation of time and seasons
    - Kaloa- Planting & fishing is good, foundation
    - Au also is a time period
        - Time comes in and time goes out

- Energy
    - Rain & wind (storms)
        - Everything reacts
        - Waliwali
        - Making water murky and exciting fish
        - Stimulating flow in the ground level
- Indicators
    - ʻIwa- Storm is coming
    - Indicator of things to come
        - From whichever direction is coming from
    - Threat
        - Ocean is rising not receding
- Cleansing
    - Breathing air and cleaning
    - Time to hiʻuwai
    - Flowing in and out as the tides
- Sound
    - Smallest of voices to largest of voices
        - Aloʻiloʻi and Uouo
- Continuing the cycle
    - Burn like incense of kukui
- Kiauau
    - Getting ready
        - Encouraging workers
            - I.e. I kū mau mau
    - Walk lightly
    - Passion of the area
        - Ualapuʻe wants to emerge
    - Encouraging that energy from community
    - Communities needing to retreat and change their way of life
    - Energy follows call to place

        - Ocean brings us all together
- Boundaries
    - Lehua
        - Western most point of Pae ʻāina
        - Related to the high sacrifice
        - Related to Hoʻolehua
        - Symbolic of going west (especially after one passes)
        - Cyclical
    - Ualapuʻe
        - A hill of sweet potatoes
        - What our Kupunas did in the area.
        - Most basic of foods
    - Lepe
        - Another way to look at ʻōlepe (barnical)
        - Lepelepe (land section on molokaʻi?)
    - Kaunakakai -> Kaunakahakai
        - Kauna-kahakai
- Energy follows where the attention and intention of focus is placed
- A consciousness that extends to and from across time and season, ever flowing, ever present
- The ocean is what connects our consciousness, the waters from which all are born and regenerate
- The heavens (or those seen as in authority) perhaps exalted in position by others have been harsh
- Those of the earth (of the people) still remain foundational even in crisis and distress
- Kaloapau , this is the marker of the season, the extension and foundation from which actions that are rooted in spirituality become affirmations of a change to come in which life and our people shall not only persist but thrive in abundance.

Synthesis for ‘Oli Kiauaua

- Water Cycles
    - Forumula that happens
        - ‘Aina water bringing minerals down to the sea
        - Ocean water has different minerals in it
        - When they come together marine animals must acclimate to the water
            - Reacting to change
    - Balance of feeding mauka and makai
    - Water is really important for this area
    - Healing requires water
    - Waters need to flow
- Cleansing
    - Reconciliation
    - Healing
- Indicators
- Succession
- Community Preparedness
- Marine life reproduction

Appendix C

Natural Resources Assessment, 2022

AECOS

AECOS No. 1685

A natural resources assessment for DHHL ʻUalapuʻe Kuleana Homestead Settlement Plan, ʻUalapuʻe, Molokaʻi

AECOS Inc.
45-939 Kamehameha Highway
Suite 104
Kāneʻohe, Hawaiʻi 96744

January 18, 2022

A natural resources assessment for DHHL ʻUalapuʻe Kuleana Homestead Settlement Plan, ʻUalapuʻe, Molokaʻi

January 18, 2022 *AECOS* No. 1685

Eric B. Guinther, Reginald E. David, Susan Burr, and Bryson Luke
AECOS Inc.
45-939 Kamehameha Highway Suite 104
Kāneʻohe, Hawaiʻi 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: guinther@aecos.com

Introduction

The Department of Hawaiian Home Lands (DHHL) proposes the ʻUalapuʻe Kuleana Homestead Settlement Plan ("Project") for 166 ha (410 ac) on southeast Molokaʻi (TMKs: 5-6-006:017, 040 and 5-6-002:024, 025, 026, 027, 036, and 001). *AECOS* Inc. was contracted by G70 to undertake a natural resource survey of the subject parcels[1] and prepare this report of findings[2]. The surveys included terrestrial flora and fauna surveys, with particular attention paid to sensitive biological resources and environments. Sensitive biota includes species currently listed by the Endangered Species Act of 1973 as amended (ESA; see USFWS, 2021a), or by state administrative rule (HDLNR, 1998, 2015), or a biological community comprising native plants and animals that may or may not be under any specific threat of extirpation, but which would be regarded as special and worthy of preservation. Another purpose of our surveys, and the reason we discuss wetlands mapping and soil types, was to establish whether the gulches in the Project area contain surface waters that are federally jurisdictional as authorized by the Clean Water Act (CWA).

Site Description

The ʻUalapuʻe Kuleana Homestead Settlement Project is located in the *ahupuaʻa* of ʻUalapuʻe on the south-facing slope of East Molokaʻi Mountain, extending north to south from Maileliʻi to East Kamehameha V Highway (State Route No. 450; see Figure 1). Project elevations range from 10 m (30 ft) above sea level (ASL)

[1] TMK 5-6-002:001 was not included in our survey area.
[2] This report is intended to become part of the public record and incorporated into an EA for the subject project.

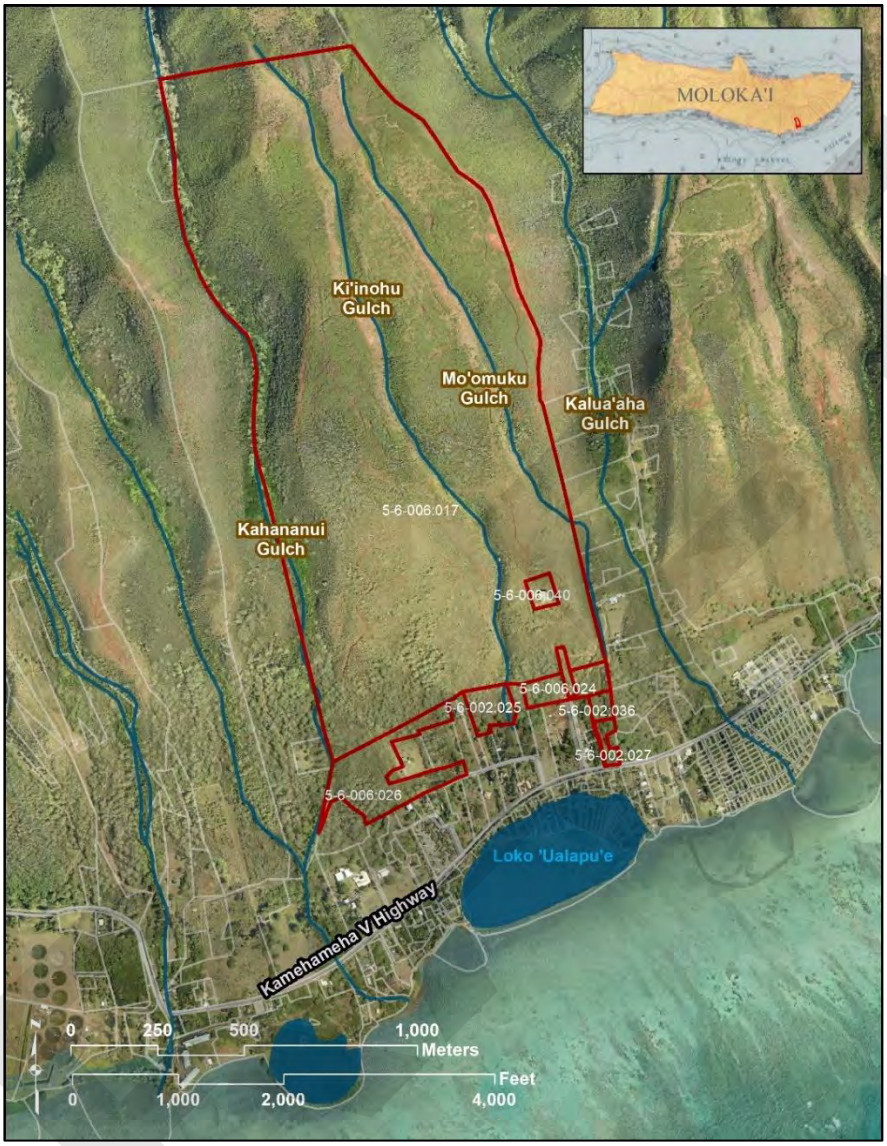


Figure 1. ʻUalapuʻe Project survey area (outlined in red) and NWI hydrology features (in blue).

immediately *mauka* (inland) of the highway to approximately 500 m (1,600 ft) ASL. The ridge or interfluve (slope extending inland between major gulches) continues upward reaching an elevation of 1,244 m (4,080 ft) at Kilau (a peak on the East Molokaʻi Mountain ridge top).

The parcels proposed for the Project are mostly unoccupied and undeveloped. The highway and existing private residences and farms at ʻUalapuʻe are located on the narrow coastal plain formed when sea level was higher than at present. The fishpond, Loko ʻUalapuʻe, is located a short distance *makai* (seaward) of the

highway. On the coastal plain, the parcel TMK: 5:6-002:001, and other parcels outside of the Project parcels are occupied by residential development with some farming occurring.

A 55-km (34-mi) long fringing reef lies offshore of the south coast of Molokaʻi and extends up to 2 km (1.25 mi) from the shoreline in some areas. At least 50 ancient fishponds were constructed on the south Molokaʻi shore (James, 2001) to take advantage of mixing of freshwater from the numerous streams and springs and marine waters on the shallow reef flats. Poor land management at the turn of the 19th century resulted in severe coastal erosion and, in 1902, red mangrove (*Rhizophora mangle*) was introduced to Molokaʻi with the intent of stemming coastal erosion (Chimner et al., 2006). Unfortunately, the introduction of mangrove intensified problems resulting from terrigenous sediment deposition along the shoreline. At present, mangrove has invaded most of the ancient fishponds and the mangal trapping sediment is contributing to a prograding shoreline (Coastal Geology Group, n.d.).

Three gulches[3] occur within the Project site (Fig. 1). Two of the gulches, Kiʻinohu and Moʻomuku, originate near Maileliʻi and bisect the Project area. Both gulches essentially dissipate on the coastal plain within developed parcels *mauka* of the highway and neither gulch has a distinct surface connection to the ocean. A third gulch, Kahananui, demarcates the western boundary of the Project site. Kahananui and similarly large Kaluaʻaha Gulch—located on the east side of ʻUalapuʻe—originate at the top of East Molokaʻi Mountain and both reach the ocean after flowing under bridges on the highway. The eastern boundary of the Project site lies along the western margin of Kaluaʻaha Gulch; this gulch is not in the Project site.

The south side of Molokaʻi has a characteristically dry climate and most streams on this side of the island are either perennial but interrupted in the lowlands or are ephemeral[4]. Of the three gulches in the Project site, only Kahananui Gulch is considered to contain an interrupted perennial stream in the Hawaiʻi Stream Assessment (Hawaiʻi Cooperative Park Service Unit, 1990). In the Hawaiʻi Watershed Atlas (Parham et al., 2008), two of the three gulches—Moʻomuku and Kahananui—are included as streams in the adjacent watersheds of Kaluaʻaha and ʻŌhiʻa, respectively.

[3] Within this report, "gulch" refers to a steep-sided valley eroded into the land by flowing water (a fluvial feature). The term "stream" refers to the channel within a gulch in which water flow is normally confined. A gulch may or may not contain a stream. Uplands between gulches are called interfluves.

[4] A perennial stream has year-round, continuous flow in at least part of its bed; flow need not be continuous from upper reaches to the sea in all seasons. An ephemeral stream has surface water flowing or pooling only in direct response to local precipitation.

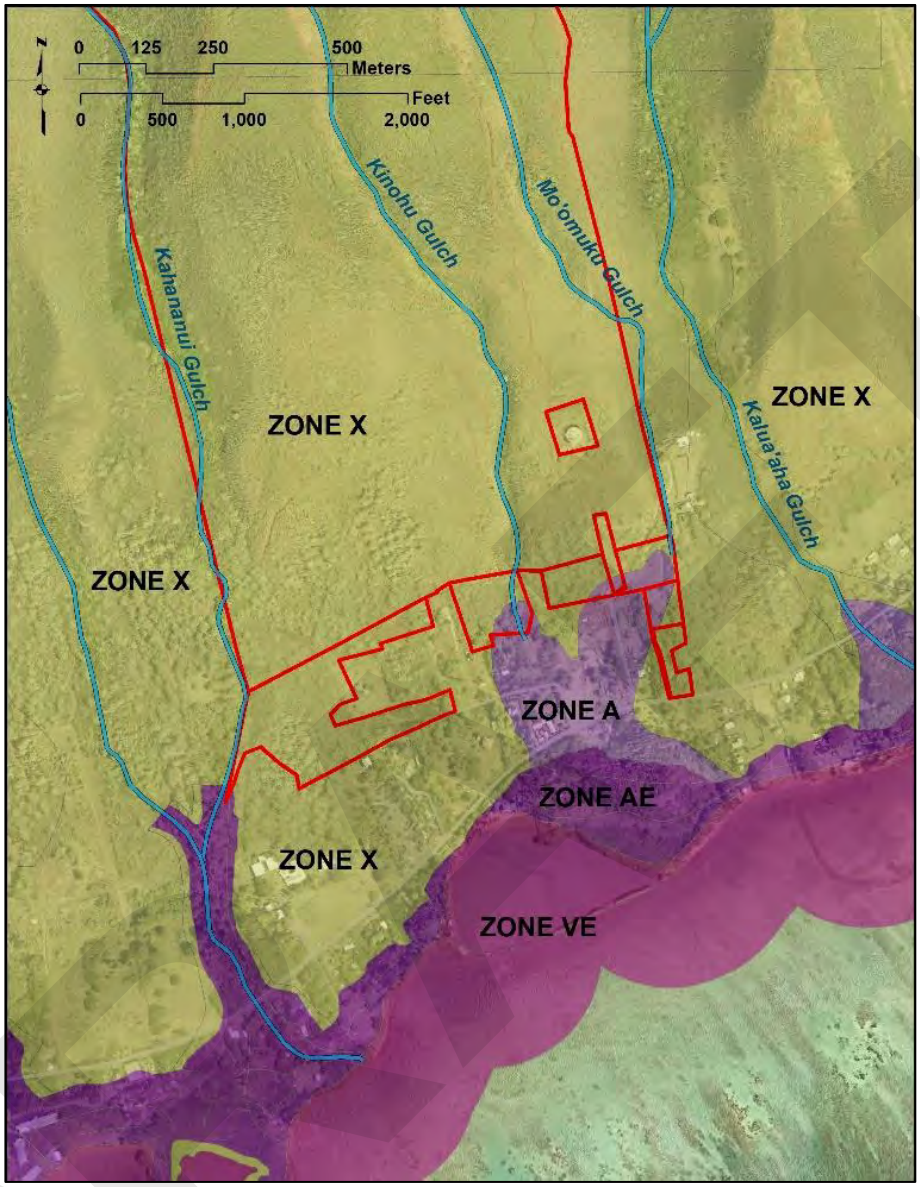


Figure 2. Project area (outlined in red) and flood zones.

The U.S. Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI) is a nationwide geospatial dataset of wetlands and other surface hydrology features (USFWS, nd-a). The NWI maps the bottom of the four gulches in the Project area as intermittent streams that are seasonally flooded (R4SBC; Figure 2, above). The NWI does not map any wetlands in the Project site. The lowest reaches of Moʻomuku and Kiʻinohu gulches are not channelized but dissipate into a special flood hazard area subject to inundation by the 1% annual chance flood, as shown on the Hawaiʻi Department of Land and Natural Resources (HDLNR) Flood Zone Hazard Assessment Tool (FHAT) maps (Fig. 2; HDLNR, 2019). The

lowest reach of Kahananui Stream is channelized and bordered by levees, so the zone subject to inundation by the 1% annual chance flood is largely contained within the channel.

None of the soils mapped in the Project area by the U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) web soil survey (USDA-NRCS, 2021) is listed in the Soil Data Access *Hydric Soils List* (USDA-NRCS, nd.) for Moloka'i.

Climate

Although the Project area is located on the south (and leeward) side of Moloka'i, 'Ualapu'e and lands east of Kamalo Valley face generally to the southeast and are thus better angled to receive precipitation from the prevailing Trade Winds than the leeward lands west of Kamalo Valley, which face southwest. The *Rainfall Atlas of Hawai'i* (Giambelluca et al., 2013) approximates the average annual rainfall in the upper part of Project area as 1,924 mm (76 in) and 932 mm (37 in) at the lower end of the Project site (Figure 3). Rainfall is seasonal at both elevations, with the "official" wet season extending from November through April and the dry season from May through October.

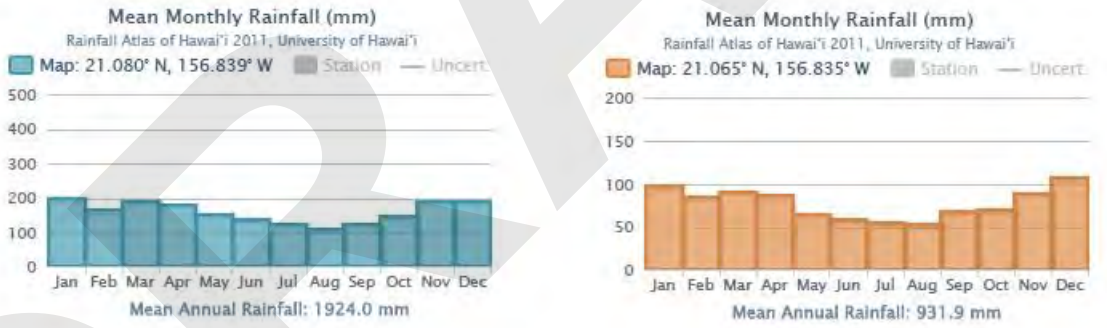


Figure 3. Mean monthly rainfall (mm) in the upper Project area (left) and lower Project area (right). Source: Giambelluca et al., 2013.

The U.S. Climate Normals dataset reports average annual rainfall at the nearest climate normal station ("Kaunakakai 536" located near the harbor on leeward Moloka'i) as 423.16 mm (16.66 in; NOAA-NCEI, 2021). Although rainfall is much less at this station than at 'Ualapu'e, the seasonal distribution is similar with fairly distinct wet and dry seasons. Data are based on a 30-year average (1991 to 2020).

Jurisdictional Waters

Waters of the U.S. (also called "jurisdictional waters") are surface waters that come under federal jurisdiction as authorized by the Clean Water Act (CWA) and the Rivers and Harbors Act (RHA). Authority over these waters is granted to various federal agencies, including the U.S. Environmental Protection Agency (USEPA), with the U.S. Army Corps of Engineers (USACE) having permit authority for actions that impact jurisdictional waters. Jurisdictional waters include all tidal waters and a subset of streams, lakes, reservoirs, and wetlands.

Because ecosystem boundaries tend to be gradients in nature, defining the limits of jurisdiction is essentially a political decision. Supreme Court cases (including *Rapanos v. United States*, *SWANCC v. USACE*, and *Carabell v. United States*), a guidance memorandum (USEPA and DA, 2008), and recent published rules (USACE and USEPA, 2015; 2020) have variously defined waters of the U.S.; however, on August 20, 2021, a District Court order remanded and vacated the most recent definition of waters of the U.S. (US District Court for AZ, 2021) and, until a new rule is published, the definition reverts back to the pre-2015 regulatory language, decided upon by the Supreme Court and described in a guidance memorandum (USEPA and DA, 2008). The USACE and USEPA initiated another round of rulemaking by publishing a proposed rule to revise the definition of waters of the U.S. (USACE and USEPA, 2021), so the definition is likely to continue to remain in flux for a while longer. ~~Our jurisdictional"~~ Our jurisdictional assessment presented herein is based on best professional judgement, but the USACE must concur for our findings to become official determinations of federal jurisdiction. If a feature is determined by the USACE to be jurisdictional, certain activities would require a permit from that agency before undertaking work within the boundaries of that feature.

Wetland determinations, should suspected wetlands be located, would follow methods described in the *Corps of Engineers Wetland Delineation Manual* ("Manual"; USACE, 1987) and *Regional Supplement for Hawai'i and Pacific Islands* (USACE, 2012). Consideration of topography, mapped soils, and observations made in the field survey indicate no wetlands are present in the survey area.

Methods

Natural Resources surveys of the ʻUalapuʻe Project were conducted October 20-23, 2021, covering most of the Project site (solid red line in Fig. 2). The especially steep slopes of Kahananui Gulch were not accessed. The surveys entailed searches for natural resources of interest or concern. Emphasis was on vascular

plants and birds, with consideration given to mammals. The location of the Project strongly suggests that non-vascular plants, invertebrates, fishes, amphibians, or reptiles of conservation interest or concern would not be present. The survey also included an assessment of jurisdictional waters, presence and boundaries.

Jurisdictional Waters Survey

Biologists assessed potential extent of federal jurisdiction of Moʻomuku, Kiʻinohu, and Kahananui gulches. Prior to the field surveys, we reviewed literature and GIS data: results of previous surveys conducted by *AECOS* for Projects in the Project vicinity (*AECOS*, 1998; 2005; 2013; 2019); climate data, including recent rainfall (NOAA-NWS, 2021a; 2021b); mapped soil types (USDA-NRCS, 2021); surface waters and wetlands identified in NWI (USFWS, nd-a); and mapped flood zones (HDLNR, 2019).

We determined whether the gulches have a surface connection to the ocean using aerial photographs and USGS topographic maps and verified in the field the connections or lack thereof. We assessed if flow is relatively permanent (i.e., perennial or intermittent) or not (e.g., ephemeral) and evaluated whether the gulches might significantly affect the chemical, physical, and biological integrity of downstream waters.

Plant Survey

For the botanical survey, an *AECOS* biologist conducted a wandering pedestrian survey of the Project area. An outline of the Project site was loaded onto handheld GNSS units (Trimble GeoXH and Geo7X) to serve as a guide for the survey. The GNSS units recorded the progress tracks of the biologists, providing real time feedback on location and adequacy of coverage of the pedestrian survey. Plant species were identified as they were encountered, and notations used to develop a qualitative sense of abundance. Any plant not immediately recognized during the survey was photographed and/or a representative feature (flower, fruit) collected for later identification at the laboratory. In the Project area, lots already developed with houses and appurtenant structures and/or in active agricultural production were not surveyed, so as not to unduly disturb residents.

Plant names used in the report follow *Manual of the Flowering Plants of Hawaiʻi* (Wagner, Herbst, & Sohmer, 1999) for native and naturalized flowering plants, *Hawaiʻi's Ferns and Fern Allies* (Palmer, 2017) for fern and fern allies, and *A Tropical Garden Flora* (Staples & Herbst, 2005) for crop and ornamental plants. More recent name changes for naturalized plants follow Imada (2019).

Terrestrial Vertebrates Survey

Avian Survey

Seventeen avian count stations were sited within the Project area. Count stations were located roughly 1000 ft (300 m) apart from each other. A single, eight-minute avian point-count was made at each count station. Field observations were made with the aid of Leica 8x42 binoculars and by listening for vocalizations. The avian point-counts were conducted in the early morning hours on October 20-23, 2021. Time not spent counting at point-count stations was used to search the Project area for species and habitats not observed during point-counts. Weather conditions were generally good with unlimited visibility, no precipitation, and winds between 1 and 10 miles an hour. Avian counts were stopped whenever the wind increased in intensity owing to limitations imposed on counting under very windy conditions.

The avian phylogenetic order and nomenclature used in this report follows the AOU *Check-List of North and Middle American Birds 2020* (Chesser et al., 2020), and the *62nd Supplement to the Check-list of North American Birds* (Cheeser et al., 2021).

Mammalian Survey

The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the survey area. Mammal scientific names follow *Wilson & Reeder's Mammal Species of the World* (Third Edition; Wilson and Reeder, 2005).

Results

Jurisdictional Waters

The nearest National Oceanographic Atmospheric Administration–National Weather Service (NOAA–NWS) rain gage, Kamalo (KMLH1), recorded a total of 90.17 mm (3.55 in) of rainfall in the three months preceding our jurisdictional waters survey in October 2021 (NOAA-NWS, 2021a). Total rainfall in that three-month period (August 2021 through October 2021) was 121% of the moving 30-year average rainfall for that gage. Climate Normals from the nearest NOAA-NCEI gage (Kaunakakai 536, also a coastal and leeward gage) for the same three-month period is 47.50 mm (1.87 in)—approximately half of that measured at Kamalo.

No rain was recorded at KMLH1 during our survey (NOAA-NWS, 2021b), although we noted a very light drizzle on the morning of October 23, 2021. Hydrologic conditions in ʻUalapuʻe watershed during the survey can be considered within parameters of a ʻtypical yearʼ for a determination of federal jurisdictional waters.

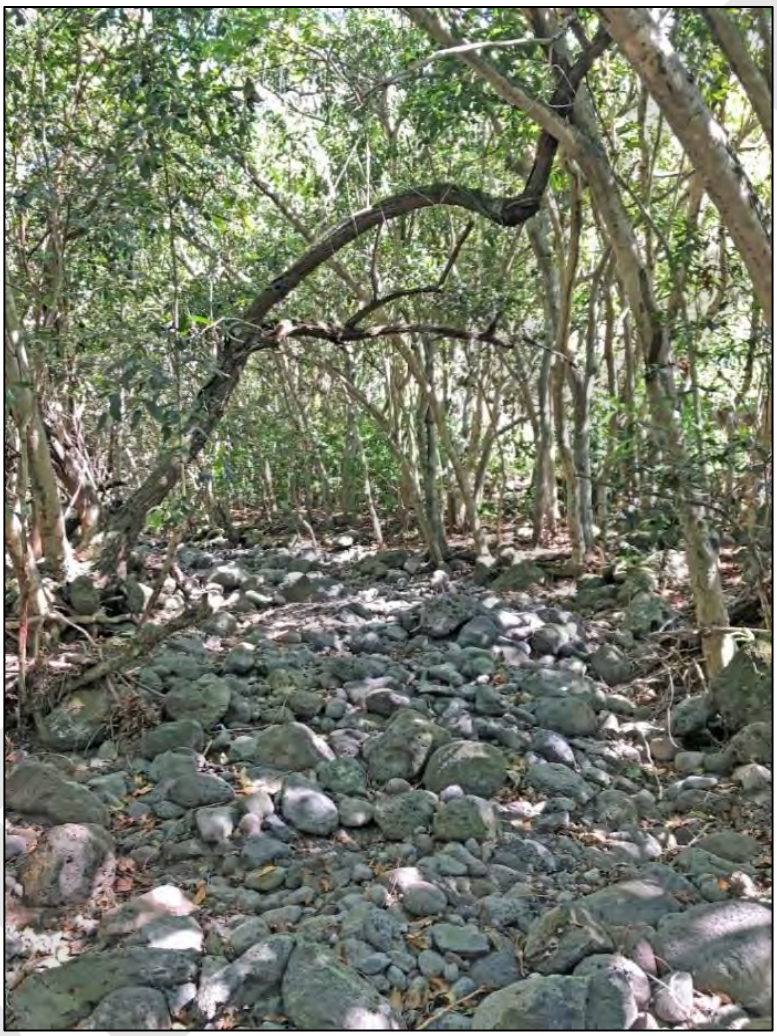


Figure 4. Typical segment of the lower reach of Kahananui Stream showing boulder-strewn bed.

Kahananui Stream occupies most of the bottom of the deeply incised Kahananui Gulch. The stream arises between Pakui and Kilau on the central ridgeline at an elevation of around 3,500 ft (1,070 m). Although the stream was not flowing at the time of our survey, the bottom of the gulch has a stream bed and banks with physical evidence of flowing water: rounded boulders, sediment bars, shelving, and eroding banks (Figure 4, above). Only a few herbaceous plants and seedlings

are present on the mostly bare stream bed. Java plum (*Syzygium cumuni*), a facultative wetland plant (FAC), is rooted at the ordinary high water mark (OHWM). Terrestrial plants, namely *koa haole* (*Leucaena leucocephala*), coffee (*Coffee arabica*), sourgrass (*Digitaria insularis*), and lantana (*Lantana camara*), are rooted above the OHWM.

West of the Project site, Kahananui Gulch is joined by Manawai Gulch, and continues in a single channel crossing East Kamehameha V Highway (Figure 5) reaching the ocean just east of Loko Pūhāloa.

Figure 5. Kahananui Stream looking *makai* from East Kamehameha V Highway.

Although dry during our site visit, the discharge (volume of water moving downstream per unit of time) of Kiʻinohu Stream is obviously much less than Kahananui Stream (Figure 6). Physical indicators of flow (i.e., bed and banks and OHWM) in Kiʻihonu Stream are faint and discontinuous. The stream bed is largely barren of vegetation and shows more boulders and exposed bedrock than the adjacent gulch bottom. A few stream features, such as dry plunge pools below escarpments are present along the channel. Terrestrial vegetation such as *koa haole* and sourgrass are rooted at the OHWM.

Kiʻinohu Gulch merges with the landscape on the coastal plain at the lower end of TMK 5-6-002:025, approximately 400 m (1,310 ft) from the ocean shore (Loko ʻUalapuʻe) and 230 m (755 ft) from a wetland adjacent to the fishpond. There is faint physical evidence (e.g., erosion, cracked mud) that stream flow continues downslope on an unimproved driveway and in a backyard ditch (Figure 7); however, there is no channel, culverts, or bridge at East Kamehameha V Highway

to convey water flow to the ocean. *Makai* of the highway is a Java plum forest and the wetland adjacent to Loko ʻUalapueʻe.

Figure 6. Kiʻinohu Stream channel occupies only a small portion of the bottom of the gulch.

Figure 7. Kiʻinohu Gulch discharges onto the coastal plain. Discharge crosses the highway as sheetflow over this unimproved driveway.

Moʻomuku Stream is generally similar to Kiʻinohu Stream. Physical indicators of flow (i.e., bed and banks and OHWM) in Moʻomuku Stream are faint and discontinuous. The stream bed is largely bare of vegetation and contains more boulders and exposed bedrock than the adjacent gulch bottom. Bedrock comprises a larger proportion of the stream bed in Moʻomuku Gulch than the other two gulches. A few stream features, such as dry plunge pools below escarpments, are present along the length of the channel. Terrestrial vegetation such as *koa haole* and lantana are rooted at the OHWM (Figure 8).

Moʻomuku Gulch opens on the coastal plain at the lower end of TMK 5-6-006:036, approximately 430 m (1,410 ft) from the ocean and 345 m (1,130 ft) from the wetland surrounding ʻUalapuʻe Fishpond. There is faint physical evidence (e.g., cracked mud) that the discharge continues downslope over an unimproved driveway. Moʻomuku Gulch does not have a channel, culvert, or bridge crossing at East Kamehameha V Highway to convey water flow beneath the roadway. Sheetflow from Moʻomuku Stream apparently enters the same Java

Figure 8. Moʻomuku Stream looking downslope from a ford in the Project area.

Figure 9. Sheetflow from Kiʻinohu and Moʻomuku streams cross Kamehameha V Highway and enter a Java plum forest adjacent to a wetland and Loko ʻUalapuʻe.

plum forest (Figure 9) and wetland adjacent to Loko ʻUalapuʻe *makai* of the highway.

Vegetation

The Project site includes several distinctive vegetation "types" as mapped in Figure 11. Much of the lowland is koa-haole dominated scrub forest (LcF) and *kiawe*-dominated forest and savannah (KwF), with riparian forest (RpF) occurring in the larger gulches and scrub growth in the smaller gulches. Above an elevation of roughly 75 m (250 ft; elevation of the water tank), the vegetation on the interfluves is *Psidium* scrub growth (PsS; Figure 10), giving way to grassland above (GrM; Figure 12) and then a *Meleleuca* forest (MlF; Figure 13) at the very top of the site.

Figure 10. Shrub vegetation dominated by *waiwi* (*Psidium cattleianum* f. *lucidum*) occupies much of the hillslope.

Flora

Table 1 provides a listing of the plant species recorded during the survey. A total of 56 taxa of plants were recorded in the survey of the Project area. Twelve (21%) of the species are native plants: 5 endemic and 7 indigenous. An additional 2 are early Polynesian introductions ("canoe plants"), raising the category of "natives" more broadly defined to 25%. Although the total number of species is

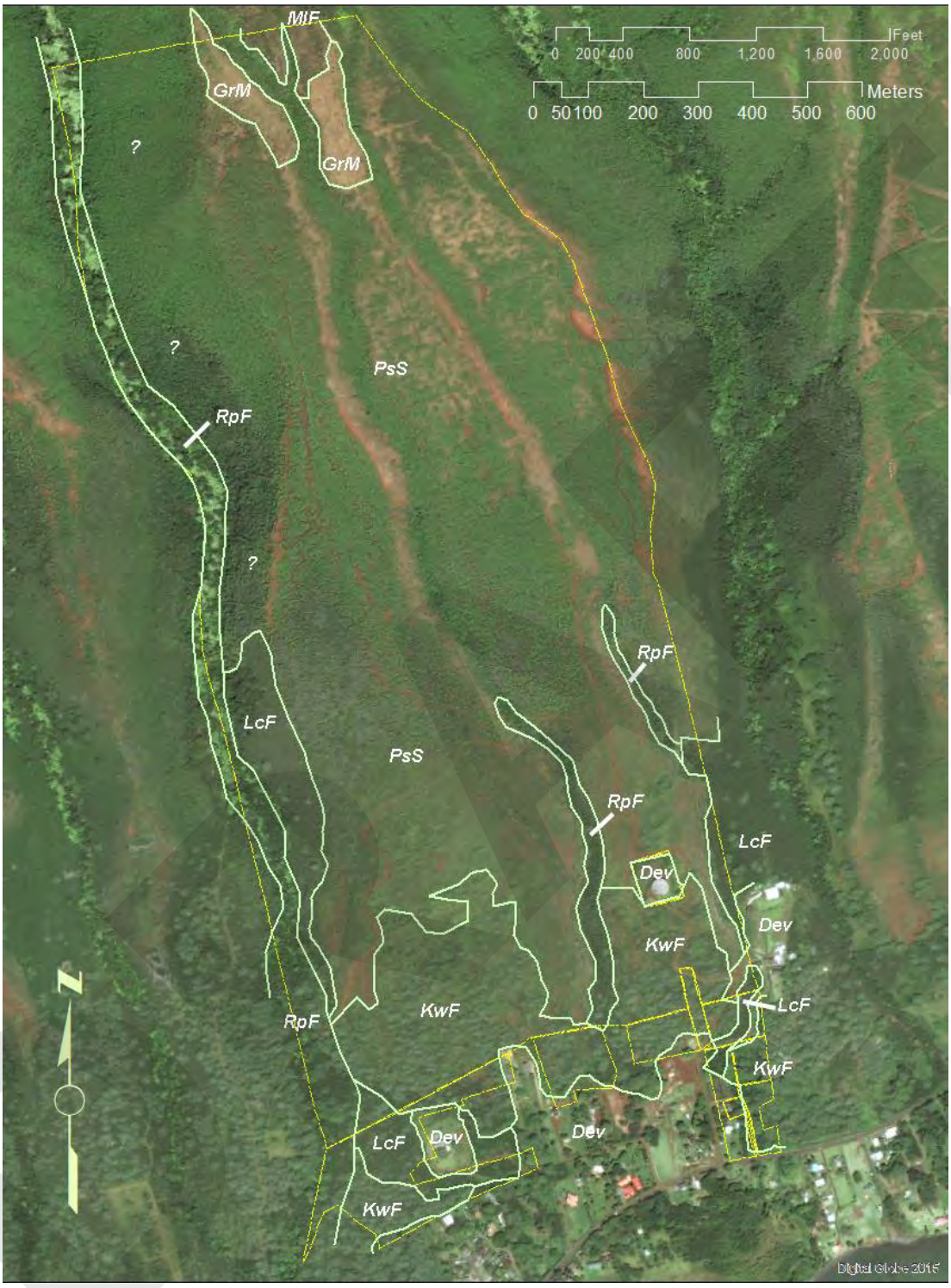


Figure 11. Vegetation map for the Project properties. Vegetation types represented are: PsS – *waiwi* scrub; Dev – developed landscape; GrM – grass meadow; LcF – *koa haole* scrub; KwF – *kiawe* forest; MlF- paperbark forest; RpF – riparian forest; and ?- uncertain vegetation type. See text for more details.

Figure 12. Grassland with scattered shrubs and mounds of *palaʻa* fern occupy an area of reduced slope near Maileliʻi.

Figure 13. A stand of paperbark trees (*Meleleuca quinquenervia*) forms an open forest at the very top of the Project site.

Table 1. Plant species observed at the ʻUalapuʻe Kuleana Homestead Settlement site.

Species listed by family	Common name	Status	Abundance	Notes
PTERIDOPHYTES - FERNS & FERN ALLIES				
DENNSTAEDTIACEAE				
Pteridium aquilinum var. *decompositum* (Gaud.) R.M. Tryon	*kīlau*	**End**	R	<3>
GLEICHENIACEAE				
Dicranopteris linearis (Burm f.) Underw.	*uluhe*	**Ind**	Oc	<3>
LINDSAEACEAE				
Sphenomerus chinensis (L.) Maxon	*palaʻā*	**Ind**	Oc	<2><3>
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F.M. Jarrett ex C.V. Morton	sword fern	Nat	C	<3>
PSILOTACEAE				
Psilotum nudum (L.) P. Beauv.	*moa*	**Ind**	R	<3>
FLOWERING PLANTS (ANGIOSPERMS) MONOCOTS				
ARECACEAE				
Cocos nucifera L.	*niu*, coconut palm	**Pol**	R	<1>
CYPERACEAE				
Carex wahuensis C.A. Mey.	—	**End**	R	<3>
Eleocharis sp.	*kohekohe*, spike rush	Nat?	R	<1>
POACEAE				
Andropogon virginicus L.	broomsedge	Nat	AA	<3>
Bothriocholoa pertusa (L.) A. Camus	pitted beardgrass	Nat	C	<2>
Chrysopogon aciculatus (Retz.) Trin.	*mānienie ʻula*	**Ind**	C	<2>
Digitaria insularis (L.) Mez ex Ekman	sourgrass	Nat	AA	<1>
Sacciolepis indica (L.) Chase	Glenwood grass	Nat	R	<3>
Sporobolus sp.	Rat-tail grass	Nat	O	<2>
FLOWERING PLANTS EUDICOTS				
ACANTHACEAE				
Barleria repens C. Nees	---	Nat	U	<1>
ANACARDIACEAE				
Schinus terebinthefolius Raddi	Christmas berry	Nat	O	<1><2>
ARALIACEAE				
Schefflera actinophylla (Endl.) Harms	octopus tree	Nat	R	<1>
ASTERACEAE				
Ageratina riparia (Regel) R. King & H. Robinson	*Hāmākua pāmakani*	Nat	R	<1><6>
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat	O	<2>

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
CACTACEAE				
Opuntia ficus-indica (L.) Mill.	*pānini*	Nat	U	<2>
CARICACEAE				
Carica papaya L.	*mīkana*, papaya	Nat	R	<1>
ERICACEAE				
Leptecophylla tameiameiae (Cham. & Schltdl.) C.M. Weiller	*pūkiawe*	**Ind**	R	<3>
EUPHORBIACEAE				
Aleurites moluccana (L.) Willd.	*kukui*	**Pol**	R	<5>
Euphorbia lactea Haworth	milk-striped euphorbia	Orn	R	<1>
Ricinus communis L.	castor bean	Nat	R	<1>
FABACEAE				
Acacia confusa Merr.	Formosan *koa*	Nat	U	<2>
Erythrina sandwicensis Deg.	*wiliwili*	**End**	R	<5>
Indigofera suffruticosa Mill.	*inikō*, indigo	Nat	Oc	<2>
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	A	<1>
Chamaecrista nictitans (L.) Moench.	partridge pea, *lauki*	Nat	R	<2>
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat	C	<1>
Senna occidentalis (L.) Link	coffee senna	Nat	Oc	<1>
Senna surratensis (N.L. Burm.) H. Irwin & Barneby	scrambled egg plant	Nat	O	<2>
Stylosanthes cf. *fruticosa* (Retz.) Alston	---	Nat	R	<2><6>
Vachellia farnesiana (L.) Willd.	*klu*	Nat	O	<1><2>
LAMIACEAE	---	Nat	R	<2>
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat	U	<2>
MALVACEAE				
Abutilon grandifolium (Wild.) Sweet	hairy abutilon	Nat	R	<1>
Sida spinosa L.	prickly sida	Nat	R	<2>
Waltheria indica L.	*ʻuhaloa*	**Ind**	U	<1><2>
MELASTOMATACEAE				
Clidemia hirta (L.) D. Don	Koster's curse	Nat	R	<3>
Pterolepis glomerata (Rottb.) Miq.	---	Nat	R	<3>
MYRTACEAE				
Melaleuca quinquenervia (Cav.) S.T. Blake	paperbark	Nat	A	<3>
Metrosideros waialealae (Rock) Rock var. *fauriei*	---	**End**	U	<3>
Psidium cattleianum f. *lucidum* Deg.	*waiwi*, strawberry guava	Nat	AA	<4>
Syzygium cumini (L.) Skeels	Java plum	Nat	O	<5>
POLYGONACEAE				
Antigonon leptopus Hook. & Arnott	Mexican creeper	Nat	R	<1>

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
ROSACEAE				
Osteomeles anthyllidifolia (Sm.) Lindl.	*ʻūlei*, *eluehe*	**Ind**	O	<2>
RUBIACEAE				
Coffea arabica L.	Arabian coffee	Nat	C	<5>
Morinda citrifolia L.	*noni*	Nat	U	<1>
SOLANACEAE				
Solanum seaforthianum Andr.	---	Nat	R	<1>
THYMELAEACEAE				
Wikstroemia oahuensis (A. Gray) Rock	*ʻākia*	**End**	U	<2>
Wikstroemia uva-ursi A. Gray	*ʻākia*	**End**	U	<1>
VERBENACEAE				
Lantana camara L.	lantana, *lākana*	Nat	AA	<4>
Lantana montevidensis (Spreng.) Briq.	trailing lantana	Nat	O	<1><2>
Stachytarpheta cayennensis (Rich.) Val.	---	Nat	R	<2>

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:
- **End** = endemic; native and unique to the Hawaiian Islands.
- **Ind** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- Orn = A cultivated plant; a species not thought to be naturalized in Hawaiʻi.
- **Pol** = An early Polynesian introduction. Introduced before 1778.

ABUNDANCE = occurrence ratings for plant species:
- R – Rare — seen in only one or two locations.
- U - Uncommon — seen at most in several locations.
- O - Occasional — seen with some regularity.
- Oc – Occasional — but more numerous in localized areas.
- C - Common — observed numerous times during the survey.
- A - Abundant — found in large numbers; may be locally dominant.
- AA - Very abundant — abundant and dominant; a defining vegetation type.

NOTES:
- <1> - Species mostly occurring at low elevation (at or below 250 ft or 75 m).
- <2> - Species mostly occurring at low to mid elevation, above 250 ft but below 1500 ft or 450 m..
- <3> - Species mostly occurring in upper elevation grassland and forest vegetation zones (above 1500 ft).
- <4> - Species widely distributed across Project site.
- <5> - Species mostly occurring in gulches.
- <6> – Plant lacks flowers or fruits; identification uncertain.

low considering the large area (nearly 170 ha [420 ac]) and elevation range (near sea level to 500 m [1,600 ft]) of the survey, the percentage of native plants is at least double what is found in surveys in the lowlands of the Hawaiian Islands (typically around 10-12%). Where these natives are found in the ʻUalapuʻe

ahupuaʻa and their current general abundance are important considerations. Likely, the native plants recorded reflect only a portion of the precontact (before 1778) composition of the flora once extant in this area. We cannot speculate here on what species of plants are no longer present, although we might assume *ʻuala* (*Ipomoea batatas*, sweet potato) is one if not currently being grown on mounds (*puʻe*) tended by residents adjacent to our survey area.

The lowland of the Project site is a forest or savanna of *kiawe* trees with an understory of *koa haole* and sourgrass. In places, *koa haole* becomes a dominant small tree. In open areas, trailing lantana (*Lantana montevidensis*) is abundant as a creeping shrub. Both *ʻuhaloa* and *ʻakiʻa* (*Wikstroemia uva-ursi*), along with the two Polynesian introductions—*niu* and *noni*—can be found in this vegetation type, although all four are rare or uncommon. The two true natives prefer open or even disturbed sites.

Upslope of the *kiawe* belt is a scrub vegetation dominated by *waiwī* (Fig. 10). Most of the other species found in this extensive scrub growth occur in scattered open areas such as along the old roads crossing or climbing through the scrub growth. Lantana (*Lantana camara*) is very abundant where the *waiwi* is sparse or absent. Two native shrubs, *ʻakiā* (*W. oahuensis*) and *ʻulei*, occur mixed with the waiwī. *ʻŪlei* shrubs are occasional (meaning moderately common), this *ʻakiā* uncommon. The *waiwī* plants are small and scattered at lower elevation, but gradually increase in size and density upslope, becoming a scrub forest. Large numbers of axis deer occupy the scrub forest. Two native ferns occur near the upper part of this vegetation type—*palaʻā* and *kīlau*, the latter rare—in open areas not so dominated by the *waiwī*.

Near the top of the interfluve is an open grassland with only scattered *waiwī*. Mounds of the fern, *palaʻā*, are scattered across this grassland as seen in Fig. 12. Above the grassland is a forest of paperbark (Fig. 132). The stand is nearly monotypic (almost no other tree species are present) and can be seen to be present at roughly the same elevation on the interfluve beyond Kahananui Gulch. Present here is *moa* and an unusual species of *ʻohiʻa*: (*Metrosideros waialealae* var. *fauriei*) typically found on ridges above 600 m (2000 ft) on Kauaʻi, Molokaʻi, and Lānaʻi (Wagner et al., 1990, p. 970). Several individuals of this plant were confirmed, although the elevation of occurrence is a little low. The presence of this uncommon *ʻōhiʻa* relative on the edge of the *Meleleuca* forest is perhaps an unusual feature of this *ʻahupuaʻa*.

The smaller gulches of Kiʻinohu and Moʻomuku support a vegetation generally the same as that on the adjacent interfluval slopes: *koa haole* with *kiawe* near the bottom and *waiwī* above. The much larger Kahananui Gulch has an associated riparian forest in which *kukui* is a prominent member. A single *wiliwili* was

observed at the lower end of this gulch. The forest that grows on the steep margins of the two deep gulches, Kahananui and Kalua'aha, may well support additional species of interest. Because of the difficult access and low likelihood that the Project will impact this very steep terrain, these slopes were not surveyed.

Fauna

Avian Fauna

A total of 387 individual birds of 17 species, representing 13 separate families, were recorded during station counts (Table 2). All of the species recorded during the course of this survey are alien to the Hawaiian Islands.

Table 2. Avian species detected on DHHL 'Ualapu'e Kuleana Homestead Settlement Project area - October 2021.

Common Name	Scientific Name	Status	RA
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Gray Francolin	*Francolinus pondicerianus*	A	1.71
Black Francolin	*Francolinus francolinus*	A	0.59
Feral Chickens	*Gallus gallus*	A	1.88
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	0.41
Zebra Dove	*Geopelia striata*	A	2.00
	PELECANIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Cattle Egret	*Bubulcus ibis*	A	0.18
	STRIGIFORMES		
	TYTONIDAE - Barn Owls		
Barn Owl	*Tyto alba*	A	0.12
	PASSERIFORMES		
	ZOSTEROPIDAE - White-eyes		
Warbling White-eye	*Zosterops japonicus*	A	6.59
	LEIOTHRICHIDAE - Babblers		
Red-billed Leiothrix	*Leiothrix lutea*	A	1.35
	MIMIDAE - Mockingbirds & Thrashers		
Northern Mockingbird	Mimus polyglottos	A	1.06
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	1.71

Table 2 (continued).

Common Name	Scientific Name	Status	RA
	MUSICAPIDAE - Old World Flycatchers		
White-rumped Shama	Copsychus malabaricus	A	0.47
	ESTRILDIDAE – Estrildid Finches		
African Silverbill	*Euodice cantans*	A	0.12
Java Sparrow	*Padda oryzivora*	A	0.06
Scaly-breasted Munia	*Lonchura punctulata*		1.35
	FRINGILLIDAE - Fringilline and Carduline Finches & Allies		
	Carduelinae - Carduline Finches and Hawaiian Honeycreepers		
House Finch	*Haemorhous mexicanus*	A	1.65
	CARDINALIDAE - Cardinals & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	1.00
	THRAUPIDAE - Tanagers		
	Thraupinae - Core Tanagers		
Red-crested Cardinal	*Paroaria ccoronata*	A	0.53

Key to Table 2.

Status:

A = Naturalized, non-native species (introduced).

RA (Relative Abundance: Species count / number of point-count stations (n=17).

Avian diversity and densities were in keeping with the highly disturbed, alien vegetation present on the site. Three species—Warbling White-eye (*Zosterops japonicus*), Zebra Dove (*Geopelia striata*), and Feral Chickens (*Gallus gallus*)—accounted for 42% of all birds recorded during station counts. The most frequently recorded species was Warbling White-eye, accounting for 30% of the total number of individual birds recorded.

Mammals

We recorded six mammalian species during the course of this survey. All of the species detected are alien to the Hawaiian Islands. The species list and detection method for each species is presented in Table 3.

Discussion and Recommendations

Recommendations are partly based on U.S. Fish and Wildlife Service, Animal Avoidance and Minimization Measures (USFWS-PIFWO, nd). Implementation of the recommendations (provided below as bulleted items) by the Project

contractor will minimize impacts to listed species to the maximum extent practicable.

Table 3. Mammalian species detected on DHHL 'Ualapu'e Kuleana Homestead Settlement Project area - October 2021.

Common Name	Scientific Name	Status	Detection Type (DT)
	CARNIVORA- FLESH EATERS		
	CANIDAE - Wolves, Jackals & Allies		
Domestic dog	*Canis lupus familiaris*	A	A, Sc, Tr
	VIVERRIDAE - Civets & Allies		
Small Asian mongoose	*Herpestes javanicus*	A	V
	FELIDAE - *Cats*		
House cat	*Felis catus*	A	Tr
	ARTIODACTYLA – EVEN-TOED UNGULATES		
	SUICIDAE - Old World Swine		
Pig	*Sus scrofa*	A	Sc, Tr, Si
	CERVIDAE - Antlered Ruminants		
Axis deer	*Axis axis*	A	V, A, Tr, Sc, Si, Sk
	BOVIDAE - Hollow-horned Ruminants		
Domestic cattle	*Bos taurus*	A	A

Key to Table 3.

Status:

A – Alien. Naturalized, non-native (introduced) to the Hawaiian Islands

Detection Type:

A – Audio. The animal was heard.
Sc – Scat. Fecal matter of the species was encountered.
Tr – Tracks. Tracks of the species were seen.
Si – Sign. Sign of the animal was seen, such as browsing, wallows, beds, rooting, etc.
V – Visual. The species was seen.
Sk – Skeletal. Skeletal remains, or horns, were encountered.

Jurisdictional Waters

Following the current guidance (USEPA and DA, 2008) to determine whether or not a stream is jurisdictional (also known as "waters of the US"), we need to

assess if the streams (1) are relatively permanent, meaning they flow year-round or have at least seasonal continuous flow (e.g., typically three months) or (2) have a significant nexus with the ocean, meaning they significantly affect the chemical, physical, and biological integrity of the jurisdictional receiving waters.

As expected for streams on the leeward sides of the Hawaiian Islands, Kahananui, Moʻomuku, and Kiʻinohu streams are not relatively permanent waters. Stream flow is absent in the Project area, except during infrequent major storms. Community members of Ahonui Homestead Association (AHA) report that the three streams flow for only a matter of hours, and not weeks or months at a time, after a rain event. AHA members report that Kahananui Stream flows in the Project after every rain event (somewhere around 20 to 60 times a year), Moʻomuku Stream flows after a rain event that lasts between two to three days, and Kiʻinohu Stream flows after a rain event that lasts between three and four days.

As a consequence of the lack of relatively permanent flow, no significant aquatic habitat or resources are present in the Project area. It is possible that the upper reach of Kahananui Stream contains perennial flow, so the dry, lower reach could be important to native, amphidromous fishes, mollusks, or prawns, because populations living in an upper perennial reach would need to migrate through the lower reach during occasional freshets.

Flow from the Project area streams to the ocean will be freshets from large rain events that could potentially affect the chemical, physical, and biological integrity of a jurisdictional receiving water (ocean off the south coast of Molokaʻi); however, this effect must be "significant" for the streams to be deemed jurisdictional. Kahananui Stream has a surface connection to the ocean and is reported to flow after every rain event, so that effect is likely to be categorically determined as significant. Evaluated with the potential of the stream serving as a migratory pathway for amphidromous animals, it is reasonable to assume Kahananui Stream is jurisdictional. Conversely, Kiʻinohu and Moʻomuku streams do not have a surface connection to the ocean and flow is less frequent than in Kahananui, so are not likely to have a significant nexus and are not likely to be jurisdictional waters of the U.S. Any influence on the chemical, physical, and biological integrity of the ocean from Kiʻinohu and Moʻomuku streams is via sheetflow over uplands or the coastal groundwater, neither of which is considered to be waters of the US nor regulated under the Clean Water Act. The channels of Kiʻinohu and Moʻomuku streams end 230+ m (755+ ft) inland of the wetland adjacent to Loko ʻUalapuʻe and 430+ m (1,410 ft) inland of the fishpond.

The nearshore waters of ʻUalapuʻe certainly are influenced by freshwater, but the significant contributions of freshwater and associated nutrients are primarily

from the coastal groundwater. AHA members report collecting *limu* (seaweeds), including *limu kohu* (*Asparagopsis taxiformis*) and *limu ʻeleʻele* (*Enteromorpha prolifera*), from nearshore waters. *Limu ʻeleʻele*, in particular, is dependent upon some degree of brackishness and the nutrients terrestrial runoff provides. Ancient Loko ʻUalapuʻe is a *loko kuapā* or a walled fishpond constructed off the shore to raise fish tolerant of a wide range of salinity. Hawaiians actively managed freshwater contributions to these fishponds to best facilitate growth of the life stage and species being raised in the pond. Loko ʻUalapuʻe is situated to the east of Kahananui Stream mouth, but directly across the highway from the terminus of Kiʻinohu and Moʻomuku streams, possibly indicating that runoff from these gulches was insignificant (or at least controllable via *ʻauwai* or ditches). It does not appear that *ʻauwai* still exist, but water in Loko ʻUalapuʻe is brackish (salinity range: 0 to 29.7 ppt, average 22.3 ppt; Wyban, 1990).

We conclude that Kahananui Stream is jurisdictional, but Kiʻinohu and Moʻomuku gulches are not. If Project activities are to occur within jurisdictional limits of Kahananui Stream, a federal permit will be needed. Federal jurisdiction is solely determined by the USACE and is based upon the USACE accepting our findings. Acceptance may require a field visit by a USACE representative from the Regulatory Branch to inspect all or representative locations surveyed by *AECOS*. Our determination is not official until an acceptance letter from the USACE is received by the applicant. Jurisdictional limits extend only to the OHWM, not yet determined but on the order of 8 to 10 m (26 to 33 ft) across the bottom of the gulch.

Whether or not the streams in the Project area are jurisdictional, best management practices (BMPs) should be employed during Project design and construction to maintain good water quality. It is important to reduce transport of sediments from the hillslopes to the nearshore waters (1) to prevent the continued filling of Loko ʻUalapuʻe and (2) to prevent the transport of agricultural chemicals and sediment to nearshore waters.

Project work may be completed with minimum impacts to stream water quality and without negative impacts to long-term water quality if proper BMPs are implemented:

- Minimize turbidity and siltation from Project-related work. Use effective silt containment devices and curtail work during adverse weather conditions.
- Prior to use, clean pollutants from all Project-related materials and equipment (dredges, barges, backhoes, etc.) that will be placed in the water.

- Do not stockpile Project-related materials (fill, revetment rock, pipe, etc.) in the water.
- Dispose of all debris removed from aquatic environments at an approved upland or ocean dumping site.
- Prevent contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of aquatic habitats from Project-related activities. Implement a litter-control plan and develop a hazard analysis and critical control point plan to prevent attraction and introduction of non-native species.
- Fuel Project-related vehicles and equipment away from the water and develop a contingency plan to control petroleum products accidentally spilled during the Project. Store absorbent pads and containment booms on-site, as appropriate, to facilitate the clean-up of accidental petroleum releases.
- Protect under-layer fills from erosion with stones (or core-loc units) as soon after placement as practicable.
- Protect from erosion any soil exposed near water as part of the Project (with plastic sheeting, filter fabric, etc.) after exposure and stabilize as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

Floral Resources

A majority of the plants on the ʻUalapuʻe interfluve are not native to the Hawaiian Islands and are relatively recent introductions (in the 19th and 20th centuries). More troublesome than the fact that the flora is largely (although not completely) naturalized species, is the fact that the flora is dominated by a few species that are capable of excluding establishment of natives or other non-natives. In much of the Hawaiian Islands in lowland mesic environments the dominant members of the vegetation that tend to exclude other species are Guinea grass (*Megathrysus maximus*) and *koa haole* (*Leucaena leucocephala*). Both of these species occur in the Project vicinity, but the dominate shrubs at ʻUalapuʻe are *lakana* and *waiwi*; the dominant herbaceous species is sourgrass below and broom sedge above, up to a monospecific forest of paperbark.

It is difficult to speculate on what impact the nature of the dominant introduced species has on the former native vegetation of ʻUalapuʻe, but it is likely the slopes were dominated in ancient times by pili grass (possibly a Polynesian introduction) and a mixture of shrubs such as *ʻakia*, *ulei*, *ʻohiʻa*, and *pūkiawe w*ith scattered *wiliwili* trees. All are present is small numbers on the Project site. Two species of *ʻakia* occur: *Wikstroemia oahuense* and *W. uva-ursi*. The latter is a smaller plant and limited here to the slopes below about 75 m (250 ft). *W.*

oahuense appears further upslope and continues up to and presumably beyond the paperbark forest.

The two larger gulches (including Kalua'aha, although outside the Project site) support riparian forests, dominated by exotic trees, but with *kukui*, an early Polynesian introduction, common. Riparian forests contribute much to the watershed and should be minimally disturbed. These forests do offer an opportunity of enhancing cultural resources in the *ahupua'a* by replacement of exotic trees with native and more culturally relevant species. Carried out on a piecemeal basis of removing selected non-native trees and planting desirable replacements over limited parts of a gulch could be a gradual process so as to not expose large areas of the gulch bottom to enhanced erosion. The flora in the smaller gulches is similar to that of the interfluve, but does show some riparian characteristics. Given the steepness of most of the land in the Project site, it is the bottom areas of these smaller gulches that offer some degree of success in providing arable land for future habitation. In these areas, placement of habitation structures (houses) should be on suitable adjacent slopes and not on potentially arable land or in the flood hazard zones found at the bottom of swales and gulches.

Invertebrates

Although we were not tasked with conducting surveys for invertebrates and the likelihood of any protected invertebrates being present on the Project site is extremely low. One species that potentially might use resources on the site is Blackburn's sphinx moth (*Manduca blackburni*) is an endangered sphingid moth. The larva of this species is a Solanaceae specialist and its' native host plants are not present on the site nor in the general vicinity. However, as these native host species have become exceedingly rarer in nature, this endemic moth has adapted to non-native solanaceous species, particularly tree tobacco (*Nicotiana glauca*), a common weed in the islands. We did not record tree tobacco on the site and the only solanaceous species recorded (and that observed as rare) was *Solanum seaforthianum*. To our knowledge, Blackburn's sphinx moth has not been recorded using this vine as a host plant.

There were relatively large numbers of butterflies seen across the Project site, especially in areas with lantana. The three most common butterflies were Lantana scrub-hairstreak (*Strymon bazochii*), clouded yellow (*Colias ponteni*), and fiery skipper (*Hylephila phyleus*).

Fauna Resources

Avian Resources

The findings of the avian survey are consistent with the location of the Project and relatively depauperate habitats present there. All of the species detected during this survey are common established human-introduced species. Currently no suitable habitat exists on the site to support native forest birds or waterbirds.

Seabirds

The endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffinus newelli*) may over-fly the Project area between April and the middle of December each year in very low numbers (David, 2021). David has heard Newell's Shearwaters flying up some of the valleys on the leeward side of the island in past years (David, 2021).

The primary cause of mortality in these three seabird species in Hawaiʻi is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawaiʻi. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. Disoriented seabirds may collide with man-made structures and, if not killed outright, become easy targets of opportunity for feral mammals (Hadley, 1961; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003). Suitable nesting habitat for these seabird species is not present in the vicinity of the Project site.

- From an avian resource's perspective, night-time construction should be avoided during the seabird fledging season that extends from September 15th through December 15th each year. This minimization will ensure that fledgling birds are not attracted to and disoriented by construction lights. Furthermore, any exterior lighting proposed when the site is developed should be dark sky complaint and shielded (See HDLNR-DOFAW, 2016).

Mammalian Resources

No mammalian species currently proposed for listing or listed under either the federal or State of Hawaiʻi endangered species statutes (DLNR 1998; USFWS, nd-a) were recorded in the Project area. All mammalian species detected during our survey are alien to the Hawaiian Islands. Although, no rodents were

recorded, all four of the established alien Muridae found on Molokai—European house mouse (*Mus musculus*), roof rat (*Rattus* rattus), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*)—likely occur and use various resources found within the Project area. These human commensal species are drawn to areas of human habitation and activity. All are deleterious to native ecosystems.

No Hawaiian hoary bats were detected during the course of this survey. It is probable that this species may use resources within forests in the gulches on a seasonal basis. The only impact that the Project may pose to bats is if tree trimming and grubbing occur that may displace individual bats roosting in the trees. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of some of the vegetation would be minimal. However, during the pupping season, females carrying pups may be less able to rapidly vacate a roost site being felled. Additionally, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups would be unable to flee a tree that is being felled.

- Potential adverse impacts from tree removal can be avoided or minimized by not clearing woody vegetation taller than 4.6 m (15 ft) between June 1 and September 15, the period in which bats may have pups.

Other Resources of Potential Concern

Critical Habitat and State Conservation Districts

Federally delineated Critical Habitat for listed plant species is present adjacent to the Project site (USFWS, nd-b). Conservation zoning in Hawaiʻi is promulgated at the state level by State Conservation Districts. The northern boundary on the Project site is contiguous with TMK: 5-6-006:026, included in the Molokai Forest Reserve founded in 1912 and, in total, encompassing some 11,960 ac (4,840 ha) across the "upper mountainous parts of the island" (HDLNR-DOFAW, 2009). This same boundary delimits Critical Habitat established by USFWS for plants. Critical Habitat has been established for Blackburn's Sphinx Moth on Molokaʻi but is located far to the west of the ʻUalapuʻe Section of the Molokaʻi Forest Reserve.

Additional Environmental Considerations

The Project proposes to develop approximately 166 ha (410 ac) of mostly steep land[5] that is predominantly scrub-shrub or grassland. Presumably future

[5] The average grade of the interfluve from the base of slope at about 50 ft elevation to the ridge top at 4080 ft is 26.1%. For the Project site, this average grade is 26.6%.

development will require new roadways (or improvements to existing roadways) to access much of the Project area. At present, several unimproved roads accommodate limited vehicular access throughout the area, but most are no longer usable by vehicles or construction equipment. The U.S. Dept. of Agriculture, Natural Resources Conservation Service (USDA-NRCS) provide conservation practice standards (essentially construction BMPs) for the construction of, or improvements to, access roads, with considerations to the protection of natural resources and minimization of erosion and runoff. Our recommendations summarize points from Conservation Practice Standards for Access Roads (USDA-NRCS, 2020)

- Locate access roads to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, and to make the best use of topographic features. Design the layout of roads to follow natural contours and slopes to minimize disturbance of drainage patterns.

- Locate access roads where they can be maintained and where water management problems are not created. To reduce potential pollution, position roads as far as possible from water bodies and watercourses. To the extent possible, do not impede overland flow.

- Provide a culvert, bridge, ford, or surface cross drain for water management at every natural drainageway. An erosion-resistant low point or overflow area may be constructed across the access road to supplement drainage capacity. Surface cross drains, such as broad-based or rolling dips, may be used to control and direct water flow off the road surface on low-intensity-use forest, ranch, or similar roads to prevent the formation of deep ruts.

- Provide ditches, as needed, to move water away from the road. Maintain unobstructed flow into the ditches to prevent flows from causing roadside erosion.

It is evident that when the existing roadways were developed (presumably in a piecemeal fashion), minimal attention was paid to the above principals. As a consequence, much of the erosion of the hillslope that has been a major contributor to the demise of the local subsistence fisheries on the reef off ʻUalapuʻe has been from these roadway cuts (Figure 14). Indeed, roads have long been recognized as a major source of erosion (Megahan, 1977) and serious erosion continues apace at ʻUalapuʻe today. The roads appear to serve as significant access ways for the local deer population, exacerbating erosion potential .

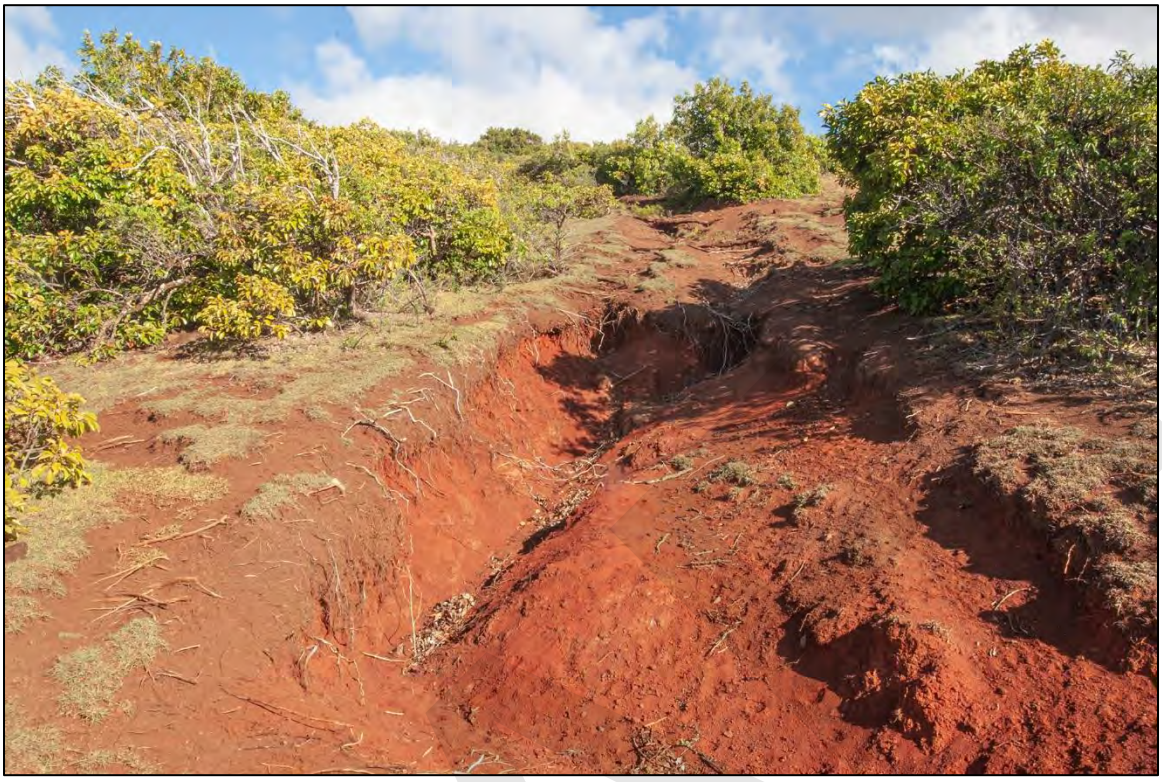


Figure 14. Portion of a former road constructed across the contours and now a site of extensive erosion. Road is no longer useful for vehicles.

Attempts to restore many portions of these roads will be unsuccessful given that the original designs were so poorly conceived. Any new access roads must incorporate the practice standards described above and be designed to avoid becoming drainageways (see Figure 15). More importantly in the short-term, if a goal of achieving sustainable habitation on the hillslope is to be achieved, the on-going erosion from the existing roads must be abated. Measures will need to be taken to reduce erosion on the existing roads and vegetation cover restored in these places. Given the poor condition of these roads, it is evident that use of them is now pretty much limited to two-wheeled vehicles, and should be restricted in any event, at least in areas of severe soil loss. Measures to be considered to attempt to restore the land where seriously eroded by roads include water bars and revegetation. A water bar (interceptor dyke or cross-drain) is a feature laid diagonal across a road to capture runoff moving down the road and redirect it off to the side. A series of water bars are placed at intervals such that each is not required to handle a large volume of water, lest the diverted water create a separate erosion problem to the slope beside the road. Ideally, diverted water should move on as sheet flow across vegetated ground, or into an

existing ditch or swale. For problem areas on not so steep roads and at water bar discharge points, the use of wattles[6] may prove beneficial.

Figure 15. Portion of same road as in previous figure, but here constructed along the contour. Road is still traversable by vehicles and is a minor contributor to slope erosion and reef degredation.

Feral ungulates, primarily Axis deer and pigs have caused and continue to cause major vegetation and erosional damage on the Project watershed. Depending on what is implemented on the site, some areas may need to be fenced with ungulate-proof fencing adequate to exclude deer (~8-ft tall) and all ungulates within such exclosures removed. To restore significant areas of the site would require extremely costly fencing and ungulate removal; it would be more practical to target areas where agricultural or native plant restoration efforts are undertaken for such expensive and labor intensive treatment and remediation.

[6] A low structure consisting of stakes interlaced with twigs or branches and other plant material and intended to intercept runoff and filter out soil particulates.

References Cited

AECOS, Inc. 1998. Reconnaissance surveys and environmental assessment of ʻAahaʻino and Uluwini gulches on East Molokaʻi.

_____. 1998. Reconnaissance Surveys and Environmental Assessment of ʻAhaʻino and Uluwini Gulches on East Molokaʻi. Prep. for: Fukunaga Matayoshi Hershey & Ching. AECOS No. 901B: 29 pp.

_____. 2005. Wetland delineation at Kalaeloa, Molokaʻi. *AECOS* No. 1225. Prep. for: Oceanic Institute. 14 pp + attachments.

_____. 2013. A functional evaluation and assessment of impacts to Keawanui Wetland by a drainage channel realignment at Kaʻamola and Keawanui, Molokaʻi. *AECOS* No. 1320A. Prep. for: Munekiyo Hiraga. 22 pp + appendices.

_____. 2019. Environmental surveys of Makakupaʻia Stream and vicinity for the Makakupaia Bridge Replacement Project near Kawela, Molokaʻi. *AECOS* No. 1457. Prep. for: EKNA. 26 pp.

Ainley, D. G, R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, in: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna. Studies in Avian Biology No. 22*. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. Pp. 108-123.

Chesser, R. T., S. M. Billerman, K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, N. A. Mason, P. C. Rassmusen, J. V. Remsen Jr., D. F. Stotz, and K. Winker. 2020. Check-list of North American Birds. American Ornithological Society. Available online at URL: http://checklist.aou.org/taxa; last retrieved August 20, 2021.

_____, _____, _____, _____, _____, B. E. Hernández-Baños, A. W. Kratter, I. J. Lovette, N. A. Mason, P. C. Rassmusen, J. V. Remsen Jr., D. F. Stotz, and K. Winker. 2021. Sixty-second Supplement to the American Ornithological Society's Check-list of North American Birds. 2021. American Ornithological Society, 138: 1-18.

Chimner, R.A., B. Fry, M. Kaneshiro, and N. Cormier. 2006. Current extent and historical expansion of introduced mangroves on Oʻahu, Hawaiʻi. *Pacific Science*, 60 (3): 377-383.

Coastal Geology Group. undated website. Molokaʻi. Available online at URL: http://www.soest.hawaii.edu/coasts/publications/hawaiiCoastline/molokai.html; last retrieved November 9, 2021.

Day, R. H., B. Cooper, and T. C. Telfer. 2003. Decline of Townsend's (Newell's Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. *The Auk,* 120: 669-679.

Giambelluca, T. W., Q. Chen, A. G. Frazier, J. P. Price, Y.-L. Chen, P.-S. Chu, J. K. Eischeid, and D. M. Delparte. 2013. Online Rainfall Atlas of Hawaiʻi. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1. available online at URL: http://rainfall.geography.hawaii.edu/; last retrieved November 2, 2021.

Hawaiʻi Cooperative Park Service Unit (HCPSU). 1990. Hawaii stream assessment. A preliminary appraisal of Hawaii's stream resources. Prep. for State of Hawaii, Commission on Water Resource Management. National Park Service, Hawaii Cooperative Park Service Unit, Rept. No. R84: 294 pp.

Hawaii Department of Land and Natural Resources (HDLNR). 1998. Indigenous Wildlife, Endangered And Threatened Wildlife And Plants, And Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

_____. 2015. Hawaiʻi Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 5 Forestry and Wildlife, Part 2 Wildlife, Chapter 124, Indigenous Wildlife, Endangered and Threatened Wildlife, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife. February 27, 2015. 16 pp.

_____. 2019. Flood Hazard Assessment Tool. Available online at URL: http://gis.hawaiinfip.org/FHAT/; last retrieved November 9, 2021.

Hawaiʻi Department of Land and Natural Resources-Division of Forestry and Wildlife (HDLNR-DOFAW). 2009. Molokaʻi Forest Reserve Management Plan. 47 pp.

Hawaiʻi Department of Land and Natural Resources-Division of Forestry and Wildlife (HDLNR-DOFAW). 2016. Wildlife Lighting. PDF available at URL: http://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf; last retrieved February 21, 2020.

Imada, C. T. 2019. Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). *Bishop Museum Tech. Rept. 69*. 209 pp.

James, V. 2001. *Ancient Sites of Maui, Molokaʻi, and Lanaʻi*. Mutual Publishing. 200 pp.

Megahan, W. F. 1977. XIV. Reducing erosional impacts of roads. Guidelines for watershed management. FAO Conservation Guide: Food and Agriculture Organization of the United Nations. Rome. 25 pp. Available online at https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_050897.pdf; last retrieved November 14, 2021.

National Oceanographic and Atmospheric Administration-National Centers for Environmental Information (NOAA-NCEI). 2021. U.S. Climate Normals. Available online at URL: https://www.ncei.noaa.gov/products/us-climate-normals; last retrieved November 3, 2021.

National Oceanographic and Atmospheric Administration-National Weather Service Forecast Office (NOAA-NWS). 2021a. Precipitation summaries. Available online at URL: https://www.weather.gov/hfo/hydro_summary; last retrieved November 9, 2021.

_____.. 2021b. Hawaii rainfall summary 90 day archive. Available online at URL: https://www.weather.gov/hfo/HRS_archive; last retrieved November 10, 2021.

Parham, J. E., G. R. Higashi, E. K. Lapp, D. G. K. Kuamoʻo, R. T. Nishimoto, S. Hau, J. M. Fitzsimmons, D. A. Polhemus and W. S. Devick. 2008. Atlas of Hawaiian Watersheds and their Aquatic Resources. Island of Oʻahu. Bishop Museum and Division of Aquatic Resources. 614 pp.

Podolsky, R., D. G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kauaʻi. *Colonial Waterbirds*, 21: 20-34.

U.S. Army Corps of Engineers (USACE). 1987. *Corps of Engineers Wetlands Delineation Manual*. Tech. Rept. Y-87-1. Environmental Laboratory, Dept. of the Army, Waterways Experiment Station, Vicksberg.

U.S. Army Corps of Engineers (USACE). 2005. Regulatory Guidance Letter No. 05-05. Ordinary High Water Mark Identification. 4 pp.

_____. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai'i and Pacific Islands Region Version 2.0,* ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-12-5. U.S. Army Engineer Research and Development Center. Vicksberg, MS. 130 pp.

_____ and U.S. Environmental Protection Agency (USACE and USEPA). 2015. Department of Defense, Department of the Army, Corps of Engineers, 33 CFR Part 328, Environmental Protection Agency, 40 CFR Parts 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401, Clean Water Rule: Definition of "Waters of the United States". Federal Register, 80 (124; Monday, June 29, 2020): 37054-37127.

_____ and _____. 2020. Department of Defense, Department of the Army, Corps of Engineers, 33 CFR Part 328, Environmental Protection Agency, 40 CFR Parts 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401, The Navigable Waters Protection Rule: Definition of "Waters of the United States". Federal Register, 85 (77; Tuesday, April 21, 2020): 22250-22342.

_____ and _____. 2021. Department of Defense, Department of the Army, Corps of Engineers, 33 CFR Part 328, Environmental Protection Agency, 40 CFR Part 120, revised definition of "Waters of the United States". *Federal Register*, 86 (232; Tuesday, December 7, 2021): 69372-69450.

U.S. Department of Agriculture–Natural Resources Conservation Service (USDA-NRCS). 2020. Conservation Practice Standard – Access Road, Code 560. 5 pp. Available online at URL: https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/ technical/cp/ncps/?cid=nrcs143_026849; last retrieved November 9, 2021.

_____. 2021. Web Soil Survey, Soil Map—Island Of Molokaʻi Area, Hawaiʻi. Available online at URL: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx; last retrieved November 9, 2021.

_____. No date (nd.). Soil Data Access, Hydric Soils List: State of Hawaii, County of Maui. Available online at URL: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316620.html; last retrieved November 9, 2021.

U.S. District Court for the District of Arizona (US District Court for AZ). 2021. Order No. CV-20-00266-TUC-RM regarding Pasqua Yaqui Tribe, et al v. USEPA et al. 11 pp.

.

U.S. Environmental Protection Agency and Department of Army (USEPA and DA). 2008. Clean Water Act jurisdiction following the U.S. Supreme Court's decision in *Rapanos v. United States & Carabell v. United States.* December 2, 2008. 13 pp.

U.S. Fish & Wildlife Service (USFWS). 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.

_____. 2021a. Endangered Species. List of species available online at URL: https://www.fws.gov/endangered/index.html; last accessed on November 1, 2021.

_____. Undated website (nd-a). National Wetlands Inventory (NWI). U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Access gateway online at URL: https://www.fws.gov/wetlands/index.html; last retrieved November 9, 2021.

_____. Undated maps (nd-b). Critical Habitat Portal. Available online at URL: https://ecos.fws.gov/ecp/report/table/critical-habitat.html; last retrieved December 1, 2021.

U.S. Fish & Wildlife Service-Pacific Islands Fish and Wildlife Office (USFWS-PIFWO). No date (nd). Avoidance and Minimization Measures. Available online at URL: https://www.fws.gov/pacificislands/articles.cfm? id=149489720; last retrieved December 1, 2021.

Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i: Volume I and II*. Bishop Museum Special Publication 83. University of Hawai'i Press. 1853 pp.

_____ and _____. 1999. *Supplement to the Manual of the flowering plants of Hawai'i*, pp. 1855-1918. *In:* Wagner, W. L., D. R. Herbst, and S. H. Sohmer, Manual of the flowering plants of Hawai'i. Revised edition. 2 vols. University of Hawaii Press and B.P. Bishop Museum.

Wilson, D. E., and D. M. Reeder (editors), 2005. *Mammal species of the world: a taxonomic and geographic reference.* 3rd edition. 2 vols. John Hopkins University Press. Baltimore, Maryland. 2142 pp.

Wyban, Carol Araki. 1990. Master Plan for ʻUalapuʻe Ahupuaʻa: Blending Tradition & Technology. Prep. for: DBEDT, Molokaʻi Office. 91 pp.

Appendix D

Archaeological Literature Review and Field Inspection, 2023

Honua Consulting

Archaeological Literature Review and Field Inspection for Phase 1 of the ʻUalapuʻe Kuleana Homestead Project ʻUalapuʻe Ahupuaʻa, Kona District, Molokaʻi Island TMK: [2] 5-6-002:001, -024, -025, -026, -027, -036; [2] 5-6-006:017 por., -040

Prepared for

Prepared by

Nathan J. DiVito, B.A.,

Christopher M. Monahan, Ph.D., and

Trisha Kehaulani Watson, J.D., Ph.D.

Honolulu, Hawaiʻi

January 2023 (First Revision)

Management Summary

On behalf of G70, and the Department of Hawaiian Homelands (DHHL), Honua Consulting (Honua) has completed an archaeological literature review and field inspection (ALRFI) in support of DHHL's ʻUalapuʻe Kuleana Homestead Project in ʻUalapuʻe Ahupuaʻa, Kona District, Molokaʻi Island, Hawaiʻi (TMK: [2] 5-6-002:001, 024–027 & 036 and [2] 5-6-006:017 por. & 040). This ALRFI specifically covers the phase 1 area, which is approximately 59 acres of the makai portion of the overall project area of 412 acres. The proposed phase 1 portion of the project will designate approximately 59 acres of undeveloped DHHL land into Kuleana Homestead, Community Use, Special District, Stewardship, and Conservation land use areas. This includes the lower (makai [seaward]) portion of the property, TMK: [2] 5-6-002:001, -024, -026 -027, -036, and -017 (portion), which will be divided into 30 one-acre Kuleana Homestead lots interspersed with Conservation, Stewardship, Special District and 11 acres of Community Use. The remaining approximately 353 acres in the upper (mauka [upland]) portion of the property, the remaining portion of TMK: [2] 5-6-002:017, will be zoned Stewardship and Conservation Use.

The objectives of this ALRFI were the following: (1) documentation and description of the parcel's land-use history in the context of both its traditional Hawaiian character as well as its historic-period changes; (2) identification of any historic properties or component features in the project area; and (3) providing information relevant to the likelihood of encountering historically-significant cultural deposits in subsurface context during future construction. This ALRFI is not an archaeological inventory survey (AIS), and it is not intended for formal review by the State Historic Preservation Division (SHPD). It may be used, however, to support the project proponent's consultation with the SHPD and/or other stakeholders in compliance with applicable historic preservation and/or environmental law.

A total of 103 sites have been identified in the phase 1 project area. This includes 98 sites identified by Honua as well as four (4) sites previously identified by Keala Pono (McElroy 2022) and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui. Honua archaeologists visited and briefly inspected this heiau, whose exact name and number is unclear based on conflicting archival information. No new data were recorded by Honua at this heiau, but its geospatial location and general boundaries were mapped.

Site descriptions for the identified sites include formal site types as well as interpretations of function and age. Given the high number of sites encountered, and the relatively limited amount of time allotted to complete the fieldwork, all information—but specifically function and age—should be considered preliminary. If a formal archaeological inventory survey (AIS) is required—which is a legally-binding document that requires the accurate identification of 100% of the historic properties in a project area—subsurface testing (archaeological excavation) would need to be conducted at a sample of site types in order to better understand their preliminary interpretations of function and age.

Most of the sites (61 of 103, or 59.2%) are traditional Hawaiian constructions that date from the pre-contact to early historic period. These include at least 22 habitation sites and a few shelters, some which also include cultivation / garden features; and at least one of which includes a possible burial feature (Honua 89). The traditional Hawaiian sites also include approximately

two dozen cultivation / garden sites of various formal types. One distinctive and ubiquitous construction style of traditional Hawaiian sites identified at dozens of sites in the phase 1 project area is use of a windbreak of stacked and/or piled rocks along the northeast / east facing sides of site-features. These windbreaks are clearly intended to block the prevailing trade winds from the northeast / east.

The traditional Hawaiian sites also include one koʻa (fishing shrine) [Honua 30] near the center of the phase 1 project area; and several site complexes interpreted as heiau or possible heiau. These include Honua 45 and Honua 47 in the southwestern project corner of the project area, and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui.

Several rockshelters (with definite human modifications) and possible rockshelters (which need subsurface testing [archaeological excavation] to determine if they are cultural sites) were also identified in Kiʻinohu Gulch.

Thirteen (13) sites date exclusively to the late historic period and mostly include ranching features and structures related to water storage and distribution.

A substantial number of sites (29 of 103, or 28.2%) are interpreted as indeterminate in terms of their age. Many of these are in poor physical condition due to damage and/or neglect over time, making their temporal interpretation difficult. Some of these (e.g., modified boulder outcrops with rocks placed on top—consistent with being "clearing mounds" or piles) could have been made at various times in the past and are notoriously difficult to accurately date throughout the Hawaiian Islands.

The SHPD-Archaeology Branch should be consulted regarding appropriate next steps in anticipation of ground disturbance associated with the proposed development project, given the potential for encountering subsurface finds. Such consultation would benefit from detailed map depictions of specific proposed uses (e.g., residential versus preservation) in light to location of the 103 known historic properties identified herein.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

On behalf of G70, and the Department of Hawaiian Homelands (DHHL), Honua Consulting (Honua) has conducted an archaeological literature review and field inspection (ALRFI) in support of DHHL's ʻUalapuʻe Kuleana Homestead Project in ʻUalapuʻe Ahupuaʻa, Kona District, Molokaʻi Island, Hawaiʻi (TMK: [2] 5-6-002:001, 024–027 & 036 and [2] 5-6-006:017 por. & 040).

As depicted in Figure 1 (USGS topographic map), Figure 2 (aerial image) and Figure 3 (TMK map), this ALRFI specifically covers the phase 1 area, which is approximately 59 acres of the makai portion of the overall project area of 412 acres.

The proposed phase 1 portion of the project will designate approximately 59 acres of undeveloped DHHL land into Kuleana Homestead, Community Use, Special District, Stewardship, and Conservation land use areas. This includes the lower (makai [seaward]) portion of the property, TMK: [2] 5-6-002:001, -024, -026 -027, -036, and -017 (portion), which will be divided into 30 one-acre Kuleana Homestead lots interspersed with Conservation, Stewardship, Special District and 11 acres of Community Use. The remaining approximately 353 acres in the upper (mauka [upland]) portion of the property, the remaining portion of TMK: [2] 5-6-002:017, will be zoned Stewardship and Conservation Use.

The general agricultural use area is the largest and includes 299 acres in the central portion of the property. The next largest area includes 78 acres in the upper reaches of the property zoned special district and designated the ʻUalapuʻe Natural Resource Management and Subsistence Access Area. A 25-acre area in the lower portion of the property is proposed for residential use and will be subdivided into 74 kuleana homesteads each measuring 10,000 square feet. A 7-acre area has been set aside for the preservation of Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui.[1] Lastly, three acres will be split into two separate areas for community use and include a cemetery and community park and/or center.

Proposed ground disturbances for the project include grubbing and grading for roads, Kuleana Homestead lots and Community Use areas (DHHL 2005).

The objectives of this ALRFI are the following: (1) documentation and description of the parcel's land-use history in the context of both its traditional Hawaiian character as well as its historic-period changes; (2) identification of any historic properties or component features in the project area; and (3) providing information relevant to the likelihood of encountering historically-significant cultural deposits in subsurface context during future construction.

This ALRFI is not an archaeological inventory survey (AIS), and it is not intended for formal review by the State Historic Preservation Division (SHPD). It may be used, however, to support the project proponent's consultation with the SHPD and/or other stakeholders in compliance with applicable historic preservation and/or environmental law.

[1] The correct name and site number for this heiau is unclear based on conflicting archival information. Honua archaeologists inspected this heiau and recorded its accurate geospatial location and general boundaries, as reported and depicted in this report.

Figure 1. Portion of 1993 U.S. Geographical Survey (USGS) topographic map (Kamalo quadrangle) showing project-area location and phase 1 area

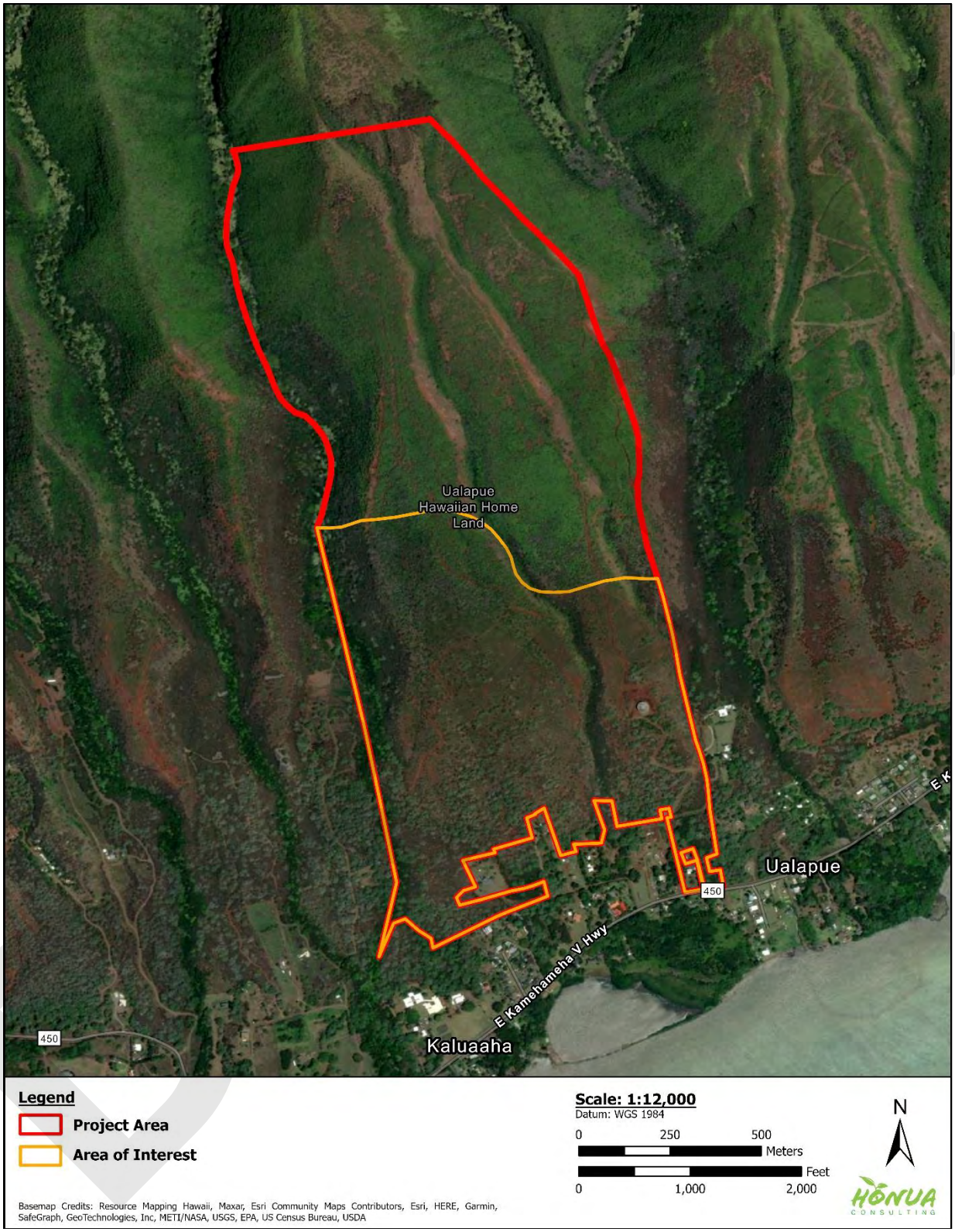


Figure 2. Aerial Photo showing the location of the project area and phase 1 area (Esri 2021)

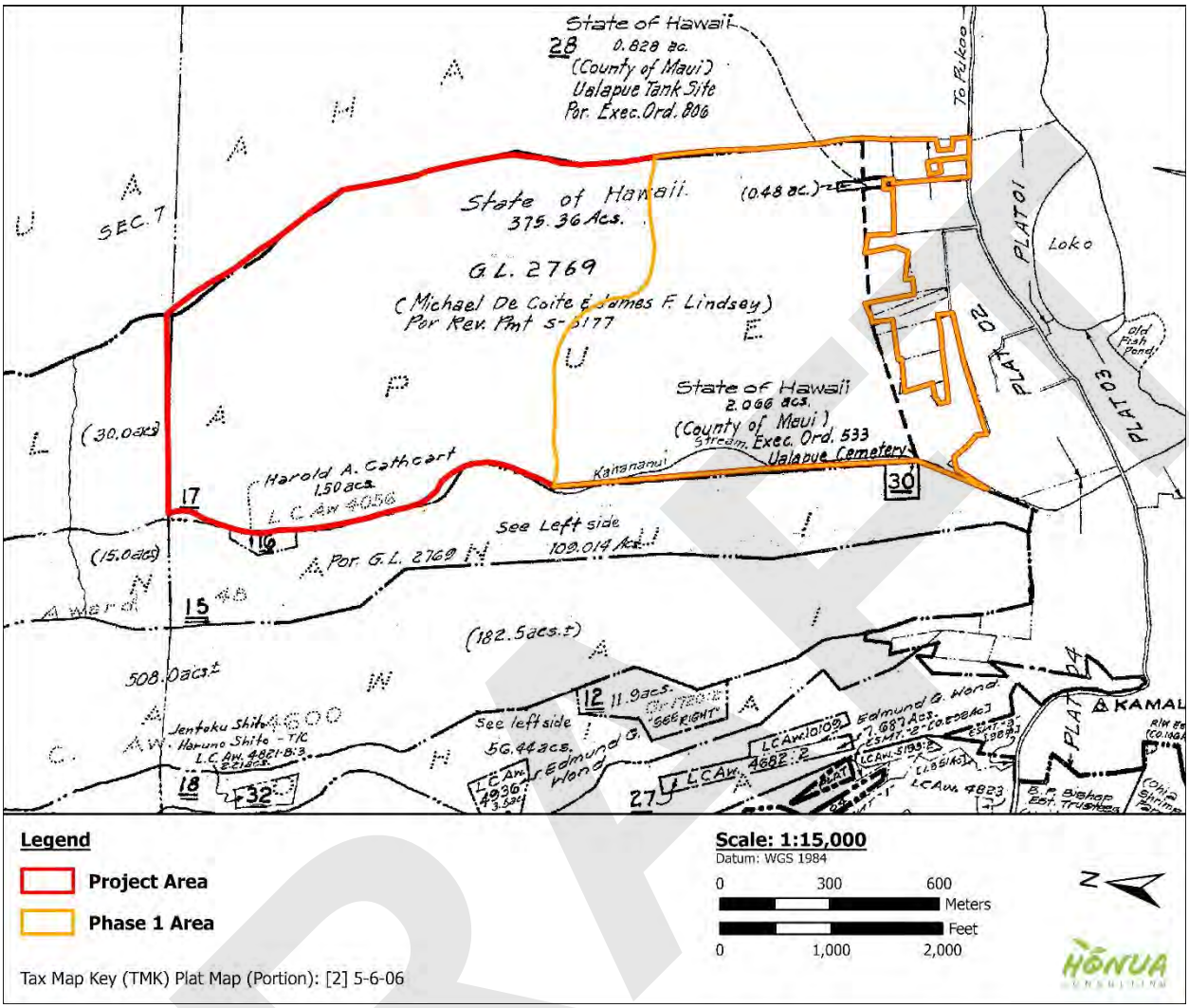


Figure 3. Portion of Tax Map Key (TMK): [2] 5-6-006 showing the location of the project area and phase 1 area

1.2 Environmental Setting

Molokaʻi, the fifth largest Hawaiian Island, was formed by two volcanoes: one that created east Molokaʻi and one that created west Molokaʻi. The larger, east Molokaʻi volcano was higher and erupted for longer than the west Molokaʻi volcano and overlaps it to create the middle of the island (Stearns and Macdonald 1947). Later, the Kalaupapa peninsula was formed through rejuvenation-stage volcanic activity. The project area is on the southern flank of the east Molokaʻi volcano; the terrain at this location is highly dissected with deeply-cut stream valleys. The project area slopes down steeply to the south; elevation varies from approximately 440 meters (m) (1,443 feet [ft]) to 10 m (32 ft).

The project area is in east Molokaʻi and receives annual rainfall of approximately 900 millimeters (mm) (35.4 inches [in]) in the coastal portion and up to 1,925 mm (75.8 in) on the upper slopes (Giambelluca et al. 2013). Three main drainages cut through the project area from north to south: Kahananui Gulch, which roughly defines the western boundary of the project area; Kiʻinohu Gulch, running down the center of the project area; and Moʻomuku Gulch, traversing the northeast corner of the project area and a portion of its eastern boundary.

Four soil types and two land types present in the project area are described below.

Alaeloa Soils

Alaeloa soils, which are on the ridges in the northernmost reaches of the project area, developed in material weathered from basic igneous rock. The soil in the project area consists of Alaeloa silty clay on slopes ranging from 15 to 35% (AeE); it occurs on the side and toe slopes of the uplands and includes gently to moderately sloping areas. Alaeloa soils are generally found between 100 and 1,500 ft elevation and are typically used for pineapple, pasture, truck crops, wildlife habitat and homesites. Vegetation on this soil series includes guava (*Psidium guajava*), Java plum (*Syzygium cumini*), Christmas berry (*Schinus terebinthifolia*), Japanese tea (Camellia sinensis) and hilo grass (*Paspalum conjugatum*) (Foote et al. 1972:26).

Hoolehua Soil

Hoolehua soils are the most abundant, particularly in the phase 1 area, and occur on ridge slopes. They consist of Hoolehua silty clay on slopes ranging from 15 to 35% (HzE), a soil type unique to ʻUalapuʻe; this very sticky and very plastic soil includes abundant stones and boulders and workability is difficult. Due to rapid runoff from the steep slope, the erosion hazard of these areas is severe and they frequently include highly-eroded soils and gullies. The current phase 1 area is a prime example of this. Hoolehua soils of this type are found between 400 and 1,300 ft elevation and are typically used for pasture. Vegetation on this soil series includes lantana (*Lantana camara),* ʻilima (*Sida fallax*), kiawe (*Prosopis pallida*), guinea grass (*Urochloa maxima*) and feather fingergrass (*Chloris virgata*) (Foote et al. 1972:44-45).

Kawaihapai Soil

Kawaihapai soils are present in two extremely small areas near the lowermost (makai) corners and coastal boundary of the project area. This includes Kawaihapai stony clay loam on slopes ranging from 2-6% (KlaB) in the southeastern corner and Kawaihapai stony clay loam on slopes ranging from 6-15% (KlaC) in the southwestern corner of the project area. Kawaihapai soils occur on the coastal plains of Molokaʻi and consist of well drained soils on alluvial fans and coastal plains formed in alluvium derived from basic igneous rock. Kawaihapai soils are located

along the coast between sea level and 300 ft elevation and are typically used for sugarcane, truck crops and pasture. Vegetation on this soil series includes kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), lantana (*Lantana camara*) and bermuda grass (*Cynodon dactylon*) (Foote et al. 1972:63-64)

Mala Soil

The Mala soil series, present in a small area in the southeastern corner of the project area, consists of Mala silty clay on slopes ranging from 0-3% (MmA) and 3-7% (MmB). Mala silty clay consists of well drained soils on the bottom of drainageways and on coastal alluvial fans formed in recent alluvium. Mala soils are located along the coast between sea level and 100 ft elevation and are typically used for pasture, alfalfa, truck crops, orchards and wildlife habitat. Vegetation on this soil series includes kiawe (*Prosopis pallida*), bristly foxtail (*Setaria parviflora*), feather fingergrass (*Chloris virgata*), ʻilima (*Sida fallax*) and Australian saltbush (*Atriplex semibaccata*) (Foote et al. 1972:92-93).

Rough Mountainous Land

Rough mountainous land (rRT) is located along the sides of the three gulches in the project area and consists of very steep land broken by numerous intermittent drainages. Rough mountainous land is found between sea level and elevations of more than 6,000 ft and is typically used for water supply, wildlife habitat and recreation. Vegetation typically consists of ʻohiʻa (*Metrosideros polymorpha*), false staghorn fern (*Dicranopteris linearis*), tree fern, yellow foxtail (*Setaria pumila*), lantana (*Lantana camara*), kukui (*Aleurites moluccanus*) and pukiawe (*Styphelia tameiameiae*) (Foote et al. 1972:119).

Stony Alluvial Land

Stony alluvial land (rSM) is located along the western boundary of the project area adjacent to Kahananui Stream and in the lower, southwestern corner where the stream forms an alluvial fan. Stony alluvial land is mostly on slopes ranging from 3 to 15 % and consists of stones, boulders and soil deposited by streams along the bottoms of gulches and alluvial fans. Lands of this type are located between sea level and the 1,000 ft elevation and are typically used for pasture. Vegetation typically consists of kiawe (*Prosopis pallida*), klu (*Acacia farnesiana*), ʻilima (*Sida fallax*), piligrass (*Heteropogon contortus*), lantana (*Lantana camara*) in the dry areas and guava (*Psidium guajava*), kukui (*Aleurites moluccanus*), hilograss (*Paspalum conjugatum*) and Christmas berry (*Schinus terebinthifolia*) in wet areas. Due to the numerous stones and boulders, improvement of this type of land is difficult (Foote et al. 1972:120).

1.3 Built Environment

The majority of the project area remains undeveloped except for a few dirt roads on the ridges leading to the upslope areas. The only area of development is in the southeast portion of the project area and includes a paved roadway leading to a water tank facility and the remnants of the former tank facility downslope. Aside from water and electrical utilities associated with the existing water tank facility, no utilities are known to be present in the project area.

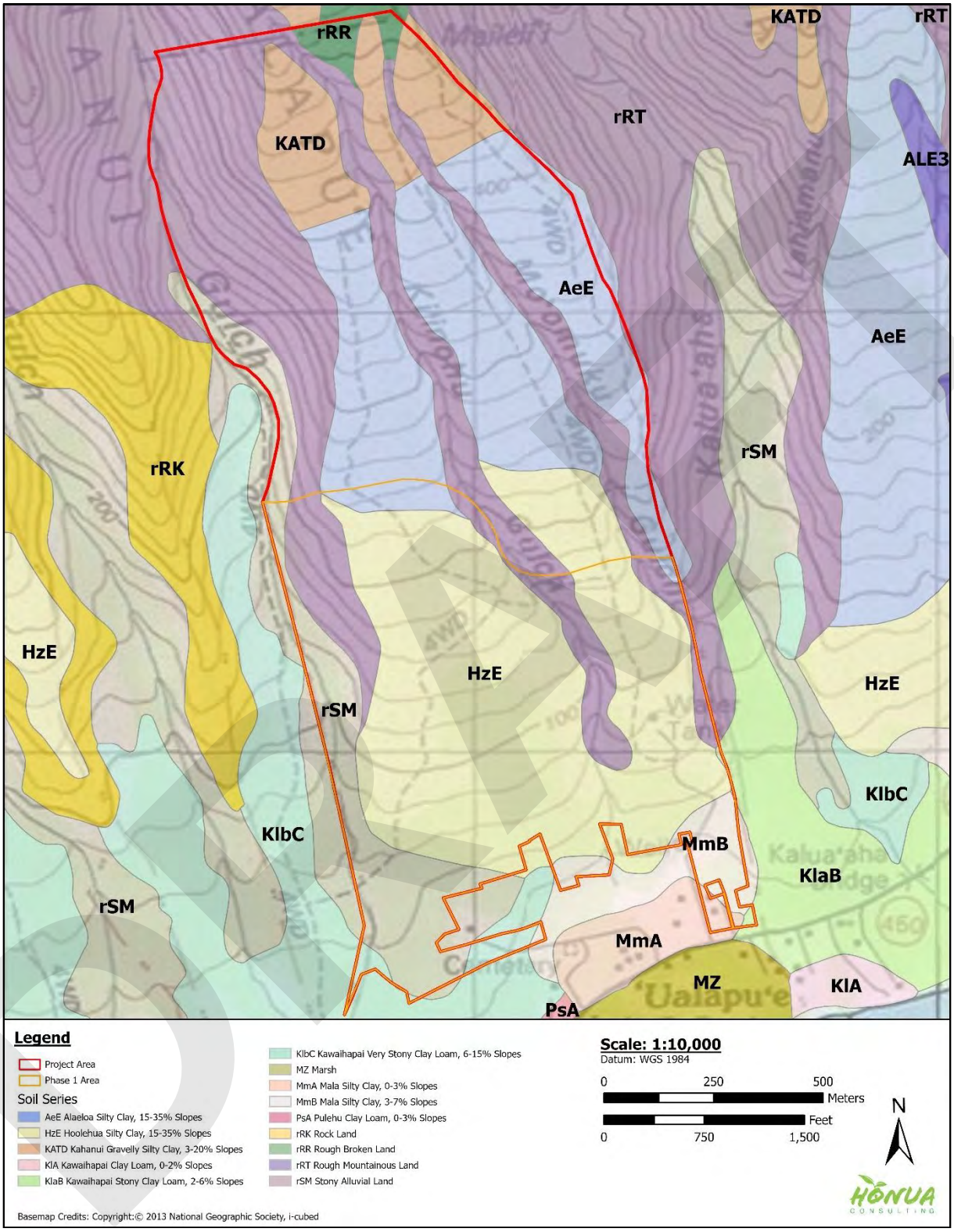


Figure 4. Soil series overlay showing previously-documented soils in the project area and phase 1 area (Foote et al. 1972)

Section 2 Traditional and Historical Context

Archival research included reference to resources from the State Historic Preservation Division (SHPD) library in Kapolei and the Honua Consulting library and database. On-line materials consulted included Ulukau Hawaiian Electronic Database (www.ulukau.com), Papakilo Database (www.papakilodatabase.com), Hawai‘i State Library (http://www.librarieshawaii.org/Serials/databases.html) and Waihona ‘Aina database (http://www.waihona.com). Hawaiian terms and place names were translated using the on-line Hawaiian Dictionary (Nā Puke Wehewehe ‘Ōlelo Hawai‘i, www.wehewehe.com), Soehren (n.d.) and *Place Names of Hawaii* (Pukui et al. 1974). Historic maps were obtained from the Hawai‘i State Archives, Hawai‘i Land Survey Division website (http://ags.hawaii.gov/survey/map-search/) and UH-Mānoa Maps, Aerial Photographs and GIS (MAGIS) website (http://guides.library.manoa.hawaii.edu/magis). Maps were geo-referenced using ArcGIS Pro desktop.

The following is a brief summary of the traditional and historical context of the project area with a focus on land tenure, land use and historical events and mo‘olelo (oral-historical information) in ‘Ualapu’e Ahupua’a.

2.1 Hawaiian Cultural Landscape

In pre-contact times (pre-1778) the valleys on the southeastern coast of Moloka‘i had a substantial Hawaiian population following a traditional, subsistence lifestyle. This general conclusion is based on the large number of fishponds along the coastline, numerous heiau (traditional places of worship) at commanding locations along the coast and on ridgelines leading up into the mountains, the relatively abundant, narrow ahupua‘a in the area (implying a relative abundance of food resources) and relatively dense clustering of kuleana parcels (Land Commission Awards [LCAs]) along the coast.

This part of Moloka‘i has numerous stream valleys that allowed for rain-fed agriculture in the uplands and irrigated agriculture along the coastal plain, as well as an extensive fringing reef that provided abundant marine resources. Finally, the coastline at this part of Moloka‘i was intensively used for constructing fish traps and large walled fishponds. Based on the distribution of mid-nineteenth century LCAs in the area, the main settlement area was along the coastline of ‘Ualapu‘e with lo‘i (pond fields) and kula (pasture) lands exending back mauka (inland) along Kahananui Stream to the back of the valley. Two heiau, known as Kalauonākukui and Kalauonōkukui Heiau, are located along the ahupua‘a boundary with Kahananui, a common location for heiau in this area. The numerous heiau in the area indicate it was a chiefly power center with a large Hawaiian population, social stratification and a division of labor.

2.1.1 Mo‘olelo

The early history of Hawai‘i is told through mo‘olelo recorded in Hawaiian newspapers and by native and foreign commentators in the nineteenth and early twentieth centuries. Mo‘olelo convey various types of cultural information and include descriptions of places and place names, chiefly lineages, legends, important people and events aspects of the natural and cultural landscape, and so on.

ʻUalapuʻe is mentioned mainly in reference to the Kahua Maika of Kaʻakeke, a famous ʻulu maika course and gathering place of chiefs thought to be located south of the coastal roadway along the end portion of Kahananui Stream. The place was well known even in the early historic period and was reportedly visited by Kamehameha in 1812. The course was supposedly abandoned after people and livestock had been poisoned by a nearby spring (Summers 1971). Kamakau (1991:130) explains that ". . . the stump of one [forbidden or kapu] tree was left by the spring at the *maika* ground of Kaʻakeke . . . hence that spring at ʻUalapuʻe was filled in." No sign of the course has been documented and its true location and orientation are uncertain.

ʻUalapuʻe is also briefly mentioned in the Legend of Kūapākaʻa, also known as the Wind Gourd of Laʻamaomao. The story follows Pākaʻa and his son Kūapākaʻa, the descendents of Laʻamaomao, as they fight to regain Pākaʻaʻs title in the royal court of Hawaiʻi Island with the help of the wind gourd containing the remains of Laʻamaomao. ʻUalapuʻe is briefly mentioned in the Nakuina (1991:56-57) version of the story when Kūapākaʻa calls upon the winds of Molokaʻi and names Makaolehua as the wind of ʻUalapuʻe:

ʻĒkahanui is of Kamalō,
Akani is of Wāwāʻia
Pōhākupukupu is of Kaʻamola,
Heakai is of Kalaeloa,
Makaolehua is of ʻUalapuʻe
Kipukaholo is of Kauaʻaha,
Waikōloa is of Mapulehu...

In the Fornander (1918:99-100) version of the story, ʻUalapuʻe is mentioned shortly before the naming of the Molokaʻi and Maui winds in a chant about the natural coastal environment of Molokaʻi:

Gently! Gently! Gently!	Kiauau! Kiauau! Kiauau!
Hasten this way, hasten that way,	E au mai, e au aku,
The ocean is like a wreath around your neck.	E lei ka moana,
The heaven is cloudless,	Kalaihi ka lani,
The earth is in distress,	Kupilikii ka Honua,
The month is Kalo-pau.	Kalo-pau ka malama,
Up comes lepe, down sits lepe.	Ku ana lepe, noho ana lepe,
The iwa bird is in the sky, it is a windy day.	Kau ka iwa he la makani,
The rain falls, the water runs.	U ka ua, kahe ka wai.
The shrimps are coming up, the sea-caves are exposed.	Pii ka opae, ku ka halelo,
Where the sea is foamy, there the moi dwell;	Ehuehu kai, noho ka moi,
Where the sea is rough, the mullet spawn.	Ki kai hua ka anae.
When the sea is at low tide, the squids are speared,	Maloo kai o na hee,
The ina are gathered, the wana are hooked up.	Kui ka ina, lou ka wana,
The turtles come up to breathe on a windy day.	Puha ka honu i ka makani.
Where the sea is not clear, there the manini live,	Aeae kai noho ka manini,
Where the shoals are rocky, the uoa turn over;	Puupuu ke a kahuli ka uoa,
Where the sea is blue, the sharks dwell;	Uliuli kai holo ka mano,
Where the feeding ground is deep, the kahala grows thin;	Moana koa hi kahala,

Where the kukui-nu is spat on, the sea is smooth,	Pupuhi ke kukui malino ke kai,
The uhu are caught;	Kaka ka ia o ka uhu;
Caught by those in front, by Mumu, by Wawa.	A loaa ia mua, o mumu, o wawa,
As it falls down, the rain leaves holes,	Haule iho, he malua ka ua,
The wind doubles over,	He pelu ka makani,
The beach at Kaunakahakai is marshy,	Haualialia Kaunakahakai,
The scent of Kawela is strong,	He ihu hanu ko Kawela,
The sound is deafening,	Kania wawa i kupukupu,
As you paddle to destruction at the point of Lehua,	Hoe make i ka lae o Lehua,
Ualapue, Kaluaaha, Molokai.	Ualapue, Kaluaaha, Molokai.

2.1.2 Inoa ʻĀina (Place Names) of ʻUalapuʻe

ʻUalapuʻe literally translates "hilled sweet potatoes" (Pukui et al. 1974:214), possibly in reference to the fertile lands of this area of coastline, which were well known for growing sweet potatoes (Lorrins 1922:671).

Many other place names are known in historical records and maps for ʻUalapuʻe. Most inoa ʻāina for ʻUalapuʻe refer to ʻili associated with kuleana parcels (Land Commission Awards [LCAs]) and people associated with them from the mid-nineteenth century land reform process known as the Māhele. The names of people connected to this ʻāina is a significant part of the ʻUalapuʻe story.

Table 1 is a listing of places names for ʻUalapuʻe.

Table 1. Inoa ʻĀina (Place Names) in ʻUalapuʻe Ahupuaʻa

Inoa ʻĀina	Description[1]
ʻAiʻīlio	ʻIli associated w. LCA 9102 to Kaauhaukini; "dog eating"
Halemahana	3.3-acre fishpond (loko kuapa type) used commericially as late as 1901 (Summers 1971:121)
Hoʻokupualiʻi	ʻIli associated w. LCA 3821 to Puupuu; "chiefly tribute"
Huahuaʻi	ʻIli associated w. LCA 4194 to Kuluwaimaka; "to boil up, as water in a spring"
ʻĪnaʻimanu	ʻIli associated w. LCA 3678 to Muolo
Kaʻakaulua or Kaʻākaulua	ʻIli mentioned in LCA 3678 to Muolo; Pukui et al. (1974:59) interpret Kaʻakaulua as "rolling side-by-side"; they translate Kaʻākaulua as "the double north *or* [the] double right"
Kaʻakeke	ʻIli and kahua maika (maika course) associated w. LCA 4618 to Pohuehue (Summers 1971:121)
Kaʻepa	ʻIli associated w. LCA 3823 to Pala; "the trickster"
Kalauonākukui	Heiau, at western boundary of ʻUalapue (Summers 1971:119); *and* ʻili associated w. LCA 3821 to Puupuu; "the multitudes of lights"
Kalawaha	ʻIli associated w. LCA 4192 to Kaheaka
Kaloko	ʻIli associated w. LCA 3975 to Hulihae; "the pond"
Kamāpuna	ʻIli associated w. LCA 3793C to Paele; "bubbling spring"
Kamohoaliʻi	ʻIli associated w. LCA 4078 to Kaheiau; "the chiefly chosen one"

Inoa ʻĀina	Description[1]
Kaniuelua	ʻIli associated w. LCA 4204 to Ku; "the double coconut"
Kaukeanu	ʻIli associated w. LCA 3975 to Hulihee
Kaulukukui	ʻIli associated w. LCA 4170 to Kaupe; "the candlenut tree grove"
Kekalawa	ʻIli associated w. LCA 3823 to Pala
Kenolu	ʻIli associated w. LCA 3823 to Pala; "boggy"
Kiʻinolu Gulch	Stream, begins at 1750 ft elevation and ends near the shoreline
Kīlau	Puʻu (hill), on boundary of ʻUalapuʻe / Kaluaʻaha / Wailau ahupuaʻa on rim of Wailau Valley at 4080 ft elevation; Pukui et al. (1974:111) state "probably named for a fern" on Molokaʻi
Kilohana	Place, possibly a peak at corner of Kahananui / ʻUalapuʻe ahupuaʻa boundary at 3800 ft elevation; "lookout point"
Kuaimamaki	ʻIli associated w. LCA 3966 to Hanakahi
Kūlani	ʻIli associated w. LCA 4177 to Kualualu; "like heaven"
Kumunui	ʻIli associated w. LCA 3837 to Paele
Kupa / Makupa	ʻIli associated w. LCA 3792 to Koenakaia
Loʻipūnāwai	ʻIli associated w. LCA 5147 to Kaiu; "spring pond"
Maii	ʻIli associated w. LCA 3982 to Hilo
Maileliʻi	Point along boundary of ʻUalapuʻe / Kaluaʻaha ahupuaʻa at 1650 ft elevation
Makalihua	Point along boundary of ʻUalapuʻe / Kaluaʻaha ahupuaʻa at 2295 ft elevation
Moho	ʻIli associated w. LCA 3916 to Nahoaai
Moʻoiki	ʻIli associated w. LCA 4209 to Kauhikoakoa
Moʻokahi	ʻIli associated w. LCA 3792B to Paele
Moʻomuku	Gulch or stream, which begins at 1700 ft elevation and ends at 50 ft elevation, *and* ʻili associated w. LCA 3792D to Kawelo; "cut off land section"
Nāloʻiekolua	ʻIli associated w. LCA 4069 to Kuihewa; "the three taro patches"
Nāniuelua	ʻIli associated w. LCA 4204 to Ku; "the two coconut trees"
Naulu	ʻIli associated w. LCA 4078 to Kaheiau
Pōhakumāʻuleʻule	ʻIli associated w. LCA 8105 to Hakuole
Pūkoʻo	Former post office location; "support hill"
Puʻu Hānau	ʻIli associated w. LCA 3840 to Paaluhi
Puʻu Kuha or Pukuha	ʻIli associated w. LCA 3666 to Kaule
Puʻu Kuhe	Heiau, reported to be in ʻUalapuʻe ahupuaʻa but not found by Stokes
ʻUalapuʻe	Ahupuaʻa and village, crown lands returned by Kekauʻōnohi in the Māhele and a small community formerly served by the Pūkoʻo Post Office, meaning "hilled sweet potatoes" (Lorrins 1922:671) *and* fishpond, 22.25-acre loko kuapa, only 15 acres visible in 1957 (Summers 1971:121)

[1] ʻIli are smaller land divisions within ahupuaʻa; unless indicated (and cited) otherwise, information in this table is from Soehren (n.d.)

2.1.3 Fishponds of Molokaʻi and ʻUalapuʻe

Molokaʻi has the most fishponds of any island in the archipelago with over 60 documented along its extensive, south-coast fringing reef (Cobb 1902). Fishponds played an important role in Hawaiian society not only for food production but also as political tools and status symbols of the high chiefs. Two walled fishponds (loko kuapā) are along the coast at ʻUalapuʻe: Halemahana and ʻUalapuʻe. Both of these were considered chiefly ponds owned and leased by the Hawaiian and Territorial governments. Fishponds are generally thought to have a chiefly association due to the labor required in their construction; however, certain types of fishponds were also utilized by the makaʻāinana. Five types of fishponds (following Apple and Kikuchi, see below) are recognized in Hawaiʻi: Types I, II and III were owned exclusively by the ruling chiefs and managed by the kia'i loko (pond caretaker) and the konohiki (local overseer). Types IV and V were accessible to the makaʻāinana but always at the discretion of the konohiki and ruling chiefs.

Type I: Loko Kuapā. This is a fishpond whose main characteristic is a seawall (kuapā, often shorted to pā) as its artificial enclosing feature and which in most cases contains at least one sluice grate (makahā).

Type II: Loko Puʻuone. Also called loko hakuʻone, this is an isolated shore fishpond usually formed by the development of a barrier beach building a single, elongated sand ridge (puʻone or hakuʻone) parallel to the coast.

Type III: Loko Wai. This is a fishpond located inland from the shore and whose main characteristic is that it is of fresh water.

Type IV: Loko iʻa kalo. Also called loko loʻi kalo, this is a fishpond which utilized an irrigated taro plot. Fish were grown in the waters which flowed among earth mounds planted with taro corms. The pond could be owned exclusively by a high chief with products exclusively his.

Type V: Loko ʻumeʻiki. Similar in shape and construction to Type I loko kuapā, the loko ʻumeʻiki is a fishtrap characterized by the presence of numerous stone-flanked lanes which led fish into netting areas with the ebb and flow of the tide. In those loko ʻumeʻiki assigned to commoners, women were sometimes permitted to net.

According to McElroy et al.'s (2021:12) draft Cultural Impact Assessment (CIA) of the current proposed project and project area, "[t]he southeastern coast [of Molokaʻi] . . . contains 80% of the island's fishponds, illustrating the importance of marine resources to populations residing in this region."

Referring specifically to the fishponds of ʻUalapuʻe Ahupuaʻa, McElroy et al. state that ". . . the main ʻUalapuʻe Pond (Site 185) . . . had freshwater springs favored by mullet and clams" and that Halemahana Fishpond was filled in some years ago (ibid.). Summers' (1971) compilation of sites and wahi pana (legendary places) of Molokaʻi, cited a 1902 account by one Kahaulelio describing ʻUalapuʻe as one of the ponds that was noted for the "fatness" of its mullet in the nineteenth century.

2.2 Historical Background

2.2.1 Overview

Molokaʻi in the late eighteenth century experienced major changes resulting from its being conquered—along with Maui and Lānaʻi—by Kamehameha's forces in their efforts to establish hegemony over the entire Hawaiian archipelago. Following Kamehameha's death and the collapse of the kapu system in 1819, the door was opened for missionaries to establish mission stations throughout the islands. The influx of westerners and Asians to Hawaiʻi after 1820 introduced diseases and eventually led to private property ownership through the legal and administrative process known as the Māhele. The introduction of ungulates to the island in the mid-nineteenth century and the drilling of artesian wells and diversion of water for plantation agriculture in the late nineteenth century led to the destruction of native forests and the drying up of its water resources. All of these factors led to a sharp decline in the Hawaiian population over the nineteenth century. Starting in the early twentieth century, attempts were made to resettle Hawaiians back on the land through the establishment of the Department of Hawaiian Homelands (DHHL) and the awarding of homestead lots, which had the effect of increasing the Hawaiian population of the island after years of decline. Throughout the twentieth century, land use has focused mainly on commercial ranching and agriculture, and the island has remained relatively rural and undeveloped. More recently, steps have been taken to revitilize the island by increasing sustainablilty, managing the islands' ungulate population and protecting native watersheds and plant communities.

2.2.2 ʻUalapuʻe in the Early Post-Contact Period

Our research did not yield any specific information about ʻUalapuʻe—neither in historical accounts nor moʻolelo—from the early post-contact (post-1778) period. However, moʻolelo from neighboring Kaluaʻaha Ahupuaʻa indicates that, when Molokaʻi was conquered in 1794, Kamehameha set up a portion of his retinue from Hawaiʻi Island in the area. It is said that the local people eventually grew tired of the constant demands of the occupiers and a plan was made to poison their sweet potato with the ʻauhuhu, also known as the Hawaiian fish poisoning plant. A feast was called by Kamehameha and it was used as the perfect opportunity to poison them, as they ate sweet potato and the locals ate poi. This led to the posioning of all of the Hawaiʻi islanders except for one who was spared to tell Kamehameha of their fate. Following their expulsion, the Molokaʻi chiefs regained control of their land and moved back into the area (Summers 1971:123-124).

The initial descriptions of the people and population of Molokaʻi, and the surrounding area, come mostly from missionary accounts and reports. The first mission station on Molokaʻi was established in nearby Kaluaʻaha Ahupuaʻa in 1832 by the Reverend Harvey Rexford Hitchcock. Records indicate that church membership was over 600 in 1836 and over 1,000 by 1843, which gives some idea of the population of the area. Three iterations of the church were constructed early on; the church as it stands today was built in 1844 but has had several alterations since that time (Jacobsen and Wright 1974). Church membership, as well as the overall population of the area, began to decline over the latter half of the nineteenth century due in part to the introduction of western concepts of land ownership known as the Māhele ʻĀina.

2.2.3 The Māhele ʻĀina (ca. 1847-1855)

Between 1847 and 1855, the lands of Hawaiʻi were divided under the Māhele. Prior to western contact, all land in the Hawaiian Islands was held by the chiefs as descendants of the gods—no one owned the land. After western contact, following Hawaiian traditions, some foreigners were granted gifts of land for services to Kamehameha I and/or his heirs or close associates. With a growing number of foreigners arriving and establishing businesses and/or mission stations, many petitioned for fee-simple title to land upon which they lived or worked.

In 1848, under pressure from both malihini (foreigners) and kamaʻāina (native born) to take decisive action after a few decades of chaos with respect to land ownership and control, Kauikeaouli (Kamehameha III) agreed to the Māhele ʻĀina. This legal and administrative process defined the land interests of the King, some two hundred and fifty-two high-ranking Aliʻi and Konohiki (including several foreigners who had been befriended by members of the Kamehameha line) and the Government. As a result of the Māhele, all lands in the Kingdom of Hawaiʻi and associated fisheries came to be placed in one of three categories: (1) Crown lands (for the occupant of the throne), (2) Government lands, and (3) Konohiki lands.

In an attempt to specifically protect the rights of makaʻāinana (commoners), the "Enabling," or "Kuleana Act," of 1849 further defined a process by which hoaʻāina (native tenants) could apply for, and be granted, fee-simple interest in "Kuleana" lands (Kamakau 1961:403-405). The Kuleana Act reconfirmed the rights of hoaʻāina to access, subsistence and collection of resources from mountains to the sea, which were necessary to sustain life within their ahupuaʻa. Though not specifically stated in this Act, the rights of piscary (to fisheries and fishing) had already been granted and were protected by earlier Kingdom laws.

Numerous Land Commission Awards (LCA) were awarded to natives of ʻUalapuʻe who actively lived on and worked their lands; and who could provide testimony and sworn witnesses to prove ownership. LCA documents typically contain information on land boundaries and names of abutting neighbors, land uses and natural and cultivated resources. Patterns of LCA location also generally indicate where the best lands were for subsistence agriculture and settlement. Over 30 LCAs were awarded in ʻUalapuʻe Ahupuaʻa in the lower flatlands around and near ʻUalapuʻe Fishpond, and along the coast in general; these LCA consist of loʻi kalo (irrigated taro fields), kula lands and a few house lots.

No LCAs were awarded in the current project area. The remainder of the ahupuaʻa, including the current project area, was initially retained by the Crown for an initial payment of $50 by Kamehameha III in 1847 (see Appendix A).

Table 2 is a summary of all LCAs awarded in ʻUalapuʻe Ahupuaʻa.

Starting around 1846 Land Grants (LG) were established which made it possible to purchase property from the Government rather than going through the Land Commission process. No LGs were purchased in ʻUalapuʻe at this time, but several were awarded later in the mid-1890s and early 1920s (see below).

Table 2. Land Commission Awards in ʻUalapuʻe Ahupuaʻa

LCA #	Claimant	ʻIli	Land Utilization
3666, ʻāpana 1 & 2	Kaule	Puʻu Kuha/Pukuha	Kalo & kula land
3678, ʻāpana 1 & 2	Muolo	ʻĪnaʻimanu & Kaʻakaulua	Kalo & kula land
3791	Oopa	--	--
3792	Koenakaia	Kupa/Makupa	Loʻi
3792B	Paele 2	Moʻokahi	Kalo & kula land
3792C	Paele 1	--	Kalo & kula land
3792D	Kawelo	--	Kalo & kula land, 1 house lot
3793C ʻāpana 2	Paele 3	Kamāpuna	Kalo (possibly not awarded)
3821	Puupuu	Hoʻokupualiʻi & Kalauonākukui	Fenced house lot
3823, ʻāpana 1 & 2	Pala	Kekalawa & Kenolu	Kalo & kula land
3837	Paele	Kumunui	Kalo & kula land
3840, ʻāpana 1, 2 & 3	Paaluhi	Puʻu Hānau/Puhanau	Kalo & kula land
3916, ʻāpana 1, 2 & 3	Nahoaai	Moho	Kalo & kula land
3966, ʻāpana 1, 2, 3 & 4	Hanakahi	Kuaimamaki	Kalo & kula land
3975, ʻāpana 1 & 2	Hulahee/Hulahae	Kaloko & Kaukeanu	Kalo & kula land
3982, ʻāpana 1 & 2	Hilo	Maii	Loʻi & kula land
4069, ʻāpana 1 & 2	Kuihewa	Nāloʻiekolua	Kalo & kula land
4078 ʻāpana 1, 2 & 3	Kaheiau	Kamohoaliʻi & Naulu	Kalo & kula land
4098	Kana	Hoʻokupualiʻi	House lot
4170, ʻāpana 1 & 2	Kuihewa/Kaupe	Kaulukukui	3 loʻi & kula land
4177, ʻāpana 1, 2, 3 & 4	Kualualu	Kūlani	Loʻi & kula lands
4192, ʻāpana 1 & 2	Kaheaku	Kalawaha	Kalo & kula land
4194, ʻāpana 1 & 2	Kaluwaimaka	Huahuaʻi	Kalo & kula land
4196	Keanui	--	Kula land
4204, ʻāpana 1, 2 & 3	Ku	Kāniuelua/Nāniuelua	Kalo & kula land, 1 house lot
4209, ʻāpana 1 & 2	Kauhikoakoa	Moʻoiki	Kalo & kula land
4618, ʻāpana 1 & 3	Pohuehue	--	Loʻi
5147, ʻāpana 1, 2 & 3	Kaiu	Paukeanu & Loʻipūnāwai	Loʻi & pūnāwai (spring)
5184	Kekuhe	Naonokakai?	Kalo land
6516, ʻāpana 1, 2 & 5	Wailiili	Kalauonākukui	Kalo & kula land
8105, ʻāpana 1, 2 & 3	Hakuole	Pōhakumāʻuleʻule	Kalo & kula land
9102 ʻāpana 1 & 2	Kaauhaukini	ʻAiʻīlio/Loʻipūnāwai	Kalo & kula land
10505	Kaholowaʻa	Puʻuhuka or Loʻipūnāwai	House lot

2.2.4 Mid to Late 19th Century Development of ʻUalapuʻe

The fishponds and non-kuleana lands at ʻUalapuʻe were retained by the crown through 1856. It was noted that the kapu fish for the ahupuaʻa during that time period was the ʻanae (mullet). In 1855, a hui (group) of Hawaiians at ʻUalapuʻe represented by Kamaipelekane made an offer to William Webster of the Hawaiian Government to lease the Crown lands for 10 years at a price of $300. In 1856, the lands were then leased to Paele and Kaholowaʻa, two luna (managers) representing the hui at ʻUalapuʻe. The leased lands included the ahupuaʻa of ʻUalapuʻe except for ʻUalapuʻe fishpond, a quarter-acre hale waʻa (canoe shelter area), 10 loʻi kalo patches worked by Kuewa, Kahoʻohalahala and Pukua, and all previously-awarded LCA. In 1857, three additional luna were appointed to act in conjunction with the two other luna. In 1859, Kaholowaʻa paid $250 in rent on the lease via Paul Nahaolelua. In 1865, Kaholowaʻa traveled to Honolulu to convey the land to his son in order to pay off the remaining lease balance and paid $43 in rent toward the lease. However, rent was still owed on the Crown lands lease and a large sum of rent money was owed for the lease of ʻUalapuʻe Fishpond based on a lease agreement made by Kaholowaʻa for the pond in 1857 at a price of 75 dollars per annum for 9 years. At this time Paul Nahaolelua petitioned Judge Owen Dominis to bring legal preceedings for dilinquent lease rent against Kaholowaʻa and the hui. It is not known whether legal action was actually taken against them and the outcome of any legal proceedings, if any, are unclear.

Land ownership was a new concept to Hawaiians and legal proceedings for delinquent rent and foreclosure were common in the decades following the Māhele ʻĀina. These types of legal actions, coupled with the effects of introduced diseases, displaced native Hawaiians and helped fuel the decline of the native population of Molokaʻi. At the same time there was a growing movement to fence off land areas and control access to resources which native tenants had traditionally been allowed to use. By the 1860s, foreign landowners and business interests petitioned the Crown to have the boundaries of their respective lands—which were the foundation of plantation and ranching interests—settled once and for all. In 1862, the King appointed a Commission of Boundaries, a.k.a., the Boundary Commission, whose task was to collect traditional knowledge of place, pertaining to land boundaries and customary practices, and to determine the most equitable boundaries of each ahupuaʻa that had been awarded to aliʻi, konohiki and foreigners during the Māhele. The commission proceedings were conducted under the courts and as formal actions under the law. As the commissioners on the various islands undertook their work, the Kingdom hired or contracted surveyors to begin the surveys, and in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them (Thrum 1891:117-118). [2]

Notably, the first cases of leprosy were documented in the islands in 1853, which led to the establishment of the now-famous leper colony on the Kalaupapa peninsula in 1866. Prior to that time, residents of Kalaupapa grew sweet potatoes in large amounts to provision ships leaving the islands. Land tenure at Kalaupapa, although seemingly unrelated, has importance in the later development of ʻUalapuʻe Ahupuaʻa at the end of the century (see below).

Several lease offers were made regarding the ʻUalapuʻe Crown lands in 1873 including: one from E.C. Fountain of $300 per annum for a period of five years, a request by Paul Nahaolelua to lease the land and fishpond to Niki and a request from the Governor of Maui to the Governor of

[2] W.D. Alexander in Thrum's Hawaiian Annual, 1891:117–118

Oʻahu to lease the land to Kupihea for $300 per annum for a period of 10 years. A report from Paul Nahaolelua in late 1873 indicates that Halualani et al. paid $126.75 toward rental of the land (see Appendix A).

No information was found regarding the property for the remainder of the 1870s and the 1880s. It has been posited that Princess Poʻomaikelani may have purchased the property, or attempted to do so, during this time period. However, no evidence was found to support that claim and it does not match with previous and later lease use of the property by the Hawaiian Kingdom, Provisional and Territorial governments.

The ahupuaʻa of ʻUalapuʻe was surveyed for the Boundary Commission by M.D. Monsarrat in 1890 (and certified in 1894); the resulting map (Figure 5) represents the first depiction of ʻUalapuʻe Ahupuaʻa. Monsarrat's map shows a section of large LCAs in the adjacent ahupuaʻa to the east (Kaluaʻaha) along its boundary with the project area.

In 1894, J.F Brown created a map of the lower coastal portion of ʻUalapuʻe showing the two fishponds (and other fishponds to the east and west of ʻUalapuʻe) and the locations of various LCAs, Land Grants and 22 lots known as the ʻUalapuʻe Homestead Lots (Figure 6). The ʻUalapuʻe Homestead Lots were established by the provisional government to accomodate residents relocated from Kalaupapa via land swaps and land grants. The lots each consisted of a house lot with an associated loʻi kalo patch located in the taro lands around ʻUalapuʻe Fishpond. Lots 1 and 2 were located in the southeastern corner of the current project area. In 1895, at least seven of the lots (#s 5, 6, 7, 8, 11, 13, and 20) were transferred as Land Grants (Table 3).

Table 3. Land Grants Associated with ʻUalapuʻe Homestead Lots in 1895

Land Grant	Claimant	Lot No.	Acreage
3793	Uilama	13	2.31
3794	Lono	11	2.18
3795	Aimoku	7	1.85
3796	Kawelo	5	2.47
3797	Joseph I. Keoki	6	1.91
3798	Kaulakupaʻa	8	2.33
3799	Simon Kahalehulu	20	1.18

In late 1894, the Crown lands, including the project area, were leased to H.R. Hitchcock on a 5 to 10 year lease at $75 dollars per annum. His father, H.R. Hitchcock, Sr., had purchased the neighboring ahupuaʻa of Kaluaʻaha in 1850 for $439 as Land Grant 474 and the lease was likely purchased to expand their land holdings. It is not known whether the lease agreement was for 5 years or 10 years but an application for the lease with an upset price of $110 was submitted by J. Kahue and the hui of ʻUalapuʻe in 1899 indicating it may have only been five years. The hui was verbally informed that the property had already been leased to Hitchcock under Lease #519. It is likely that the lease ended in 1904, and a letter was sent from the Commissioner of Public Lands to the Governor in relation to rent due on the land by Hitchcock & Meyer.

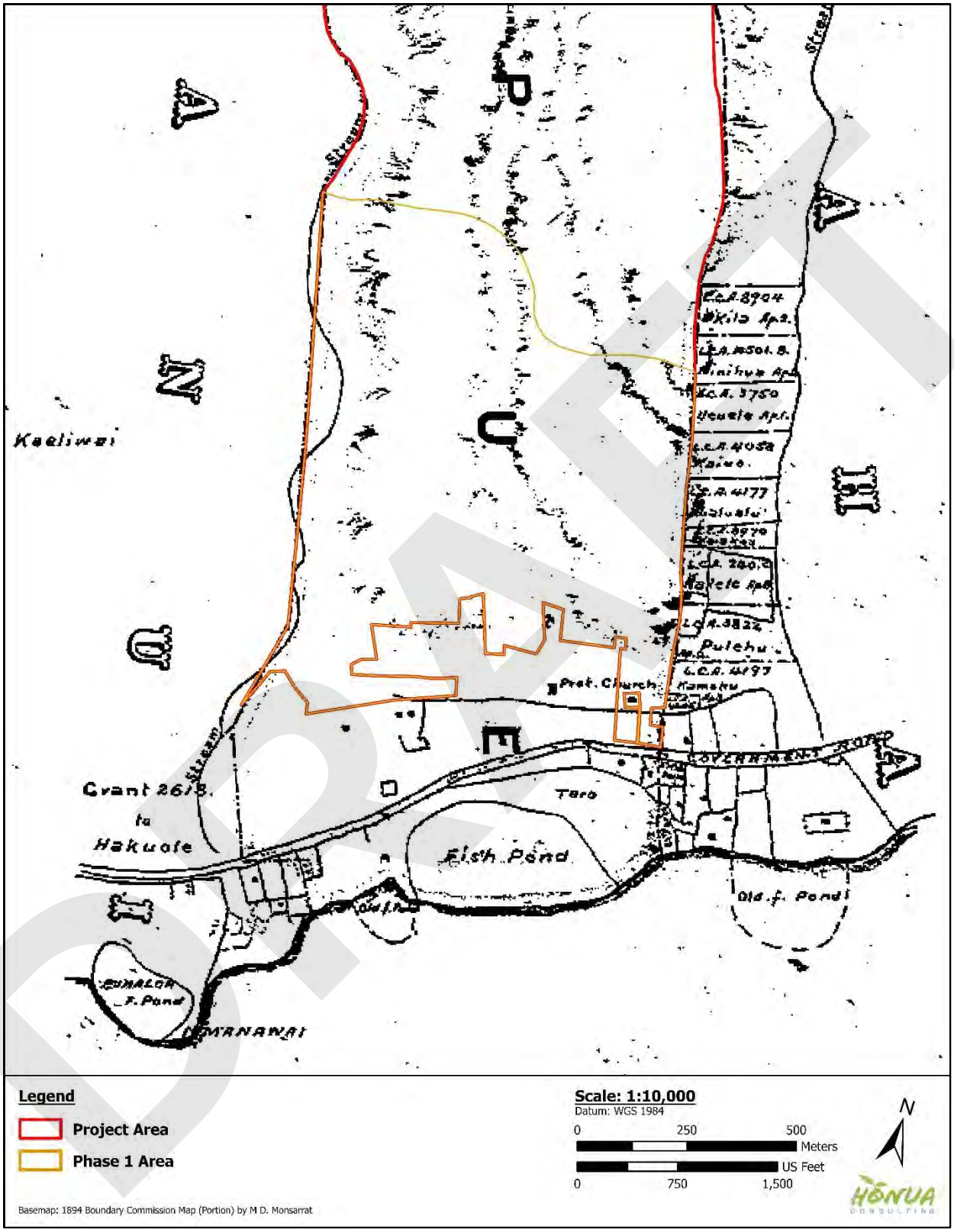


Figure 5. Portion of Boundary Commission map (Monsarrat 1894) of ʻUalapuʻe showing the project area and coast

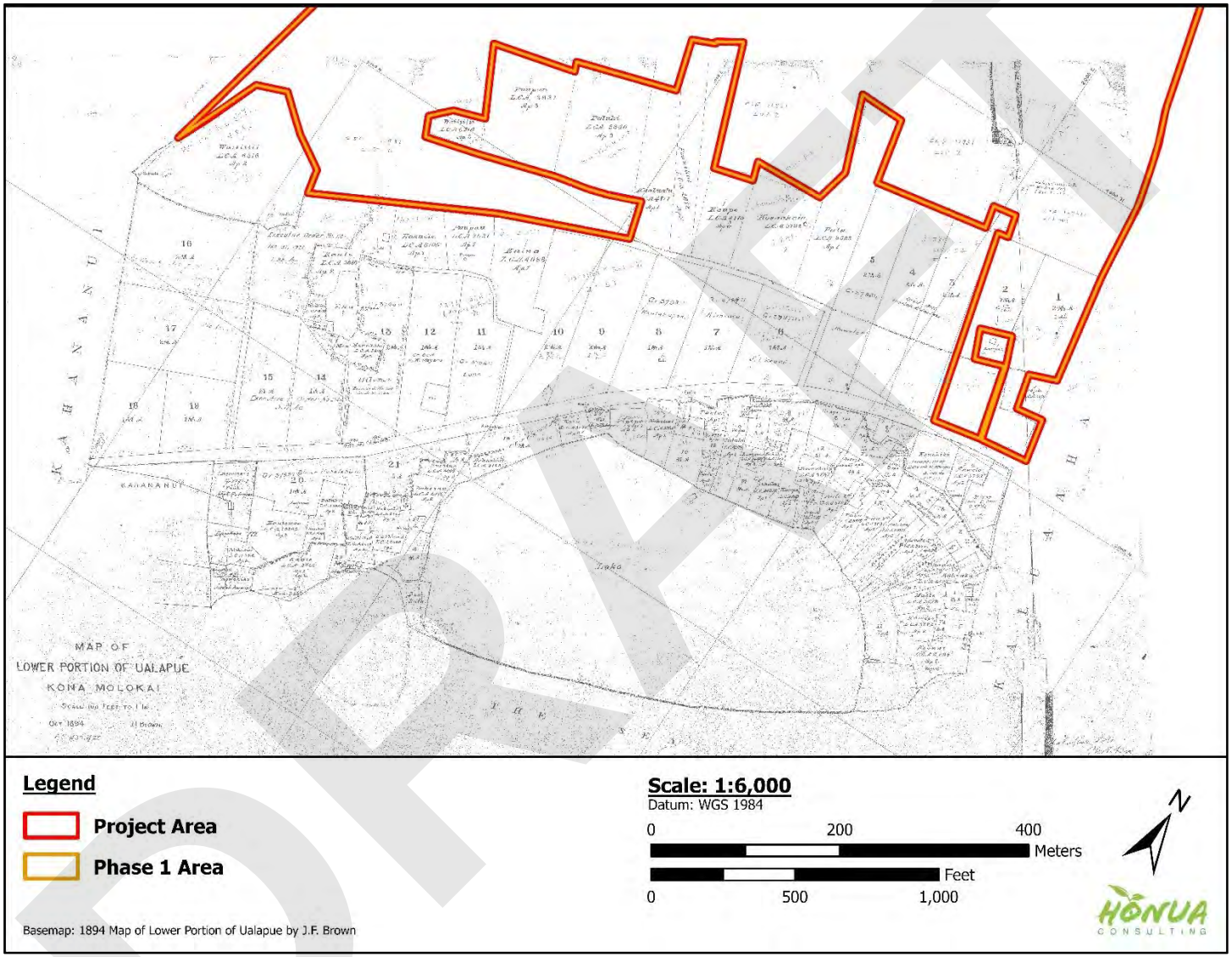


Figure 6. Map by J.F Brown map dated 1894 of makai portion of ʻUalapuʻe showing project area in relation to the numerous coastal LCA awarded during the Māhele (Brown 1894, Registered Map 1773)

2.2.5 20th Century Development of ‘Ualapu‘e

Although the population had declined at the close of the nineteenth century, people were still making a living in communities on the eastern third of the island. Early maps of the area show the extent of development within and surrounding ‘Ualapu’e Ahupua’a and numerous heiau and fishponds along the coastline (Figure 7 and Figure 8). Due to its central location, ‘Ualapu‘e was chosen as the county seat and steps were taken to expand its community infrastructure. The first of these steps included setting aside Lots 16, 17, 18 and 19 of the ‘Ualapu’e Homestead Lots for the site of the Ualapue Hospital in 1910.[3] Lots 14 and 15 were set aside for the site of Ualapue Park, a public park and playground in 1921.[4] An additional parcel was added adjoining the north side of the park in 1922.[5] A final addition to the park was deeded from the Bishop Trust Co. to the Territory of Hawai’i on February 26, 1923, and it was added a month later.[6] The Ualapue Hospital was constructed in 1928 and operated as the county hospital of Moloka‘i for seven years. The last area to be set aside was a 2-acre plot for the Ualapue Cemetery in 1930.[7]

In the early 1920s, Prince Kūhiō Kalaniana‘ole developed a plan to resettle Hawaiians back on the land, which eventually led to the passing of the Hawaiian Homes Commission Act by the United States Congress in 1921. The act set up a commission and provided the capital, land and a basic plan of action for resettlement. Homesteaders were first settled on the coastal flats of lower Kalama’ula and later Ho’olehua. Several land grants were established in ‘Ualapu’e during this time and included Homestead Lots 3, 4 and 12 and several parcels of land along the makai side of the government road. It is likely that the addition of new residents to the area helped facilitate the need for a community park and cemetery. Table 4 is a list of land grants awarded in coastal ‘Ualapu‘e during this time.

Table 4. Listing of Land Grants awarded in ‘Ualapu‘e ahupua‘a in the 1920s

Land Grant	Claimant	Lot No.	Acreage
8190	Edward Kaupu	--	0.48
8209	E.K. Meyers	12	2.2
8421	Joseph Kapuni	--	--
8447	John Rodrigues	--	--
9239	Louis B. Bens	--	0.55
13046	Elizabeth H. Iaea	--	4.82

It is possible that Lots 1 and 2 of the ‘Ualapu’e Lots, part of the current project area, were leased around this same time. It is not known when his lease began but James K. Poaha was the lease holder of the two lots under Homestead Lease #56 in 1937. The Crown lands portion of ‘Ualapu‘e were leased out to Makakoa K. Kaauwai, during the 1930s under general lease 1685

[3] Executive Order 1, November 10, 1910
[4] Executive Order 94, April 2, 1921
[5] Executive Order 118, Parcel 1, January 31, 1922
[6] Executive Order 138, March 21, 1923
[7] Executive Order 533, 1930

which expired on January 1, 1940. The duration of the lease term is unknown but based on previous documentation it is likely that the lease agreement was for a period of 5 or 10 years.

In 1935, the admininstrative center of the island was moved from ʻUalapuʻe to Kaunakakai, likely due to its more central location and good harbor; this process included the physical re-location of the adminstrative buildings and courthouse to Kaunakakai. The operations of the county hospital also moved to Kaunakakai and the former Ualapue Hospital became the Kilohana School under the direction of Albert U. Inaba.[8]

A water pumping station, a water pipeline right of way and water distribution tanks with an associated road were constructed in the southeastern portion of the project area as early 1937 (Figure 9). The land for the water tank facility was appropriated by the Territorial Government under Executive Order 806. Aerial photographs from 1949 and 1950 show the majority of the project area denuded of vegetation, likely from use as pasture through much of the late nineteenth and early twentieth centuries (Figure 10 and Figure 11). The establishment of four pasture lots in the southern portion of the current project area in 1954 indicates the property was still likely being utilized as pasture through the 1950s and 60s (Figure 12). A water tank facility that replaced the old facility was built as early as 1956 about 160 m north of the existing facility with an associated paved access road (Figure 13). The water tank facility shows clearly on a 1965 aerial photograph of the surrounding area (Figure 14).

ʻUalapuʻe and the surrounding area grew slowly and additions were made to the Kilohana School in 1961 and 1977. The Kilohana School was assessed as eligible for listing to the National Register of Historic Places (NRHP) and nominated in 1993, but was never added to the register. Although many of the single family homes and buildings of the area were originally constructed in the 1920s, like the former Ah Ping Store, the majority of the homes seen today were built between the 1980s and 2000s. The only residential subdivision in ʻUalapuʻe, the Kilohana Kai condominiums, was built in the late 1990s and the Kilohana Recreation Center was constructed on the park land adjacent to the Kilohana School around that same time. In 1994, the lands of the project area were awarded to the DHHL as part of a statewide settlement. The land transfer from the Department of Land and Natural Resources (DLNR) to the DHHL was completed in 1999 (DHHL 2019). ʻUalapuʻe has seen relatively little growth in recent time and continues to be a rural community of approximately 393 residents according to 2020 United States Census data.[9]

[8] https://www.kilohana.k12.hi.us/About-Us

[9] https://www.census.gov/search-results.html?q=ualapue&page=1&stateGeo=none&searchtype=web&cssp=SERP&_charset_=UTF-8

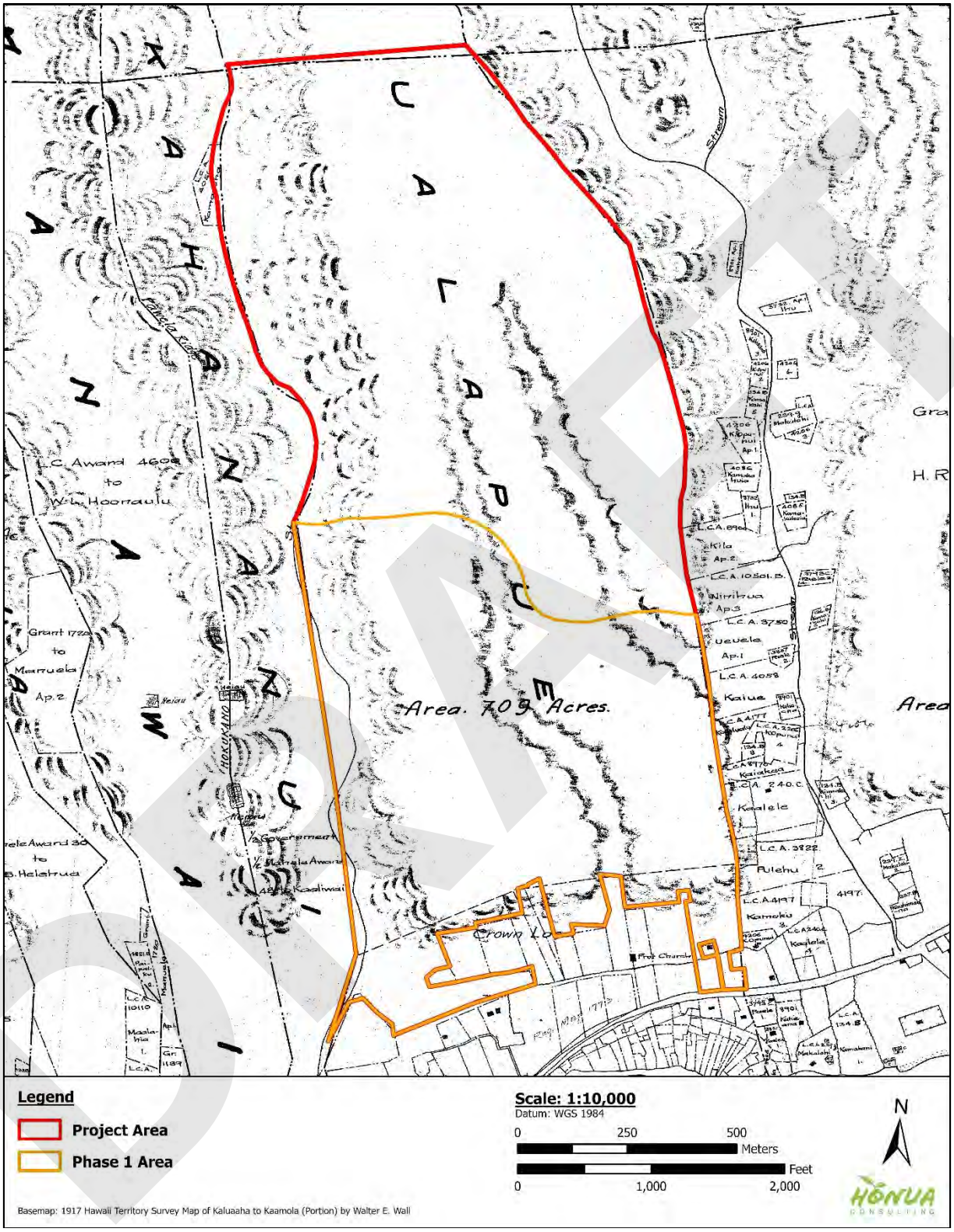


Figure 7. Portion of Territorial Survey map (Wall 1917, Registered Map 1724) of Kaluaʻaha to Kaʻamola showing project area in relation to LCAs, heiau and fishponds

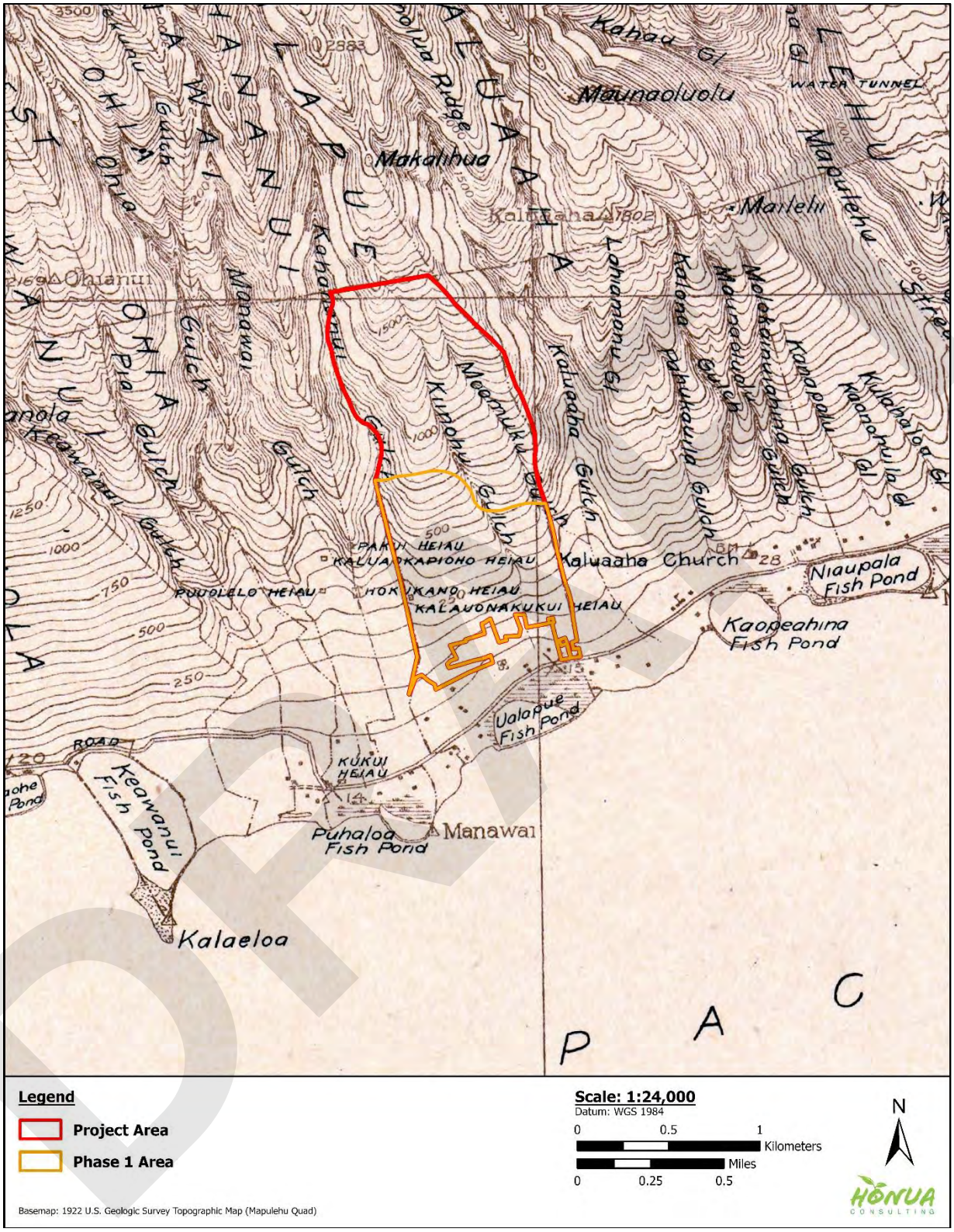


Figure 8. Portion of a 1922 USGS Mapulehu Quadrangle map showing the location of the project area in relation to nearby gulches, fishponds and heiau (USGS 1922)

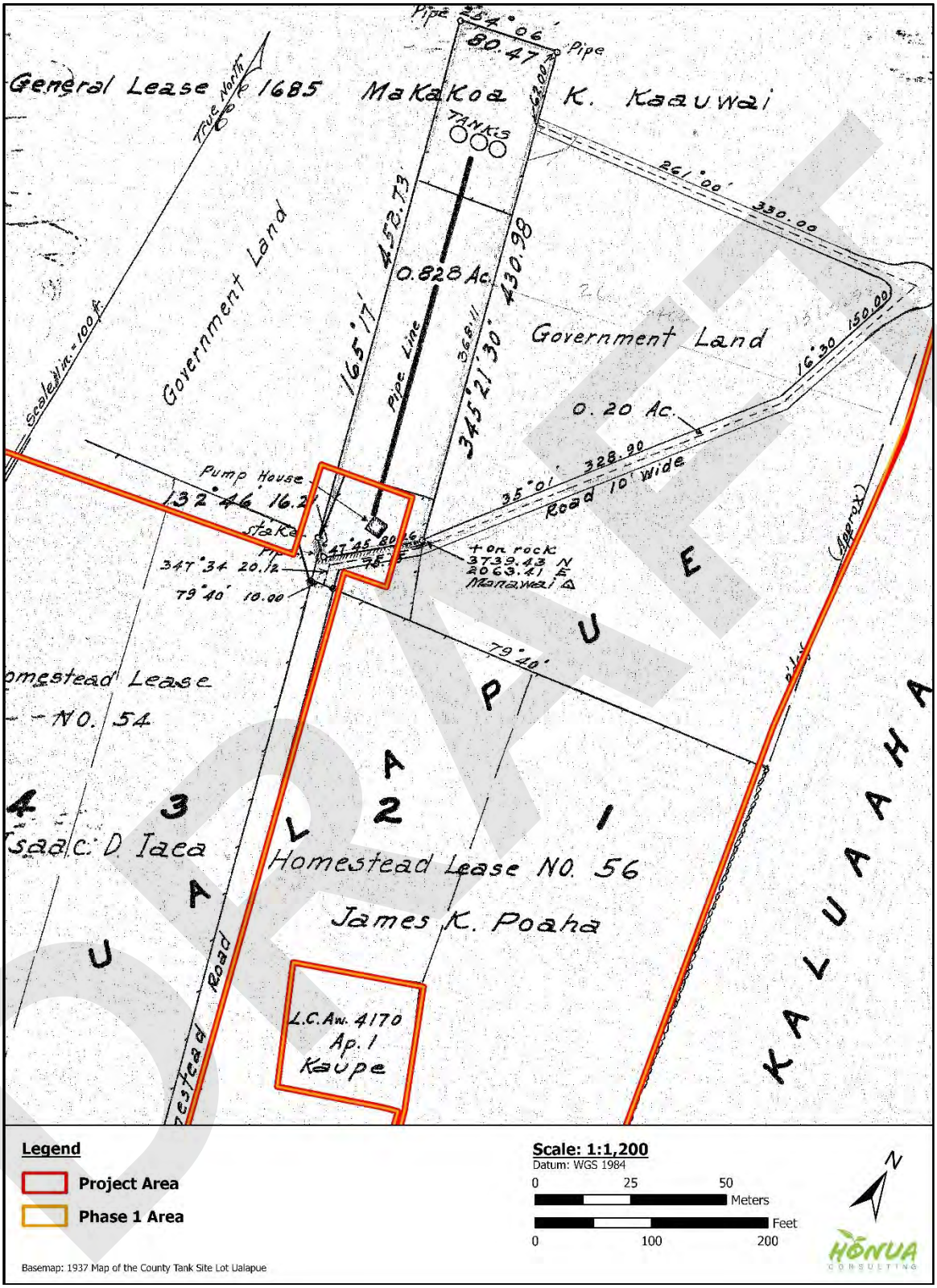


Figure 9. Portion of 1937 map showing water tanks, a water line right of way and an associated roadway in project area (Evans 1937)

Figure 10. 1949 USGS aerial photograph of the ʻUalapuʻe area showing sparse vegetation on the slopes of the project area; ʻUalapuʻe Fishpond indicated by red arrow

Figure 11. Portion of 1950 USGS aerial photograph showing location of the project area and phase 1 area (USGS 1950)

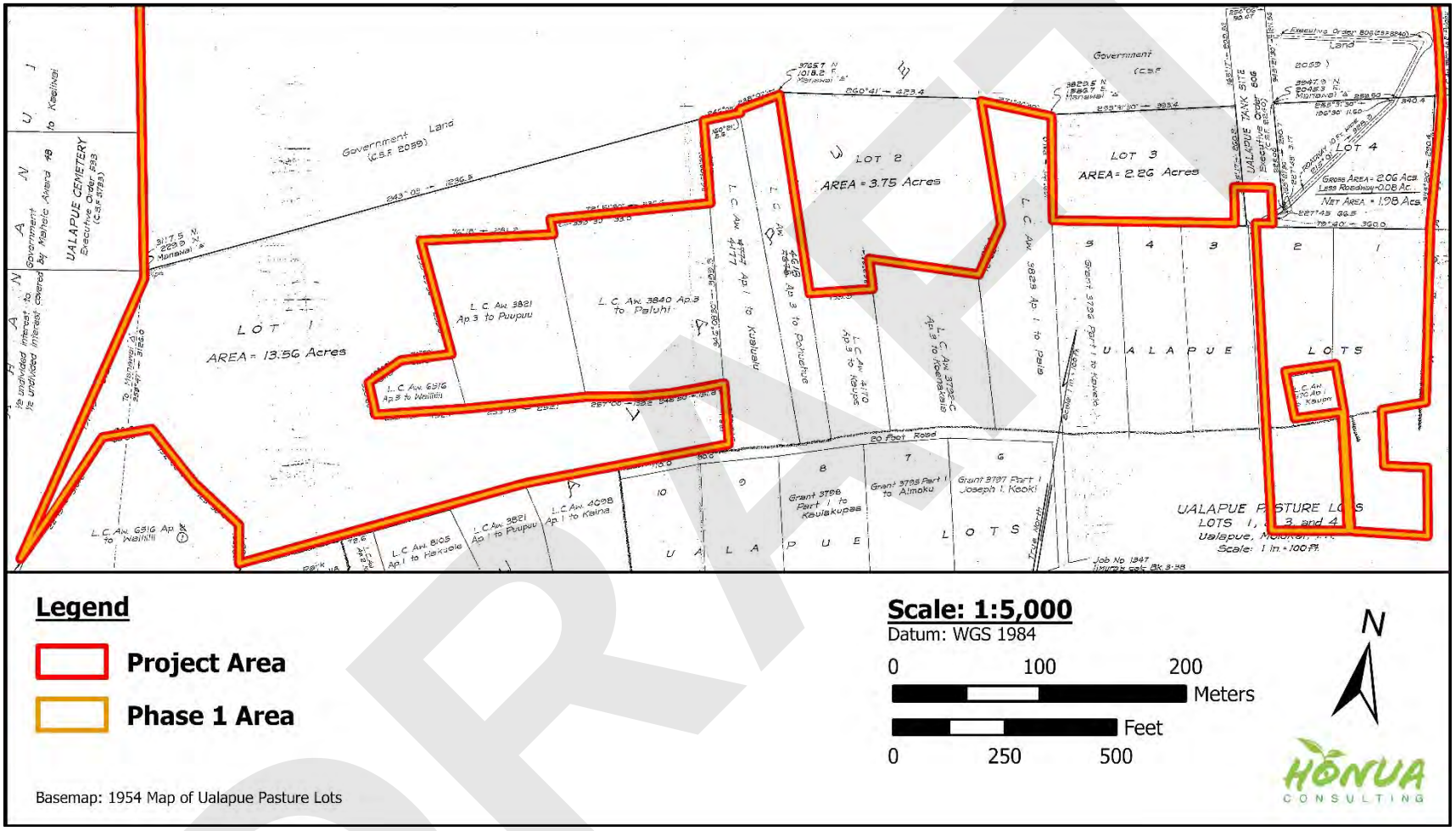


Figure 12. Portion of 1954 Copy of Survey Furnished (CSF) map #11931 showing Pasture Lots 1 through 4 in southern portion of the project area and phase 1 area (Limura 1954).

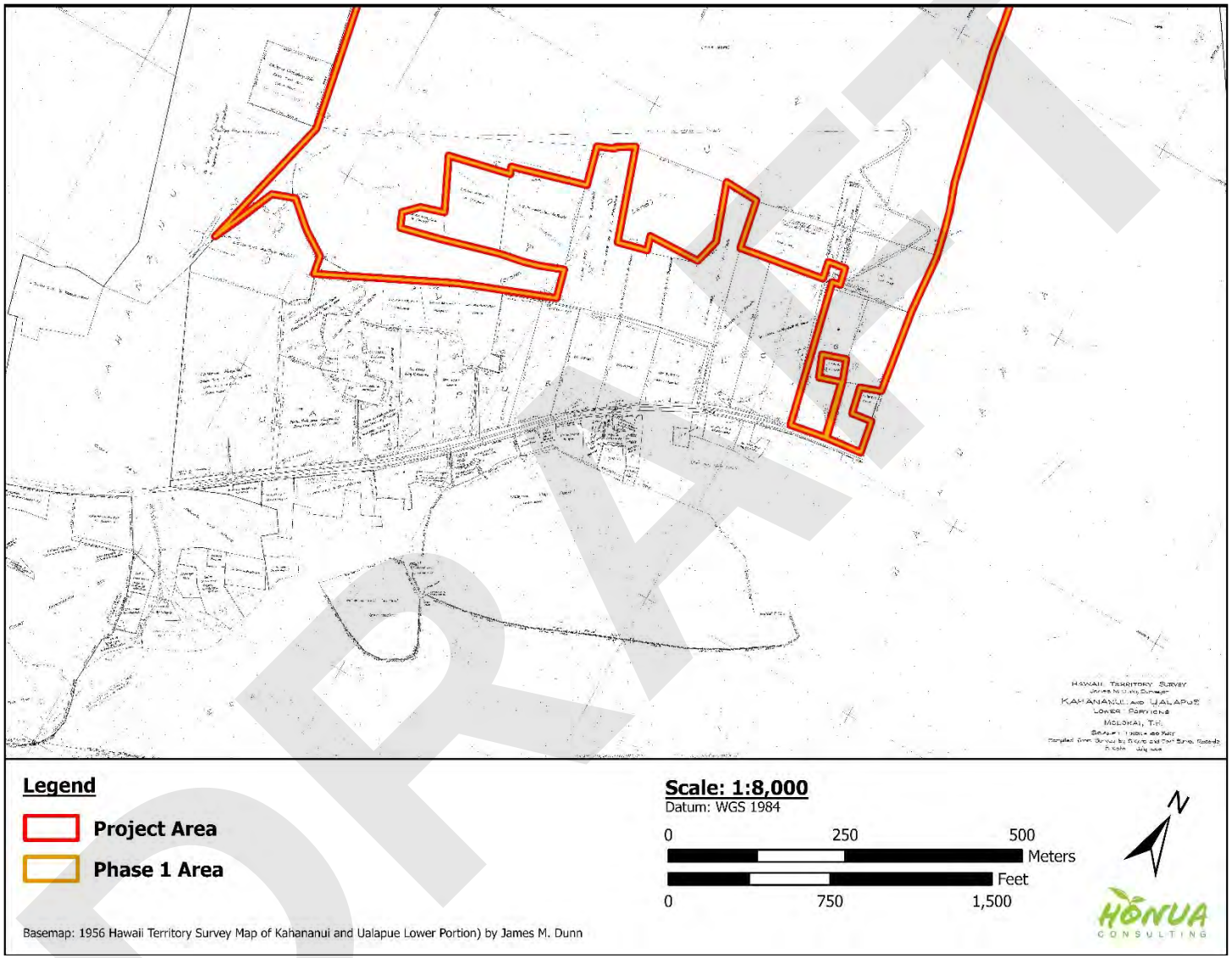


Figure 13. Portion of a 1956 Hawaii Territory Survey map showing the lower portion of the project area and phase 1 area and the road up to the existing tank facility under construction (Kato 1956)

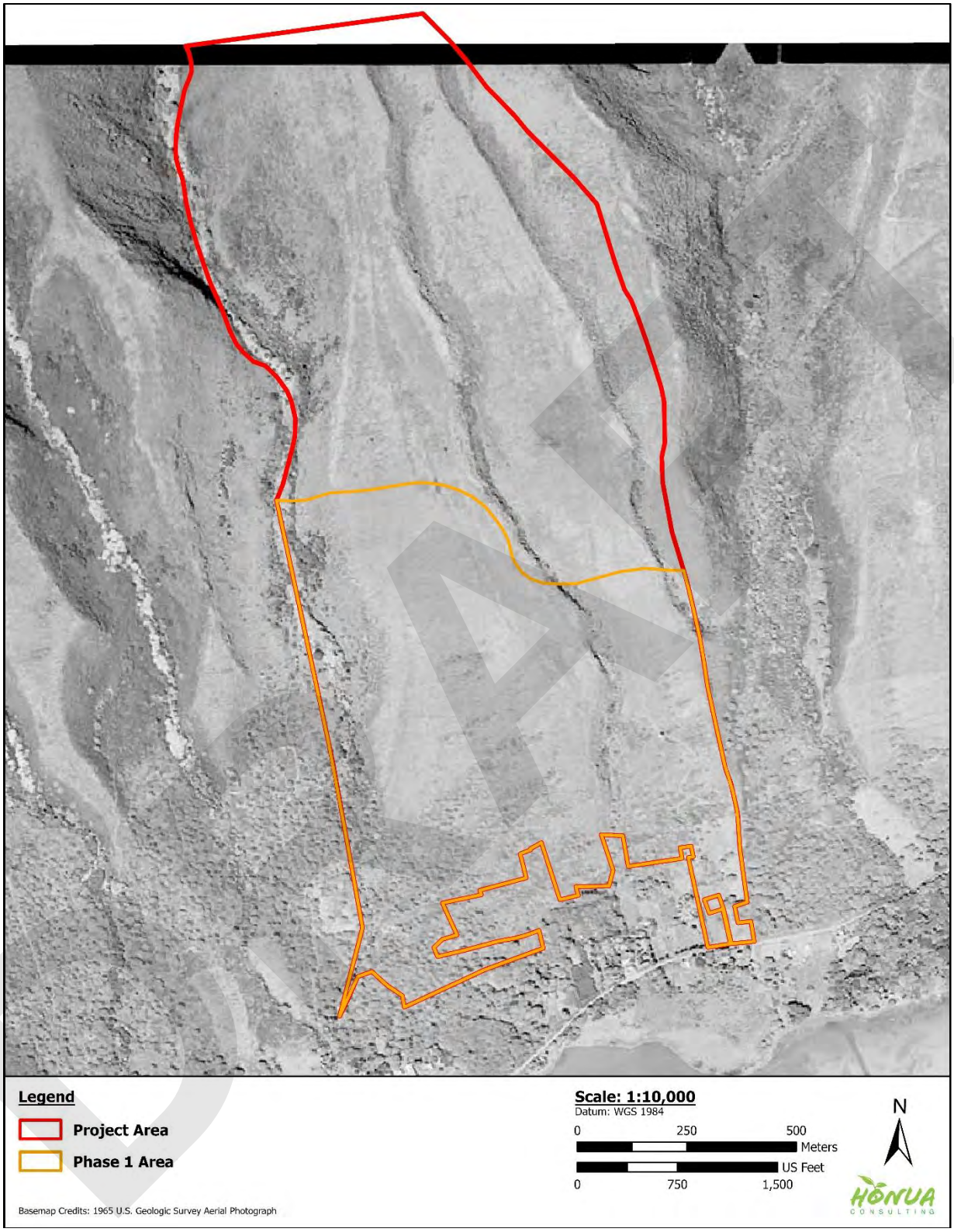


Figure 14. Portion of a 1965 USGS aerial photograph showing the location of the project area and phase 1 area (USGS 1965)

Section 3 Archaeological Context

In this section, we summarize relevant previous archaeological studies in order to reconstruct human use and modification of the land in and near the project area. The main purpose of presenting this information is to develop predictive data about the types and distribution of historic properties and their component features we expected to encounter during the field inspection; and to assist interpretation of any new findings.

Figure 14, Figure 15 and Figure 16 summarize and depict the location and results of previous archaeological studies in and near the project area. For the purposes of this study, this discussion of previous work and results is limited to a radius of approximately 1.5-miles around the project area.

Three previous archaeological studies are most relevant to the current project area: Summers' (1971) compilation of sites and other wahi pana (legendary places) of Molokaʻi; Dunbar's (1988) National Register of Historic Places (NRHP) inventory – nomination form for the Hōkūkano-ʻUalapuʻe National Historic Landmark; and McElroy's (2022) reconnaissance survey of a small portion of the current project area. After a brief overview (Section 3.1) below, the results of these three relevant studies are summarized (Sections 3.2, 3.3 & 3.4). Finally, details on other nearby work are provided (Section 3.5).

3.1 Overview

Archaeological research on Molokaʻi is consistent with general observation that the traditional Hawaiian settlement pattern was primarily along the coastline and focused on the eastern side of the island. This was due to a variety of factors including land fertility, access to wai (fresh water)—including surface water (streams) as well as pūnāwai (springs, seeps and other subterranean sources) for human consumption and food cultivants, and access to coastal reef resources. Molokaʻi's most prominent and large-scale archaeological sites were compiled in a 1971 Bishop Museum study (Summers 1971). The study documented 31 sites in the vicinity of the project area, mostly consisting of heiau and fishponds.

Due to the overall lack of modern development in the project-area vicinity, a limited number of archaeological studies have been conducted in the area. The studies include a survey of Keawanui Ahupua'a, a survey and archaeological monitoring for the Kaluaʻaha Estates subdivision, a survey of Lots 11 and 12 of the ʻUalapuʻe Lots, a survey for the relocation of the ATON Light at Kaʻamola Point, a series of literature reviews, surveys, monitoring and burial treatment reports associated with development at the former D&J Ocean Farms property, monitoring at Kilohana Elementary School, a survey of a private property, a cultural impact assessment for the East Molokaʻi upland fencing project, and a partial survey of a small portion of the current project area.

The types of traditional Hawaiian sites documented in the project-area vicinity include numerous heiau and fishponds, habitations, cultivation / garden site-features, several subsurface cultural deposits, a former ʻulu maika course, a traditional Hawaiian water procurement area, and a flexed human burial. The historic sites included several rock walls, a possible livestock enclosure, and the Kilohana School which once operated as the county hospital.

Table 5. Archaeological Studies and Results in and near the Project Area

Author(s)	Type of Study	Location	Findings (SIHP #50-60-04)
Summers 1971	Archival	Island-wide	Recorded 31 sites in vicinity (Sites 160-190): 4 sites in ʻUalapuʻe Ahupuaʻa include Kalauonākukui Heiau (Site 182), Kahua Maika of Kaʻakeke (Site 183), Halemahana Fishpond (Site 184) & ʻUalapuʻe Fishpond (Site 185)
Barrera 1974	Archival	Bishop Estate lands, Keawanui Ahupuaʻa	Archival research described Keawanui Fishpond (Site 163) & Hualele Heiau (Site 164)
Barrera 1983	AR	Kaluaʻaha Estates Subdivison	Recorded SIHP #-531: a traditional Hawaiian enclosure w. surface midden deposits and scatters of historic and traditional Hawaiian artifacts
Athens 1985	AM	Kaluaʻaha Estates Subdivision	At SIHP #-531, documented an imu (earth oven), traditional and historic artifacts, and an extensive midden scatter
Dunbar 1988	NRHP nomination form	ʻUalapuʻe and neighboring ahupuaʻa	Hōkūkano-ʻUalapuʻe National Historic Landmark consisting of 9 sites (see text)
Moore and Kennedy 1994	AIS	ʻUalapuʻe Lots 11 and 12; TMK: [2] 5-6-002:007	Documented 9 surface sites including 4 platforms, 2 enclosures, 1 alignment, 1 partially-damaged wall, and 1 mound; test excavations at platforms and an enclosure yielded negative results; recorded SIHP #-1625, an enclosure assessed as a possible livestock pen and SIHP #-1626 a partially damaged rock wall consisting of two wall segments measuring approximately 50 m each
Tulchin et al. 2002	AIS	Kaʻamola Point ATON Light Relocation; TMK: [2] 5-6-006	No sites recorded
Lee-Greig et al. 2010	ALRFI	Former D&J Ocean Farms Improvements; TMK: [2] 5-6-006, :008, -024 & -034	No sites recorded
Wilkinson and Hammatt 2010	AM	Kilohana Elementary School; TMK: [2] 5-6-02:008	No sites recorded; fill materials over truncated B-Horizon sediments observed
McIntosh and Cleghorn 2011	AIS	Goodman Property; TMK: [2] 5-6-004:021	Recorded SIHP #-7089: rock wall interpreted as historic property marker or boundary wall
Graves et al. 2016	CIA	East Pākuʻi Fence Unit, East Molokaʻi; multiple TMK	Documented 2 sites: Site 1 was a walled terrace & alignment; Site 2 was a 6 m-long wall on west side of Kaluaʻaha Stream

Author(s)	Type of Study	Location	Findings (SIHP #50-60-04)
Lee-Greig and Hammatt 2017	AIS	Former D&J Ocean Farms Improvements; TMK: [2] 5-6-006, :008, -024 & -034	Recorded 5 archaeological sites: SIHP #-2574, historic dry-stacked wall; SIHP #-2575, traditional Hawaiian habitation site w. subsurface cultural deposit (6 firepit features) and a wall remnant; SIHP #-2576, historic retaining wall; SIHP #-2577, traditional Hawaiian subsurface cultural deposit w. 3 firepit features and a buried rock wall alignment; and SIHP #-2578, traditional Hawaiian subsurface cultural deposit w. 2 firepits; radiocarbon dates from firepits indicate human use and occupation from late 13th century into middle 17th century
Frey 2019	AM		No sites recorded
Yucha & Hammatt 2019	Burial treatment		Recorded SIHP #-2581, an intact, flexed Hawaiian burial, preserved in place w. 5 ft buffer
McElroy 2022	ARS	‘Ualapu‘e Kuleana Homestead Project **- in a portion of current project area**	Documented 8 sites & 1 isolated artifact; sites include 3 terraces (UA-3, UA-4 & UA-5), 2 sections of stacked rock wall (UA-2 & UA-6), 2 modified outcrops (UA-7 & UA-8) & 1 mound (UA-1); no SIHP numbers were assigned

Abbreviations: AIS = archaeological inventory survey, ALRFI = archaeological literature review and field inspection, AM = archaeological monitoring, ARS = archaeological reconnaissance survey, CIA = cultural impact assessment, NRHP = National Register of Historic Places

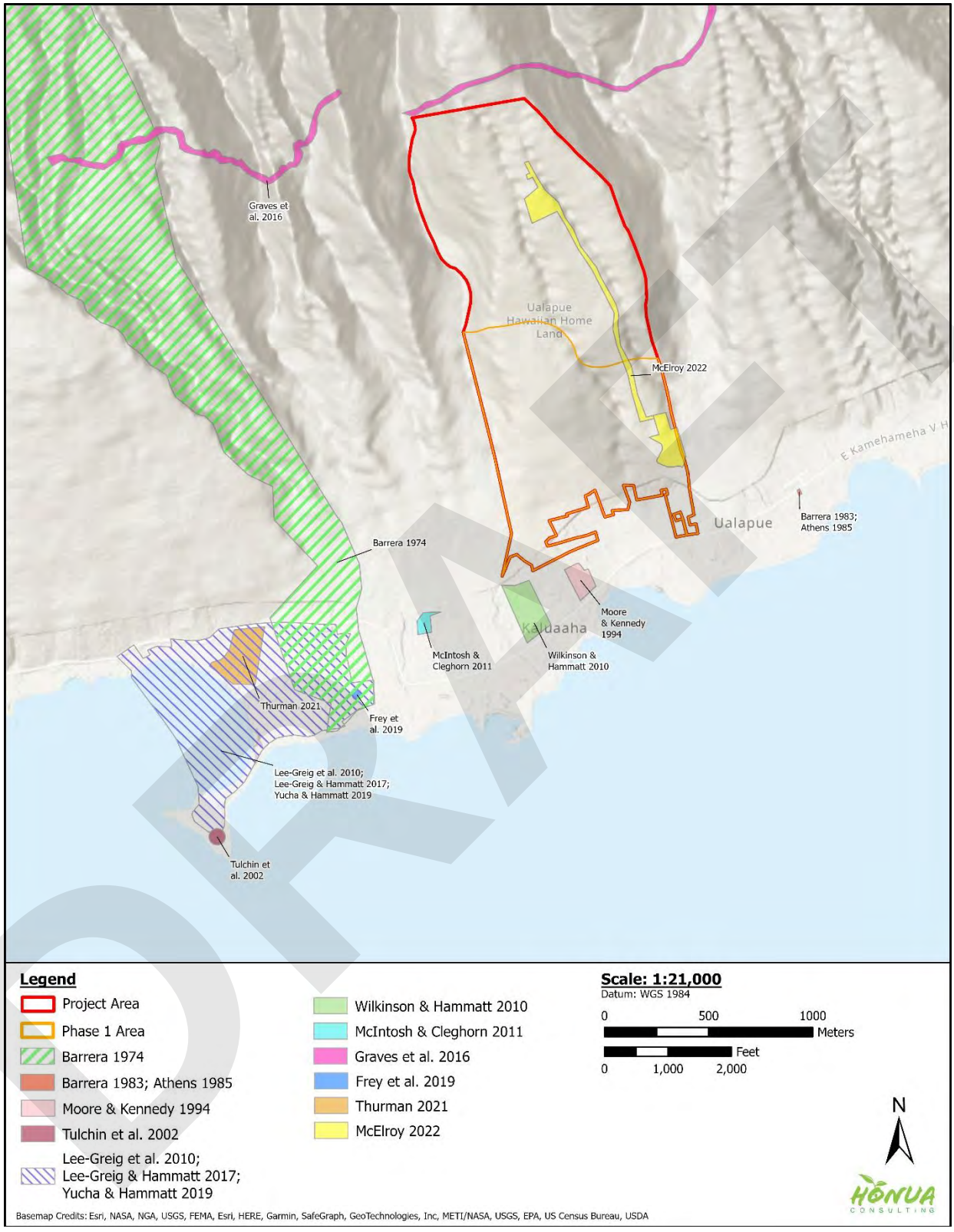


Figure 15. Previous archaeological studies in and near the project area

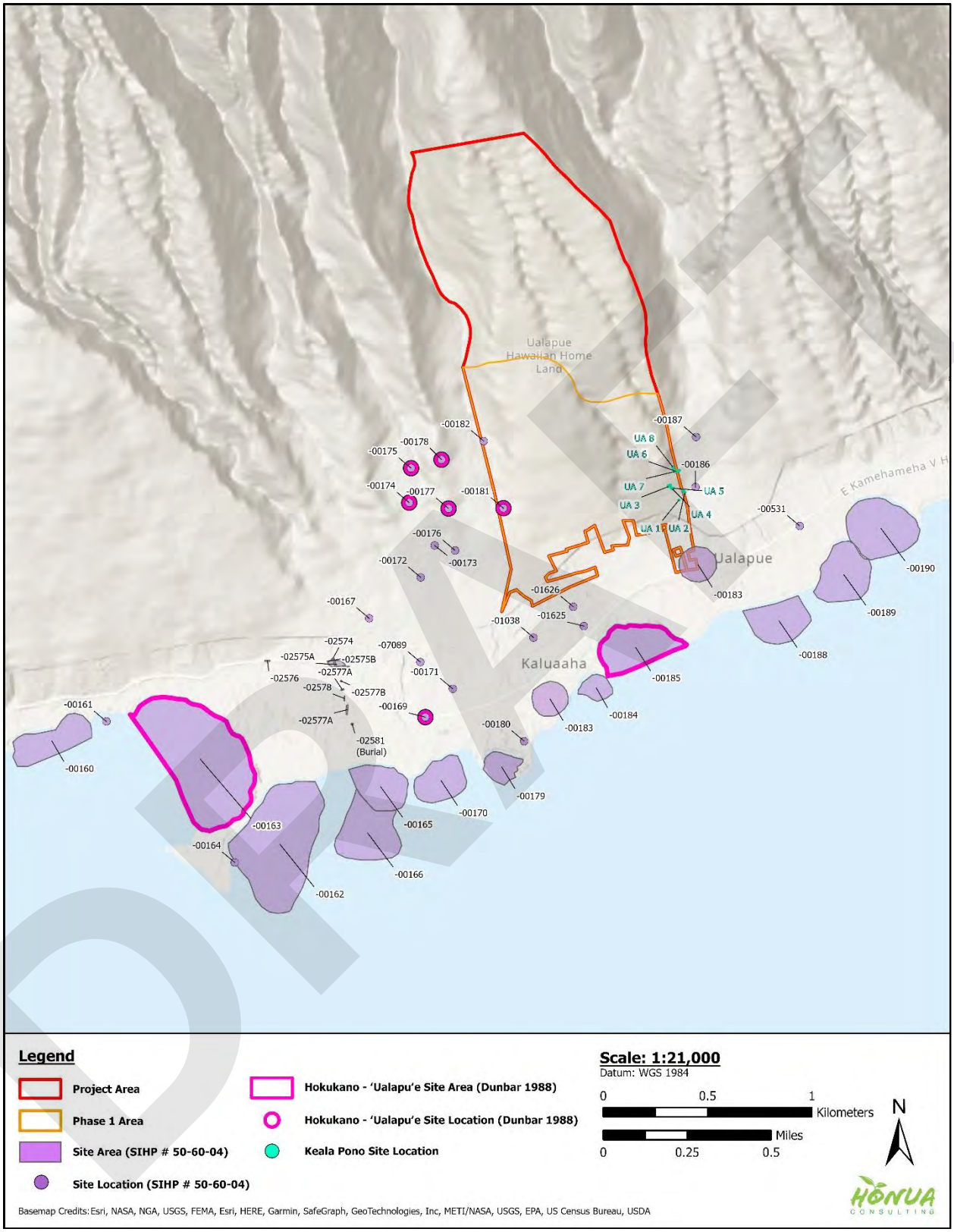


Figure 16. Previously-documented archaeological sites in and near the project area

3.2 McElroy (2022)

Keala Pono conducted reconnaissance survey of a small portion of the project area, in support of the proposed ʻUalapuʻe Kuleana Homestead Project (see Figure 15). The survey was suspended after two days and the notes, photos and a brief end of field letter were provided to G70 (McElroy 2022). The study documented eight archaeological site-features (UA-1 through UA-8)—including terraces, rock walls, modified outcrops and a mound—and one artifact. These findings, summarized below, are consistent with traditional Hawaiian use of the land.

Site UA-1 is on the north (upslope) side of the roadcut for the water tank road and is a mound of 3-4 courses of cobbles informally piled in a 3 x 2 m area (Figure 17). About half of the feature has collapsed down the road cut and next to the roadway below.

Site UA-2 is on the steep western slope of Mo'omuku Gulch just outside (east of) the project-area boundary; it is a 20 m section of stacked, small boulder wall incorporating natural boulders and outcrops (see Figure 17). The wall is oriented NW/SE and is stacked 2-3 courses high with a maximum height of 1 m.

Site UA-3 is a rock faced terrace measuring ~15 x 5 m with its long axis oriented perpendicular to the slope. The western portion of the terrace face was the most substantial and is stacked 4-6 courses high (Figure 18). The interior of the terrace was earthen and free of stones. A 75 cm high upright boulder was documented at the eastern end of the terrace.

Site UA-4 is a ~5 m long low terrace oriented perpendicular to the slope. It has a single rock faced terrace on the downslope side of cobbles stacked 1-2 courses high with a maximum height of 50 cm (Figure 19).

Site UA-5 is a ~4 m long low terrace oriented perpendicular to the slope. The terrace is similar to UA-4 but comprised of a smaller number of larger cobbles in the terrace facing. The facing on the downslope side is stacked 1-3 courses high with a maximum height of 50 cm (Figure 20). A small (5 x 3 cm) piece of branch coral was observed on the ground surface ~4 m west of the terrace.

Site UA-6 is a rock wall along the eastern boundary of the project area on the western side of Moʻomuku Gulch. It is partially within the current project area. The wall is perpendicular to the gulch drainage and comprised of large cobbbles and small boulders stacked 3-4 courses high with a maximum height of 1 m (Figure 21). Upslope from the western end of the wall are several discontinuous stacked areas with rocks piled onto natural boulders and outcrops.

Site UA-7 is several discontinuous sections of modified natural boulders and outcrops on the western slope of Moʻomuku Gulch. Rocks are stacked 1-3 courses high atop the boulders and outcrops with a maximum height of 50 cm (Figure 22).

Site UA-8 is similar to Site UA-7 and consists of a modified outcrop located on the western slope of Moʻomuku Gulch. Several small boulders are stacked on top of the natural outcrop with a maximum height of 60 cm; the feature is oriented perpendicular to the slope (see Figure 22).

Finally, a single artifact (Artifact-1)—identified as a traditional Hawaiian stone disc with a pecked, concave depression in the center of one side (Figure 23)—was on the ground surface in an eroded area just north of the intersection of the paved water tank road and an unpaved road leading northeast to the residential housing. It was photographed and left in place.

Figure 17. Mound designated Site UA-1 (*left*) and wall segment designated Site UA-2 (*right*) (McElroy 2022, courtesy of G70)

Figure 18. Overview photo of a rock faced terrace recorded as Site UA-3 (McElroy 2022, courtesy of G70)

Figure 19. Overview of a low terrace recorded as Site UA-4 (McElroy 2022, courtesy of G70)

Figure 20. Overview photo of a low terrace recorded as Site UA-5 (McElroy 2022, courtesy of G70)

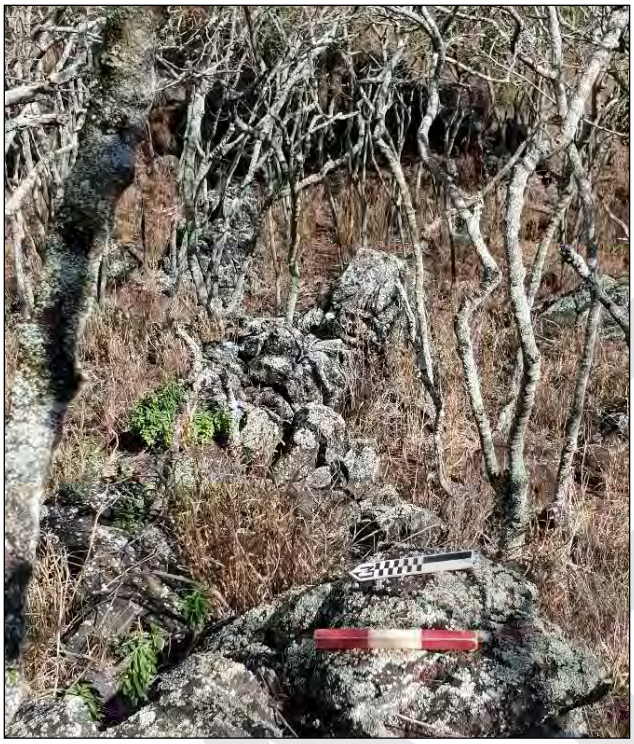


Figure 21. Overview of a rock wall recorded as Site UA-6 (McElroy 2022, courtesy of G70)

Figure 22. Overview photo of modified outcrops recorded as Sites UA-7 (*top*) and UA-8 (*bottom*) (McElroy 2022, courtesy of G70)

Figure 23. Overview photos of the front (*left*) and back (*right*) of Artifact-1, a modified basalt disc with a pecked concave depession (McElroy 2022, courtesy of G70)

3.3 Dunbar (1988)

In 1988, Helene R. Dunbar of the U.S. National Park Service completed a Nomination Form for the National Register of Historic Places Inventory of the Hokukano-Ualapue National Historic Landmark, which was included in the National Register in 1990 (Reference # 66000304) (see Appendix B). The national historic landmark includes nine discontiguous historic properties, all of which are either fishponds or heiau (ceremonial sites / temples). The nine sites include the following heiau (spelling uses Hawaiian diacriticals that were not used in the original NRHP form):

- Kukui Heiau (Site 169) – East ʻŌhiʻa Ahupuaʻa
- Puʻu ʻŌlelo Heiau (Site 174) – Manawai Ahupuaʻa
- Kaluakapiʻioho Heiau (Site 175) – Manawai Ahupuaʻa
- Kahokukano Heiau (Site 177) – Manawai / Kahananui boundary
- Pākuʻi Heiau (Site 178) – Manawai / Kahananui boundary
- Kalauonākukui Heiau (Site 181) – ʻUalapuʻe / Kahananui boundary
- ʻIliʻiliʻōpae Heiau (Site 200) – Mapulehu Ahupuaʻa

And the following fishponds:

- Keawanui Fishpond (Site 163) – Keawanui Ahupuaʻa
- ʻUalapuʻe Fishpond (Site 185) – ʻUalapuʻe Ahupuaʻa

Archaeological information included by Dunbar (1988) in the NRHP form was generally based on archival information in Summers (1971), who, in turn, was referencing older sources such as manuscript material from Stokes (n.d.), Thrum and others.

Of these sites, the only one that is in, or partially in, the current project area is Kalauonākukui Heiau, reported in various sources as along the boundary of ʻUalapuʻe and Kahananui ahupuaʻa. Dunbar (1988) did not visit Kalauonākukui Heiau during preparation of the NRHP form.

3.4 Summers (1971)

In 1971, Catherine Summers of the Bernice Pauahi Bishop Museum, Department of Anthropology compiled *Molokai: A Site Survey*, a compilation of previously recorded sites for the island, mostly derived from earlier unpublished manuscripts (Summers 1971). Most of the archaeological information was based on work conducted between the late nineteenth and mid-twentieth century by seven individuals who wrote descriptions of the archaeological sites of the island, primarily heiau and the numerous fishponds ringing the southern coast. These individuals included M.D. Monsarrat, a surveyor for the Kingdom of Hawai‘i, John N. Cobb, an agent of the U.S. Fish Commission that described 54 fishponds on the island, George P. Cooke, a long-time resident and former manager of the Molokai Ranch Ltd., John F. G. Stokes, Kenneth P. Emory and Bruce Cartwright of the Bishop Museum, and James M. Dunn, surveyor for the State of Hawai‘i that described 41 fishponds on the island.

Summers (1971) provides descriptions of the various ahupua‘a of the island and over 300 sites. A total of 31 sites were documented in the vicinity of the current project area, four of which are located within ‘Ualapu‘e Ahupua‘a. The sites primarily consist of heiau and fishponds from Ka‘amola Ahupua‘a in the west to Kalua‘aha Ahupua‘a in the east. The 31 sites (Sites 160 to 190) in the vicinity of the current project area, and ahupua‘a descriptions, by Summers (1971) are included below.

Ka‘amola

Formerly the *ahupua‘a* was divided into six sections (*‘ili*). Ka‘amola had a *lele*, Kiloa, in Pelekunu, which had an area of 126 acres. The Pohakukupupu and the Pu‘upapa‘i are the winds of Ka‘amola.

> This place is composed of six small pieces of land but is know wholly as Ka‘amola. Near where it adjoins Pua‘ahala is a pond [Kaina‘ohe Pond, Site 160]. There are taro patches and the sea comes in a good way. It is not very level. Close to the government road, about one chain away come the level lands used as taro patches. Most of the land is covered by thorny weeds on both sides of the main highway. A plain stretches unbroken from the mountain to the road (Kanepuu, 1867b).

Keawanui (Site 163) and Kalaeloa point used to be a part of Ka‘amola. They were given to the ahupua‘a of Keawanui in the early part of the 16th century. (See Site 163.) (Summers 1971:104)

Site 160. Kaina‘ohe Pond, Ka‘amola

The area of this *loko kuapa* is 17 acres. Its wall is approximately 1770 ft long, built of basalt with some coral fill. The height of the wall from the bottom of the pond is 5 ft. There were two makaha, one at the eastern bend, the other in the middle of the southern portion of the wall. Both had been destroyed by 1962.

In 1901 the wall of Kaina‘ohe was broken but the pond was used commericially (Cobb, 1902:430). The pond was used in 1957 and its wall was intact. In 1960 a tsunami destroyed portions of the wall, which had not been repaired by 1962. (Summers 1971:104)

Site 161. Papa‘ili‘ili Pond, Ka‘amola

Papa‘ili‘ili, “Pebble flats,” was a *loko ‘umeiki* having an area of 6.5 acres. It is now completely destroyed. The pond was constructed by building walls between the Kaina‘ohe Pond (Site 160) and Keawanui (Site 163), a distance of 750 ft. There were eight lanes, three going outward and five going inward, two the latter being closed lanes. (Summers 1971:105)

Site 162. Mikiawa or Ka‘amola Pond, Ka‘amola

Mikiawa was *loko ‘umeiki* having an area of “44 acres more less” (Dunn, n.d.). There were 26 lanes, 16 going inward and 10 outward. The pond is sometimes also called Ka‘amola Pond.

This is the only *loko ‘umeiki* for which thre is information concerning its usage. At a Land Commission Award hearing (LCA 2715) in 1853, Keawanui testified that Mikiawa belonged to the land of Ka‘amola but was used by the people of Keawanui when the tide was coming in; then, at ebb tide, the people of Ka‘amola used the pond. “The way the fish are caught. When the net is put down and turned outward, the fish belong to Keawanui. When the sea ebbs, the net is turned inward, and the fish belong to Ka‘amola” (LCA 2271, n.d.).

Stokes was given the following information concerning the use of Mikiawa: “Sometimes one person had a prior right to fish at a certain inward and a certain outward opening, both of which bore the same name, and other persons might use the same openings in the proprietor‘s absence” (Stokes, 1911).

The fish caught in this pond were the *‘ama‘ama, awa, weke, ulua, moi, kala* (unicorn fish), *Naso unicornis*), ‘o‘io (ladyfish, *Albula vulpes*), and palani (surgeon fish, *Acanthurus dussumieri*) (Stokes, n.d.*e*:11).

According to one informant, “Lohelohe, an *ali‘i*, built Mikiawa, and the fishpond Mikimiki [Site 163]” (Stokes, 1911). This would place the building of Mikiawa Pond as being prior to the 16th century. (Summers 1971:105, 108)

Keawanui

Keawanui had a *lele* whose name we do not know in Wailau. Prior to the 16th century, Keawanui Pond and Kalaeloa were a part of Ka‘amola (see Site 163). The Heakai is the wind of Kalaeloa, the point of land between Keawanui (Site 163) and Mikiawa (Site 162) Ponds. (Summers 1971:108)

Site 163. Keawanui, Mikimiki, or Hinau Pond, Keawanui

This *loko kuapa*, which is still being used, has an area of 54.5 acres. It was made by constructing a wall approximately 2000 ft long between two point of land. In 1937 there was one *makaha* in the wall, since that time, at least two *makaha* have been added.

Keawanui Pond formerly belonged to the ahupua‘a of Ka‘amola, as stated in testimony of Land Commission Award 2715:

> I have heard that the pond of Keawanui belonged to Ka‘amola in the time of Pohano. Hekilikaakaa was the konohiki. Kaaoaoa stole the food (ka‘ai). He was a man of Ka‘amola. The food was hidden in the harbor of Keawanui. The konohiki sought the food and found it. The name of the thief was told to him and a trial was

> held and the pond was taken for Keawanui. It was taken from the time of Kihapiilani to this time. It never returned to Ka‘amola... The point of Kalaeloa belonged to Keawanui (LCA 2715, n.d.).

The pond is now called Keawanui. Kahaulelio (1902a) gave the name Mikimiki, as did Stokes (1911 and n.d.e:39) although the latter also called it Keawanui. Cobb (1902:430) referred to it as Hinau, which was the name of the man to whom the pond was awarded by the Land Commission in 1853. (Summers 1971:108)

Site 164. Hualele Heiau, Keawanui

The heiau was located on the isthmus between Keawanui and Mikiawa Ponds. From Kalaeloa (datum) it would bear 206 degrees; 100 ft. Stokes was told about this heiau and shown its site:

> The isthmus and peninsula of Kalaeloa has built up of sea sand by the currents, and a small amount of soil has formed. A possible change in the current since has been removing the soil, and, according to the statement has demolished the heiau (Stokes, n.d.*a*:2). (Summers 1971:108)

West and East ‘Ohi‘a

These two adjoining land sections were formerly known as the *ahupua‘a* of ‘Ohi‘a. West ‘Ohi‘a is sometimes referred to as ‘Ohi‘a-nui and ‘Ohi‘a 1.

The land of East ‘Ohi‘a did not extend to the sea; it went only to just S of the present Government road. The area between it and the sea was a part of Manawai. East ‘Ohi‘a had a distant *lele* in Wailau called Pepeiaoloa. (Summers 1971:108-109)

Site 165. Kaunahiko‘oku or Onahikoko Pond, West ‘Ohi‘a

Kaunahiko‘oku, “upright fish scales,” was a loko ‘umeiki having an area of 13.5 acres (Stokes, n.d.*d*:35). The pond is now destroyed, only traces of the foundation remain.

There were 11 lanes in the 2000 foot-ft wall. The two on the eastern side went inward and had platforms on their northern walls. The other nine, located on the southern and western sides, went outward and had platforms on their western walls.

Stokes (n.d. *d:*35) gave the name of the pond as Kaunahiko‘oku; and Dunn (n.d) called it Onahikoko. (Summers 1971:109)

Site 166. Fishpond, West ‘Ohi‘a

Aerial photographs show the foundations of a pond that was attached to the southern and southwestern portion of Kaunahiko‘oku Pond‘s wall (Site 165).

According to Dunn (n.d), no old maps show this pond; “...the name and ownership of which is lost in antiquity... This was presumably a government pond.” (Summers 1971:109)

Site 167. Heiau, West ‘Ohi‘a

This heiau is located between the stream and the boundary line of Keawanui, at an elevation of about 100 ft above sea level. From Kalaeloa (datum) it bears 208 degrees 55 minutes, 30 seconds; 4640 ft. According to Stokes:

> This enclosure was called by the local natives an animal pound, not a heiau. The main part is roughly rectangular in plan, measuring 125 ft each way. It is enclosed by walls 5.5 ft. high and thick, and contains the remains of other walls of platforms.
>
> ...Outside the southern wall the ground dipped sharply,and here a terrace of water-worn stones has been built up against the foot of the wall... The terrace is 9 feet high, 11 wide and 150 feet long. ...Along the foot of its retaining wall are six or more small, semi-circular cleared spaces which have been cultivated.They are protected on the outside by stones, loosely piled... The ground outside has also been cleared for cultivation. The size of the terrace and the care with which it has been built makes me believe that this place was originally a heiau, but its use abandoned long before the numerous other heiau in the neighborhood (Stokes, n.d.*a*:2)

When the structure was seen in 1959, it appeared to be in a condition similar to that described by Stokes. A platform in the SE corner of the main portion of the heiau measured approximately 80 by 80 ft. It was bounded on the N by a wall whose western section had deteriorated. (Summers 1971:109, 111)

Site 168. Heiau (?), West ʻOhiʻa

Located about 200 yards S of Site 167, this possible heiau is a large, rambling structure on which traces of platforms still remained in 1959. Some coral was found among the stones.

A hundred yards N of this structure, there is a basi-like depression lined with small, water-worn stones. It is 50 ft long, 15 ft wide, and 5 ft deep. (Summers 1971:111)

Site 169. Kukui Heiau, East ʻOhiʻa

Located in East ʻOhiʻa on the low ground adjoining the Government road, this heiau bears 120 degrees, 24 minutes, from Manawai (datum); 1805 ft. Stokes described this site: "...a collection of enclosures and low platforms of irregular shape. Though pointed out as an agricultural heiau site, there was nothing in the construction or location of the place to warrant such identification. The length... was 170 feet and the width 120 feet, and the general direction north and south" (Stokes, n.d.*a*:2). (Summers 1971:111)

Kahoʻolulu Heiau, ʻOhiʻa

"...said to be in Ohia, Molokai. Not seen" (Stokes, n.d.*a*:2). (Summers 1971:112)

<u>Manawai</u>

Site 170. Wehelauʻulu Pond, Manawai

This *loko kuapa* had an area of 8 acres. The 1770-ft wall was square-shaped, beginning in West ʻOhiʻa and extending into Manawai. There were three makaha in the S wall. The walls are now completely destroyed; however, the foundations may be seen on aerial photographs.

The pond was listed as "Nameless old pond" by Cobb (although he listed it as being in ʻOhiʻa 1) (1902:430). Stokes gave its name as "Wehelauulu" (n.d.).

From Manawai (datum) it bore 146 degrees, 2 minutes, 22 seconds; 1850 ft. Stokes reported, "Heiau entirely destroyed" (n.d.*a*:2). (Summers 1971:112)

Site 171. Malukou Heiau, Manawai

From Manawai (datum) it bore 146 degrees, 2 minutes, 22 seconds; 1850 ft. Stokes reported, "Heiau entirely destroyed" (n.d.*a*:2). (Summers 1971:113)

Site 172. Kahakahana, Manawai

From the Kalaeloa (datum) this site bears 211 degrees, 36 minutes, 30 seconds; 5570 ft. The structure is approximately 85 ft E to W and 65 ft N to S. It consists of several paved enclosures and small, circular, walled-in areas. On the S side is an enclosure that is lower than the main structure. Some coral was found on the pavements in 1962.

Stokes referred to this site as being "...a place for worship to kapa gods, and for making sacred kapas. Used for kapa before ʻai noa [1819]." He also said it was used before the time of Kumukoʻa and mentioned the gods Ku and Hina as being connected with it (n.d.*d*:49; and print from Bishop Museum Negative 990). (Summers 1971:113)

Site 173. "Wet Stones," Manawai

Located N of Kahakahana (Site 172), these stones are a short distance W of the jeep road just before going in the gate. The "wet stones" are two large, fairly flat boulders adjoining one another. Under the western portion of the boulders, there is a cavity about 4 ft long, 3 ft wide, and 1 ft deep. In the past, water was always found in this cavity. In 1962 there was water during the wet season, but during the dry season the dirt was only damp. The Hawaiians are said to have used this place for obtaining their drinking water. On top of the boulders, stones have been placed as if to shade the cavity. These stones have "always been there." To the W of this site is a house site. (Summers 1971:113)

Site 174. Puʻu ʻOlelo Heiau, Manawai

Located on rising ground in the middle of the valley, this heiau bears 205 degrees, 6 minutes, 30 seconds from the Kalaeloa (datum); 6400 ft. Stokes described the heiau as follows:

> The main feature is a platform facing the sea on the south. The ground inclines to the north, and here an extension of the main platform is enclosed on the west, north and east by a small section of heavy wall. There are numerous pits or excavations in the pavement of the platform the presence of which it is difficult to explain. They are not quite regular in size. Nor is their order of arrangement regular; they are accurately plotted on the plan. East of the main platform is an enclosed pavement, open on the south. The enclosing walls are small. The two structures are joined by a causeway of loose stones, now much disturbed, at their nearest southern corners built almost entirely of water stones (Stokes, n.d.*a*:3). (Summers 1971:113)

Site 175. Kaluakapiʻioho, Kapiʻioho, or Kumukoʻa Heiau, Manawai

Located on the E side of Manawai Valley this heiau is on the W bank of the stream bed. From Kalaeloa (datum) it bears 203 degrees, 6 minutes, 30 seconds; 6900 ft.

Stokes wrote a detailed description of this heiau and the probable bases for its several names.

> A combination of platform and walls somewhat suggestive of Puu Olelo heiau [Site 174], from which it is about 600 feet distant.
>
> The most striking feature is the retaining wall of the eastern end. The surface of the valley declines in general to the south. The stream bed of Manawai is on the east side of the valley, adjoining the ridge. Between this and the western ridge is a stretch of valley bottom about 500 feet wide. It might have been expected that the builder would have chosen suitable ground about 200 feet to the west. The reason for the actual selection will perhaps be found in the desire to build something large and impressive and this effect was obtained.
>
> At the southeast corner, the retaining wall was originally 36 feet high and at the northeast corner, 26 feet. On the south side, the least height is 8 feet.
>
> It might be mentioned that the upper part of the eastern retaining wall was almost vertical originally from 6 to 9 feet, but below this level the slope was one horizontal to two vertical.
>
> At the western end of the southern face, the stones are piled up loosely not carefully laid as in other parts of the heiau. They seemed, however, to have been piled up in crescentic form. The large boulders forming the horns of the crescent were probably placed by nature.
>
> On the north, a terrace adjoins the main platform, and is itself bounded on the west, north, and east by walls (3 to 5 feet wide). The pavement of the terrace, which is a foot higher than that of the main platform, is composed of small stones, in which there is much soil. (The terrace is 54 feet west to east, and 24 feet north to south.)
>
> On the main platform, however the present pavement is composed of the same large water-worn stones as are in the retaining walls. It was probably finished off with smaller stones originally, and these, as usual, sifted down out of sight among the larger stones. At about the middle of the western half of this pavement is a fire place which measures inside 1.8 by 1.5 feet and is 1.4 feet deep. It is curbed with four thin stones, 5 inches wide, which are placed on the edge.
>
> (The main platform is 96 feet west to east, and 33 feet south to north.)
>
> Time and weather seemed to have been the main disturbing elements at this heiau. There is practically no sign of vandalism. On this account, I was surprised to find no trace of house platforms and other details of internal heiau arrangement.
>
> Concerning the name; in the list given me by Mr. Thrum, he had the name Kumukoʻa noted for this heiau. The name given by local natives is Kapiioho or Kaluakapiioho, the former probably being an abbreviation. Kapiioho is, locally, said to have been a kahuna kilokilo (seer), who was buried at Pakui [Site 178] on the ridge overlooking Kaluakapiioho.
>
> A king of Oahu called Kapiioho was defeated and killed at the famous battle of Kawela [Site 139], some eight miles to the west. As the Oahuan survivors hurriedly fled in thier canoes, the body of Kapiioho was probably taken and

> offered in sacrifice at some Molokai heiau. Thus, a suggestion of the origin of the name Kapiioho for this heiau is found. However, prior to such sacrifice, it probably had another name.
>
> Kumukoʻa was not the king of Molokai, though he may have been chief of the district where the heiau is. He was a contemporary of Kapiioho of Oahu, and no doubt contributed to his defeat (Stokes, n.d.*a*:3,4). (Summers 1971:113-114, 116)

Site 176. Heiau, Manawai

A heiau is reported to be located in the kukui-tree grove to the E of the jeep road and S of the ridge that separates Manawai and Kahananui. It is said to be a rambling structure in which kukui trees are growing (Cornwell Friel, personal communciation 1962). (Summers 1971:116)

Site 177. Kahokukano Heiau, Manawai and Kahananui

This heiau is located on the ridge which is the boundary line of Manawai and Kahananui. From Kalaeloa (datum) it bears 209 degrees, 20 minutes, 30 seconds; 6590 ft. Stokes described this structure in detail.

> A structure of four terraces following down the ridge. The two upper terraces are protected by walls on the west, north and east, and the latter wall continues along the third terrace. All the other sides are open.
>
> The lines of this heiau are very difficult to follow because of the condition of the west, south and part of the east retaining walls. The stones for the most part seem to have been loosely piled and not ladi, but I would not care to make such a statement unless an extended investigation were made. The heiau has been part of a cattle range for many years, and the animals may be responsible for the present condition.
>
> As well as can be judged, the entrance was on the east, up the incline between the third and fourth terraces. Access to the second terrace from the third, was probably obtained by using the top of the broad wall on the east, or possibly over the large rock used in the retaining wall between the two terraces. The tops of the walls were also probably use to pass from the second to the first terrace.
>
> The pavements of the terraces are mostly of large stones, many of them water-worn. In some portions the earth is found, particularly towards the northern borders of the floors, where grading was probably done.
>
> Connected with the heiau were the names of Kaohela, a famous warrior and athlete, and Kumukoʻa, a Molokai chief, son of Keaweikekahialii of Hawaii and his Molokai wife Kanealae (Stokes, n.d.*a*:5).

The following information concerning the heiau was given by Thrum: "...credited to the Menehunes for its construction... said to be a fish heiau in which sacrifices were offered. Mauka of it is a pond that used to be used for fish for a quartette of chiefs, Kumekoa [Kumukoʻa], Halai, Mulehu, and Kalaniahiikapaa, who lived at the heiau with one, Kaohele, a famous runner, as their guard and protector" (1909b:53). (Summers 1971:116)

Site 178. Pakuʻi Heiau, Manawai and Kahannui

Located on the ridge which is the boundary line of Manawai and Kahananui, this heiau is to the N of Site 177. From Kalaeloa (datum) it bears 205 degrees, 42 minutes; 7225 ft. Stokes reported:

> The base of this structure might be described as an earthen terrace faced with retaining walls of stone. The ridge which the terrace spans declines to the south. The plan and cross-section are complete enough to require no special description.
>
> This heiau had a remarkable command of the surrounding country. While called a heiau by local people, no one was able to designate its class. One man said it was the grave of Kapiioho, a seer [see Site 175] (Stokes, n.d.*a*:4).

According to Thrum, the heiau was "...of *luakini* class, ...traditional Menehune construction and *puuhonua* character, dedicated to Hina. Destroyed in the time of Kamehameha I" (1909a:40).

Kamakau gave Pakuʻi as being a puʻukaua, fortress. Kiha-a-Piʻilani, in trying to escape from Lono-a-Piʻilani on Maui, "...fled in secret to Molokai. The fortress [puʻukaua] of Pakuʻi above Hananui [Kahananui] and ʻUalapuni [ʻUalapuʻe], was surrounded [by warriors] [sic]. Kiha escaped with his life by leaping from the fortress into a kukui tree and went to Lani... His life was saved by leaping from the fortress of Pakuʻi and fleeing to Lanai" (Kamakau, 1961:22).

Thrum mentioned a heiau in Manawai, "...said to have been built and occupied by Pakui; still to be seen" (Fornander, 1916-1917:10, footnote). He probably was referring to the Pakuʻi heiau, although the heiau seems originally to have been built before Pakuʻi's time. (Summers 1971:119)

Site 179. Puhaloa Pond, Manawai

This loko kuapa was 6 acres in area. The wall was approximately 1245 ft long. Puhaloa, "Long hollow," was being used in 1901 (Cobb, 1902:430). In 1949 the eastern part of the pond was filled in and that portion of the wall was in ruins. The western side was also filled in, but the wall was still standing. The wall in the center was still intact (Aerial Photo, 1949). (Summers 1971:119)

<u>Kahananui</u>

Kahananui had a lele, Makea, in Wailau. The fishing right of Kahananui was also at Wailau, "along Waiehu Point" (Monsarrat, n.d.*a*:154). Waiehu is located to the W of Wailau Valley. (Summers 1971:119)

Site 180. Waiauwia Heiau, Kahananui

Located 400 ft from the sea, from Manawai (datum) the heiau bears 180 degrees, 7 minutes, 625 ft. "Lines indefinite, probably a platform originally" (Stokes, n.d.*a*:6). (Summers 1971:119)

Site 181. Kalauonakukui Heiau, Kahananui

Located just N of the cemetery and near the boundary of ʻUalapuʻe, this structure measures approximately 125 ft E to W and 85 ft N to S. The walls on the S and W were still standing in 1962.

Thrum described Kalauonakukui heiau as, "...80 feet by 100 feet, with walls 6 feet high. Of husbandry class" (1909a:40). Stokes did not list this heiau (n.d.*a*). (Summers 1971:119. 121)

Site 182. Kalauonokukui Heiau, Kahananui

This heiau is located in the valley near the boundary of ʻUalapuʻe; from Kalaeloa (datum) it bears 209 degrees, 40 minutes, 30 seconds; 7755 ft. Stokes described it as: "An irregular shaped enclosure whose lines have been destroyed by later cultivation. A point of interest is the height of the south wall, 8 feet" (n.d.*a*:6). (Summers 1971:121)

ʻUalapuʻe

The land is described as being "...a good land, one filled with taro patches and also a pond" (Kanepuu, 1867b). The Makaolehua is the wind of ʻUalapuʻe.

ʻUalapuʻe is said to have had a lele in Wailau called Halekoki (Monsarrat, n.d.*a*:90).

South of the Government road there is a spring called Loʻipunawai. "Famous soring about which there are many legends. In seeking this spring many people would die of thirst, or after finding it they would drink to much and die as a result" (Cooke, 1949:182). (Summers 1971:121)

Site 183. Kahua Maika of Kaʻakeke, ʻUalapuʻe

This game field is located between Kaluaʻaha and Kahananui. The *kahua maika* began where the stone wall of Kaluaʻaha is, "where you see that stone wall running directly inland." It went in a straight line to Kahananui stream, S of the road (a distance of about 1000 yards). The course was a straight groove. Like a ditch. No stakes were used. It was for distance, and if the *ʻulu maika* could be rolled up the other side of the Kahananui stream, then that stone was the winner. "Some only went half way and were spent. The stone stopped rolling. The course was hard. At Milimaʻa was where the stone scored" (Tape n.d.*b*). The *kahua maika* is now filled in.

Kanepuu said of Kaʻakeke: "Here [ʻUalapuʻe] lies the famous maika rolling field, Kaʻakeke and for this field came the proud boast, "Pohapoha keiki o Kaʻakeke (The lads of Kaʻakeke make resounding noises)." Perhaps because they were such strong maika throwers" (1867b).

In the olden days, the chiefs gathered at Kaʻakeke. Kamehameha I visited it in 1812. He had evidently been there before, as Ii said: "...the king sailed to Molokai to see again the maika field Kaakeke" (1959:106).

Kamakau mentioned a spring at Kaʻakeke: "It is said, however, that the stump of one tree was left by the spring at the *maika* ground of Kaʻakeke, and that people and animals were poisoned by drinking the water there; hene the spring at ʻUalapuʻe was filled in (*kanu ʻia*)" (1964:130). (Summers 1971:121)

Site 184. Halemahana Pond, ʻUalapuʻe

This small *loko kuapa*, 3.3 acres in area, was used commercially in 1901 (Cobb, 1902:430). Cobb listed the pond as "nameless." The name, Halemahana, was given by Stokes (n.d.*e*:37). It had two makaha in its 725-ft wall. The pond is now destroyed. (Summers 1971:121)

Site 185. ʻUalapuʻe Pond, ʻUalapuʻe

A loko kuapa of 22.25 acres originally, this pond had only approximately 15 acres that were clear of all bullrushes and silt in 1957 (Dunn, n.d.). The 1575-ft wall had two makaha in it in 1962.

Made of basalt with some coral fill, the wall was 4 ft high on the pond side and 8 to 19 ft wide. The latter width was on the eastern wall of the western *makaha*.

ʻUalapuʻe was being used commerically in 1901 (Cobb 1902:430) and was used almost continually until 1960, when the tsunami damaged the wall considerably and destroyed the two *makaha*. In 1966, the wall and *makaha* had not been repaired.

ʻUalapuʻe was one of the ponds that was noted for the "fatness" of its mullet in the 19th century (Kahaulelio 1902a). In 1959 it was considered "...one of the best fishponds on Molokai because there are several fresh water springs in the pond which seem to benefit the raising of mullet and clams" (Apo 1959). (Summers 1971:121,123)

Puʻukuhe Heiau, ʻUalapuʻe

"Not seen" (Stokes, n.d.*a*:6). (Summers 1971:123)

Kaluaʻaha

The Kipukaholo and the Makaolehua are the winds of Kaluaʻaha. Kaluaʻaha is said to have the following lele in Wailau: "Manu, Paehala, Kahuwa, Puulena, Kawailoa, Ohia, Kanakapaio, Upelele, Haleokona, also the stream" (Monsarrat, n.d.*a*:90-91).

Formerly, Kaluaʻaha was a *puʻuhonua*, a place of refuge. Pogue wrote of it, more than 100 years ago:

> ...certain lands were set apart on these islands and called Sacred Earth [*puʻuhonua*]. Such were Ka-lua-aha and Mapu-lehu on Molokai. In the time of Kamehameha the First some people came from Hawaii and landed on Molokai. Some were killed, but others ran through the brush and hid for fear of death and others still ran to Ka-lua-aha and that place and escaped. They were not killed, they were not punished because this was a place of Sacred Earth (Pogue, n.d.:32).

According to Kamakau (1964:19), Kamehameha I made Kaluaʻaha a *puʻuhonua* because it was one of the lands belonging to his favorite wife Kaʻahumanu. There are references to kaluaʻahaʻs being a puʻuhonua before Kamehamehaʻs time, however. It was to this land that Kaʻohele was running when he was fatally hit by a sling stone. Another account said that the chiefs Kumukoʻa, Halai, Mulehu, and Kalaniahiikapaʻa "...fled to Kaluaaha and hid" when they were attacked by a force from Hawaii (Thrum 1909b:49).

The following incident occured at Kaluaʻaha during the time of Kamehameha I, according to a native informant:

> People from Hawaiʻi came to live at Kaluaʻaha. The commoners of Molokaʻi living on this land wer sent inland to Kula to live. That is the reason, if you should go to Kula, you will find the shells of the *opihi* and *pipipi* there. When these people of Molokaʻi came down to go fishing, and caught a basket of fish, they had to divide them with the followers of Kamehameha--half for them and half for those people.
>
> You have heard the saying, "O Molokaʻi i ka pule oʻo, (Molokaʻi of the potent prayers)." That is not what happened. The Hawaiʻi people were poisoned by the

> *'auhuhu*. These followers of Kamehameha did not east poi made of taro. They ate sweet potatoes. One day a command came from Kamehameha to make a big feast for his subjects, a command given to all of the Moloka'i people. The Moloka'i people resented the taking of these shores, here, by those people. These people assured Kamehameha, "Yes, we can do it." They went and got some *'auhuhu*. Men, women and children brought it home and pounded it. Mixed it with water, and this water is what they mixed with the sweet potatoes. The people of Hawai'i, in eating it, all died, except the steward who portioned out the food. He was spared for Kamehameha. (One person is spared to run away with the news of the death of all of the others.) "Harken O Chief, all of our people are dead. They sickened." It wasn't sickness. They were poisoned by the people of Moloka'i with the *'auhuhu.* That is the story told on Moloka'i, here, of how all of the people of Hawai'i were destroyed. That's how bones were left heaping on all of the beaches. The skeletons and the skulls, all were Hawai'i people. That's how the Moloka'i people returned to dwell on the shore, here to this day. And this is the tale. Then it was said to be Moloka'i pule o'o. No potent prayer. The people of the chief Kamehameha were poisoned (Tape n.d.*g*). (Summers 1971:123-124)

Site 186. Hale o Lono or Pahu Kauila Heiau

Located at the mouth of the western valley, this heiau is 2000 ft from the sea. From Manawai (datum) it bears 212 degrees, 37 minutes; 5125 ft. East of the heiau site is a gulch called Pahukauila. Stokes wrote of this site i 1909:

> The site has been somewhat disturbed in later time, but a curious feature is the western half. This in the main consists of a stone platform and a stone pavement, both on the same level, but divided by a high wall. Probably originally, the wall continued around the northern end of the platform, leaving the western and southern borders open. The ground declines to the west and the south, so that such borders are 3 to 5 feet above the ground.
>
> The local information gathered was to the effect that this heiau was only used for prayers, not human sacrifice, and that another name for it was Pahu Kauila (Stokes, n.d.*a*:6). (Summers 1971:124)

Site 187. Heiau, Kalua'aha

This heiau is located in the valley, 1000 ft to the N of Hale o Lono heiau (Site 186). From Manawai (datum) it bears 205 degrees, 25 minutes, 30 seconds; 5870 ft. According to Stokes:

> The structure is an enclosure measuring approximately 100 by 50 feet. Inside the enclosure adjoining the northern wall, is a platform, approximately 40 by 18 feet. On its northern side it is 4.7 feet high. Extending from the western portion of the north wall is an irregular enclosure about 40 by 40 feet.
>
> This place was described as kahi ho'olulu o na mahi'ai (resting place of the farmers). The site indicates a heiau (Stokes, n.d.*a*:6, and n.d.*f*). (Summers 1971:125)

Site 188. Kalua‘aha Pond, Kalua‘aha

This *loko kuapa* was 13 acres in area (Dunn, n.d). There were four makaha in the 2110-ft wall. In 1901 the pond was being used commercially (Cobb, 1902:430). The wall is now destroyed; only the foundations remain. Kalua‘aha Pond “...has alway been considered a government pond” (Dunn n.d.). (Summers 1971:125)

Site 189. Mahilika Pond, Kalua‘aha

This *loko kuapa* was 13.3 acres in area (Dunn, n.d.). There were three makaha in the 1760-ft wall. In 1901 the pond was being used commercially (Cobb, 1902:430). The wall is now destroyed; only the foundations remain. (Summers 1971:127)

Site 190. Mahilika Pond, Kaulua‘aha

This *loko kuapa* has an area of 20.5 acres; the wall is approximately 1770 ft long. Since 1933, three tsunamis have severely damaged the wall of this pond. Each time it has been rebuilt by the present owner. The eastern portion was rebuilt in 1960 with stones brought from “up mauka”. This portion of the wall is now 6 to 7 ft wide and 5 ft high. The western portion of the wall has not been as severely damaged by the tsunamis and is probably in its original form. It is 3 to 4 ft wide and 5 to 8 ft high.

In 1962 there was a cement *makaha* in the eastern wall, which was 4 ft wide, with a metal grating on the sea side of the opening, but prior to 1960 there was no *makaha*.

> Rex [Hitchcock] never had a makaha at Kaluaaha and all the fish were spawned in his pond. He never had many fish to eat because it probably is necessary for the water to go in and out in abundance to give food or maje the food in the pond grow faster. The taste of Kaluaaha fish good but not in a class with Kupeke [Site 206] (Wight, 1956).

Ka‘ope‘ahina Pond was used commercially in 1901 and was still being used in 1962. It was stocked with mullet and *aholehole* in 1962. The pond was probably named after the person to whom it was awarded by the Land Commission, D. Kaopeahina. (Summers 1971:127)

3.5 Other Archaeological Studies

Barrera 1974

In 1974, the Bishop Museum conducted an archaeological literature review of Bishop Estate lands on Moloka‘i (Barrera 1974). The review included archival research on nearby Keawanui ahupua‘a and the description of two previously documented sites, Keawanui Fishpond, Site 163, and Hualele Heiau, Site 164. The study created a map of land ownership on Moloka‘i and shows ‘Ualapu‘e ahupua‘a as state owned.

Barrera 1983

In 1983, Chiniago, Inc. conducted an archaeological inventory survey for the Kalua’aha Estates subdivision located along the coastal road east of Kalua’aha Stream (Barrera 1983). The survey identified SIHP #50-60-04-531, a traditional Hawaiian enclosure with exposed midden

deposits and scatters of historic and traditional Hawaiian artifacts. Following the survey, archaeological monitoring was recommended for ground disturbance associated with the project.

Athens 1985

In 1985, International Archaeological Research Institute, Inc. (IARII) conducted archaeological monitoring for the Kalua'aha Estates subdivision and previously identified SIHP # -531 (Athens 1985). A large imu was identified and traditional Hawaiian artifacts consisting of basalt flakes, volcanic glass, and polished adze fragments and flakes were collected during monitoring. Based on the artifacts recovered during monitoring, data recovery excavations were recommended for an extensive midden deposit spanning more than 130 square meters. Although data recovery excavations were recommended, it appears that no further work was ever conducted at the site.

Moore and Kennedy 1994

In 1994, Archaeological Consultants of Hawaii conducted an archaeological inventory survey in support of the subdivision of ʻUalapuʻe Lots 11 and 12 (Moore and Kennedy 1994). The AIS consisted of a pedestrian survey and the excavation of five test units. The survey documented a total of nine surface sites that included four stone platforms, two enclosures, a stone alignment, a partially damaged wall, and a rock mound. The test units were excavated at each of the four stone platforms and one of the enclosures. Based on the lack of traditional Hawaiian artifacts and the presence of modern rubbish in the test excavations, the features were assessed as modern. The second enclosure was assessed as a possible livestock pen and recorded as SIHP #50-60-04-1625. The partially damaged rock wall was recorded as SIHP #50-60-04-1626 and consisted of two wall segments measuring approximately 50 m each. They run along the access road to the property and along the former LCA boundary. The two sites were assessed as historic with possible modern modifications and no further work was recommended.

Tulchin et al. 2002

In 2002, Cultural Surveys Hawaiʻi Inc. (CSH) conducted an archaeological inventory survey in support of the proposed relocation of an Aids to Navigation (ATON) light lcoated at Kaʻamola Point (Tulchin et al. 2002). The AIS consisted of a pedestrian survey of Kalaeloa Point and an access road and the excavation of two 1 x 0.50 m test units. The subsurface excavations encountered the water table at 60 cm below surface and no cultural materials or deposits were identified. Based on the negative results of the survey and excavations no historic properties were recorded and no further work was recommended.

Lee-Greig et al. 2010

In 2010, Cultural Surveys Hawaiʻi Inc. (CSH) conducted a literature review and field inspection for after the fact permits associated with improvements to D&J Ocean Farms (Lee-Greig et al. 2010). A pedestrian survey of the project area documented no artifacts or historic properties. However, due to its location on the coast consultation with the SHPD was still recommended prior to any additional ground disturbance within the property.

Wilkinson and Hammatt 2010

In 2010, CSH conducted archaeological monitoring at Kilohana Elementary in support of the Department of Education (DOE) cesspool replacement project (Wilkinson and Hammatt 2010). Monitoring documented fill soils over a truncated clay loam B Horizon observed to a maximum depth of 260 cm below surface. No artifacts were collected, and no historic properties were documented during monitoring.

McIntosh and Cleghorn 2011

In 2011, Pacific Legacy Inc. conducted an archaeological inventory survey for a 1.5 acre property in East ʻŌhiʻa ahupuaʻa. The AIS consisted of a pedestrian survey and the excavation of several shovel test probes on the property. Due to prior grading of the property, no artifacts or cultural deposits were encountered in the subsurface excavations. A single historic property was documented during the survey and included SIHP #50-60-04-7089, a rock wall interpreted as hsitoric property marker or boundary wall. Following the survey, the wall was preserved by the landowner and no further work was recommended.

Graves et al. 2016

In 2016, Keala Pono conducted a cultural impact assessment and archaeological reconnaissance survey for the East Pākuʻi Fence Unit of the Pākuʻi Watershed Protection Project (Graves et al. 2016). The first portion of the fence begins at the confluence of the boundaries of Wailau, Kaluaʻaha, and Mapulehu ahupuaʻa and runs north-south along the boudary separating Kaluaʻaha and Mapelehu. The second portion of the the fence turns west and continues across the upper portion of Kaluaʻaha, ʻUalapuʻe, Kahananui, Manawai, East and West Ōhiʻa, Keawanui, and Puaʻhala ahupuaʻa before terminating at an existing fence. The cultural impact assessment portion of the project conducted archival research on the area and conducted interviews with people from the area. Archaeological reconnaissance for the project consisted of two brief pedestrian surveys and a helicopter survey of the entire fenceline.

The study relocated and photographed four previously recorded sites thought to be Puʻu ʻŌlelo Heiau (Site 174), Kaluakapiʻioho Heiau (Site 175), Kahokukano Heiau (Site 177) and Pākuʻi Heiau (Site 178), all of which were included as part of the Hōkūkano-ʻUalapuʻe National Historic Landmark (Dunbar 1988). The study also identified two sites in the vicinity of the fenceline. They were documented as Site 1 and Site 2. Site 1 was located on the west bank of Ōhiʻa stream and consisted of a walled terrace measuring approximately 8 by 2.5 m with a 5 m long rock alignment running parallel to the stream. Site 2 consisted of a 6 m long wall segment documented on the west side of Kaluaʻaha Stream approximately 30 m north of the proposed fenceline. Following the survey, a 10 ft (3 m) buffer and archaeological monitoring was recommended for Site 1 and due to being outside the proposed path of the fenceline, avoidance was recommended for Site 2. No SIHP numbers were assigned to either of the sites documented.

Lee-Greig and Hammatt 2017

Between 2015 and 2016, CSH conducted an archaeological inventory survey for after the fact permits associated with improvements to D&J Ocean Farms (Lee-Greig and Hammatt 2017). Although the current project area was included in the survey, intensive survey and subsurface excavations were limited to four areas of improvements that were the subject of the after the fact

permitting process and located outside the project area. The survey included a pedestrian survey and the excavation of 33 small test pits for soil testing, 28 backhoe trenches, four 50 x 50 cm shovel tests, and two 1 x 1 meter test units.

The study identified five archaeological sites recorded as SIHP #s 50-60-04-2574 through -2578. The sites include a historic-period wall recorded as SIHP #-2574, a traditional Hawaiian habitation site and subsurface cultural deposit with six firepit features and a wall remnant recorded as SIHP #-2575, a historic retaining wall recorded as SIHP #-2576, a traditional Hawaiian subsurface cultural deposit with three firepit features and a buried rock wall alignment recorded as SIHP #-2577, and a traditional Hawaiian subsurface cultural deposit with two firepits recorded as SIHP #-2578. Charcoal samples from SIHP #-2577 and -2578 were sent for radiocarbon dating and indicate traditional Hawaiian occupation of the area as early as the late 13th century with continued use through the middle of the seventeenth century. Following the survey, all five of the sites were assessed as significant under Criterion "d", for their information content and monitoring was recommended for work in the vicinity of the fishpond and for a proposed septic system.

Frey 2019

In 2018, CSH conducted archaeological monitoring for the proposed septic system for Keawa Nui Farms, formerly D&J Ocean Farms (Frey 2019). Documented stratigraphy during the project consisted of fill materials over natural soils. No artifacts, cultural deposits, or histric properties were documented during monitoring.

Yucha and Hammatt 2019

In 2019, human skeletal remains, recorded as SIHP # 50-60-04-2581, were inadvertently discovered on the Keawa Nui Farms property during monitoring for a fire protection project and a burial site component of a preservation plan was developed for the site (Yucha and Hammatt 2019). SIHP #-2581 consisted of an intact traditional Hawaiian burial in a flexed position and was assessed as significant under Criterion "e". The remains were preserved in place and a burial preserve with a square 5 foot buffer was established around the site.

Section 4 Fieldwork Results

This section, which presents the results of the fieldwork effort, is organized into the following subsections: (1) methods of the fieldwork, (2) organization and presentation of the findings, and (3) site descriptions and documentation.

4.1 Methods

Fieldwork for this project was conducted for approximately three weeks on March 21-25, May 16-20 and June 28-30, 2022, by Honua archaeologists Nathan DiVito, B.A., Ryan Garrido B.A., Radha Martin, B.A., Cassandra Pascua B.A., and Christopher M. Monahan, Ph.D. (who was also the principal investigator). Approximately 52 person-days (416 person-hours) were needed to complete the fieldwork, which was conducted under archaeological permit number 22-26 issued to Honua Consulting by the SHPD/DLNR in accordance with HAR Chapter 13-282.

The archaeological field inspection consisted of a pedestrian survey of portions of the phase 1 project area (Figure 24). Survey included a visual inspection for any constructed surface architecture and observation of the ground surface and soil exposures for artifacts and/or exposed cultural deposits. Survey transects generally proceeded in a N/S orientation with archaeologists generally separated by ~10 meters.

Digital photographs were taken throughout the project to record the vegetation, topography, and condition of the project area. An associated photo log was maintained, which recorded the subject of the photograph, the direction the camera was pointing, and other information as appropriate. A hand-held Trimble GeoXT (7000 series) device was used to record transect paths, site location, orientation and boundaries, and other points of interest. The Trimble maintained an accuracy ranging between 1-3 m (3-10 ft.) and all recorded GIS data was post-processed for accuracy. Post processing of data and maps and figures for this project were created by Honua Consulting archaeologist and GIS specialist Frederick LaChance IV, B.A.

4.2 Organization and Presentation of the Findings

Table 6 is a summary of the 103 sites in the phase 1 project area. This includes 98 sites identified by Honua as well as four (4) sites previously identified by Keala Pono (McElroy 2022) and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupua‘a boundary between ‘Ualapu‘e and Kahananui. Honua archaeologists visited and briefly inspected this heiau, whose exact name and number is unclear based on conflicting archival information. No new data were recorded by Honua at this heiau, but its geospatial location and general boundaries were mapped.[10]

Figure 25 shows the location of all 103 sites.

Figure 26, Figure 27 and Figure 28 are inset (zoomed-in) maps of different portions of the phase 1 project area.

[10] As noted elsewhere in this report, McElroy (2022) identified eight (8) temporary sites (UA-1 through UA-8); three (3) of these (UA-3, UA-4 & UA-5) have been incorporated into Honua 41; four (4) of these are within the current project area (UA-1, UA-7 & UA-8) or partially within it (UA-6); UA-2 is not within the current project area.

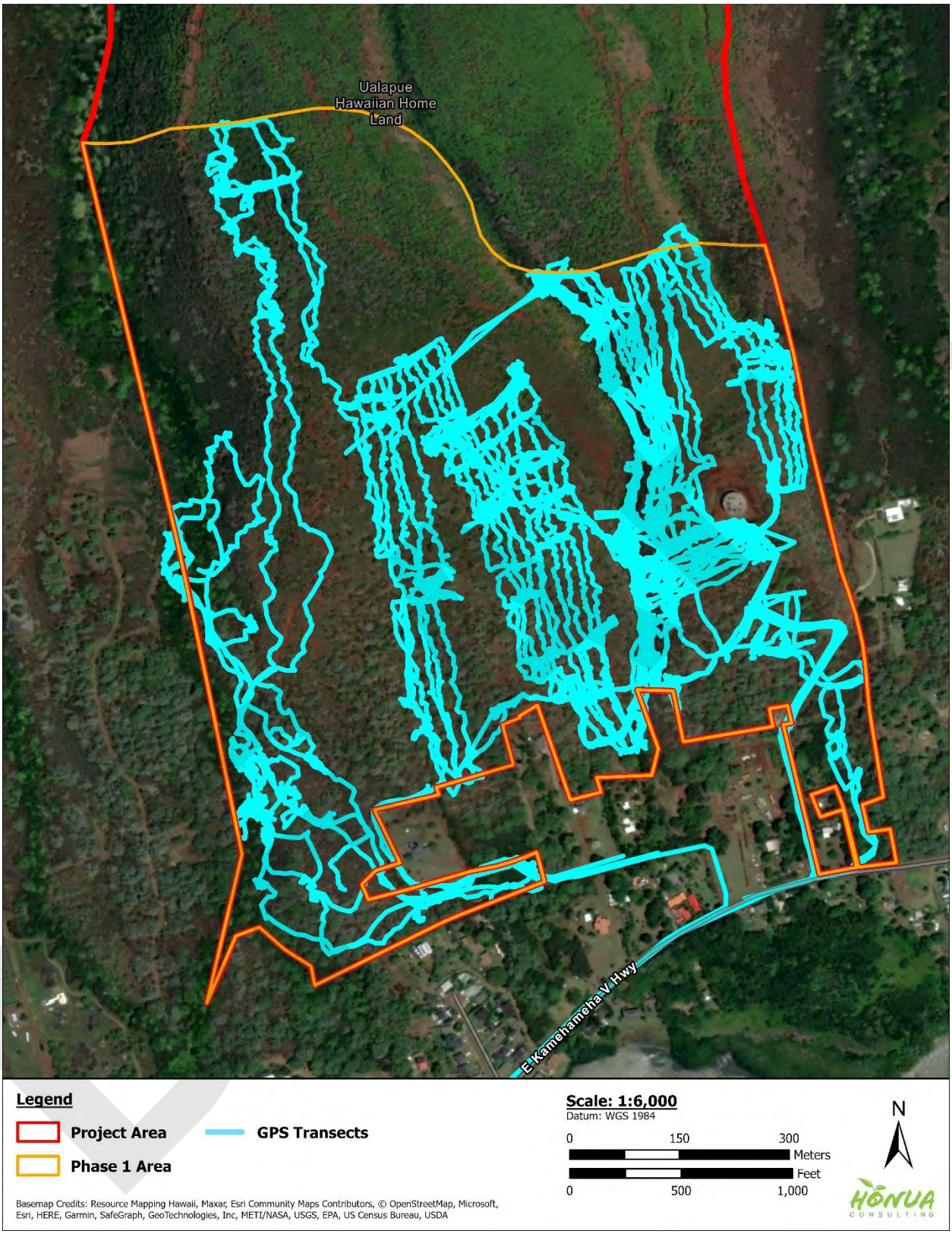


Figure 24. Aerial image showing survey transects walked by Honua archaeologists (base image from Esri 2021)

Table 6. Site Summary for the Phase I Project Area

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
1	1	Terrace/alignment	Cultivation/garden	Pre-contact / early historic	Long, low, cross-slope terrace/alignment
2	1	Modified outcrop	Soil/landscape retention	Indeterminate	Functioned to reinforce / retain upper plateau edge above Mo‘omuku Gulch
3	2	Terraces	Cultivation/garden	Pre-contact / early historic	Located at upper edge of Ki‘inohu Gulch
4	1	Mound	Clearing mound	Probably historic	Mostly subrounded boulders w. cobbles – no formal structure
5	5	Site complex	Habitation	Pre-contact / early historic	Fea. A = soil-filled platform (house site); site is on edge of plateau area above Ki‘inohu Gulch
6	1	Modified outcrop	Soil/landscape retention	Indeterminate	Functioned to reinforce / retain upper plateau edge above Ki‘inohu Gulch
7	1	Possible rockshelter	Temporary shelter	Pre-contact / early historic	Single marine shell (*Turbo* sp.) on ground surface within rockshelter
8	1	Possible rockshelter	Temporary shelter	Pre-contact / early historic	Several rocks on ground surface inside rockshelter
9	2	Rockshelter w. small wall at one end	Temporary shelter	Pre-contact / early historic	Short, subangular boulder wall (Fea. B) defines the north end of the site
10	3	Terrace/alignment	Cultivation/garden	Pre-contact / early historic	Located in bottom / floodplain of Ki‘inohu Gulch
11	2	Rockshelter w. small terrace in front	Temporary shelter	Pre-contact / early historic	Terrace (Fea. B), 3-4 courses high, retains living floor in front of rockshelter
12	1	Terrace at dry waterfall	Indeterminate	Indeterminate	Atypical / unique feature located under a small, dry waterfall in gulch
13	2	Terrace/alignment	Cultivation/garden	Pre-contact / early historic	Creates level planting area along east side gulch floodplain
14	1	Alignment	Historic boundary line	Historic	Jumbled, relatively poor condition boulder alignment
15	1	Modified outcrop / terrace	Soil/landscape retention or possible garden	Indeterminate	Short section of angular, blocky 2-3 courses high boulder terrace
16	2	T-shaped linear mound	Possible historic boundary lines	Historic	These may also be the base foundation rocks of an old fence line
17	2	Boulder retaining wall/terrace	Soil/landscape retention	Historic	Two long sections appear to have once connected, and were installed to combat soil erosion of hillside
18	2	Modified boulder outcrops	Clearing mounds	Indeterminate	Pair of large boulder outcrops w. several smaller clasts placed on top
19	1	Short wall section	Windbreak – small temporary shelter or garden	Pre-contact / early historic	Function of this windbreak feature should be investigated by archaeological excavation

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
20	1	Terrace / retaining wall	Soil/landscape retention	Historic	Does not appear to be a traditional Hawaiian structure
21	1	Indeterminate	Indeterminate	Indeterminate	Possible degraded (poor condition) mound or small windbreak
22	2	Terraces (n=2)	See column 6 ("Comments")	See column 6 ("Comments")	Function / age of this pair of parallel terraces should be investigated by archaeological excavation
23	3+	Site complex	Cultivation/garden	Pre-contact / early historic	Rock work is in altered / degraded condition, and, thus, it is difficult to define individual features
24	3+	Modified outcrop w. wall & terrace	Cultivation/garden	Pre-contact / early historic	There is a formalized hole (possibly a drainage feature) in south end of interior floor of this feature
25	2	Terrace w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Fea. A = stacked windbreak creating small level area to W; Fea. B = terrace creating level soil area
26	1	Terrace w. windbreak wall	Cultivation/garden	Pre-contact / early historic	This type of feature is typical of the project area
27	1	Modified boulder outcrops	Clearing mounds	Indeterminate	Large boulder outcrops w. several smaller clasts placed on top
28	1	Terrace	Indeterminate	Indeterminate	Degraded (altered) cross-slope boulder terrace in poor condition
29	3	Site complex w. terraces	Cultivation/garden	Pre-contact / early historic	Fea. A = typical (for this project area) terrace / windbreak combination
30	2	Elevated platform	Fishing shrine (koʻa)	Indeterminate	Fea. A = platform; Fea. B = lower constructed area on platform's east side; site contains several old (degraded) coral fragments in matrices of rock work
31	1	Modified outcrop	Possibly temporary shelter/resting place or clearing mound	Pre-contact / early historic	Use of *in situ* large boulder functions as a "back rest" seat protected from trade winds
32	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
33	1	Terrace	Indeterminate	Indeterminate	Very poor (altered) physical condition
34	2+	Modified boulder outcrops	Clearing mound	Indeterminate	Boulder outcrops w. several boulders placed on top
35	1	Modified outcrop w. windbreak	Cultivation/garden	Pre-contact / early historic	--
36	1	Long boulder wall / terrace	Soil/landscape retention	Historic	Directly associated functionally with a soil berm and drainage ditch heading downslope to southeast
37	1	Modified outcrop w. windbreak	Cultivation/garden	Pre-contact / early historic	--

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
38	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
39	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
40	1	Modified boulder outcrop	Clearing mound	Indeterminate	Large boulder outcrop w. several smaller clasts placed on top
41	4	Site complex w terraces	Habitation/garden	Pre-contact / early historic	Site 42 includes McElroy's (2022) temporary site #s UA-3, UA-4 & UA-5 Fea. A = soil filled platform (house site); Fea. B = alignment / terrace; Fea. C = walled enclosure Fea. D = possible walled enclosure
42	1	Mound	Indeterminate	Indeterminate	Rectangular rock mound constructed on slope; small boulders on exterior, large cobbles in interior
43	1	Partial enclosure w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Linear mound constructed atop existing boulders paralleling a small drainage; single course alignment between end of wall and drainage; 'ulu maika (gaming stone) observed on drainage side
44	1	Enclosure w. windbreak wall	Habitation	Pre-contact / early historic	Habitation structure has one high wall facing prevailing trade winds
45	4+	Site complex	Habitation or heiau (ceremonial complex)	Pre-contact	Large well-constructed site complex = 2 enclosures w. earthen terrace & paved platform in between; evidence of bulldozing around structure Fea. A = recessed walled enclosure; Fea. B = earthen terrace and paved platform; Fea. C = heavily paved platform; Fea. D = walled enclosure
46	1	Partial enclosure	Indeterminate	Pre-contact / early historic	--
47	6+	Site complex	Habitation or heiau (ceremonial complex)	Pre-contact	Large site complex: at least 6 main enclosures divided into rooms; numerous other rock alignments & mounds; large, stepped wall constructed on a slight slope near a stream
48	2	Walled terraces	Water diversion / agriculture	Historic	2 large walled earthen terraces running parallel to a stream Fea. A = rectangular terrace; Fea. B = triangular terrace
49	2	Enclosure with windbreak & alignment	Habitation/garden	Pre-contact / early historic	Enclosure incorporates existing boulders w. cobbles stacked on top; a piled mound built on crest of gentle slope Fea. A = C-shaped enclosure; Fea. B = alignment

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
50	1	Platform or terrace	Indeterminate	Pre-contact / early historic	Remnant of paved platform or terrace w. boulders on perimeter & filled w. cobbles; in a graded area between existing housing
51	1	Enclosure	Habitation	Pre-contact / early historic	Remnant of a C-shaped enclosure in a graded area between existing housing
52	1	Mound	Clearing mound or cache of cleared rocks	Indeterminate	Large & medium size cobbles piled in a mound, located in a graded area between existing housing
53	1	Enclosure	Cultivation/garden	Pre-contact / early historic	Cobbles piled on & between existing boulders on side facing prevailing trade winds; remainder is low piled rocks
54	7+	Wall & circular alignments	Cultivation/garden and/or water diversion	Pre-contact / early historic	Wall runs along a diversion channel from stream that has 6-8 circular rock alignments, possibly for planting; large boulders along nearby stream
55	1	Enclosure	Habitation	Pre-contact / early historic	C-shaped enclosure that incorporates existing boulders w. cobbles stacked on top; opens to opposite direction of prevailing trade winds
56	1	Modified boulder enclosure	Indeterminate	Pre-contact /early historic	Cleared area among line of boulders; 2 locations on each side of cleared area have been filled w. cobbles & core filling
57	1	Wall	Water diversion and/or flood control	Historic	Thick well-constructed wall segment running parallel to stream, slightly curved and angled on front and back
58	1	Walled enclosure w. notch	Habitation	Pre-contact / early historic	Rectangular walled enclosure w. notch; comprised of piled cobbles & boulders
59	1	Platform / terrace w. retaining wall	Cultivation/garden	Pre-contact / early historic	Terrace / retaining wall built into slope of gulch running parallel to ridge; wall partially collapsed due to erosion; site surface is covered w. soil
60	1	Enclosure w. windbreak wall	Habitation	Pre-contact / early historic	C-shaped walled enclosure w. high wall on side facing prevailing (trade) winds
61	1	Enclosure	Habitation	Pre-contact /early historic	C-shaped walled enclosure w. high wall on side facing prevailing (trade) winds
62	1	Walled enclosure	Habitation	Pre-contact /early historic	Large well-constructed rectangular walled enclosure between stream and gulch; slab-lined hearth built into interior of structure
63	1	Enclosure	Habitation	Pre-contact /early historic	C-shaped walled enclosure w. high wall on side facing prevailing (trade) winds, w. a small platform constructed on one side

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
64	1	Walled enclosure	Habitation	Pre-contact / early historic	Heavily overgrown rectangular walled enclosure
65	1	Enclosure	Indeterminate	Indeterminate	--
66	3	Mound & enclosures	Cultivation/garden	Pre-contact / early historic	Located around small drainage w. many large boulders Fea. 1 = mound of cobbles & boulders; Fea. 2 = modified boulder enclosure; Fea. 3 = modified boulder enclosure
67	3	Cleared area	Cultivation/garden	Pre-contact / early historic	Similar to Site 66; consists of 3 or more cleared areas in boulder field, mostly single boulder alignments w. cobbles strewn over top
68	1	Enclosed cleared area	Cultivation/garden	Pre-contact / early historic	Circular cleared area w. rocks piled on existing (natural) boulders
69	1	Walled enclosure	Habitation	Pre-contact / early historic	Large rectangular walled enclosure w. faced & piled boulders around the outside
70	10+	Terraces	Cultivation/garden	Pre-contact / early historic	Numerous multi-stepped terraces in a rocky area adjacent to a gulch
71	1	Walled enclosure	Habitation	Pre-contact / early historic	Rectangular walled enclosure w. a high back retaining wall running parallel to stream & facing prevailing (trade) winds; enclosure opens to the stream side
72	1	Wall	Water diversion and/or flood control	Historic	--
73	2	Enclosure w. attached wall	Habitation	Pre-contact / early historic	Rectangular walled enclosure on rocky slope of gulch; attached wall runs toward gulch
74	1	Alignment	Indeterminate - possible collapsed windbreak	Indeterminate	--
75	2	L-shaped wall w. paved platform	Indeterminate	Pre-contact /early historic	One portion of wall faces prevailing (trade) winds; other incorporates a paved platform
76	1	Terrace	Cultivation/garden	Pre-contact / early historic	Terrace w. a boulder & cobble retaining wall, built on slope
77	1	Mound	Indeterminate	Indeterminate	Collapsed square shaped mound constructed of cobbles & boulders on bedrock outcrop
78	1	Enclosure	Habitation	Pre-contact / early historic	Earthen terrace enclosed by a high backed wall facing prevailing (trade) winds; overgrown
79	1	Platform / terrace	Habitation	Pre-contact /early historic	Platform / terrace on slope w. retaining wall in front; 10 cm diameter hole was present in a basalt boulder comprising one of the corners

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
80	1	Modified boulder outcrop – C-shaped Enclosure	Habitation	Pre-contact / early historic	Walled enclosure w. a high back wall facing prevailing (trade) winds; large boulder incorporated into wall
81	1	Platform / terrace	Habitation	Pre-contact / early historic	Square platform / terrace constructed on a slope w. paved upper surface
82	3	Terraces & enclosure	Habitation/garden	Pre-contact / early historic	Set of earthen terraces constructed on slope w. retaining walls on downslope side & small enclosure
83	1	Enclosure w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Enclosure incorporates a boulder outcrop on side of prevailing (trade) winds
84	1	Enclosure w. windbreak wall	Cultivation/garden	Pre-contact / early historic	Enclosure w. a wall blocking prevailing (trade) winds
85	1	Linear mound	Indeterminate	Indeterminate	Linear mound parallel to slope, possible clearing mound
86	1	Enclosure w. windbreak	Habitation	Pre-contact / early historic	Rectangular enclosure w. retaining wall on downslope side; incorporates bedrock & natural boulders
87	2	Mound & alignment	Indeterminate	Indeterminate	Fea A = mound; Fea B = alignment
88	1	Wall or rock berm	Boundary marker	Historic	70 m long piled boundary wall or rock berm
89	3	Site complex	Habitation w. possible burial (platform)	Pre-contact / early historic	Fea. A = terrace w. retaining wall; Fea. B = collapsed, depressed rectangular enclosure; Fea. C = well constructed rectangular platform w. upright slabs around exterior; possible burial
90	1	Partially collapsed enclosure w. windbreak wall	Possible habitation	Pre-contact / early historic	Heavily damaged (partially collapsed) enclosure; once had a high backed wall facing prevailing (trade) winds
91	2	Mound & push pile	Result of road construction	Historic	Mound & push pile near existing trail
92	1	Modified boulder outcrop – windbreak wall	Cultivation/garden	Pre-contact / early historic	Wall constructed of cobbles & small boulders that incorporates large (outcrop) boulder; built perpendicular to prevailing (trade) winds
93	2	Large livestock enclosure	Ranching	Historic	Large rectangular livestock enclosure w. small square terrace on downslope portion; NE corner destroyed by road above Fea A = livestock enclosure; Fea. B = terrace
94	3+	Historic water distribution complex	Ranching	Historic	Rows of raised concrete water tank foundations enclosed by barbed wire fence; retaining wall & an excavated pit are present in the area; and the entrance of a road is present in upslope portion

Site #	# of Fea.	Formal Type	Functional Interpretation	Temporal Interpretation	Comments
95	1	Mound	Indeterminate	Indeterminate	Low rectangular paved area w. small boulders on outside & cobbles in interior; in a graded area near existing housing
96	1	Mound	Indeterminate	Indeterminate	Low rectangular paved area w. small boulders on outside & cobbles in interior; in a graded area near existing housing
97	1	ʻAuwai	Water diversion/garden	Pre-contact /early historic	Curved depressed area running parallel to stream; adjacent to Site 98
98	2+	Terraces	Cultivation/garden	Pre-contact /early historic	Possible agricultural terraces along stream
UA-1	1	Mound	Indeterminate*	Indeterminate*	These temporary site #s refer to site-features identified by McElroy (2022) that are discussed in the previous archaeology section of this report
UA-6	1	Wall	Indeterminate*	Indeterminate*	
UA-7	1	Modified outcrop	Indeterminate*	Indeterminate*	
UA-8	1	Modified outcrop	Indeterminate*	Indeterminate*	
Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182)					See text for discussion

Notes: McElroy (2022) identified eight (8) temporary sites designated UA-1 through UA-8; three (3) of these (UA-3, UA-4 & UA-5) have been incorporated into Honua 41; four (4) of these are within the current project area (UA-1, UA-7 & UA-8) or partially within it (UA-6); UA-2 is not within the current project area. Functional and temporal interpretations for UA-1, UA-6, UA-7 & UA-8 are listed as "Indeterminate*" because McElroy (2022) did not provide specific interpretations, and Honua did not have sufficient time to interpret these site-features in the field.

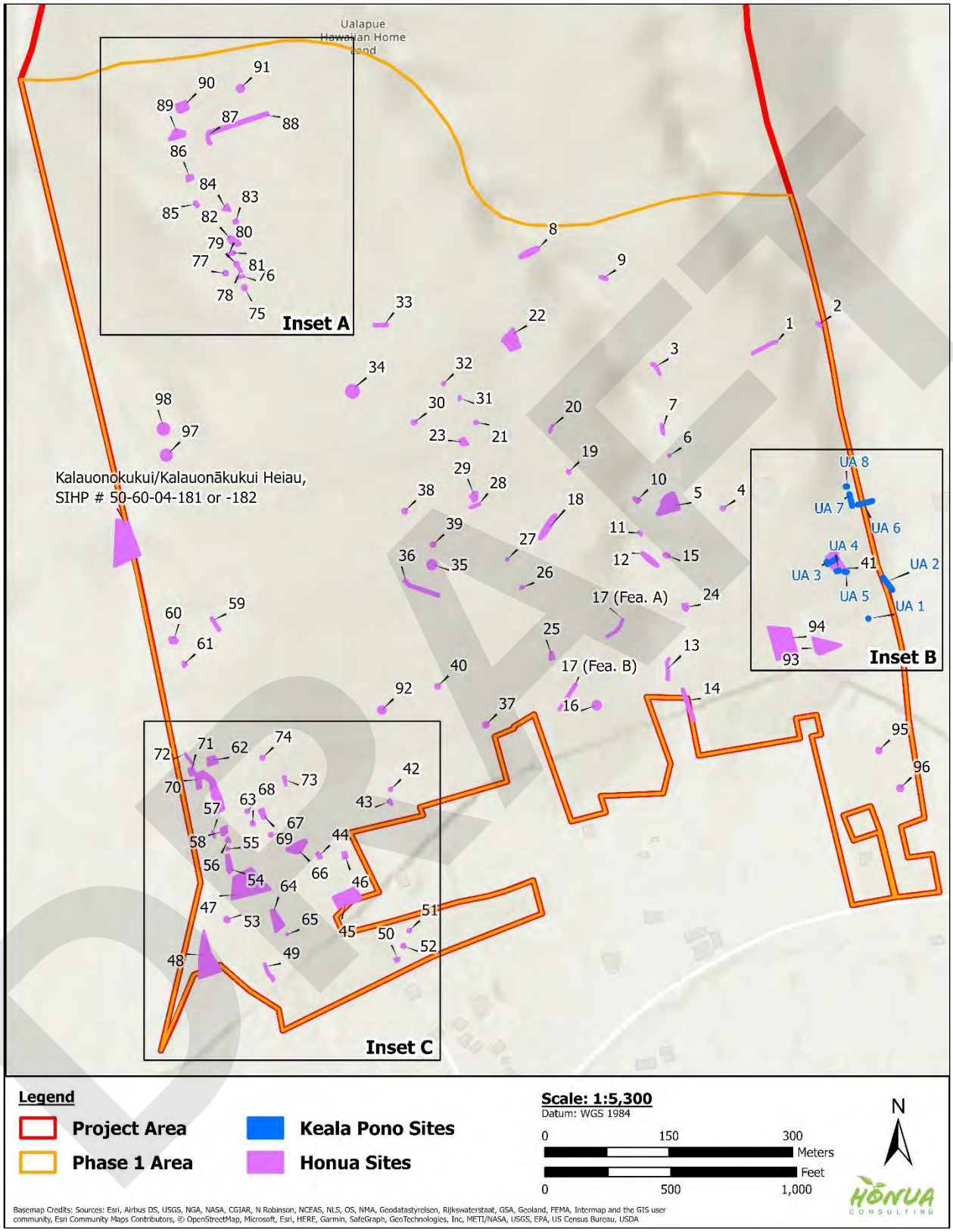


Figure 25. Sites identified by Honua and Keala Pono (McElroy 2022) in project area; note, three areas with dense findings are included below as inset (zoomed-in) maps A-C

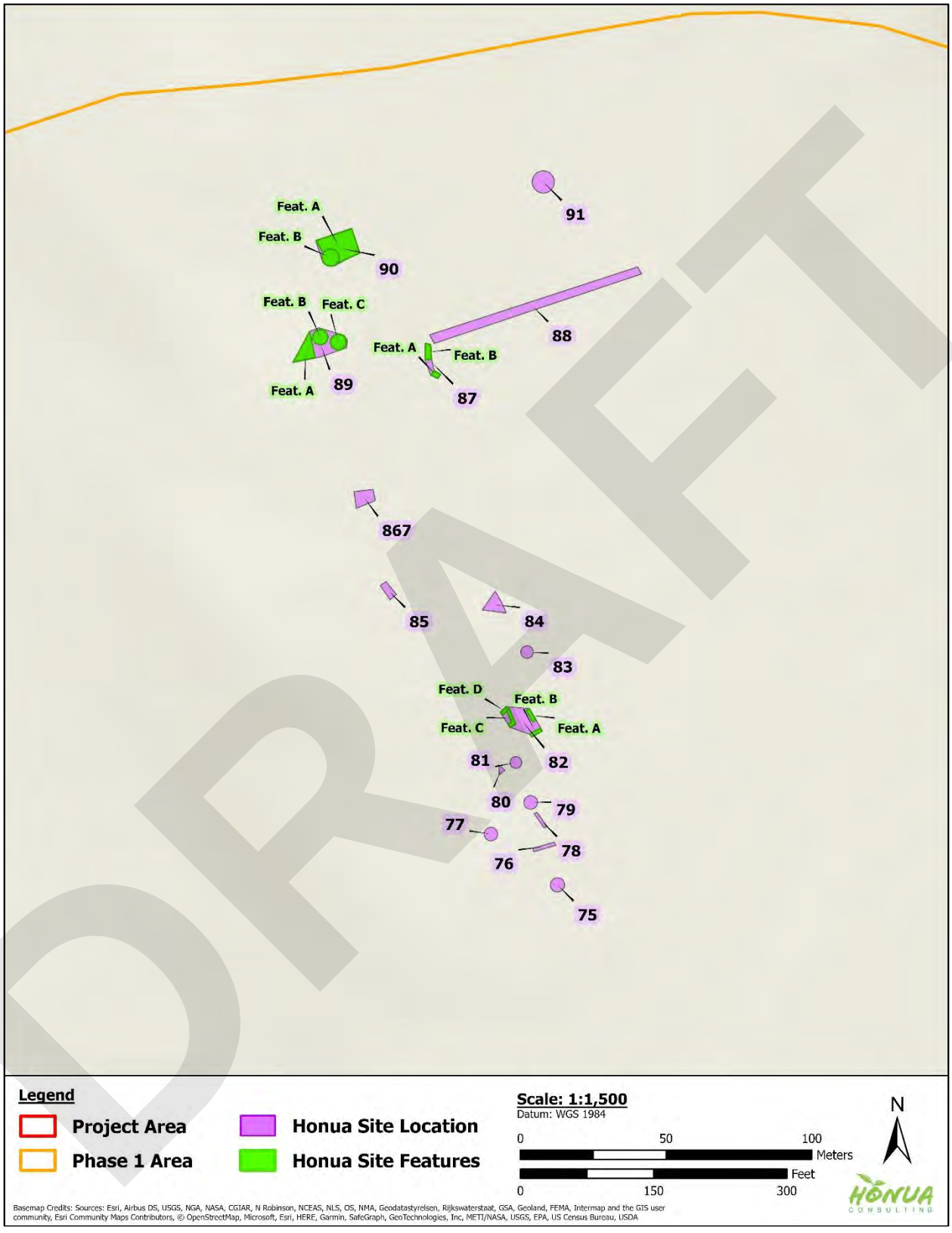


Figure 26. Inset map A (see Figure 25 for location in project area, and see text for explanation)

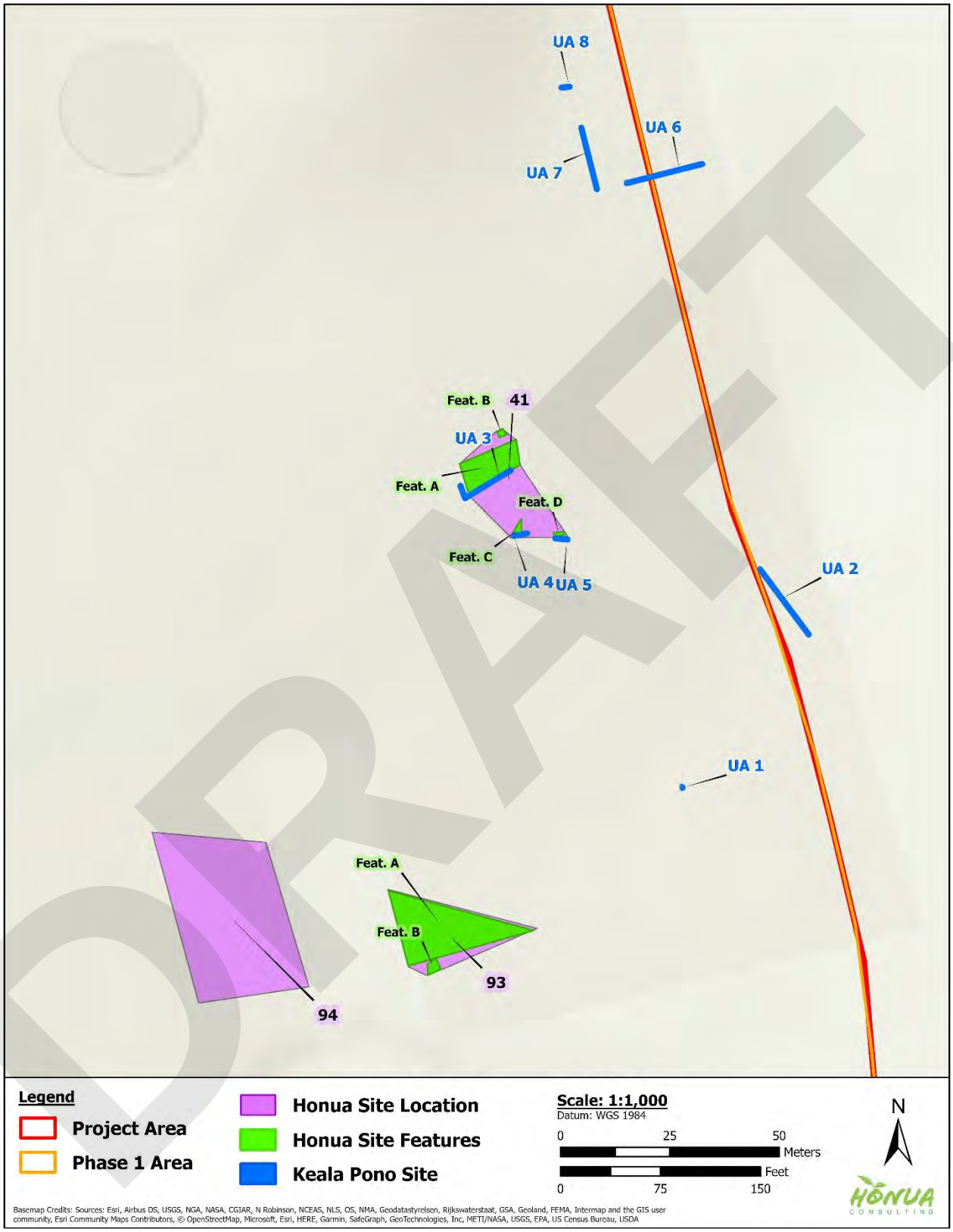


Figure 27. Inset map B (see Figure 25 for location in project area, and see text for explanation)

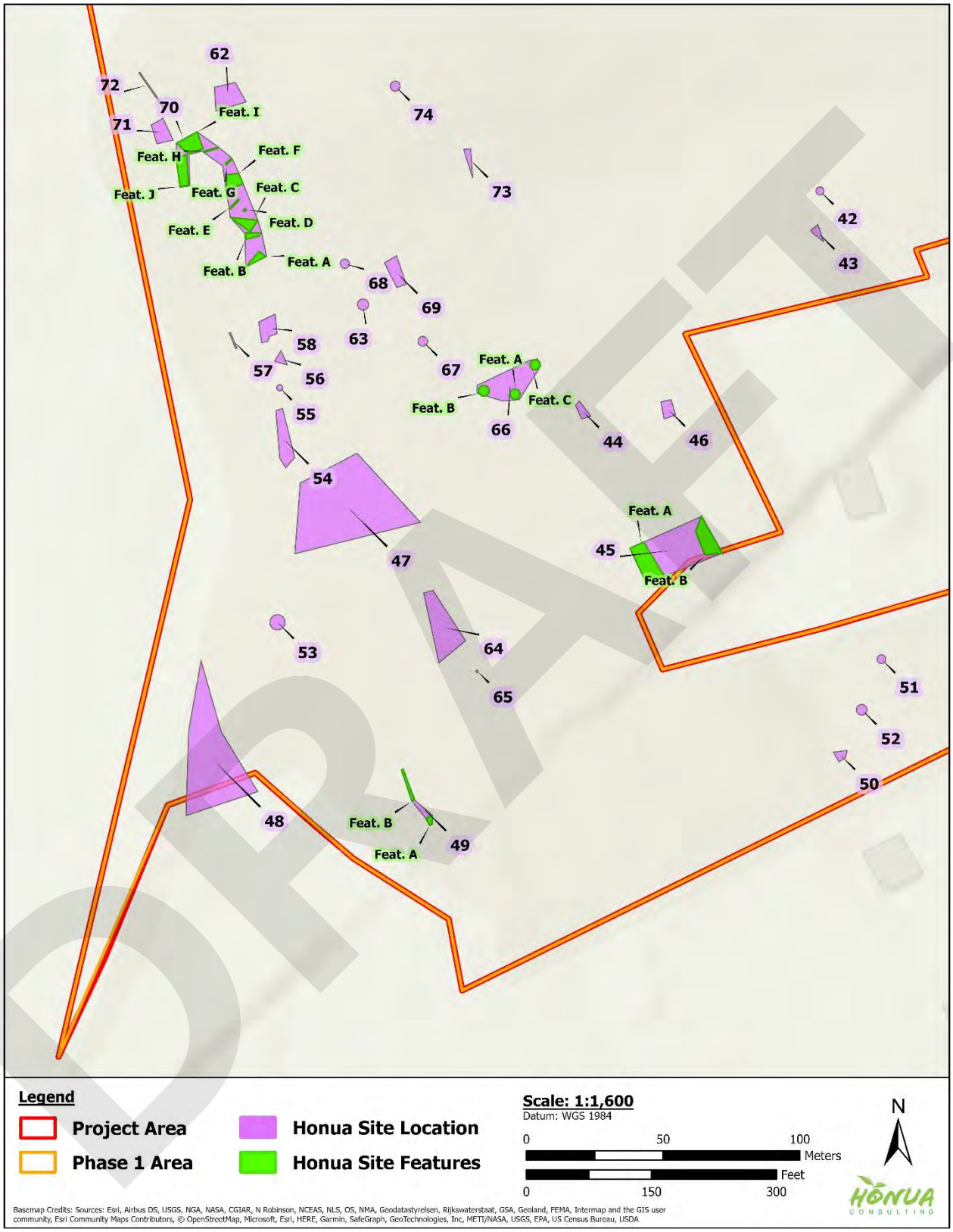


Figure 28. Inset map C (see Figure 25 for location in project area, and see text for explanation)

4.3 Site Descriptions and Documentation

The following site descriptions include interpretations of function and age that should be considered preliminary. If a formal archaeological inventory survey (AIS) is conducted in the current project area, subsurface testing (archaeological excavation) would need to be conducted at a sample of site types in order to better understand their function and age. Also, for the purposes of this report, we have generally included only one or two representative photographs for each site or site-feature, although additional photographs are available in many cases. Unless stated otherwise, all above-ground structures consist of dry-stacked (mortar-free) rock work using local basalt.

Honua 1 (Terrace / Alignment)

Honua 1 is a low terrace / alignment of subangular / subrounded boulders oriented cross-slope (NE/SW) creating a level soil area on its upslope side to the N. It is measures ~35 (meters) m long but is discontinuous and broken up in places (Figure 29 to Figure 31). Its physical condition is fair. The western half of the site consists of larger boulders compared with the eastern half; and is less formal than the eastern half. In several places, there is one course stacking, but mostly the structure is an alignment. Vegetation at the site includes lantana and kiawe.

Honua 1 is interpreted as a dryland (rain-fed) cultivation / garden structure dating from the pre-contact to early historic period.

Honua 2 (Modified Outcrop)

Honua 2 is a modified outcrop along the upper edge of the western side of Mo‘omuku Gulch (Figure 32 and Figure 33). It is oriented roughly N/S; and consists of angular / subangular boulders and cobbles stacked and piled on bedrock outcrop. Stacking and piling is up to 2-3 courses in some places. The site is informally constructed and in good physical condition.

Honua 2 functioned as a soil / landscape retention structure to reinforce / retain the upper, rocky edge of the plateau above Mo‘omuku Gulch. The age of this site is indeterminate.

Honua 3 (Terraces)

Honua 3 is two informally-constructed terraces (Feature A and Feature B) of subangular / subrounded boulders that create several small level soil areas on their upslope side to the east (Figure 34 [Feature A] and Figure 35 [Feature B]). The site, which is located at the upper, eastern edge of Ki‘inohu Gulch, measures ~15 m long (N/S). Its physical condition varies from good to fair. In several places, there is 1-2 course stacking, and portions of the site (particularly Feature A) are partially collapsed. Vegetation at the site includes koa haole and grasses. Feature A is the smaller of the features and uses the natural outcrop in its construction. Feature B is a pair of more formal terraces in better physical condition compared with Feature A. Feature B has some sections of 2-3 course stacking / piling of subrounded / subangular boulders and cobbles. Several slabs placed on their sides are located at the S and SE (downslope) sides of Feature B.

Honua 3 is interpreted as a dryland (rain-fed) cultivation / garden site dating from the pre-contact to early historic period.

Figure 29. Overview of middle section of terrace / alignment (Honua 1); view east-northeast

Figure 30. Overview of east end of terrace / alignment (Honua 1), facing west

Figure 31. Detail of east end of terrace / alignment (Honua 1), facing northeast

Figure 32. Overview of modified rock outcrop (Honua 2), facing south-southeast

Figure 33. Overview of modified rock outcrop (Honua 2), facing west

Figure 34. Overview of terrace recorded (Honua 3, Feature A), facing east

Figure 35. Overview of terrace (Honua 3, Feature B), facing north

Honua 4 (Mound)

Honua 4 is an informally-stacked and -piled mound of mostly subrounded boulders with some cobbles just west of the water tank (Figure 36 and Figure 37). The mound is roughly circular to oval in plan view shape, and has a diameter of ~1.5-2.0 m. Its maximum height is ~1.0 m above the ground surface (mas). Stacking and piling is up to 3-4 courses in some places. In general, the mound has no formal structure and in good to fair physical condition.

Honua 4 is likely a clearing mound constructed in the historic period, rather than a traditional Hawaiian feature.

Honua 5 (Site Complex - Habitation)

Honua 5 is a site complex consisting of five features (A-E) located near the western edge of the plateau above Ki‘inohu Gulch (i.e., site is above and just east of the east side of the gulch). In general, the features are constructed of subrounded / subangular boulders and cobbles. Honua 5 is also due west of the water tank. The site occupies an area ~25 m (E/W) by ~15 m (N/S). Vegetation at the site includes kiawe, koa haole and grasses. The site is in fair to good physical condition.

Feature A is a soil-filled platform defined by low terraces / alignments on its west and south sides. Portions of these two sides have one course of informally-stacked clasts and are up to 0.4-0.5 mas. This probable house site occupies a roughly square area measuring ~2.0 m by ~2.0 m. A narrow entranceway appears to be located in the southwestern corner of this feature (Figure 38 and Figure 39).

Feature B is an area of informal rock stacking and alignment on and adjacent to the bedrock outcrop along the edge of the drop-off in Ki‘inohu Gulch (Figure 40 and Figure 41) to the W of Feature A. This feature includes an upright slab balanced on its side. Most of the rock work is informal mounding and piling. This area appears to be a work or resting place associated with the house site (Feature A).

Feature C is a somewhat amorphous piled mound (Figure 42) that has likely been impacted by vegetation growth NNW of Feature A. The function of this feature is indeterminate, but it may simply be a clearing pile.

Feature D, which is SE of Feature A, is a partial enclosure with a windbreak wall (Figure 43 and Figure 44) on its east side. Such built-in wall sections of the east side of site-features are common in this project area and appear to be a distinctive characteristic of the ‘Ualapu‘e uka (upland) sites. The west side of the “windbreak wall” has several foundation rocks (i.e., tightly fitted and balanced boulders), stacked 2-3 courses high, at its base. This feature measures ~3.0 m (N/S) by ~1.5 m (E/W) with a maximum height of ~0.7 mas. This feature appears to have been altered somewhat from its original shape and size.

Feature E (Figure 45) is an informally-constructed boulder terrace supporting an area of level soil on its upslope (N) side. This feature is in relatively poor physical condition.

Honua 5 is interpreted as a traditional Hawaiian habitation dating from the pre-contact to early historic period.

Figure 36. Overview of mound (Honua 4), facing south

Figure 37. Another view of mound (Honua 4), facing west

Figure 38. Overview of soil-filled platform (Honua 5, Feature A), facing northwest

Figure 39. Detail of southwest corner of Feature A (Honua 5), facing northwest; note, possible entranceway (yellow arrow)

Figure 40. Overview of modified boulder outcrop (Honua 5, Feature B) viewed from down in the gulch; facing northeast

Figure 41. Another view of Feature B (Honua 5) from the top, facing south-southwest; yellow arrow points to upright placed on its side

Figure 42. Overview of piled mound (Honua 5, Feature C), facing north-northeast

Figure 43. Overview of partial enclosure with windbreak wall (Honua 5, Feature D), facing south

Figure 44. Another view of partial enclosure with windbreak wall (Honua 5, Feature D), facing east

Figure 45. Overview terrace (Honua 5, Feature E), facing northeast

Honua 6 (Modified Outcrop)

Honua 6 is a modified outcrop located along the upper edge of the eastern side of Ki‘inohu Gulch (Figure 46 and Figure 47). It is oriented roughly N/S; and consists of angular / subangular boulders stacked and piled on bedrock outcrop. Stacking and piling is 1-2 courses in some places. In general, the site is informally constructed and in good physical condition.

Honua 6 functioned as a soil / landscape retention structure to reinforce / retain the upper, rocky edge of the plateau above the gulch. Its age is indeterminate.

Honua 7 (Possible Rockshelter)

Honua 7 is a possible rockshelter with a few small level areas under a vertical cliff face overhang (Figure 48 and Figure 49). The site is oriented N/S on the east side of Ki‘inohu Gulch and is ~12 m long. Maximum depth (i.e., E/W orientation) of the rockshelter at its deepest point is ~2.75 m; maximum height under the dripline is ~2.0 m. The ceiling slopes back to the E to ~1.0 m. There is a possible area of burning inside the rockshelter but this needs to be tested further. On the ground surface near the middle of the overhang, a marine snail commonly known as a triton shell (family Cymatiidae) was observed. There are no formally-constructed surface modifications (e.g., stacked or aligned rocks) at the site.

Honua 7 is a possible temporary shelter used in the pre-contact to early historic period. Subsurface testing (archaeological excavation) is needed to prove site occupation and use, given the lack of above-ground surface modifications.

Honua 8 (Possible Rockshelter)

Honua 8 is a possible rockshelter under a vertical cliff face overhang high above Ki‘inohu Gulch (Figure 50 and Figure 51). The site is oriented NE/SW along the west side of the gulch and is ~22 m long. Maximum depth of the rockshelter at its largest section of overhang is ~2.2 m; maximum height under the dripline is ~1.0 m. There are several scattered rocks, none larger than cobble size, on the level floor of the site; but there are no formally-constructed surface modifications (e.g., stacked or aligned rocks) at the site.

Honua 8 is a possible temporary shelter used in the pre-contact to early historic period. Subsurface testing (archaeological excavation) is needed to prove site occupation and use, given the lack of above-ground surface modifications.

Honua 9 (Rockshelter with Wall)

Honua 9 is a rockshelter under a vertical cliff face overhang on the east side of Ki‘inohu Gulch (Figure 52). The site is oriented NW/SE and is ~10 m long. Maximum depth of the rockshelter is ~2.0 m; maximum height under the dripline is 1.2 m. At the northern end of the rockshelter, there is an informally-constructed rock wall (Feature B), built of angular blocks (Figure 53). There may be a boulder terrace fronting the rockshelter opening as well.

Honua 9 is most likely a temporary shelter used in the pre-contact to early historic period. Subsurface testing (archaeological excavation) at this site would likely yield evidence of site occupation and use.

Figure 46. Overview of modified outcrop (Honua 6), facing east

Figure 47. Detail of informal rock stacking atop Honua 6; facing east

Figure 48. Oblique view of possible rockshelter (Honua 7), facing north

Figure 49. View of central section of possible rockshelter (Honua 7); facing northeast

Figure 50. Overview of possible rockshelter (Honua 8), facing northwest

Figure 51. Another view of Honua 8; facing east

Figure 52. Overview of rockshelter with rock wall at N end (Honua 9), facing northeast

Figure 53. View of constructed rock wall at N end of Honua 9 (foreground); view east

Honua 10 (Terraces / Alignments)

Honua 10 is three terraces in the bottom of Ki‘inohu Gulch on its narrow floodplain. Feature A (Figure 54), the largest and most formally-constructed of the features, is just upstream of the other two. Features B and C are smaller terraces on the SE side of the drainage (Figure 55 and Figure 56). Vegetation is mostly koa haole. Feature A has formal stacking of subrounded boulders and cobbles up to 5-6 courses high on its SW side; this terrace retains a large level soil area just upstream.

Honua 10 is interpreted as a cultivation / garden structure, which could have been irrigated directly by being located in the floodplain / bottomlands of the gulch, dating from the pre-contact to early historic period.

Honua 11 (Rockshelter with Terrace)

Honua 11 is a rockshelter under a cliff face overhang on the E side of Ki‘inohu Gulch (Figure 57 and Figure 58). The site is just downstream of a ~30 foot-high dry waterfall. Honua 11 is oriented NW/SE and is ~10 m long. Maximum depth of the rockshelter is ~2.0 m; maximum height under the dripline is 1.2 m. Just in front of the rockshelter, a level soil area is retained by a small, informally-constructed terrace (Feature B), with 3-4 courses of stacking of angular / subangular boulders. Other than this, there are no other surface modifications at the site.

Honua 11 is most likely a temporary shelter used in the pre-contact to early historic period. Subsurface testing (archaeological excavation) at this site would likely yield evidence of site occupation and use.

Honua 12 (Terrace under Dry Waterfall)

Honua 12 is an unusual site-feature in Ki‘inohu Gulch, directly underneath the head wall of a small dry waterfall. The site is a small crawlspace tucked underneath and behind the dripline of the dry waterfall. There is a small rocky shelf in the bedrock. Just outside of the crawlspace is a small terrace of angular / subangular small boulders stacked 3-4 courses high (Figure 59 and Figure 60). The terrace retains a level soil area under the dripline.

The function of Honua 12 is indeterminate without further testing. Likewise, its age is indeterminate, but it probably dates to the pre-contact or early historic period.

Honua 13 (Terrace / Alignment)

Honua 13 is long, low terrace / alignment oriented roughly N/S in the bottom of Ki‘inohu Gulch (Figure 61 to Figure 63). The terrace / alignment retains a level soil area to the E on the E side of the gulch’s floodplain. The level soil area is relatively long and narrow and is constrained on its E side by the base of the cliff / outcrop defining the side of the gulch. The rock work at Honua 13 is discontinuous. Two features were defined: Feature A is the northern section, which is the most formal portion (see Figure 62), and Feature B is the southern section, which is generally in poorer physical condition (see Figure 63).

Honua 13 is interpreted as a cultivation / garden structure, which could have been irrigated directly by being located in the floodplain / bottomlands of the gulch, dating from the pre-contact to early historic period.

Figure 54. Overview of larger, more formal terrace (Honua 10, Feature A), facing east

Figure 55. Overview of small terrace (Honua 10, Feature B), facing northeast

Figure 56. Overview of small terrace (Honua 10, Feature C), facing northeast

Figure 57. Overview of rockshelter with terrace (Honua 11), facing north-northeast

Figure 58. Detail of terrace in front of Honua 11; view east-northeast

Figure 59. Overview of terrace at dry waterfall (Honua 12), facing north

Figure 60. Another view of Honua 12, facing northwest

Figure 61. Overview terrace (Honua 13, Feature A), facing east; arrows indicate level soil area retained by terrace

Figure 62. Detail of formal terracing at Honua 13, Feature A; view northeast

Figure 63. Overview of southern half of terrace (Honua 13, Feature B), facing southeast

Honua 14 (Wall / Alignment)

Honua 14 is a low wall / alignment of predominately subangular boulders informally-piled and stacked and oriented NNW/SSE (Figure 64). The physical condition of this linear and discontinuous resource varies from fair to poor. Well preserved sections exhibit informal piling and stacking up to 1-2 courses high. Other sections appear more like a single-boulder alignment. It is likely that this site once retained more boulders that have been removed / repurposed elsewhere over time. The overall length of this site is 14 is ~45 m.

Honua 14 is likely a boundary marker for a kuleana parcel (LCA) dating from the mid-1800s.

Honua 15 (Modified Boulder Outcrop)

Honua 15 is a small section of modified outcrop / retaining terrace oriented NW/SE along the upper edge of the slope down into Ki‘inohu Gulch on its E side (Figure 65 and Figure 66). Angular / subangular blocky boulders are stacked up to 2-3 courses high. This rock work supports and defines a pathway for walking up and downstream; it also supports a small level soil area on its upper (NE) side. The constructed rock work is ~2.0 m (N/S) and ~0.8 mas.

Honua 15 appears to be a soil / landscape retention structure (i.e., formalizing the upper slopes of the gulch) or a possible dryland garden site. Its age is indeterminate.

Honua 16 (T-Shaped Mound)

Honua 16 is a T-shaped mound with one section oriented NW/SE and a perpendicular section connected to it oriented NE/SW (Figure 67 and Figure 68). A wood-post and wire fence line runs through the NE/SW-oriented portion of the site. The site occupies an area ~2.0 m (NW/SE) by 2.0 (NE/SW); portions of the site are stacked and piled 2-3 courses high with maximum heights varying from 0.5-0.8 mas.

Honua 16 appears to be the base of an old fence line, perhaps dating from the nineteenth century; it may also have served the dual purposes of being a clearing mound.

Honua 17 (Retaining Wall - Discontinuous)

Honua is two sections of heavy-duty retaining wall oriented across the slope (NE/SW) (Figure 69 and Figure 70). Two sections—designated Feature A (northeast portion of the site) and Feature B (southwest portion of the site)—were likely once part of the same long wall. The site occupies an overall linear distance of ~140 m, but the middle section has been mostly destroyed; there are scattered boulders between Features A and B, but nothing intact.

Feature A to the northeast is ~30 m long and curves around slightly to the north at its northern end. It is constructed of stacked boulders 3-4 courses high and up to ~1.0 mas. Portions of the SE side of this site-feature exhibit relatively formal (i.e., plumb) facing. Where the wall curves around to the north is at the upper edge of a steep slope down into the west side of Ki‘inohu Gulch. Feature B to the southwest is ~35 m long and straight. Its construction and dimensions are similar to Feature A.

Honua 17 appears to be a heavy-duty soil-retention structure built during the historic period to mitigate large-scale soil erosion.

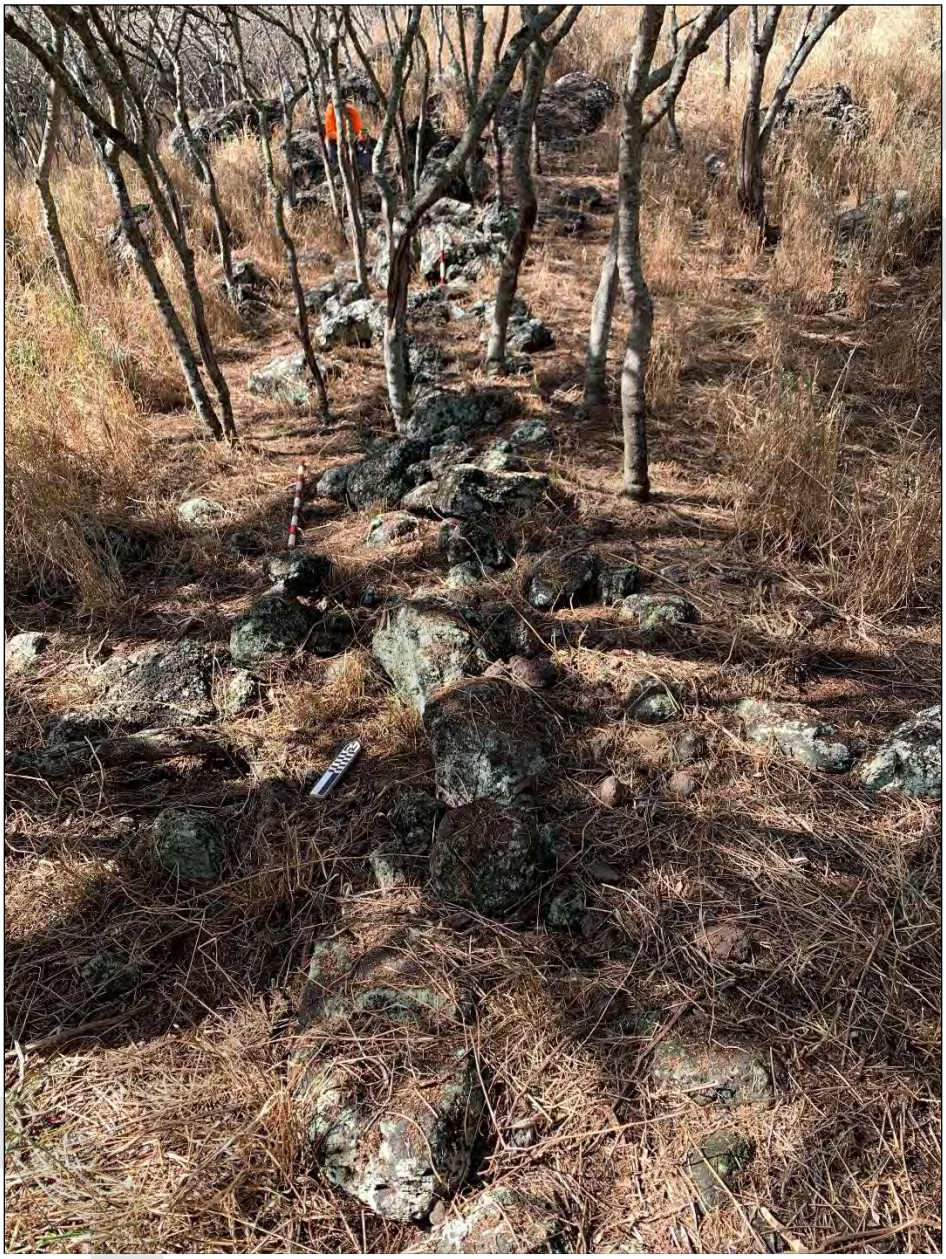


Figure 64. Overview wall / alignment (Honua 14), facing north-northwest

Figure 65. Overview of modified boulder outcrop (Honua 15), facing east-northeast

Figure 66. Another overview of Honua 15, facing north

Figure 67. Overview of a portion of T-shaped mound (Honua 16), facing north

Figure 68. Detail of stacking at Honua 16, facing northwest

Figure 69. Overview southern portion of Feature A (Honua 17) facing north-northeast

Figure 70. Overview northern end of Feature A (Honua 17), facing southwest

Honua 18 (Modified Boulder Outcrop – Clearing Mounds)

Honua 18 is a pair of large boulder outcrops with several smaller clasts placed on top. These two site-features are ~30 m apart from each other. Figure 71 and Figure 72 show one of the two features at Honua 18 (the other was not photographed in the interest of time). Vegetation at the site consists of dense lantana with kiawe trees.

Honua 18 appears to be pair of typical clearing mounds where loose rocks have been piled atop boulder-bedrocks. The age of this site is indeterminate age.

Honua 19 (Short Wall with Windbreak)

Honua 19 is a short section of wall that resembles other site-features in the project area interpreted as windbreaks (Figure 73 and Figure 74). The northern end of the wall section is built up higher and a corner, turning to the west, is built into its north end. The site occupies an area of ~3.0 m (N/S) by ~1.2 m (E/W). The north end of the site makes a 90° turn to the west (i.e., it is L-shaped at the north end). The maximum height of the site (its north end) is ~0.8 mas. The constituent materials are mostly subrounded boulders stacked up to 2-3 courses high in some places. Vegetation at the site consists of dense lantana with kiawe trees.

Honua 19 appears to be either a small temporary shelter or a dryland garden feature. The function of this structure could be investigated by subsurface testing (archaeological excavation). The age of this site likely pre-contact to early historic.

Honua 20 (Terrace / Retaining Wall)

Honua 20 is a terrace / retaining wall oriented roughly cross-slope (N/S) (Figure 75 and Figure 76). The site is ~4.75 m long (N/S) and varies in height—measured at the front (i.e., S side)—from ~0.5-1.0 mas. The constituent materials are mostly subrounded / subangular boulders stacked up to 2-3 courses high. The south end of the site is partially collapsed. The rest of the site is in good to fair physical condition. Vegetation at this site consists of thick grass with some lantana.

Honua 20 appears to be a soil / landscape retention structure designed to minimize soil erosion down into the west side of Ki‘inohu Gulch. This site probably dates to the historic period.

Honua 21 (Indeterminate)

Honua 21’s formal description is indeterminate given its relatively altered / poor physical condition. A large kiawe tree is growing in the SW end of the rock work, which consists of mostly subrounded / subangular boulders informally piled 1-2 courses high in some places. Other parts of the site consist of aligned (not piled or stacked) boulders only. The site occupies an area of ~2.5 m (NE/SW) by ~1.3 m (NW/SE) (Figure 77 and Figure 78).

Honua 21 is a possible degraded mound or partially-collapsed small windbreak. The function of this structure could be investigated by subsurface testing (archaeological excavation. Its age is indeterminate at this time.

Figure 71. Overview modified boulder outcrop (Honua 18); facing south

Figure 72. Another view of Honua 18; facing east

Figure 73. Overview of short wall with windbreak (Honua 19), facing north

Figure 74. Detail of interior corner of short wall with windbreak (Honua 19); facing northeast

Figure 75. Overview terrace (Honua 20), facing northwest

Figure 76. Detail of formal middle section of Honua 20 (terrace), facing west

Figure 77. Overview of Honua 21 (possible collapsed mound or windbreak); view northwest

Figure 78. Another view of Honua 21; facing northeast

Honua 22 (Pair of Terrace / Retaining Walls)

Honua 22 is a pair of terrace / retaining walls oriented cross-slope (roughly NE/SW). The two features, designated Feature A and Feature B, are roughly parallel to each other—Feature A is ~20 m downslope of Feature B; the site occupies an area measuring ~15 m (NE/SW) by ~25 m (NW/SE). Vegetation at the site includes thick grass and koa haole.

Feature A is a heavily-built subangular / subrounded boulder terrace that retains level soil on its upslope side (Figure 79). The retained soil on the upslope side is more or less flush (at the same level) as the top of the constructed rock work. The downslope (southeast) side consists of formally-faced / stacked boulders up to 5-6 courses high and ~1.2 mas. Feature A, which is in good to fair physical condition, is ~15 m long (NE/SW). The west end of this feature incorporates large bedrock outcroppings, where boulders have been placed atop and against them; the east end of the feature grades into the existing ground surface.

Feature B (Figure 80) is similar in form and function to Feature A. Several meters of the west end of Feature B consists of degraded / partially collapsed rock work. The downslope (SE) side consists of formally-faced / stacked boulders up to 2-3 courses high and ~0.6-0.8 mas. Feature B is in fair physical condition and is ~15 m long (NE/SW). There is another area of partial collapse in the middle of the feature.

Honua 22 appears to be a pair of heavy-duty soil-retention structures built during the historic period to mitigate large-scale soil erosion. Subsurface testing (archaeological excavation) of one of these terraces might provide more definitive data on this preliminary interpretation.

Honua 23 (Site Complex – Cultivation / Garden)

Honua 23 is a site complex of at least three features, but there are probably additional, as-yet undocumented above-ground features. The site occupies an area measuring ~8.0 m (N/S) by 8.0 m (E/W) and is located on a moderately sloping (down to the SE) terrain with small, artificially-constructed areas of more level terrain (Figure 81 and Figure 82). Vegetation at the site includes thick grass, kiawe and koa haole.

In general, the site is in a relatively degraded physical state making it challenging to unambiguously define individual features with any certainty. For these reasons, and in the interest of time, we did not formally assign feature designations. Informally observed site-features include:

- a few circular- to oval-shaped rock alignments (likely representing planting circles);
- a near-level area of soil at the top (NW) of the site, which is retained by a short, low section of boulder terracing; and,
- an informally-stacked and -piled linear mound along the NE side of the site.

Honua 23 is likely a cultivation / garden site dating from the pre-contact to early historic period. More extensive and careful vegetation clearing at this site would probably increase our understanding of its full suite of above-ground features.

Figure 79. Overview of terrace / retaining wall (Honua 22, Feature A), facing northeast

Figure 80. Overview terrace / retaining wall (Honua 22, Feature B), facing north

Figure 81. Overview of site complex (Honua 23), facing north-northeast

Figure 82. Another view of site complex (Honua 23), facing south

Honua 24 (Modified Outcrop / Enclosure - Cultivation / Garden)

Honua 24 is a modified outcrop with a formally-constructed wall and a terrace; the wall creates a partial enclosure of the upper E side of the site (Figure 83). The enclosure portion of the site measures ~5.0 m (N/S) by ~4.0 m (E/W), but the rock wall along the E side extends further to the NW and SE. The wall varies from loosely-constructed to more formal; its constituent material is mostly subrounded boulders stacked up to 5-6 courses. Maximum wall heights vary from ~0.5-1.0 mas. A terrace constructed of subrounded boulders stacked up to 2-3 courses high retains the lower W side of the site. Maximum height of the terrace is ~0.7-0.8 mas. All of the integrated rock work creates an enclosed and protected (from the prevailing trade winds) planting area of level soil (roughly oval in plan view shape). There is also a constructed hole—possibly a drainage feature—of arranged cobbles and small boulders in the S end of the interior (soil) floor of this feature (Figure 84).

Honua 24 is likely a cultivation / garden site dating from the pre-contact to early historic period. This site would greatly benefit from a detailed plan map of its entire layout and orientation on the landscape.

Honua 25 (Terrace with Windbreak Wall - Cultivation / Garden)

Honua 25 is a windbreak wall / terrace (Feature A) and a terrace (Feature B). Both features are built partially atop and adjacent to low bedrock outcroppings. The site is oriented N/S and measures several meters by several meters (precise measurements were not recorded). Constituent material is mostly subrounded / subangular boulders. Feature A, a section of stacked boulder wall, serves as a windbreak and also creates a small level soil area on its W side (Figure 85). This feature measures ~3.0 m (N/S) by ~1.5 m (E/W). Formal stacking with some well-faced sections is up to 3-4 courses high. Maximum height is ~0.8-0.9 mas. Feature A is in good physical condition. Feature B is a stacked boulder terrace that retains an elevated soil area on its N and W sides (Figure 86). This feature measures ~2.5 m (N/S) by ~2.5 m (E/W). Formal stacking with some well-faced sections is up to 2-3 courses high. Maximum height is ~1.0 mas. Feature B is in fair physical condition with collapsed portions at its NE and SW ends.

Honua 25 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Honua 26 (Terrace with Windbreak Wall)

Honua 26 is an informally-constructed terrace with a low windbreak wall (Figure 87). The constructed rock work utilizes a large boulder outcrop in its design. This site is typical of the current project area with the stacked-boulder terrace retaining a level soil area on its west side, and a low windbreak wall on its east. Honua 26 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Honua 27 (Modified Boulder Outcrop – Clearing Mound)

Honua 27 is a large boulder outcrop with several smaller clasts placed on top (Figure 88).

Honua 27 is a fairly common yet simple site type in the project area. Its age is indeterminate.

Figure 83. Overview of modified outcrop / enclosure (Honua 24), facing northeast

Figure 84. Detailed of constructed hole in floor (level soil area) at Honua 24 (arrow) and portion of loosely-constructed rock wall in the southeast part of the site

Figure 85. View from northwest end of windbreak wall / terrace (Honua 25, Feature A), facing southeast; note, Feature B indicated by arrow in background

Figure 86. View of east-facing side of Feature B (Honua 25), facing west; level soil area indicated by arrow

Figure 87. Overview of terrace with low windbreak wall (Honua 26), facing north-northeast

Figure 88. Overview of modified boulder outcrop (clearing mound) (Honua 27), facing west

Honua 28 (Terrace)

Honua 28 is a cross-slope terrace in poor physical condition (Figure 89 and Figure 90). The best-preserved section is ~3.5 m long (NE/SW orientation). There are scattered boulders W of the W end of the terrace that may have once been part of it. The E end is in better physical condition. Constituent materials and methods are subrounded / subangular boulders stacked and piled 1-2 courses high. Maximum height of the site from the downslope side is ~0.5 mas.

Honua 28's function and age are indeterminate mostly due to its poor physical condition.

Honua 29 (Site Complex - Terraces)

Honua 29 is a site complex of two terraces (Feature A and Feature B) and a rock pile (Feature C) whose formal type cannot be determined. The site is in fair to poor physical condition. Feature A (Figure 91) is an L-shaped terrace with a windbreak wall. The constituent materials and methods are subrounded / subangular boulders stacked and piled 2-3 courses high. Maximum height of the feature from the downslope side is ~0.6-0.8 mas. Feature B is a cross-slope terrace in poor physical condition (Figure 92). At least half of this feature is collapsed. The constituent materials and methods are subrounded / subangular boulders stacked and piled 1-2 courses high. Maximum height of the feature is ~0.3 mas.

Honua 29 appears to a poorly-preserved cultivation / garden site dating from the pre-contact to early historic period.

Honua 30 (Koʻa – Fishing Shrine)

Honua 30 is an elevated platform interpreted as a probable koʻa, or fishing shrine. This interpretation is based on its overall size and shape—when intact, a square or cube shape, with its upper surface some 1.2-1.3 mas; and the presence of several pieces of old (degraded) coral visible in matrices of the rock work. The presence of coral (koʻa) built into the structure, at a distance of some 0.65 miles from the ocean, is a strong indicator that this is a fishing shrine. In addition to the elevated platform (Feature A), there is also a lower constructed area (Feature B) on the site's E side that appears to represent an altar for offerings. Figure 93 to Figure 96 illustrate that the platform has partially collapsed downslope to the S; also, that the mauka (upslope) side is intact and well-preserved with large boulder blocks and slabs arranged in a vertical (plumb) fashion. The possible altar on the E side is shown in detail in Figure 97. Figure 98 shows one (of several at the site) example of a boulder with waterworn grooves on its upper surface (see Figure 93 for another example). Grooves like these are sometimes found at shrines and heiau where protocol / ceremony associated with pouring wai (fresh water) is practiced.

The original / intact platform measures ~2.75 m (N/S) by ~2.75 m (E/W) but partial collapse of the upper S side and S (makai) face has spilled rocks another meter or so downslope. Feature B on the E side extends the site to the E another ~0.8 m or so. The height of the original / intact platform is ~1.2-1.3 mas. Construction of this site includes large boulders at the base and smaller boulders to cobbles at and near the top. Stacking, which includes vertical facing on the N, E and W sides, is up to 4-5 courses high.

Honua 30 is an elevated platform interpreted as a probable koʻa, or fishing shrine dating from the pre-contact to early historic period. This site should be part of a preservation plan for the project area.

Figure 89. Overview of poorly preserved terrace (Honua 28), facing west

Figure 90. Detail of west end of Honua 28 (poorly preserved terrace); view north

Figure 91. Overview of terrace with windbreak (Honua 29, Feature A), facing west

Figure 92. Overview of degraded (poorly-preserved) terrace (Honua 29, Feature B), facing northwest

Figure 93. Overview of probable koʻa (fishing shrine) (Honua 30), facing north; arrow points to large boulder with waterworn groove (discussed in text)

Figure 94. Overview of probable koʻa (fishing shrine) (Honua 30); view east

Figure 95. Another view of probable koʻa (fishing shrine) (Honua 30); facing south

Figure 96. Another view of probable koʻa (fishing shrine) (Honua 30); facing west

Figure 97. Detail of constructed feature (possible alter for offerings) on east side of Honua 30

Figure 98. Detail of one of a few large boulders with waterworn grooves (arrow) at Honua 30 (see text); view north

Honua 31 (Modified Outcrop – Possible Temporary Shelter)

Honua 31 is an unusual site in its constructed rock work is oriented upslope / downslope (N/S) with the north end higher than the south. The upper (N) end resembles a small temporary shelter or resting place with a large boulder outcrop serving as a kind of windbreak; aligned, piled and stacked boulders and cobbles extend downslope to an area of several other boulder outcrops. The large boulder at the N end functions as a "back rest" / seat protected from the prevailing trade winds (Figure 99). The middle to lower portion of the site appears to be nothing more than a clearing pile (Figure 100). The site is ~6.0 m long (N/S) by ~1.5 m wide (E/W). Stacking and piling of small boulders and cobbles is up to 1-2 courses in places. Material is mostly subrounded / subangular boulders.

Honua 31 may be a temporary shelter / resting place and / or a clearing mound. Its age is indeterminate. This atypical site might benefit from subsurface testing (archaeological excavation) at its N (upper) end.

Honua 32 (Modified Outcrop – Clearing Mound)

Honua 32 is a large boulder outcrop with several smaller clasts placed on top (Figure 101).

Honua 32 is a fairly common yet simple site type in the project area. Its age is indeterminate.

Honua 33 (Terrace)

Honua 33 is a cross-slope terrace (oriented E/W) in poor physical condition (Figure 102). It measures several meters long (specific dimensions were not recorded). The east end of the terrace is marked by several large, displaced boulders. The site is located on the mauka side of an ATV (earthen 2-track) road. Constituent materials and methods are subrounded / subangular boulders stacked and piled 1-2 courses high. In places, the site is simply boulders in an alignment. Maximum height of the site from the downslope side is ~0.5 mas.

Honua 33's function and age are indeterminate mostly due to its poor physical condition.

Honua 34 (Modified Boulder Outcrops – Clearing Mounds)

Honua 34 is a pair of large boulder outcrops with several smaller clasts placed on top of each (Figure 103).

Honua 34 is a fairly common yet simple site type in the project area. Its age is indeterminate

Honua 35 (Modified Outcrop – Partial Enclosure)

Honua 35 (Figure 104) is a partial enclosure (stacked rock wall) built around a large boulder outcrop. The site occupies as area measuring ~2.0 m (N/S) by ~2.0 m (E/W). The wall portion of the site varies from loosely-constructed to more formal; its constituent material is mostly subrounded boulders stacked up to 5-6 courses. Maximum wall heights vary from ~0.6-0.7 mas. The rock wall and boulder outcrop enclosure a level soil area measuring ~1.5 m (N/S) by ~1.5 m (E/W).

Honua 35 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Figure 99. Upper (north) portion of modified outcrop with windbreak (Honua 31), facing northeast

Figure 100. Another view of Honua 31 from the downslope (south) end; facing north

Figure 101. Overview of modified boulder outcrop (Honua 32); facing northwest

Figure 102. Overview of degraded terrace (Honua 33), facing west-northwest

Figure 103. Overview photo of modified boulder outcrop (Honua 34), facing northeast

Figure 104. Overview of modified boulder partial enclosure with windbreak wall recorded (Honua 35); facing northeast

Honua 36 (Long Boulder Wall / Terrace)

Honua 36 is a long, curvilinear boulder-stacked wall (Figure 105) oriented roughly NW/SE and traversing terrain sloped down to the SE. This wall retains a substantial earthen berm and a ditch on part of its upslope (NE) side. Constituent materials and methods are large boulders (including many blocks and slabs) stacked 1-2 courses high. Maximum height is ~1.0 mas. The overall length of Honua 36 is ~45 m.

Honua 36 is a historic-period structure related to controlling / mitigating downslope soil erosion and drainage of high-energy (i.e., storm water run-off) events.

Honua 37 (Modified Outcrop with Windbreak Wall)

Honua 37 is an informally-constructed windbreak wall built around boulder outcrops (Figure 106). The carefully-fitted rock work at this site exhibits a high degree of skill of the dry-stacking method. This site is typical of the current project area with the windbreak retaining a level soil area on its west side.

Honua 37 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Honua 38 (Modified Boulder Outcrop – Clearing Mound)

Honua 38 is a large boulder outcrop with several smaller clasts placed on top. No photographs were taken of this site.

Honua 38 is a fairly common yet simple site type in the project area. Its age is indeterminate.

Honua 39 (Modified Boulder Outcrop – Clearing Mound)

Honua 39 is a large boulder outcrop with several smaller clasts placed on top. No photographs were taken of this site.

Honua 39 is a fairly common yet simple site type in the project area. Its age is indeterminate.

Honua 40 (Modified Boulder Outcrop – Clearing Mound)

Honua 40 is a large boulder outcrop with several smaller clasts placed on top. No photographs were taken of this site.

Honua 40 is a fairly common yet simple site type in the project area. Its age is indeterminate.

Figure 105. Detail of a section of boulder-stacked wall / terrace (Honua 36), facing southeast

Figure 106. Overview of modified boulder outcrop with windbreak wall (Honua 37), facing northeast

Honua 41 (Site Complex – Habitation / Garden)

Honua 41 is along the eastern boundary of the project area to the east of a paved roadway to a modern water tank complex and consisted of several rectangular terraces. Three of the features were previously documented by McElroy (2022). Feature A (UA-3) is a rectangular terrace on the ridge slope (Figure 107) oriented perpendicular to the ridge slope; it measures ~17 m long but is collapsed in a 5-m section on the east side. The feature is built of subangular cobbles stacked 4-5 courses with a maximum height of 120 centimeters (cm). A side wall on the east side measures 3.5 m long and is built of cobbles stacked 2-3 courses high with a maximum height of 75 cm and a maximum width of 90 cm. Feature B, just northeast of Feature A, is a square terrace not documented during the previous survey; it measures ~2 x 2 m and is comprised of 1-2 courses of small boulders with a maximum height of 30 cm and a width of 45 cm (Figure 108). Feature C (UA-4) is a rectangular enclosure on the slope with a retaining wall measuring 4.5 m long (Figure 109); it is comprised of subangular cobbles stacked 1-2 courses high with a maximum height of 40 cm and a maximum width of 50 cm. This feature incorporates an exposed bedrock outcrop in the southwest corner. Feature D (UA-5) is a possible square or rectangular enclosure with a retaining wall on a slope. It measures 3 m long and is comprised of subangular cobbles stacked 2-3 courses high with a maximum height of 40 cm and a maximum width of 30 cm (Figure 110). No artifacts were observed at Honua 41.

Honua 41 is interpreted as a habitation and cultivation / garden site dating from the pre-contact to early historic period.

Honua 42 (Mound)

Honua 42 is in heavy grasses in the southern portion of the project area and consists of a rectangular mound that may be the collapsed remnants of a windbreak wall for an enclosure (Figure 111). The mound is comprised of large cobbles and small boulders piled up to two courses high in a 2 x 1 m area. The feature has a maximum height of 45 cm with boulders on the exterior and small cobbles filling the interior portion. No artifacts were observed at Honua 42.

Honua 42's function and age are indeterminate, largely based on its poor (collapsed) physical condition.

Honua 43 (Partial Enclosure with Windbreak Wall)

Honua 43 is near the southern boundary of the project area along a shallow drainage channel and is a collapsed enclosure with windbreak wall (Figure 112). Remnants of the windbreak wall, which measure 7.5 m long and 2.5 m wide, are constructed of subrounded / subangular cobbles and small boulders atop natural boulder outcrops. Stacking is evident along the drainage fronting the enclosure and a boulder alignment extends to the northwest. An 'ulu maika (gaming stone) was observed a few meters south of the enclosure on the bank of the drainage (Figure 113). On the other side of the drainage, boulders are piled and strewn from grading for the bordering house lot and have been pushed up and around the existing koa haole vegetation.

Honua 43 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Figure 107. Overview photo of a terrace recorded as Feature A of Honua 41, looking north

Figure 108. Overview photo of a terrace recorded as Feature B of Honua 41, looking south

Figure 109. Overview photo of a terrace recorded as Feature C of Honua 41, looking north

Figure 110. Overview photo of a terrace recorded as Feature D of Honua 41, looking north

Figure 111. Overview photo of a rock mound recorded as Honua 42, looking north

Figure 112. Overview of partial enclosure with windbreak wall (Honua 43), looking north

Figure 113 ‘Ulu maika (gaming stone) found a few meters south of Honua 43

Honua 44 (Enclosure with Windbreak Wall)

Honua 44, in the southern portion of the project area along a shallow drainage in an area of grass and koa haole, is an enclosure with a windbreak wall (Figure 114). The enclosure is oval-shaped and measures 7.5 x 4 m with a cleared interior measuring 4 x 2.5 m. The sides of the enclosure are collapsed, and a few small boulders are lined up along the drainage on the front side. The windbreak wall faces the prevailing wind to the northeast and is comprised of subrounded cobbles stacked 3-4 courses high with a maximum height of 80 cm and a width of 1.5 m. No artifacts were observed at Honua 44.

Honua 44 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 45 (Site Complex – Habitation or Heiau)

Honua 45, which is either a permanent habitation or a heiau, is in the southwest corner of the project area. The site occupies a 30 x 15 m area and is constructed of hundreds of subrounded cobbles; it consists of two walled enclosures on each side, with an earthen terrace and a heavily-paved platform in the center. Bulldozing and/or grading is evident around the site and a boulder push pile is just south of the site; more push piles are on the east side of the site along the boundary with the adjacent house lot. Aside from historic rubbish in the vicinity, no artifacts were observed at Honua 45. Feature A, on the west side of the site, is a recessed rectangular enclosure measuring 14 x 8 m with a cleared level interior (Figure 115). The east wall is comprised of subrounded cobbles stacked 10-12 courses high with a maximum height of 135 cm and a width of 60 cm (Figure 116). The west and north sides are retaining walls as the enclosure has been constructed into the slope. The walls, which have collapsed into and around the structure, measure 100 and 80 cm, respectively. The south wall has collapsed in the western portion but is intact where it meets with the east wall in the southeast corner of the enclosure. The corner is comprised of subrounded small boulders / cobbles stacked 8-10 courses high with a maximum height of 180 cm. Feature B is a level cleared earthen terrace with a platform adjacent to the eastern side of Feature A (Figure 117). Feature B measures ~14 x 6 m and the southern portion consists of a paved area, possibly a platform, in a 6 x 3.5 m area. The paved area is faced on the south and east sides and comprised of two courses of subrounded cobbles with a maximum height of 90 cm. The interior is paved with small and large subrounded cobbles. Feature C, in the central portion of the site, is a heavily-paved platform measuring ~10 x 7.5 m (Figure 118). A possible enclosure or two are in the northern portion of this area but are heavily collapsed. The southern portion appears to be the entrance to the structure and some of the original facing is present in the front. The intact areas were stacked up to five courses with a maximum height of 125 cm and were comprised of boulders on the bottom with cobbles on top. Feature D, on the east side of the site, is another rectangular enclosure (Figure 119). It has a rocky cleared interior and measures ~14 x 8 m. The enclosure consists of a terrace with a low retaining wall on the south and a wall on the east side. The wall is comprised of subrounded boulders / cobbles stacked up to six courses high with a maximum height of 115 cm in the intact portions. A possible terrace measuring ~10 x 4.5 m with a cleared rocky interior is below and fronting Feature D.

Honua 45 is interpreted as a permanent habitation complex or a heiau dating from pre-contact times. Subsurface testing (archaeological excavation) is needed to more definitively determine the site's function/s.

Figure 114. Overview of an enclosure with windbreak wall (Honua 44), looking north

Figure 115. Overview photo of a recessed enclosure documented as Feature A of Honua 45, looking southeast

Figure 116. Overview photo of the eastern wall of Feature A (Honua 45), looking southwest

Figure 117. Overview photo of an earthen terrace and paved platform recorded as Feature B, of Honua 45, looking northwest

Figure 118. Overview photo of a heavily paved platform recorded as Feature C of Honua 45, looking southwest

Figure 119. Overview photo of an enclosure recorded as Feature D of Honua 45, looking northwest

Honua 46 (Partial Enclosure)

Honua 46 is a collapsed rectangular enclosure in the southwest corner of the project area near the boundary with an adjacent house lot. The enclosure measures ~8 x 6 m and has been constructed on top of existing boulder outcrops with boulders stacked on the bottom and smaller cobbles on top (Figure 120 and Figure 121). Retaining walls make up the east, west and south sides of the enclosure and are comprised of subrounded cobbles and boulders stacked 3-4 courses high. The maximum height of the intact portion of the facing for the enclosure was 65 cm and the walls were 65-70 cm thick. The interior of the enclosure is level and opens to the northwest. No artifacts were observed at Honua 46.

The function of Honua 46 is indeterminate, but its construction methods are consistent with an age of pre-contact to early historic period.

Honua 47 (Heiau)

Honua 47, a heiau complex in the southwestern portion of the project area, occupies an area measuring ~30 x 30 m along the east bank of Kahananui Stream (Figure 122). The complex has at least six main enclosures several of which were further divided (Figure 123). Numerous other alignments and small enclosures are located south of the complex and a possible rock lined path leads into the southeastern side. Portions of the east wall have collapsed but it was large and stepped measuring 1.5 m thick on each stepped portion and stacked a maximum of 12 courses in some areas (Figure 124). A paved platform comes off the eastern side of the structure and is partially collapsed in some sections. Noni and kukui trees were observed along the stream nearby and were the only trees of that kind documented in the project area. No measurements were taken of the interior elements of the Honua 47 complex so as not to further degrade the already collapsing structural elements. Remnants of fence posts and barbed wire fencing was present in the area and a dump area of insulators and 1970s beer cans was present to the east of the site.

Honua 45 is interpreted as a heiau dating from pre-contact times.

Honua 48 (Walled Terraces)

Honua 48, in the southwestern corner of the project area along the east bank of Kahananui Stream, consists of a triangular terrace (Feature A) connected to a rectangular terrace (Feature B). Feature A is oriented parallel to the stream with a maximum length of 26 m and a maximum width of 11 m (Figure 125). Portions of a low wall are present under the trees on the stream bank and parts of it have washed away. The wall on the east side of the terrace would have been 1 m wide in places and continues to where it meets with Feature B. A single low cobble / boulder alignment divides Features A and B (Figure 126). Feature B is a rectangular terrace oriented parallel to the stream with a maximum length of 55 m and a width of 25 m (Figure 127). The wall at the south end is comprised of rounded cobbles stacked up to eight courses high with a maximum height of 1.3 m (Figure 128). No artifacts were observed at Honua 48.

Honua 48 is interpreted as a water diversion structure related to historic-period agriculture.

Figure 120. Overview photo of enclosure recorded as Honua 46, looking west

Figure 121. Another view of enclosure recorded as Honua 46, facing north

Figure 122. Overview photo of the southern portion of a site complex recorded as Honua 47, looking northwest

Figure 123. Overview photo of the northern portion of a site complex recorded as Honua 47, looking northwest

Figure 124. Overview photo showing a large, stepped wall on the western side of Honua 47, looking southwest

Figure 125. Overview photo of a large triangular shaped terrace recorded as Feature A of Honua 48, looking south

Figure 126. Overview photo of a large triangular shaped terrace recorded as Feature A of Honua 48, looking north

Figure 127. Overview photo of a rectangular terrace recorded as Feature B of Honua 48, looking south

Figure 128. Overview photo of a rectangular terrace recorded as Feature B of Honua 48, looking northwest

Honua 49 (Enclosure with Windbreak Wall & Alignment)

Honua 49 is in the southwestern corner of the project area; the site is an enclosure with windbreak wall (Feature A) and an alignment (Feature B). Feature A is roughly C-shaped, opens to the west and measures ~3.3 x 2.5 m (Figure 129 and Figure 130). It is constructed of large subrounded cobbles on existing boulder outcrops with two large boulders comprising the northern wall. The windbreak wall is stacked 3-4 courses high with a maximum height of 1 m and a width of 70 cm. Feature B (Figure 131) is a 13 m-long alignment of small boulders / cobbles piled two courses high on the crest of a gentle slope. The east side of the south end of the alignment has a maximum height of 60 cm. The maximum width of the alignment was 130 cm. No artifacts were observed at Honua 49.

Honua 49 is interpreted as a habitation and cultivation / garden site dating from the pre-contact to early historic period.

Honua 50 (Platform or Terrace)

Honua 50 is in the southernmost project area in a small, graded strip of land between the existing house lots; it consists of a rectangular paved terrace or platform measuring ~4 x 2.65 m (Figure 132). It is comprised of small boulders around the perimeter filled with rounded / subangular cobbles one course high with a maximum height of 25 cm. It is likely that the structure was graded as bulldozing is evident on all sides and a push pile of rocks and debris is a few meters to the north. No artifacts were observed at Honua 50.

Due to its altered physical condition, Honua 50's formal type and function are indeterminate, although its construction methods are consistent with the pre-contact to early historic period.

Honua 51 (C-Shaped Enclosure)

Honua 51 is in the same graded strip of land as Honua 50 and consists of a C-shaped enclosure measuring ~3 x 2.3 m (Figure 133). The enclosure opens to the west and is comprised of large subrounded cobbles piled 1-2 courses high with a maximum height of 25 cm. It is likely that the structure was graded as bulldozing is evident on all sides and dumped car parts are strewn in the vicinity. Aside from the modern car parts, no artifacts were observed at Honua 51.

Honua 51 is interpreted as an altered (i.e., partially impacted by bulldozing) habitation dating from the pre-contact to early historic period.

Honua 52 (Mound)

Honua 52 is also in the same graded strip of land as Honua 50 and 51 and consists of a mound in a 2.5 x 1.7 m area (Figure 134). The mound is comprised of large and medium sized cobbles piled 1-2 courses high with a maximum height of 25 cm. Once again, bulldozing was evident around the feature and car parts were strewn in the vicinity. Other than the car parts, no artifacts were observed at Honua 52.

Honua 52 is probably a clearing mound or cache of cleared material; its age is indeterminate.

Figure 129. Overview photo of an enclosure with windbreak wall recorded as Feature A of Honua 49, looking northeast

Figure 130. Another view of enclosure with windbreak wall recorded as Feature A of Honua 49, looking south

Figure 131. Overview photo of a linear alignment recorded as Feature B of Honua 49, looking north

Figure 132. Overview photo of a paved platform / terrace recorded as Honua 50, looking west

Figure 133. Overview photo of a C-shaped enclosure recorded as Honua 51, looking northeast

Figure 134. Overview photo of a mound recorded as Honua 52, looking southeast

Honua 53 (Modified Boulder Outcrop Enclosure with Windbreak Wall)

Honua 53 is in the southwestern corner of the project area southwest of a heiau complex (Honua 47) and consists of an enclosure with windbreak wall. The enclosure measures ~3 m x 2.5 m and has been constructed of subrounded large cobbles incorporating and set atop the existing boulder outcrops (Figure 135). The windbreak wall measured 3.1 m in length, 80 cm wide and is comprised of cobbles stacked 3-4 courses high with a maximum height of 80 cm. No artifacts were observed at Honua 53.

Honua 53 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Honua 54 (Wall & Circular Alignments)

Honua 54, in the southwestern corner of the project area along Kahananui Stream northeast of Honua 47, is a wall and several circular alignments in an area measuring 21.5 x 6 m. The wall is parallel to the stream and turns to the east, possibly enclosing an earthern terrace on that side. It is 90 cm wide and comprised of subrounded cobbles stacked 5-6 courses high with a maximum height of 1.25 m (Figure 136). The wall, which is on the upslope portion and a swale (possibly a former ʻauwai), traverses the middle of the site. Several circular alignments stacked two courses high on the downslope side are possibly planting features; they average ~1.65 m in diameter (Figure 137). A concentration of boulders with a maximum height of 90 cm is along the stream in a 1.4 m wide area west of the alignments. No artifacts were observed at Honua 54.

Honua 54 is likely a cultivation / garden site that may also have diverted water from around the nearby heiau; the site dates from the pre-contact to early historic period.

Honua 55 (C-Shaped Enclosure)

Honua 55, along Kahananui Stream near the western boundary of the project area, is a C-shaped enclosure in a 4 x 2.5 m area (Figure 138). The enclosure opens to the southeast, incorporates the existing boulder outcrops, and is oriented with the long axis running north to south. The wall of the enclosure is comprised of boulders and cobbles stacked 1-2 courses high with a maximum height of 70 cm and a width of 90 cm. No artifacts were observed at Honua 55.

Honua 55 is interpreted as a habitation site dating from pre-contact to early historic times.

Honua 56 (Modified Boulder Outcrop - Enclosure)

Honua 56, along Kahananui Stream near the western boundary of the proiect area, is an enclosure and a cleared area measuring ~6.7 x 5.7 m (Figure 139). The enclosure opens to the south and the outcrops are filled with cobbles in portions on the north, east, and west sides; and with core filling in the east and west sides. The west side measures 2.9 x 1.2 m and is stacked 3-4 courses high with a maximum height of 1 m. The north side measures 1.9 x 1 m and is stacked 2-3 courses high with a maximum height of 70 cm. Cobbles are stacked in between the natural boulders on the east side in a 1.4 x 1.2 m area up to five courses high with a maximum height of 120 cm. No artifacts were observed at Honua 56.

Honua 56 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Figure 135. Overview photo of a modified boulder outcrop enclosure with windbreak wall recorded as Honua 53, looking east

Figure 136. Overview photo of a wall recorded as part of Honua 54, looking northeast

Figure 137. Overview photo of circular alignments at Honua 54, looking north

Figure 138. Overview photo of a C-shaped enclosure recorded as Honua 55, looking west

Figure 139. Overview of modified boulder enclosure (Honua 56), looking north

Honua 57 (Wall)

Honua 57 is on the east bank of Kahananui Stream near the western boundary of the project area and consists of a boulder wall running parallel to the stream. The wall is 8 m in length and comprised of small and large boulders stacked 5-6 courses high with a maximum height of 1.4 m (Figure 140). The wall is slightly curved and has a width of 2.4 m. It is thicker and has more stacking on the north side which faces the water flow of the stream. The wall is angled in the front and on the back as well. No artifacts were observed at Honua 57.

Honua 57 may have functioned as a flood control or water diversion structure; the site appears to date from the historic period.

Honua 58 (Walled Enclosure with Notch)

Honua 58 is in a grassy area with boulders and kiawe trees along Kahananui Stream and consists of a square enclosure with a notch in a ~10 x 10 m area (Figure 141). Wall lengths are 9.6 m (north side), 7.5 m (east side) and 9.8 m (west side). The notched south side of the enclosure has walls measuring 5.4 m, 2.2 m and 4 m. The walls consist of a single course of cobbles and boulders in some areas but in others they are piled 2-3 courses high with a maximum height of 85 cm. The width of the walls averages ~90 cm. A boulder with a hole in the middle was part of the wall in the notched area and may be for a wooden support infrastructure or possibly a candle hole (Figure 142). No artifacts were observed at Honua 58.

Honua 58 is interpreted as a habitation site dating from pre-contact to early historic times.

Honua 59 (Platform / Terrace with Retaining Wall)

Honua 59 is on the east side of Kahananui Gulch near where it begins and consists of a platform / terrace with a retaining wall running parallel to the gulch (Figure 143). The cleared area above it has been covered with colluvium (i.e., rocks and soil eroding down from the slope above). The wall is slightly curved and the faced area measures ~17 m long but has collapsed in areas due to water erosion. The retaining wall is angled and comprised of large cobbles stacked up to 12 courses high with a maximum height of 2.3 m. The wall becomes shorter upstream. The visisble portion of the wall averages 70 cm but is thicker and more substantial on the makai portion, measuring 1.4 m wide. No artifacts were observed at Honua 59.

Honua 59 is interpreted as a cultivation / garden site dating from pre-contact to early historic times.

Honua 60 (Enclosure with Windbreak Wall)

Honua 60 is in a grassy area near the beginning of Kahananui Gulch and consists of an enclosure with a windbreak wall in a 7 x 6 m area (Figure 144). The enclosure opens to the stream in the west and the wall is comprised of subrounded cobbles stacked 3-4 courses high with a maximum height of 50 cm. The windbreak wall was 5.5 m long, 1 m wide and comprised of cobbles stacked 5-6 courses high with a maximum height of 1.1 m. Possible grading and/or clearing was observed east of the enclosure. No artifacts were observed at Honua 60.

Honua 60 is interpreted as a habitation site dating from pre-contact to early historic times.

Figure 140. Overview photo of a wall recorded as Honua 57, looking northeast

Figure 141. Overview photo of an enclosure recorded as Honua 58, looking east

Figure 142. Overview of a hole in a boulder in notched portion of Honua 58, looking southeast

Figure 143. Overview photo of a platform / terrace recorded as Honua 59, looking northeast

Figure 144. Overview photo of an enclosure with windbreak wall recorded as Honua 60, looking

Honua 61 (Enclosure with Windbreak Wall)

Honua 61, ~25-30 m south of Honua 60, is almost identical in its construction and orientation consisting of an enclosure with windbreak wall in a 6.5 x 4 m area (Figure 145 and Figure 146). The enclosure opens to the west (stream side) and has a cleared, level interior. The windbreak wall is comprised of subrounded cobbles stacked up to seven courses high with a maximum height of 80 cm and a width of 1 m. The front and side walls have collapsed and the cobble core filling is exposed. They are comprised of subrounded cobbles stacked 3-4 courses high with a maximum height of 55 cm and a width of 1.1 m. No artifacts were observed at Honua 61.

Honua 61 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 62 (Enclosure)

Honua 62 is east of Kahananui Stream in grass and kiawe trees and consists of a rectangular enclosure (Figure 147) that opens to the west (stream side) and is constructed on natural boulder outcrops. It measures ~10.5 m by 7.5 m with the long axis running parallel to the stream. The east wall makes up the back side of the enclosure and is the highest. It is comprised of subrounded large cobbles and small to medium-sized boulders stacked 10 or more courses with a maximum height of 2.1 m and a width of 1 m (Figure 148). The interior portion of the back wall is stacked 5-6 courses with a maximum height of 1.3 m. The walls on the north and south sides are comprised of subrounded cobbles stacked 4-5 courses with a maximum height of 110 cm and maximum width of 140 cm. A slab-lined hearth measuring 50 x 40 cm and 30 cm deep is along the north wall of the enclosure (Figure 149). The enclosure is well-built, commands the surrounding area and is in excellent physical condition. No artifacts were observed at Honua 62.

Honua 62 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 63 (Enclosure with Windbreak Wall)

Honua 63 is located in a grassy area in the southwestern corner of the project area and consisted of an enclosure with windbreak wall which was similar in construction to the Honua 60 and 61 enclosures. The enclosure is constructed of rounded small and medium-sized boulders stacked two courses on the lower sides and entrance of the enclosure (Figure 150). The windbreak wall incorporates an existing boulder outcrop and is stacked 3-4 courses high with a maximum height of ~1 m. No artifacts were observed at Honua 63.

Honua 63 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 64 (Enclosure with Windbreak Wall)

Honua 64, a short distance south of Honua 63, is an enclosure with windbreak wall. The enclosure measures ~3 x 2 m and consists of a square, low wall comprised of a single course of large cobbles and small boulders (Figure 151). The windbreak wall on the north and east sides of the enclosure is somewhat collapsed and incorporates two large basalt boulders on the east side. The windbreak wall is comprised of subrounded cobbles stacked 3-4 courses high with a maximum height of 70 cm. No artifacts were observed at Honua 64.

Honua 64 is interpreted as a habitation dating from the pre-contact to early historic period.

Figure 145. Overview photo of an enclosure with windbreak wall recorded as Honua 61, looking northeast

Figure 146. Side view of the Honua 61 enclosure showing the Honua 60 enclosure in the background, looking northwest

Figure 147. Overview photo of an enclosure recorded as Honua 62, looking northeast

Figure 148. Overview photo of the high back wall of Honua 62, looking west

Figure 149. Close-up of a slab-lined hearth in the interior of Honua 62

Figure 150. Overview of enclosure with windbreak wall (Honua 63), looking east

Figure 151. Overview of enclosure with windbreak wall recorded as Honua 64, looking northeast

Honua 65 (Enclosure)

Honua 65 is in a grassy area in the middle of the southwestern corner of the project area and consisted of a large rectangular enclosure. The enclosure consists of a low wall stacked 2-3 courses. *This enclosure was not measured or photographed due to time constraints*.

Honua 65 is currently indeterminate in terms of its possible function and age, given time constraints that precluded more in-depth investigation.

Honua 66 (Mound & Modified Boulder Outcrop Enclosures)

Honua 66 is in a boulder field on a low drainage in the southwestern corner of the project area near the western boundary and consisted of a mound and two modified boulder outcrop enclosures. Feature A, a mound of cobbles and boulders piled three courses high, measures ~2.5 x 2 m area with a maximum height of 60 cm (Figure 152). Feature B is an informally-constructed enclosure with a cobble / boulder retaining wall piled up to four courses high with a maximum height of 65 cm. The cleared interior area is rectangular and measures ~5 x 4.5 m (Figure 153). Feature C is another informally-constructed enclosure with a cleared area measuring 4 x 2.5 m (Figure 154). It is rectangular and consists of a single alignment of small boulders on the outside with cobbles piled on top in some areas. No artifacts were observed at Honua 66.

Honua 66 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Honua 67 (Modified Boulder Outcrop - Enclosures)

Honua 67 is in a grassy area with koa haole and consists of three modified boulder enclosures with boulders and cobbles piled around the outside. The enclosures are relatively circular and consist of boulder alignments incorporating the existing boulders with cobbles strewn over the top. The southern enclosure measures 2.3 x 1.8 m; the northern enclosure measures 2.8 x 1.5 m; and the eastern enclosure measures 2.3 x 1.8 m (Figure 155). No artifacts were observed at Honua 67.

Honua 67 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Honua 68 (Enclosure with Windbreak Wall)

Honua 68 is in a grassy area with koa haole in the southwestern corner of the project area and is a circular enclosure with windbreak wall (Figure 156). The enclosure opens to the west and the windbreak is set to block the prevailing trade winds from the northeast. The subrounded small boulders that comprise the enclosure are stacked on natural boulder outcrops. The windbreak wall was stacked three courses high with a maximum height of 70 cm. Other cleared areas were in the vicinity, but none as obvious as this feature. No artifacts were observed at Honua 68.

Honua 68 is likely a cultivation / garden site dating from the pre-contact to early historic period.

Figure 152. Overview photo of a mound recorded as Feature A of Honua 66, looking southwest

Figure 153. Overview of boulder outcrop enclosure (Honua 66, Feature B), looking northeast

Figure 154. Overview of boulder outcrop enclosure (Honua 66, Feature C), facing north

Figure 155. Overview of a group of modified boulder enclosures recorded as Honua 67, looking northeast

Figure 156. Overview photo of a modified boulder enclosure with windbreak wall (Honua 68), looking northeast

Honua 69 (Walled Enclosure)

Honua 69 is in grass and koa haole in the middle of the southwestern corner of the project area and consists of a rectangular enclosure with faced and piled boulders around the outside (Figure 157). The cleared interior of the enclosure measures 11 x 4.5 m. The enclosure incorporates the existing boulders into the construction and a large boulder is present in the northern wall. The eastern wall is the most substantial and comprised of subrounded cobbles and small boulders stacked up to three courses high with a maximum height of 75 cm and a maximum width of 150 cm. The remaining walls are stacked up to two course high with a maximum height of 50 cm and a maximum width of 90 cm. No artifacts were observed at Honua 69.

Honua 69 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 70 (Terrace Complex)

Honua 70 is a complex of terraces in a boulder field near the western boundary of the project area east of Kahananui Stream. The terraces are constructed on a slope and are multi-stepped with low alignments and retaining walls on the side perpendicular to the slope. A total of 10 terraces (designated Feature A through J) were documented and several more are probably in the vicinity (Figure 158 through Figure 167). The terraces were constructed of subangular boulders and cobbles with retaining walls stacked up to three courses high with heights ranging from 50-70 cm and widths ranging from 50 to 60 cm. No artifacts were observed at Honua 70.

Honua 70 is interpreted as a cultivation / garden complex dating from the pre-contact to early historic period.

Honua 71 (Enclosure with Windbreak Wall)

Honua 71 is along the east bank of Kahananui Stream near the western boundary of the project area and is a rectangular enclosure measuring 8.5 m long and 5 m wide with the long axis parallel to the stream (Figure 168). The windbreak wall is comprised of large cobbles stacked up to seven courses high with a maximum height and maximum width of 1.5 m. Facing on the west (stream) side of the enclosure was stacked 1-2 courses high with a maximum height of 60 cm. The side walls of the enclosure have collapsed in places but have several intact portions. The highest intact portion was in the west wall where it was stacked with cobbles five courses with a maximum height of 90 cm. No artifacts were observed at Honua 71.

Honua 71 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 72 (Wall)

Honua 72 is located near the western boundary of the project area north of Honua 71 and along the east bank of Kahananui Stream. The wall parallels the stream and measures ~12 m long. No photos or other metric data were recorded for the site. No artifacts were observed at Honua 72.

Honua 72 may have functioned as a flood control or water diversion structure; the site appears to date from the historic period.

Figure 157. Overview photo of a rectangular enclosure recorded as Honua 69, looking east

Figure 158. Overview photo of a terrace recorded as Feature A of Honua 70, looking southwest

Figure 159. Overview photo of a terrace recorded as Feature B of Honua 70, looking northwest

Figure 160. Overview photo of a terrace recorded as Feature C of Honua 70, looking northwest

Figure 161. Overview photo of a terrace recorded as Feature D of Honua 70, looking northwest

Figure 162. Overview photo of a terrace recorded as Feature E of Honua 70, looking northwest

Figure 163. Overview photo of a terrace recorded as Feature F of Honua 70, looking northwest

Figure 164. Overview photo of a terrace recorded as Feature G of Honua 70, looking northwest

Figure 165. Overview photo of a terrace recorded as Feature H of Honua 70, looking northeast

Figure 166. Overview photo of a terrace recorded as Feature I of Honua 70, looking northeast

Figure 167. Overview photo of a terrace recorded as Feature J of Honua 70, looking northeast

Figure 168. Overview of enclosure with windbreak wall recorded as Honua 71, looking north

Honua 73 (Enclosure with Attached Wall)

Honua 73, along the crest of the rocky eastern slope of Kahananui Gulch, is an enclosure with a windbreak wall and an attached wall (Figure 169). The rectangular enclosure measures 4.2 x 2.5 m. The windbreak wall constitutes its north and east sides; it is made of subrounded cobbles and boulders atop and against natural boulder outcrops of the slope. The wall is stacked seven courses high with a maximum height of 1.2 m and a maximum width of 1.5 m. The retaining wall side of the enclosure is stacked 5-6 courses on top of the existing bedrock with a maximum height of 2 m. Another wall measuring 5.5 m long, 1 m high and 1 m wide is connected to the enclosure and runs south (downslope) and roughly perpendicular to the gulch. No artifacts were observed at Honua 73.

Honua 73 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 74 (Alignment)

Honua 74, in the southwestern portion of the project area along the upper portion of the east side of Kahananui Gulch, is an alignment, possibly a collapsed windbreak wall. The alignment is comprised of subangular cobbles piled 2-3 courses high and incorporates a 70 cm tall boulder on the south side (Figure 170). It measures ~2.3 m long, 40 cm high with a width of 40 cm. No artifacts were observed at Honua 74.

Honua 74's function is indeterminate, given its poor physical collection; it may be a collapsed section of windbreak wall. Likewise, its age is also indeterminate.

Honua 75 (L-Shaped Wall with Paved Platform)

Honua 75, in the northwestern portion of the project area on the ridge comprising the east side of Kahananui Gulch, is an L-shaped wall with a paved platform (Figure 171). The wall on the northern (upslope) side is a single course of boulders measuring 2 m long and 30 cm wide. The other portion of the wall is subangular cobbles stacked up to four courses high on natural boulder outcrops and is a retaining wall for a paved platform measuring ~4.6 x 3.3 m in size. No artifacts were observed at Honua 75.

Honua 75's function is indeterminate; it appears to date from the pre-contact to early historic period.

Honua 76 (Terrace)

Honua 76 is located in the northwestern portion of the project area on the ridge comprising the east side of Kahananui Gulch and consisted of a rectangular terrace measuring 10 m long and 4 m wide with the long axis oriented roughly east-west. The retaining wall for the terrace was comprised subangular small boulders and cobbles stacked 4-5 courses high with a maximum height of 70 cm (Figure 172). No artifacts were observed at Honua 76.

Honua 76 is interpreted as a cultivation / garden site dating from the pre-contact to early historic period.

Figure 169. Overview of enclosure with windbreak wall and attached wall (Honua 73), looking northeast

Figure 170. Overview photo of an alignment recorded as Honua 74, looking northwest

Figure 171. Overview photo of an L-shaped wall recorded as Honua 75, looking northeast

Figure 172. Overview photo of a terrace recorded as Honua 76, looking northeast

Honua 77 (Mound)

Honua 77 is in the northwestern portion of the project area on the slope of the ridge comprising the east side of Kahananui Gulch and is a square shaped mound of subangular cobbles and boulders piled 3-4 courses high with a height of 70 cm (Figure 173). A large boulder outcrop is part of the north side of the mound. No artifacts were observed at Honua 77.

Honua 77's function and age are indeterminate.

Honua 78 (Enclosure with Windbreak Wall)

Honua 78 is on the slope of the ridge comprising the east side of Kahananui Gulch and is an enclosure with a windbreak wall. The wall measures 7.5 m long and curves in its last 1.5 m. It is comprised of boulders and cobbles stacked 5-6 courses high with a maximum height of 90 cm and a width of 1.5 m (Figure 174). The interior of the enclosure is overgrown, and its dimensions have not been determined. No artifacts were observed in association with Honua 78.

Honua 78 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 79 (Platform / Terrace)

Honua 79 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a rectangular platform / terrace measuring ~5 x 2 m with its long axis oriented east to west (Figure 175). It is constructed with boulders on the outside and filled with subangular cobbles in the interior. The downslope portion is partially collapsed but the faced portion is stacked 4-5 courses high with a maximum height of 80 cm. A 10 cm diameter circular hole is present in a boulder adjacent to the platform. No artifacts were observed in association with the Honua 79.

Honua 79 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 80 (Modified Boulder Outcrop - C-shaped Enclosure)

Honua 80 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a C-shaped enclosure incorporating a boulder outcrop as its windbreak wall (Figure 176). The enclosure opens to the west and has a cleared interior measuring 1.5 x 1.5 m in. The enclosing wall on the downslope side measures 3.3 m long and is comprised of subangular cobbles stacked 3-4 courses high with a maximum height of 60 cm. No artifacts were observed in association with Honua 80.

Honua 80 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 81 (Platform / Terrace)

Honua 81 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a square platform / terrace that has collapsed in the downslope portion. It measures 3.5 by 2.5 m and is made of subangular cobbles stacked 3-4 courses high with core filling (Figure 177). The platform had a maximum height of 50 cm and the surface of the platform is paved with cobbles. No artifacts were observed in association with Honua 81.

Honua 81 is interpreted as a habitation dating from the pre-contact to early historic period.

Figure 173. Overview photo of a mound recorded as Honua 77, looking north

Figure 174. Overview of enclosure with windbreak wall (Honua 78), looking southwest

Figure 175. Overview photo of a terrace recorded as Honua 79, looking west

Figure 176. Overview photo of a C-shaped enclosure with a windbreak recorded as Honua 80, looking north

Figure 177. Overview photo of a platform / terrace recorded as Honua 81, looking northwest

Honua 82 (Terraces & Enclosure Complex)

Honua 82 is on the slope of the ridge comprising the east side of Kahananui Gulch and consisted of several terraces (Features A through C) and a possible enclosure with windbreak wall (Feature D). Feature A is a rectangular terrace with a retaining wall on the downslope side and walls on the sides oriented parallel to the slope (Figure 178). The front retaining wall is comprised of large subangular cobbles stacked 5-6 courses high with a maximum height of 1 m and a maximum width of 80 cm. The interior of the enclosure measures ~5.5 x 2.5 m. Feature B is a rectangular terrace with a retaining wall on the downslope side (Figure 179). The retaining wall portion measures 3.2 m long and is comprised of subangular cobbles and small boulders stacked 3-4 courses with a maximum height of 70 cm and a maximum width of 80 cm. Feature C is a C-shaped enclosure constructed on a slight slope to create the windbreak feature for the enclosure (Figure 180). The enclosure walls, which are collapsed, are comprised of subangular cobbles stacked 2-3 courses high with a maximum height and width of 50 cm. Feature D is a possible enclosure with windbreak situated to utilize the natural boulders and slope to block the prevailing wind on the north and northeastern sides (Figure 181). The low wall of the enclosure is comprised of subangular cobbles stacked 2-3 courses with a maximum height and width of 50 cm. The large boulder comprising the northeast corner of the enclosure is 70 cm high. The interior of the enclosure measures ~3 x 1.5 m. No artifacts were observed at Honua 82.

Honua 82 is interpreted as a habitation and cultivation / garden site dating from the pre-contact to early historic period.

Honua 83 (Enclosure with Windbreak Wall)

Honua 83 is on the slope of the ridge comprising the east side of Kahananui Gulch and consisted of an enclosure with a large L-shaped windbreak wall (Figure 182). The wall is substantial and is ~9 m long. It is comprised of subangular cobbles stacked 4-5 courses high with a maximum height of 80 cm. As the wall turns south it is stacked 1-2 courses with a height of 50 cm. The lower enclosing wall is stacked three courses high with a maximum height of 50 cm and a maximum width of 90 cm. The interior of the enclosure measures ~5 x 3 m. No artifacts were observed at Honua 83.

Honua 83 is interpreted as a cultivation / garden site dating from the pre-contact to early historic period.

Honua 84 (Enclosure with Windbreak Wall)

Honua 84 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a modified boulder enclosure with windbreak wall (Figure 183). A 50 cm high boulder with cobbles stacked on top comprises a portion of the windbreak wall and faces the prevailing wind to the northeast. The wall measures 1.8 m long and is comprised of small subangular cobbles stacked 3-4 courses high with a maximum height of 70 cm. The possible interior of the enclosure measured ~2 x 1 m. No artifacts were observed at Honua 84.

Honua 84 is interpreted as a cultivation / garden site dating from the pre-contact to early historic period.

Figure 178. Overview photo of a terrace recorded as Feature A of Honua 82, looking north

Figure 179. Overview of terraces recorded as Feature B of Honua 82, looking northwest

Figure 180. Possible enclosure recorded as Feature C of Honua 82, looking northwest

Figure 181. Modified boulder enclosure with windbreak (Honua 82, Feature D), looking northwest

Figure 182. Overview of enclosure with windbreak wall (Honua 83), looking northwest

Figure 183. Overview of enclosure with windbreak wall recorded as Honua 84, looking north

Honua 85 (Linear Mound)

Honua 85 is on the slope of the ridge comprising the east side of Kahananui Gulch and consists of a linear mound (Figure 184). The mound measures 6 x 2.5 m with the long axis oriented parallel to the slope. It is comprised of subangular cobbles and boulders piled 3-4 courses high with a maximum height of 60 cm. No artifacts were observed at Honua 85.

Honua 85's It may represent a clearing mound.

Honua 86 (Enclosure with Windbreak Wall)

Honua 86 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a rectangular shaped enclosure with windbreak wall (Figure 185). The walls of the enclosure incorporate natural bedrock and boulder outcrops and include a retaining wall fronting the enclosure and a low windbreak wall. The retaining wall is comprised of large subangular cobbles piled 5-6 courses with a maximum height of 1 m and a width ranging from 1 to 1.5 m. The low windbreak wall is stacked 2-3 courses with a width of 1.5 m and a maximum height of 60 cm. The interior of the enclosure measures ~7 x 5 function and age are indeterminate. m in size. No artifacts were observed at Honua 86.

Honua 86 is interpreted as a habitation dating from the pre-contact to early historic period.

Honua 87 (Linear Mound & Alignment)

Honua 87 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a linear mound (Feature A) and an alignment (Feature B). Feature A is a linear mound, possibly a collapsed windbreak wall, constructed to use the existing slope (Figure 186). The mound measures ~3 m by 2 m and is comprised of cobbles piled 3-4 courses high with a maximum height of 80 cm on the downslope side. Feature B is a 7 m long rock alignment comprised of a single course of small boulders (Figure 187). The alignment runs roughly north to south, and a relatively clear and flat area is adjacent and to the east. No artifacts were observed at Honua 87.

Honua 87's function and age are indeterminate.

Honua 88 (Boundary Wall or Rock Berm)

Honua 88 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a straight boundary wall or rock berm oriented perpendicular to the slope (Figure 188). It is comprised of subangular and subrounded cobbles and boulders piled 4-5 courses high with a maximum height of 80 cm and width ranging between 1 and 1.5 m. The wall is oriented roughly east to west and measures 70 m in length. No artifacts were observed at Honua 88.

Honua 88 is probably a historic period boundary marker.

Figure 184. Overview photo of a linear mound recorded as Honua 85, looking west

Figure 185. Overview photo of an enclosure with windbreak wall recorded as Honua 86, looking north

Figure 186. Overview photo of a linear mound recorded as Feature A of Honua 87, looking northwest

Figure 187. Overview photo of a rock alignment recorded as Feature B of Honua 87, looking northwest

Figure 188. Overview of boundary wall or rock berm (Honua 88), looking north-northeast

Honua 89 (Site Complex)

Honua 89 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a site complex consisting of three main features. Feature A is a rectangular enclosure with a retaining wall and windbreak wall. The retaining wall in the front runs perpendicular to the slope and is comprised of subangular cobbles stacked 8-10 courses with a maximum height of 1.3 m (Figure 189). The windbreak wall incorporates a large boulder outcrop and is comprised of cobbles stacked 6-7 courses with a maximum height of 1.1 m (Figure 190). The cleared interior of the enclosure measures ~9 x 8 m. Feature B is east of the windbreak wall and is a rectangular enclosure with a cleared interior (Figure 191). The walls are comprised of subangular cobbles stacked 3-4 courses high with a maximum height of 70 cm on the upslope side. The cleared interior of the enclosure measures ~ 2.2 x 1.5 m. Feature C is east-northeast of Feature B and is a collapsed rectangular platform (Figure 192). It measures ~3 x 2 m and has upright boulder slabs set around the exterior with a core filling/paving of cobbles. The intact portion of the platform is cobbles stacked 3-4 courses high with a maximum height of 60 cm. No clear function could be determined for the feature but based on the size and elaborate construction of the platform, it is possible that it could contain a human burial. No artifacts were observed at Honua 89.

Honua 89 is interpreted as a habitation with a possible burial (formally-constructed platform designated Feature C) dating from the pre-contact to early historic period.

Honua 90 (Enclosure with Windbreak Wall)

Honua 90 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a partially collapsed enclosure with windbreak wall (Figure 193). The windbreak wall is comprised of subangular cobbles stacked up to four courses with a maximum height of 75 cm. The remainder of the enclosure appears to be collapsed and its interior area measures ~2.2 x 2.2 m. A possible retaining wall was present of the downslope side but was too overgrown to determine. No artifacts were observed at Honua 90.

Honua 90 is interpreted as a possible habitation that have been severely altered by collapse dating from the pre-contact to early historic period.

Honua 91 (Mound / Push Pile and Push Pile)

Honua 91 is on the slope of the ridge comprising the east side of Kahananui Gulch and is a mound (Feature A) and a push pile (Feature B). Feature A is a mound on a slope in a 4.5 x 2.5 m area (Figure 194). It is comprised of cobbles piled up to three courses high with a maximum height of 60 cm. An earthen push pile is nearby to the east. Feature B is a linear push pile of cobbles and boulders running perpendicular to the slope (Figure 195). This feature is near an old roadbed and areas cleared for grazing. It is comprised of 2-3 courses of haphazardly piled clasts with a maximum height of 50 cm. No artifacts were observed at Honua 91.

Honua 91 is a historic-period push pile related to bulldozing to create the nearby roadbed.

Figure 189. Overview of enclosure with windbreak wall (Honua 89, Feature A), looking northeast

Figure 190. Another view of Honua 89, Feature A, looking northwest

Figure 191. Overview collapsed enclosure (Honua 89, Feature B), looking north

Figure 192. Overview of platform (Honua 89, Feature C), looking northeast

Figure 193. Overview collapsed enclosure with windbreak wall (Honua 90), looking north

Figure 194. Overview mound (Honua 91, Feature A), looking northeast

Figure 195. Overview boundary wall / rock berm (Honua 91, Feature B), looking north

Honua 92 (Modified Boulder Outcrop - Windbreak Wall)

Honua 92 is in a grassy area in the southern portion of the project area and is a short section of windbreak wall (Figure 196). The wall is ~2 m long and incorporates an existing large boulder outcrop in its construction. The wall section is made of subangular cobbles stacked 3-4 courses high with a maximum height of 1 m and a maximum width of 80 cm. The west side of this feature is level soil. No artifacts were observed in association with Honua 92.

Honua 92 is interpreted as a cultivation / garden feature dating from the pre-contact to early historic period.

Honua 93 (Livestock Enclosure & Terrace)

Honua 93 is in the southeastern corner of the project area downslope of the paved roadway to a modern water tank facility. Feature A, an enclosure measuring ~30 x 15 m, is truncated on its northeast side by the construction of a paved road (Figure 197). The enclosure has a cleared, level interior and is comprised of boulders and cobbles piled 1-2 courses high with heights ranging from 20 to 70 cm. A large boulder marks the southwest corner of the enclosure. Feature B is square terrace measuring 2.5 x 2.2 m that is attached to the south side of the enclosure (Figure 198). The retaining wall side of the terrace is comprised of large boulders ~70 cm in height with a maximum width of 60 cm. The remainder of the terrace walls are somewhat collapsed and are stacked 2-3 courses with a maximum height of 40 cm. The enclosure is close to a historic water storage and distribution facility (Honua 94) and may be associated with it or other ranching activities in the area. No artifacts were observed in association with Honua 93.

Honua 93 is a large livestock (ranching) enclosure with a terrace dating from the historic period.

Honua 94 (Historic Water Distribution Complex)

Honua 94 is in the southeastern corner of the project area located downslope of the paved roadway to a modern water tank facility and is the abandoned remains of the original water distribution facility. Aerial photographs and historic maps indicate the facility was constructed as early as 1937 (see Figure 9). The facility is enclosed by a barbed wire fence and rocks have been cleared from the interior and piled to the sides. Feature A is three rows of concrete water tank foundations, each with associated concrete pedestals for piping (Figure 199). The concrete foundations ranged between 1 m and 1.2 m in height and were in groups of three and five. Old rusty piping and valves for moving water downslope were observed throughout the complex and include the water line connecting the facility with the pump facility downslope. Feature B is a 5 m long stacked retaining wall on the slope that divides the eastern two rows of tanks (Figure 200). It was comprised of large subangular cobbles stacked 4-5 courses high with a maximum height of 1 m and a maximum width of 60 cm. A broken Coca-Cola bottle with a production date of 1942 was observed above and adjacent to Feature B. Feature C is near the northeast corner of the complex and is a low wall comprised of cobbles stacked up to three courses with a maximum height of 60 cm (Figure 201). Additionally, an excavated pit was present in the southwest corner of the complex.

Honua 94 is a water distribution complex dating from the early twentieth century.

Figure 196. Overview of windbreak wall (Honua 92), looking northeast

Figure 197. Overview of southwest corner of enclosure (Honua 93, Feature A), looking south

Figure 198. Overview of terrace (Honua 93, Feature B), looking north

Figure 199. Overview of concrete tank foundations (Honua 94, Feature A), looking northeast

Figure 200. Overview of retaining wall (Honua 94, Feature B), looking north

Figure 201. Overview of wall (Honua 94, Feature C), looking northeast

Honua 95 (Mound)

Honua 95, a mound, is in the southwestern most portion of the project area in a graded strip of land between the existing house lots. The mound is rectangular with boulders around the outside and cobbles paving the interior and measures ~4.5 x 3 m (Figure 202). Grading and modern dumped rubbish were observed in the vicinity.

Honua 95's function and age are indeterminate.

Honua 96 (Mound)

Honua 96, a mound, is in the southwestern most portion of the project area in a graded strip of land between the existing house lots. The mound is similar in shape and constituent materials to Honua 95. Honua 96 measures ~3 x 2.25 m with boulders on the outside with cobbles spread throughout the interior (Figure 203). Grading and modern rubbish were observed in the vicinity.

Honua 96's function and age are indeterminate.

Honua 97 ('Auwai)

Honua 97 is near the western boundary of the project area along the east bank of Kahananui Stream and appears to be an 'auwai (traditional irrigation ditch). The site is a swale running from the stream downslope toward a set of terraces designated Honua 98 (see below). The site was only briefly inspected, and no photos or measurements were obtained.

Honua 97 is a section of 'auwai dating from the pre-contact to early historic period.

Honua 98 (Terraces)

Honua 98 is adjacent to the southern portion of the possible 'auwai recorded as Honua 97 (see above). Honua 98 is a row of several low alignments creating low, stepped terraces, which are constructed with a single course of subrounded cobbles. The site was only briefly inspected, and no photos or measurements were obtained.

Honua 98 is interpreted as a cultivation / garden site dating from the pre-contact to early historic period.

Figure 202. Overview of mound (Honua 95), looking southeast

Figure 203. Overview of mound (Honua 96), looking northeast

Section 5 Conclusion

On behalf of G70, and the Department of Hawaiian Homelands (DHHL), Honua Consulting (Honua) has completed an archaeological literature review and field inspection (ALRFI) in support of DHHL's ʻUalapuʻe Kuleana Homestead Project in ʻUalapuʻe Ahupuaʻa, Kona District, Molokaʻi Island, Hawaiʻi (TMK: [2] 5-6-002:001, 024–027 & 036 and [2] 5-6-006:017 por. & 040). This ALRFI specifically covers the phase 1 area of the overall project area.

The proposed project will divide approximately 412 acres of undeveloped DHHL land into agricultural, community, residential and special district use areas. The upper (mauka [upland]) portion of the property, TMK: [2] 5-6-002:025 and [2] 5-6-006:017, -040, will be zoned general agricultural use and special district while the lower (makai [seaward]) portion of the property, TMK: [2] 5-6-002:001, -024, -026 -027, -036, will be zoned community and residential use.

The objectives of this ALRFI were the following: (1) documentation and description of the parcel's land-use history in the context of both its traditional Hawaiian character as well as its historic-period changes; (2) identification of any historic properties or component features in the project area; and (3) providing information relevant to the likelihood of encountering historically-significant cultural deposits in subsurface context during future construction.

This ALRFI is not an archaeological inventory survey (AIS), and it is not intended for formal review by the State Historic Preservation Division (SHPD). It may be used, however, to support the project proponent's consultation with the SHPD and/or other stakeholders in compliance with applicable historic preservation and/or environmental law.

5.1 Overview of Fieldwork Results

A total of 103 sites have been identified in the phase 1 project area. This includes 98 sites identified by Honua as well as four (4) sites previously identified by Keala Pono (McElroy 2022) and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui. Honua archaeologists visited and briefly inspected this heiau, whose exact name and number is unclear based on conflicting archival information. No new data were recorded by Honua at this heiau, but its geospatial location and general boundaries were mapped.

Site descriptions for the identified sites include formal site types as well as interpretations of function and age. Given the high number of sites encountered, and the relatively limited amount of time allotted to complete the fieldwork, all information—but specifically function and age—should be considered preliminary. If a formal archaeological inventory survey (AIS) is required—which is a legally-binding document that requires the accurate identification of 100% of the historic properties in a project area—subsurface testing (archaeological excavation) would need to be conducted at a sample of site types in order to better understand their preliminary interpretations of function and age.

Most of the sites (61 of 103, or 59.2%) are traditional Hawaiian constructions that date from the pre-contact to early historic period. These include at least 22 habitation sites and a few shelters, some which also include cultivation / garden features; and at least one of which includes a possible burial feature (Honua 89). The traditional Hawaiian sites also include approximately two dozen cultivation / garden sites of various formal types. One distinctive and ubiquitous

construction style of traditional Hawaiian sites identified at dozens of sites in the phase 1 project area is use of a windbreak of stacked and/or piled rocks along the northeast / east facing sides of site-features. These windbreaks are clearly intended to block the prevailing trade winds from the northeast / east.

The traditional Hawaiian sites also include one koʻa (fishing shrine) [Honua 30] near the center of the phase 1 project area; and several site complexes interpreted as heiau or possible heiau. These include Honua 45 and Honua 47 in the southwestern project corner of the project area, and Kalauonokukui or Kalauonākukui Heiau (SIHP 50-60-04-181 or -182) along the western project-area boundary and ahupuaʻa boundary between ʻUalapuʻe and Kahananui.

Several rockshelters (with definite human modifications) and possible rockshelters (which need subsurface testing [archaeological excavation] to determine if they are cultural sites) were also identified in Kiʻinohu Gulch.

Thirteen (13) sites date exclusively to the late historic period and mostly include ranching features and structures related to water storage and distribution.

A substantial number of sites (29 of 103, or 28.2%) are interpreted as indeterminate in terms of their age. Many of these are in poor physical condition due to damage and/or neglect over time, making their temporal interpretation difficult. Some of these (e.g., modified boulder outcrops with rocks placed on top—consistent with being "clearing mounds" or piles) could have been made at various times in the past and are notoriously difficult to accurately date throughout the Hawaiian Islands.

5.2 Recommendations

The SHPD-Archaeology Branch should be consulted regarding appropriate next steps in anticipation of ground disturbance associated with the proposed development project, given the potential for encountering subsurface finds. Such consultation would benefit from detailed map depictions of specific proposed uses (e.g., residential versus preservation) in light to location of the 103 known historic properties identified herein.

Section 6 References Cited

Andrews, Lorrin

1922 *A Dictionary of the Hawaiian Language.* The Board of Commissioner of Public Archives of the Territory of Hawaii Accessible at https://archive.org/stream/ofhawadictionary00andrrich/ofhawadictionary00andrrich_djvu.txt.

Apple, Russell Anderson and William Kenji Kikuchi

1975 *Ancient Hawaii Shore Zone Fishponds: An Evaluation of Survivors for Historic Preservation*. Office of the State Director, National Park Service, U.S Department of the Interior, Honolulu.

Athens, J. Stephen

1985 *Archaeological Investigations at the Kalua'aha Estates Subdivision, Southeast Molokai*. International Archaeological Research Institute Inc., Honolulu.

Barrera, William M.

1974 *List of Hawaiian Sites on Bishop Estate Lands, Project No. 91.* On file at the SHPD libary, Kapolei, HI. Bishop Museum, Honolulu.

1983 *Kalua'aha, Molokai: Archaeological Reconnaissance*. Chiniago Inc., Honolulu.

Buke Māhele

1848 *Buke Kakau Paa no ka mahele aina i Hooholoia i waena o Kamehameha III a me Na Lii a me na Konohiki ana*. Accessible at < https://ags.hawaii.gov/archives/online-exhibitions/centennial-exhibit/keoni-ana/mahele-book/>.

Brown, J.F.

1894 Map of the Lower Portion of Ualapue Kona Molokai. October, 1894. Registered Map 1773. Accessed via Hawai'i Land Survey Division, Department of Accounting and General Services http://ags.hawaii.gov/survey/map-search.

Cobb, J.N.

1902 *Commercial fisheries of the Hawaiian Islands.* U.S. Fish Commission Report for 1901. Washington, D.C., Government Printer.

Department of Hawaiian Homelands (DHHL)

2005 *Moloka'i Island Plan*. Department of Hawaiian Homelands, Honolulu.

2019 *Moloka'i Regional Plan*. Department of Hawaiian Homelands, Honolulu.

Dunbar, Helene R.

1988 National Register of Historic Places Nomination Form for the Hokukano-Ualapue National Historic Landmark. Interagency Archeological Service, National Park Service Western Region, San Francisco, CA. Accessed via the National Park Service website at https://npgallery.nps.gov/NRHP/GetAsset/NHLS/66000304_text.

ESRI

2022 Aerial Imagery, Moloka'i Island Quadrangle. ArcGIS Pro® software by Esri.

Evans, Thomas J.K.
1937 County Tank Site Lot Ualapue Island of Molokai. March, 1937. Copy of Survey Furnished (CSF) Map No. 8240. Survey Department, Territory of Hawaii. Accessed via Hawai‘i Land Survey Division, Department of Accounting and General Services http://ags.hawaii.gov/survey/map-search.

Foote, Donald E., E. L. Hill, S. Nakamura and F. Stephen
1972 *Soil Survey of the Islands of Kaua‘i, O‘ahu, Maui, Molokai and Lanai, State of Hawaii*. U.S. Department of Agriculture, U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham
1918- *Fornander Collection of Hawaiian Antiquities and Folk-Lore The Hawaiians’ Account of the Formation of Their Islands and Origin of Their Race, with the Traditions of Their Migrations, Etc., as Gathered from Original Sources.* Vol. V, Memoirs of the B. P. Bishop Museum. Bishop Museum Press, Honolulu.

Frey, Jennifer J., Josephine M. Yucha, and Hallett H. Hammatt
2019 *Draft Archaeological Monitoring Report for an Individual Wastewater System Project at the Aquaculture Facility (Former D&J Ocean Farms, Inc.), Keawanui and Ka‘amola Ahupua’a, Moloka‘i District, Moloka‘i Island, TMK’s [2] 5-6-006:008, 024, 034.* Cultural Surveys Hawai‘i Inc., Wailuku, HI.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte
2013 Rainfall Atlas of Hawai‘i, Interactive Map. Geography Department, University of Hawai‘i-Mānoa. Accessed at <http://rainfall.geography.hawaii.edu/interactivemap.html>.

Graves, Michael W., Windy K. McElroy, Pulama Lima, and Dietrix Duhaylonsod
2016 *Cultural Impact Assessment for the Proposed East Pāku’i Fence Unit, East Slope of Moloka‘i.* Keala Pono Archaeological Consulting, Kāne‘ohe, HI.

Jacobsen, John T. and John C. Wright
1974 Hawaii Register of Historic Places Nomination Form for Kaluaaha Church. Department of Land and Natural Resources, Division of State Parks, Honolulu, HI. Accessed via the Historic Hawai‘i Foundation website at https://historichawaii.org/2014/03/03/kaluaaha-church/.

Kamakau, S.M.
1961 *Ruling Chiefs of Hawaii.* Kamehameha Press, Honolulu.

1991 *Ka Po‘e Kahiko, The People of Old.* Bishop Museum Press, Honolulu.

Kato, S.
1956 Kahananui and Ualapue Lower Portions Molokai, T.H. Hawaii Territory Survey, July, 1956. Registered Map 4088. Accessed via Hawai‘i Land Survey Division, Department of Accounting and General Services http://ags.hawaii.gov/survey/map-search.

Lee-Greig, Tanya and Hallett H. Hammatt
2017 *Archaeological Inventory Survey Report for After-the-Fact Improvement Requirements at the FormerLocation of D&J Ocean Farms, Inc. Keawanui and Ka‘amola Ahupua‘a,*

Molokaʻi District, Molokaʻi Island TMK: (2) 5-6-006:008, 024, 034. Cultural Surveys Hawaiʻi Inc., Kailua, HI.

Lee-Greig, Tanya, Jonas K. Madeus, and Hallett H. Hammatt

2010 *An Archaeological Literature Review and Field Inspection for After-the-Fact Improvement Requirements at the FormerLocation of D&J Ocean Farms, Inc. Keawanui and Kaʻamola Ahupuaʻa, Molokaʻi District, Molokaʻi Island TMK: (2) 5-6-006:008, 024, 034*. Cultural Surveys Hawaiʻi Inc., Kailua, HI.

Limura, T.

1954 Ualapue Pasture Lots Lots 1, 2, 3, 4 Ualapue, Molokai, T.H. Survey Department Territory of Hawaii, October 7, 1954. Copy of Survey Furnished (CSF) 11931. Hawaiʻi Land Survey Division, Department of Accounting and General Services, accessed at http://ags.hawaii.gov/survey/map-search.

McElroy, W., K. McElroy, M. Graves, M. Casson-Fisher, and G. McGuire

2021 Draft *Cultural Impact Assessment for ʻUalapuʻe Kuleana Homestead, ʻUalapuʻe Ahupuaʻa, Kona District, Molokaʻi, TMKs: 5-6-002:001, 024, 025, 026, 027, 036; 5-6-006:017, and 040.* Keala Pono, Kāneʻohe, HI.

McElroy, W.

2022 "End of Fieldwork Letter" for Archaeological Survey in Support of the ʻUalapuʻe Kuleana Homestead project, Keala Pono, Kāneʻohe, HI, MS and data provided by G70.

McIntosh, James, and Paul L. Cleghorn

2011 *Archaeological Inventory Survey of the Goodman Property, A 1.5 Acre Parcel in East ʻŌhiʻa Ahupuaʻa, Kona District, Island of Molokaʻi (TMK (2) 5-6-004:021).* Pacific Legacy, Kailua, HI.

Moore, James R., and Joseph Kennedy

1994 *An Archaeological Inventory Survey with Subsurface Testing Report for the Resubdivision of the Ualapue Lots 11 and 12 Located at TMK: 5-6-2:7 in Ualapue Ahupuaʻa, Kona District, Island of Molokaʻi*. Archaeological Consultants of Hawaii, Haleiwa, HI.

Moy, Tonia, and Daina Penkiunas

1993 National Register of Historic Places Nomination Form for the Kilohana School. State Historic Preservation Division, Honolulu. Historic Hawaiʻi Foundation, accessed at https://historichawaii.org/2014/03/03/kilohana-school/.

Nakuina, Moses Kuaea

1991 *The Wind Gourd of Laʻamaomao*. Kawaharada, Honolulu.

Pukui, Mary K., Samuel H. Elbert, and Esther T. Mookini

1974 *Place Names of Hawaii*. University of Hawaii Press, Honolulu.

Soehren, Lloyd J.

n.d. Catalog of Hawaiʻi Place Names. University of Hawaiʻi at Mānoa Library, Honolulu, accessed at https://manoa.hawaii.edu/hawaiiancollection/soehren/process.php?terms1=ualapue&bool ean1=1; accessed December, 2022.

Stearns, H.T., and G.A. Macdonald
1947 *Geology and Ground-Water Resources of the Island of Molokai, Hawaii*. Bulletin 11 in Bulletin of the Division of Hydrography. Division of Hydrography, Territory of Hawaii, Honolulu.

Stokes, J. F. G.
n.d.*a* "Heiau of Molokai" [1909]. Typescript, Bernice P. Bishop Museum, Honolulu.

n.d.*b* Miscellaneous field notes [1909]. Manuscript, Bernice P. Bishop Mus eum, Honolulu.

n.d.*c* Collection of notes [1909]. Manuscript, Bernice P. Bishop Museum, Honolulu.

n.d.*d* Molokai, survey of heiau [1909]. Manuscript (Field Notebook), Bernice P. Bishop Museum, Honolulu.

n.d.*e* Field notebook [1909]. Manuscript, Bernice P. Bishop Museum, Honolulu.

n.d.*f* Partial plans of Molokai sites [based on 1909 survey]. Bernice P. Bishop Museum, Honolulu.

Summers, Catherine
1971 *Molokai, A Site Survey*. Pacific Anthropological Records Number 14. Department of Anthropology, Bernice P. Bishop Museum, Honolulu.

Tulchin, Todd, Victoria S. Creed, and Hallett H. Hammatt
2002 *Archaeological Inventory Survey in Support of the Proposed Relocation of the Ka‘amola Point ATON Light, Ka‘amola Ahupua‘a, Kona District, Island of Moloka‘i (TMK 5-6-06).* Cultural Surveys Hawai‘i Inc., Kailua, HI.

U.S. Geological Survey
1922 U.S. Geological Survey 7.5 minute topographic map, Mapulehu Quadrangle. Accessed via https://guides.library.manoa.hawaii.edu/maps.

1949 U.S. Geological Survey Orthoimagery, Kamalo OE South Quadrangle. Accessed via https://guides.library.manoa.hawaii.edu/aerials.

1950 U.S. Geological Survey Orthoimagery, Kamalo OE South Quadrangle. Accessed via https://guides.library.manoa.hawaii.edu/aerials.

1958 U.S. Geological Survey 7.5 minute topographic map, Kamalo Quadrangle. Accessed via https://guides.library.manoa.hawaii.edu/maps.

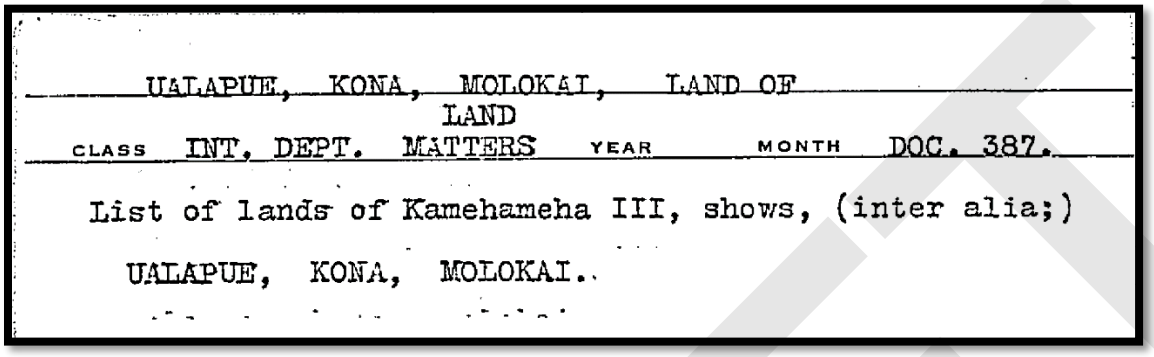
1965 U.S. Geological Survey Orthoimagery, Kamalo OE South Quadrangle. Accessed via https://guides.library.manoa.hawaii.edu/aerials.

Wilkinson, Sarah, and Hallett H. Hammatt
2010 *Archaeological Monitoring Report for Kilohana Elementary School, Hawai‘i Inter-Island DOE Cesspool Project, Ualapue Ahupua‘a, Kona District, Moloka‘i Island TMK: [2] 5-6-02:008.* Cultural Surveys Hawai‘i Inc., Kailua, HI.

Yucha, Josephine M. and Hallett H. Hammatt

2019 *Burial Site Component of a Preservation Plan for SIHP #50-60-04-2581, Fire Protection Project at Keawa Nui Farms (Former D&J Ocean Farms, Inc.) Keawanui and Kaʻamola Ahupuaʼa, Molokaʻi District, Island of Molokaʻi TMK: (2) 5-6-006:008,024, and 034*. Cultural Surveys Hawaiʻi Inc., Wailuku, HI

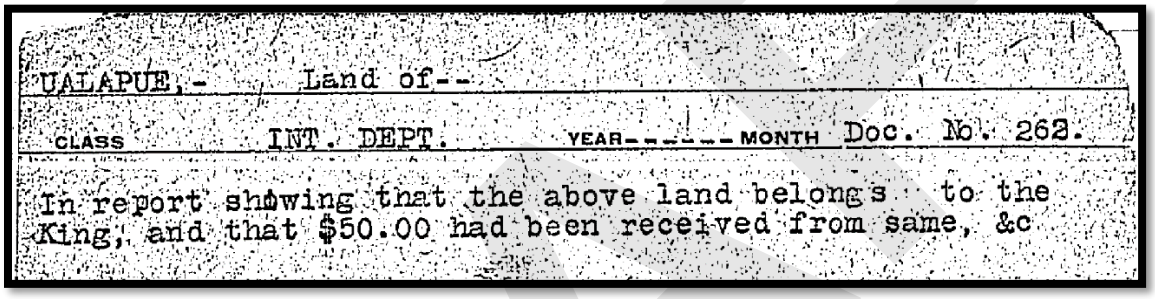
Appendix A: U.S. Department of the Interior Documents



UALAPUE, KONA, MOLOKAI, LAND OF
LAND
CLASS INT. DEPT. MATTERS YEAR MONTH DOC. 387.

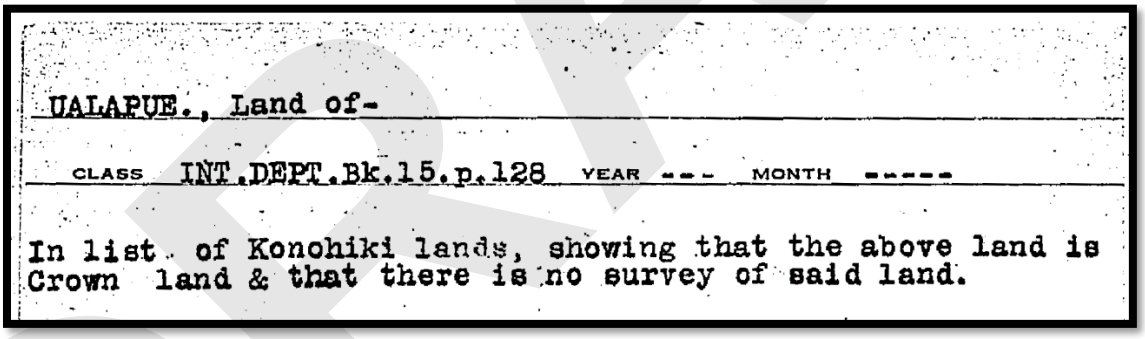
List of lands of Kamehameha III, shows, (inter alia;)

UALAPUE, KONA, MOLOKAI..



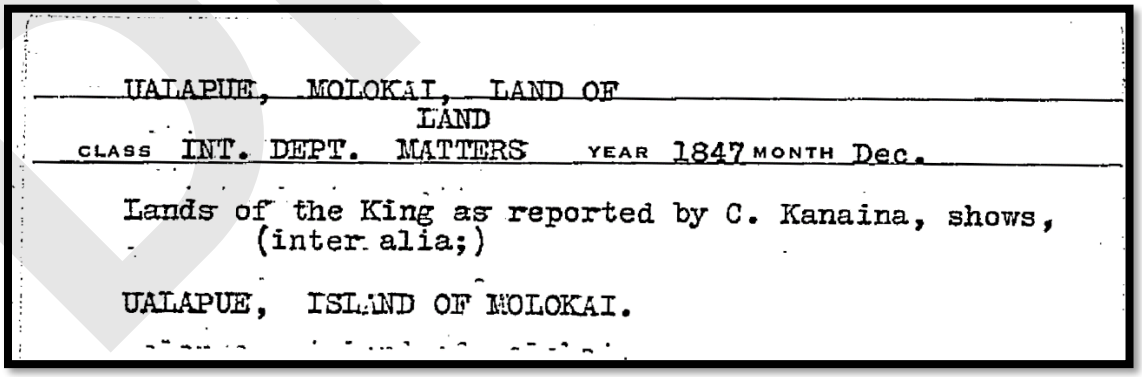
UALAPUE,- Land of--
CLASS INT. DEPT. YEAR------ MONTH Doc. No. 262.

In report showing that the above land belongs to the King, and that $50.00 had been received from same, &c



UALAPUE., Land of-
CLASS INT.DEPT.Bk.15.p.128 YEAR --- MONTH -----

In list of Konohiki lands, showing that the above land is Crown land & that there is no survey of said land.



UALAPUE, MOLOKAI, LAND OF
LAND
CLASS INT. DEPT. MATTERS YEAR 1847 MONTH Dec.

Lands of the King as reported by C. Kanaina, shows, (inter alia;)

UALAPUE, ISLAND OF MOLOKAI.

UALAPUE, MOLOKAI, LAND OF

CLASS INT. DEPT. LAND MATTERS YEAR 1847 MONTH Dec. 16th.

Lands of the King as reported by J. Kaeo, shows, (inter alia;)

UALAPUE, MOLOKAI.

UALAPUE, MOLOKAI, .LAND OF

CLASS INT. DEPT. LAND MATTERS YEAR 1847 MONTH Dec. 16th.

Lands of the King as reported by A. Paki, shows, (inter alia;)

UALAPUE, ISLAND OF MOLOKAI.

UALAPUE., Land of-

CLASS INT.DEPT.Bk.3.p.154. YEAR 1851. MONTH June.10.

That the above land belongs to the King., In letter from the Min.of Interior to Rev. S. C. Dwight.

UALAPUE., Ahupuaa of- on Molokai.-

CLASS INT.DEPT. YEAR 1852. MONTH Apr. 20.-

In letter from A. Paki to Min.of Interior. That the above land belongs to the King, and Anae is the tabu fish.

UALAPUE., Land of-

CLASS INT.DEPT. YEAR 1854. MONTH Jan.24.-

In Notice by A.Paki.That the King is the owner of the above land and that the Anae is the tabu fish.

UALAPUE,- Land of--

CLASS INT. DEPT. YEAR 1855 MONTH July 8th,-

In letter from Kamaipelekane to Wm. Webster, applying to lease the above land at $300.00 for a term of 10 years.

"UWALAPUE",- Ahupuaa of--

CLASS INT. DEPT. YEAR 1856 MONTH Apr. 1st,-

In lease from Kamehameha IV. to Paele & Kaholowaa all that tract of the land on the Island of Molokai known as the above Ahupuaa, excepting the fishpond, 1 quarter of an acre of land where the canoe houses stand & 10 Kalo patches at present occupied by Kuewa, Kahoohalahala & Pukoa, and also all Kuleana claims awarded by the Land Commission.

Uwalapue as spelled in the original document, but probably Ualapue. HSA 9-2008

UALAPUE,- Land of--

CLASS INT. DEPT. YEAR 1857 MONTH July 14,-

In letter from Kaule et. al., to Webster, stating that they have appointed three new lunas for the above land leased by them, to act in conjunction with the two former lunas, to superintend over their affairs in relation to said leased land, &c

UALAPUE,- Land of--

CLASS INT. DEPT. YEAR 1859 MONTH June 9,-

In letter from P. Nahaolelua to Wm. Webster, forwarding $250.- the amount of money received from Kaholowaa ma for the above land

UALAPUE., Land of

CLASS INT. DEPT. YEAR 1865 MONTH October 23.

In letter from P. Nahaolelua to J. O. Dominis stating that he has heard that Kaholowaa, one of the lessees of the above land had gone to Honolulu to convey his property to one of his sons - The reason for this action on his part is because of the non-payment of the rent of said land &c.

UALAPUE., Land of

CLASS INT. DEPT. YEAR 1865 MONTH November 2.

In letter from P. Nahaolelua to J. O. Dominis stating that Kaholowaa et. al. have paid $43 for the above land & $16 for the loko - Requests that legal proceedings be instituted against said persons for delinquent rents.

Doc. relating thereto, attached.

UALAPUE., Land of

CLASS INT. DEPT. YEAR 1866 MONTH March 23.

In letter from P. Nahaolelua to J. O. Dominis acknowledging the receipt of a communication of November 7th, instructing him to bring legal proceedings against the natives for the non-payment of the rent of the above land &c.

UALAPUE., Land of

CLASS INT. DEPT. YEAR 1873 MONTH February 9.

In letter from E. C. Fountain to J. O. Dominis stating that he would like to know if the above land was for lease and if so, desires that the same be leased to him for 5 years, offering $300 per year for said land &c. Doc. relating thereto, attached.

UALAPUE., Land of on Molokai.

CLASS INT. DEPT. YEAR 1873 MONTH April 1.

In letter from P. Nahaolelua to John Dominis acknowleding the receipt of his favor of March 29th relative to the application of Niki to lease the above land & the pond in said place. Docs. relating thereto, attached.

UALAPUE., Land of

CLASS INT. DEPT. YEAR 1873 MONTH May 16.

In letter from P. Nahaolelua to John O. Dominis acknowledging the receipt of his favor of May 12th regarding the lease of the above land & the pond included in same to Niki.

UALAPUE., Land of

CLASS INT. DEPT. YEAR 1873 MONTH May 31.

In letter from the Gov. of Maui to the Gov. of Oahu recommending that the above land be leased to Kupihea for the term of 10 years at a yearly rental of $300 a year - Doc. relating thereto, attached.

UALAPUE., Land of in Molokai.

CLASS INT. DEPT. YEAR 1873 MONTH October 31.

In report by P. Nahaolelua showing that $126.75 had been received from Halualani et. al. for the rental of the above land.

UALAPUE., Land of--

CLASS INT.DEPT.Bk.24.p.371 YEAR 1884 MONTH May 21

Min.of Interior- To J. K. Kaupu
Acknowledging receipt of his favor of May 8th. relative to lease of the lands lying between the Ahupuaa of Manawai & the above land, informing him that no such lease exist,&c

UALAPUE., Land of on Molokai.

CLASS INT. DEPT. YEAR 1894 MONTH Nov. 12.

Surveyor General. -To- Min. of Interior.
Submitting map & report on survey of the above land, made with reference to exchange with certain residents of Kalaupapa.

BLUE PRINT, attached.

UALAPUE., Land in on Molokai.

CLASS INT. DEPT. YEAR 1895 MONTH Jan. 17.

C. Andrews. -To- Min. of Interior.
Is desirous of obtaining a piece of land in the above place. That he be furnished with a map of said land, &c.

UALAPUE., Lands in on Molokai.

CLASS INT. DEPT. YEAR 1895 MONTH April 24.

H. R. Hitchcock. -To- Min. of Interior.
To lease from 5 to 10 years the remaining portions of the above land, at $75 a year as rental, &c. Report of Gov't Survey Office attached.

UALAPUE., Land of on Molokai.

CLASS F. O. & EX. YEAR 1899 MONTH Oct. 11.

Hui of Ualapue & J. Kahue. Re. - to
In list of applications for Public Lands. Applying to lease the above land, at upset price of $110, &c.

Remarks: Applicants verbally informed land already advertised for lease. Sold under Lease #519.

See page 1.

UALAPUE., Land of-

CLASS EX & F. O. YEAR 1904 MONTH Nov. 2.

In letter from Commissioner of Public Lands to Governor attached to letter from Governor to Commissioner of above date. Enclosing letter from Dr. Mauritz relative to rent due on above land from Hitchcock & Meyer &c.

Doc's. relating thereto attached.

UALAPUE., Lots in- Molokai.

CLASS EX. YEAR 1910 MONTH July. 20.

Commissioner of Public Lands- -To- -Governor-
Requesting approval to the setting aside of Lots 16,17,18 and 19 in above tract, for the use of the County of Maui, as a hospital site&c.

Correspondence relating thereto attached.

UALAPUE, Land of Re to-

CLASS Ex. (C.P.L.) YEAR 1921 MONTH Apr. 14

Com.Public Lands- To- Governor

Enclosing draft of Executive Order prepared by the Attorney General setting aside 3.12 acres of Ualapue. Molokai, as public park and playground.
Notes of survey and blue prints attached.

UALAPUE., Public Park & Play-ground at-

CLASS EX.(C. P. L.) YEAR 1921 MONTH Apr. 18

Commissioner of public Lands- From Governor

Enclosing certified copy of Executive Order No.95, setting aside a public park & play-ground at the above place, Molokai.

Appendix B: NRHP Nomination Form – Hokukano-Ualapue National Historic Landmark

The following 62 pages is the Nomination Form for the National Register of Historic Places Inventory of the Hokukano-Ualapue National Historic Landmark, prepared by Helene R. Dunbar of the U.S. National Park Service in 1988. According to the form, this historic landmark was included in the National Register in 1990.

THEME: HAWAII
INDIGENOUS PEOPLES AND CULTURES

NPS Form 10-900
(3-82)

OMB No. 1024-0018
Exp. 10-31-84

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received 1 3 1983
date entered

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic HOKUKANO-UALAPUE NATIONAL HISTORIC LANDMARK

and or common See Continuation Sheet

2. Location

street & number North and south of State Highway 45 ___ not for publication

city, town Ualapue X vicinity of Island of Molokai

state Hawaii code 15 county Maui code 009

3. Classification

Category	Ownership	Status	Present Use	
X district	___ public	___ occupied	___ agriculture	___ museum
___ building(s)	___ private	X unoccupied	___ commercial	___ park
___ structure S	X both	___ work in progress	___ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
___ object	___ in process	X yes: restricted	___ government	___ scientific
	___ being considered	___ yes: unrestricted	___ industrial	___ transportation
		___ no	___ military	___ other:

4. Owner of Property

name See Continuation Sheet

street & number

city, town ___ vicinity of state

5. Location of Legal Description

courthouse, registry of deeds, etc. Bureau of Conveyances

street & number Department of Land & Natural Resources, State of Hawaii

city, town Kalanimoku Building, Honolulu state Hawaii 96809

6. Representation in Existing Surveys

title See Continuation Sheet has this property been determined eligible? X yes ___ no
(NHL 1963)

date 1974 X federal X state ___ county ___ local

depository for survey records Department of Land & Natural Resources, Historic Sites Section

city, town Honolulu state Hawaii

7. Description

Condition		Check one	Check one	
___ excellent	X deteriorated	X unaltered	s original site s	NPS Inspection Visit Sept. 1987
X good	___ ruins	X altered	___ moved date	
X fair	___ unexposed			

See Condition of Individual Sites (below)

Describe the present and original (if known) physical appearance

LOCATION

The Island of Molokai, encompassing only 261 square miles, is centrally located in the Hawaiian archipelago. The heiau and fishponds comprising the Hokukano-Ualapue discontiguous NHL district are on the southeast, or leeward side of the Island in the District of Kona (Maps A and B). Ualapue Fishpond is just west of the village of Ualapue makai State Highway 45. Keawanui Pond is located approximately one and one-half miles further west. Kukui Heiau is midway between the two fishponds, mauka State Highway 45. Pu'u 'Olelo Heiau and Kaluakapi'ioho Heiau are located west of Manawai Gulch in the ahupua'a (ancient land holding unit) of East Ohia and Manawai respectively. Kahokukano and Pakui Heiau are mauka on a high ridge that separates Manawai Gulch and Kahananui Gulch. These first eight (8) sites are found on Map A. Iliiliopae Heiau is located approximately two miles east of Ualapue, and about one-half mile north of State Highway 45 in Mapulehu Gulch (Map B).

Kukui Heiau, Iliiliopae Heiau, Keawanui Pond and Ualapue Pond are easily accessible, except that access to the latter site is across private land and landowner permission is required. The upland heiau, Pu'u 'Olelo, Kaluakapi'ioho, Kalauonakukui, Kahokukano and Pakui, are difficult to locate and to reach because of steep terrain and dense vegetation.

ENVIRONMENT

The Island of Molokai is characterized by striking ecological and topographic contrasts. The Island was formed by lava flows from two shield volcanoes which overlap in the central region. West Molokai, in the rain shadow of the Island's mountain crest, is arid and desertic. East Molokai, especially the windward portions, are well watered with permanent streams. The uneven distribution of water resources was a major factor influencing prehistoric settlement patterns (Kirch 1985:123) as testified by the earlier settlement of the windward versus the leeward coasts on all the islands. The northern coast lacks a fringe reef and has an incessant pounding surf. It is also cut by great amphitheatre-headed valleys and permanent water. In contrast, the leeward or southern coast is characterized by broad reef flats, well suited to the development of fishponds for which Molokai is famous, and numerous narrow V-shapped gullies and valleys with only intermittent streamflow. The Hokukano-Ualapue NHL components are located in this latter environment.

The foothills of southeast Molokai are moderately steep but the coastal terrain essentially is flat. Rainfall averages about 30 in. per year, and occurs principally during the Kona storm season between October and January (Price 1973:54). The permeable volcanic soils with basaltic rock are less

8. Significance

Period	Areas of Significance—Check and justify below				
X prehistoric	X archeology-prehistoric	community planning	landscape architecture	X religion	
X 1400–1499	X archeology-historic	conservation	law	science	
X 1500–1599	agriculture	economics	literature	sculpture	
X 1600–1699	X architecture	education	military	social/ humanitarian	
X 1700–1799	art	X engineering	music	theater	
X 1800–1899	commerce	exploration/settlement	philosophy	transportation	
1900–	communications	industry	X politics/government	X other (specify)	
		invention		Aquaculture	

Specific dates See below **Builder/Architect** See below

Statement of Significance (in one paragraph)

Hokukano-Ualapue NHL is significant under National Register criteria A, B, C and D. In size, quality, setting, historic association and information potential, it is one of the most important archeological site complexes in the Hawaiian Islands. The temple platforms and fishponds comprising the Landmark are testimony not only to the architectural and engineering achievements of the ancient Hawaiians, but also to the impressive religious and political power and economic control that had evolved on Molokai between A.D. 1500 and A.D. 1778, the time of western contact.

The ancient District of Kona, southeast Molokai, contains more heiau and fishponds than any other comparable area in Hawaii. Many of these structures, especially those in the NHL complex, are associated with legends, rulers, and events that played an important role in Hawaiian culture and are of special significance to contemporary Hawaiians of native descent. For example, one of the temple platforms, Ilililopae, is especially sacred and may be both the oldest religious center on Molokai as well as the largest structure of its type in the Islands. Traditions indicate that it was functionally readapted several times and continued in use into the early post-contact period. Similarly, Keawanui is not only the largest surviving fishpond on Molokai but also probably the oldest. According to tradition, it was constructed about A.D. 1500 and, like Ualapue about which less is known, operated continuously until after NHL designation in 1962.

HISTORIC BACKGROUND

Molokai may have been independent until the late 16th century (Hommon 1976:139); however, by the 18th century it was coveted for its rich lands, especially its irrigated taro patches and walled fishponds (Kamakau 1961:132). Through inter-island marriage and intra-island usurpation, southeast Molokai became a focal point of island political development. By 1750 Molokai had been absorbed into an inter-island pattern of cyclical conquest. First Oahu conquered Molokai, followed by conquests and reconquests launched by Kahekili of Maui and Kamehameha I from Hawaii Island. During these periods of intra- and inter-island development, chiefdoms expanded but they were generally short lived and were followed within a generation or two by collapse and retrenchment. Changes in leadership frequently occurred through usurpation of a paramount chief by a junior collateral relative who successfully enlisted the aid of other chiefs. Following these periods of internecine conflict, fishponds and irrigation fields that had been devasted were repaired; new temples and fishponds were constructed; and old temples were rebuilt and reconsecrated.

9. Major Bibliographical References

See Continuation Sheet

10. Geographical Data

Acreage of nominated property See Continuation Sheet

Quadrangle name _____ Quadrangle scale _____

UTM References

	Zone	Easting	Northing		Zone	Easting	Northing
A				B			
C				D			
E				F			
G				H			

Verbal boundary description and justification

See Continuation Sheet

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
state	code	county	code

11. Form Prepared By

name/title Helene R. Dunbar, Archeologist

organization Interagency Archeological Service
National Park Service, Western Region date May 26, 1988

street & number 450 Golden Gate, P.O. 36063 telephone (415) 556-5190

city or town San Francisco state California 94102

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

___ national ___ state ___ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature

title date

For NPS use only

I hereby certify that this property is included in the National Register

Keeper of the National Register date 3/16/90

Attest: date

Chief of Registration

GPO 894-765

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 1 Page 2

NAME (continued)

The Hokukano-Ualapue National Historic Landmark consists of nine discontiguous properties:

Property	Ahupua'a	Statewide Inventory Number
Kukui Heiau	East Obia	50-60-04-322-169
Pu'u 'Olelo Heiau	Manawai	50-60-04-322-174
Kaluakapi'ioho Heiau	Manawai	50-60-04-322-175
Kahokukano Heiau	Manawai/ Kahanamui	50-60-04-322-177
Pakui Heiau	Manawai/ Kahanaui	50-60-04-322-178
Kalauonakukui Heiau	Ualapue	50-60-04-322-181
Iliiliopae Heiau	Mapulehu	50-60-04-322-200
Keawanui Fishpond	Keawanui	50-60-04-322-163
Ualapue Fishpond	Ualapue	50-60-04-322-185

Alternative or local names, and spelling variations for the different properties are summarized in Summers 1971. Information on Keawanui Fishpond is derived from a typescript by Dorothy Barrere (1971). All site names were also checked in Pukui et al. (1974), however, this source appears to have followed Summers (1971) exclusively.

Site	Alternative Name/Spelling
Kaluakapi'ioho Heiau	Kapiioho Kamuko'e
Iliiliopae Heiau	'Ili'iliopae 'Ili'iliopoe 'Ili'iliopoi Mapulehu
Keawanui Fishpond	Mikiniki Hinau Pond

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 4 Page 2

OWNER OF PROPERTY (continued)

Site	Owner	Tax Map Key
Kukui Heiau	Irene Bishaw 2462 Komo Mai Drive Pearl City, Hawaii 96782	5-6-04:16
Pu'u 'Olelo Heiau	Mrs. Pearl Petro Box 125 Kaunakakai, Molokai Hawaii 96748	5-6-06:13
Kaluakapi'icho Heiau	Mrs. Pearl Petro Box 125 Kaunakakai, Molokai Hawaii 96748	5-6-06:13
Kahokukano Heiau	Mrs. Pearl Petro Box 125 Kaunakakai, Molokai Hawaii 96748	5-6-06:13
Pakui Heiau	Mrs. Pearl Petro Box 125 Kaunakakai, Molokai Hawaii 96748	5-6-06:13
Kalauonakukui Heiau	State of Hawaii Dept. Land & Natural Resources 1151 Punchbowl Street Honolulu, Hawaii 96813	5-6-06:15
Iliiliopae Heiau	Mrs. Pearl Petro Box 125 Kaunakakai, Molokai Hawaii 96748	5-7-05:2
Keawanui Fishpond	Bishop Estate Kawaiahao Plaza, Suite 200 567 South King Street Honolulu, Hawaii 96813	5-6-06:8

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 4 Page 3

Ualapue Fishpond	State of Hawaii Dept. Lands & Natural Resources 1151 Punchbowl Street Honolulu, Hawaii 96813	5-6-01:1

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 6 Page 2

REPRESENTATION IN EXISTING SURVEYS (continued)

The individual properties comprising the Hokukano-Ualapue National Historic Landmark had the following earlier designations:

Name	Previous Site Numbers (Summers 1971)	(Bishop Museum 1974)
Kukui Heiau	Site 169	50-MO-A13-12
Pu'u 'Olelo Heiau	Site 174	50-MO-A12-6
Kaluakapi'ioho Heiau	Site 175	50-MO-A12-3
Kahokukano Heiau	Site 177	50-MO-A12-1
Pakui Heiau	Site 178	50-MO-A12-2
Kalauonakukui Heiau	Site 181	50-MO-A12-12
Iliiliopae Heiau	Site 200	50-MO-A10-1
Keawanui Fishpond	Site 163	50-MO-A13-1
Ualapue Fishpond	Site 183	50-MO-A12-16

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 7 Page 2

rich in organic content than alluvial soils in the windward valleys (Lau 1973:42); nevertheless, the region supported prehistoric Hawaiian staple crops such as sweet potatoes (Ipomoea batatas), dry non-irrigated taro (Colocasia esculenta as well as some irrigated taro, gourds (Lagenarea siceraria), and others (Handy and Handy 1972:212).

The Island's leeward vegetation pattern is characteristic of Zone A, lands under 1000 ft. elevation, that support open mixed xerophytic plants and thorn scrub (Ripperton and Hosaka 1955). Vegetational growth is dense around the various NHL components and consists of native as well as introduced species. Forms include: kukui (Aleurites moluccs), kiawe (Prosopis pallida), kou (Cordia subcordata), klu (Acacia sp.), koa haole (Leucaena leucocephala), ti (Cordyline terminalis), banyan (Ficus sp.), Christmas berry (Schinus terebinthefolius), pili grass (Heteropogon contortus), and other unidentified shrubs and trees. The principal vegetation around fishponds is mangrove (Rhizophora mangle), hau (Hibiscus tiliaceaus) and bulrushes (Scirpus sp.).

SITE DESCRIPTIONS

The individual site descriptions that follow were extrapolated by Summers (1971) from the unpublished field notes and site sketches of J. F. G. Stokes (n.d.a-f) whose 1909 fieldwork remains the primary source of information about the sites comprising the Hokukano-Ualapue NHL complex. Summers (1964; 1971) also researched other historic documentary sources such as Cobb (1902), Kamakau (1961), and Thrum (1907, 1909a and 1909b), however, the quality and amount of data presented on each site is not consistent.

Kukui Heiau, Site 50-60-04-322-169 (Photographs 15 and 16)

Stokes (n.d.a:2) provides only a brief description of this site:

> Located in East 'Obi'a on the low ground adjoining the Government road [present State Highway 45] this heiau ... is a collection of enclosures and low platforms of irregular shape. Though pointed out as an agricultural heiau site, there was nothing in the construction or location of the place to warrant such identification. The length ... was 170 ft. and the width 120 ft, and the general direction north and south [Figure 1].

The Heiau has been considerably damaged as a result of urban expansion (see below: Condition of the Sites); thus, although the outlines of the structure are still visible, we know little of its interior layout or features. Based on Stokes' statement above, the original structure encompassed approximately 20,400 sq. ft., covering slightly under 1/2 an acre.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 7 Page 3

Pu'u 'Olelo Heiau, Site 50-60-04-322-174 (Photographs 13 and 14)

The Heiau is located on rising ground in the middle of the Manawai Valley west of the stream. Stokes (n.d.a:3) described Pu'u 'Olelo as follows:

> The main feature is a platform facing the sea on the south. The ground inclines to the north, and there an extension of the main platform is enclosed on the west, north and east by a small section of heavy wall. There are numerous pits or excavations in the pavement of the platform and the presence of which it is difficult to explain. They are not quite regular in size. Nor is their order of arrangement regular; they are accurately plotted on the plan [Figure 2]. East of the main platform is an enclosed pavement, open on the south. The enclosing walls are small. The two structures are joined by a causeway of loose stones, now much disturbed, at their nearest southern corners built almost entirely of water-worn stones.

The main feature platform, based on Stokes' plan map (Figure 2), measures 100 x 74 ft. The enclosed pavement or courtyard to the east of the main platform measures 34 x 60 ft. The overall dimensions of the temple complex are 145 x 74 ft. (or 10,730 sq. ft. which is slightly under 1/4 acre). Pavement and wall heights are noted on Figure 2.

Kaluakapi'ioho Heiau, Site 560-04-322-175 (Photographs 8 - 12)

This temple platform is located on the west bank of Manawai stream at the boundary of the Manawai and Kahanamui land divisions (ahupua'a). Its elevation is approximately 275 ft. According to Stokes (n.d.a:3,4), the structure presents:

> A combination of platform and walls somewhat suggestive of Pu'u 'Olelo Heiau (Site 174), from which it is about 600 ft. distant [Stokes made a plan map of Pu'u 'Olelo but not of Kaluakapi'ioho].
>
> The most striking feature is the retaining wall of the eastern end. The surface of the valley declines in general to the south. The stream bed of Manawai is on the east side of the valley, adjoining the ridge. Between this and the western ridge is a stretch of valley bottom about 500 ft. wide. It might have been expected that the builder would have chosen suitable ground about 200 ft. to the west. The reason for the actual selection will perhaps be found in the desire to build

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 7 Page 4

something large and impressive and this effect was obtained [Photographs 10 and 11].

At the southeast corner, the retaining wall was originally 36 ft. high and at the northeast corner, 26 ft. On the south side, the least height [southwest corner] is 8 ft.

It might be mentioned that the upper part of the eastern retaining wall was almost vertical originally for from 6 to 9 ft., but below this level the slope was one horizontal to two vertical.

At the western end of the southern face, the stones are piled up loosely, not carefully laid as in other parts of the heiau. They seemed, however, to have been piled up in crescentic form. The large boulders forming the horns of the crescent were probably placed by Nature.

On the north, a terrace [54 x 24 ft.] adjoins the main platform, and is itself bounded on the west, north and east by walls (3 to 5 ft. wide). The pavement of the terrace, which is a foot higher than that of the main platform, is composed of small stones, in which there is much soil.

On the main platform [measuring 96 x 33 ft.], however, the present pavement is composed of the same large water-worn stones as are in the retaining walls. It was probably finished off with smaller stones originally, and these, as usual, sifted down out of sight among the larger stones. At about the middle of the western half of this pavement is a fireplace which measures inside 1.8 x 1.5 ft. and is 1.4 ft. deep. It is curbed with four thin stones, 5 in. wide, which are placed on edge.

The overall size of the temple complex, based on Stokes' information above, is 4,464 squre ft., or approximately 1/10th of an acre.

Kahokukano Heiau, Site 50-60-04-322-177 (Photographs 1, 2, 6 and 7)

This temple platform is located on the ridge which is the boundary line of the Manawai and Kahanamui land units, at an elevation of approximately 325 ft. Stokes (n.d.a:5) described this structure in detail:

> A structure of four terraces following down the ridge [Figure 3; Photographs 6 and 7]. The two upper terraces are protected

NPS Form 10-900-a
OMB

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 7 Page 5

by walls on the west, north and east, and the latter wall continues along the third terrace. All the other sides are open.

The lines of this heiau are very difficult to follow because of the condition of the west, south and part of the east retaining walls. The stones for the most part seem to have been loosely piled and not laid, but I would not care to make such a statement unless an extended investigation were made. The heiau has been part of a cattle range for many years, and the animals may be responsible for the present condition.

As well as can be judged, the entrance was on the east, up the incline between the third and fourth terraces. Access to the second terrace from the third, was probably obtained by using the top of the broad wall to the east, or possibly over the large rock used in the retaining wall between the two terraces. The tops of the walls were also probably used to pass from the second to the first terrace.

The pavements of the terraces are mostly of large stones, many of them water-worn. In some portions the earth is found, particularly towards the northern borders of the floors, where grading was probably done.

The size of this temple complex, based on the scale provided in Figure 3, is 16,800 sq. ft., or slightly under 1/2 an acre.

Pakui Heiau, Site 50-60-04-322-178 (Photographs 1 - 5)

This temple platform is also located on the ridge that forms the boundary between Manawai and Kahananui, but at an elevation of about 700 ft. Stokes (n.d.a:4) stated:

> The base of this structure might be described as an earthen terrace faced with [7 to 8 ft.] retaining walls of stone. The ridge which the terrace spans declines to the south. The plan and cross-section are complete enough to require no special description [see Figure 4].

The structure appears to be basically a single rectangular platform with internally demarcated activity areas and low interior platforms. Following Stokes' map, the heiau measures on the order of 185 x 85 ft. (ca. 15,725 sq. ft.), or about 1/3 an acre.

According to Thrum (1909a:40), an early recorder of religious structures in the Hawaiian Islands, Pakuí was of the luakini class, a late period temple

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

dedicated to the war god, Ku, whose rituals of propitiation included human sacrifice. He also noted its pu'uhonua characteristics which suggested its use at some point in time as a sacred place of refuge and asylum for those feeing punishment for taboo violations or in a time of war. Thrum did not describe the features he felt classified the structure as a pu'uhonua (which usually has a prominent walled in precinct), nor is this classification readily apparent from an study of Stokes plan map (Figure 4). Kelly, following Thrum, includes Pakui in her "Annotated List of Pu'uhonua in the Hawaiian Islands" (1986a). Kamakau (1961:22), an early contact period source, stated it was a pu'ukaua, or fortress.

Both Thrum and Kamakau are probably correct, for Kelly (1986b:137) provides the following insightful discussion:

> The term for a "place of refuge" was pu'uohonua, literally, pu'u, hill, honua, earth. The Hawaiian historian, S. M. Kamakau ... defined a pu'uohonua as a place to go "to escape and be saved from being taken prisoner or from being put to death." It may be that the word pu'uohonua was originally derived from a hill-type fortress. Such refuges are found throughout Polynesia. One attempt to explain its derivation comes from a story about the inhabitants of the island of Moloka'i. Upon being attacked by invaders from Maui, the defending population repaired to a hill from the top of which they rolled stones down on their attackers, thus saving themselves. And, the story goes, the hill became known as a pu'uohonua.

Kalauonakukui Heiau, Site 50-60-04-322-181

There is little information on this structure. The NPS 1962 registration form for the site describes it only as a "small platform heiau." Stokes (n.d.) did not list it, and Thrum (1909a:40) described it as a husbandry class temple (presumably dedicated to Lono, the god of agriculture and prosperity) measuring 100 x 80 feet, with walls 6 ft. high. Summers (1971:119) gives the measurements as 125 x 85 ft. (less than one-quarter of an acre), and notes that as of 1962 the walls on the south and west were still standing. There is no plan map or photograph available of this site.

Iliiliopae Heiau, Site 50-60-04-322-200 (Photographs 17 - 25)

Iliiliopae is a massive platform type heiau built of water-worn stones, with continuous terraces on all sides. This temple platform is the largest, most famous, and reputedly the oldest on the Island of Moloksi (Summers 1971:132). In 1909, Stokes (n.d.a:8) described it as follows:

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 7

The pavement of the main platform has suffered very greatly from vandals, and the many pits present in its surface are said to be the result of this work.

Regarding the condition of the structure when he studied it, Stokes (n.d.a:8) included this footnote observation on the heiau made by W. T. Brigham in 1865, nearly 45 years earlier:

> ... [it is] apparently intact. I remember a number of rectangular holes in the floor face with flat stone lining very neatly made, and I was told they were sockets for "Akua Kahiko," ancient gods, and as the native who told me had been a priest in the temple service, I believe he knew.

Stokes' description continues:

> There were no features left in the main platform which I could be sure were part of the original plan. The general surface, however, seemed to have been remarkably level; I found that the western end was only one foot lower than the eastern in a distance of 286 feet. The middle was 1.5 feet higher. The western end is 11 feet above ground and the eastern 22 feet. Being built across the end of the ridge, the ground dipped at each end of the heiau, where there was a stream bed.
>
> In addition to the main platform there were three terraces at the eastern end at various heights ... The faces of these terraces were well built. The lowest and the highest led to another terrace with a face of loosely heaped stones on the south of the platform. There may possibly have been steps at the southeast corner of the middle terrace; at its northern end it leads to the west where by means of a single step access is obtained to the continuation of the upper terrace. The western terrace seemed to be merely for strengthening the main wall.
>
> There was no convenient access from the terrace to the main platform. The terrace along the southern face of the latter was 6 feet below the platform pavement, while the height of the retaining wall on the north averaged 4 feet. However, there was a break in this retaining wall, near the northeast corner, and the entrance may have been there. A small heap of stones near the eastern end, 30 feet to the south, was described as the site of the lele (altar).

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 8

Stokes obtained information on the function of the terraces at the eastern end of the heiau from Obulenui, a 94 year old native, who told him that wooden idols representing Kukailimoku (Kamehameha I's war image), Lono, Kalia and Uli (goddess of sorcery) were worshipped there. These functional areas are identified in Figure 5, a composite of Stokes' 1909 records on Iliiliopae and observations made by Kenneth P. Emory, Bernice P. Bishop Museum, in 1952.

Based on Stokes' and Emory's figures, the Heiau measures 286 x 87 ft. (24,882 sq. ft., or a little over one-half an acre).

Keawanui Fishpond, Site 50-60-04-322-163 (Photographs 29 and 30)

This shoreline pond was classified by Apple and Kikuchi (1975:107) as a Type Ia-1 loko kuapa (walled pond) whose distinguishing feature is that it is built at the natural curvature of the shoreline utilizing an islet as part of the arc of the seawall. All Type Ia fishpond variations were constructed and owned under the aegis of a paramount chief who used them to raise 'ama 'ama (mullet; Mugil cephalus) and awa (milkfish; Chanos chanos) and sometimes other species. They were built on apron reefs where fresh or brackish springs were found (the yellow-green algae favored by these species thrived best in brackish water). Produce from the pond was reserved for the use of the paramount chief, his ali'i retainers and priests, and for ritual sacrifices at the temples.

Keawanui, the largest extant fishpond on Molokai, may have encompassed an original area of 73 acres, however, through siltation and vegetational growth it has now been reduced to an area of approximately 51 acres. The seawall is of multiple stacked construction. It measures 2,000 ft. in length and averages 6 to 7 ft. in width. In 1937 Keawanui had only one makaha (sluice gate); two additional makaha were added sometime after that date (Summers 1971:108). In the approximate center of the wall is a section at least 227 ft. long that has been rebuilt and reinforced with cement. Basalt and coral have been stacked up on both sides of the reinforcement to simulate the original construction technique. Presently the seawall does not join the shore. The breach from shore to existing wall is about 65 ft. long (Hawaii Statewide Inventory Form, Site 163) and was probably caused by the tsunami of 1960 as well as later tidal waves.

Ualapue Fishpond, Site 50-60-04-322-185 (Photographs 27 and 28)

Ualapue is a Type Ia loko kuapa, whose seawall is the main enclosing feature between two points of land (Apple and Kikuchi 1975:86). The seawall of this pond is constructed of coral and basalt fill. It measures about 1575 ft. in length, from eight to 19 ft. wide and is four ft. high. The structure contains two sluice gates.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Originally the pond encompassed at least 22 acres, however, extensive siltation plus the growth and invasion of bullrushes and mangrove into the pond have reduced its depth and overall area to 15 acres or less. In 1976, a portion of the landward side of the pond was further impacted through emplacement of artificial fill for construction of a private residence.

Although the date of its construction is unknown, Ualapue Pond appears to have been in continuous use until the tsunami of 1960 damaged the wall and destroyed the two makaha. Summers (1971:123) tells us that historically Ualapue was one of the ponds that was noted for the fatness of its mullet and was one of the best fishponds on Molokai because there were several fresh water springs in the pond which seemed to benefit the raising of mullet and clams.

CONDITION OF THE SITES

Both the heiau and the fishponds have sustained impacts. The heiau in the Landmark complex exhibit some degree of slump (natural erosion over time) and are overgrown with vegetation which disrupts walls, platform surfaces and interior archaeological features. Vegetational growth accelerated in the last decade when disease forced a cattle eradication program on Molokai. This environmental change is vividly evident in a comparison of the historic photographs of the heiau taken by J.F.G. Stokes in 1909 with those taken in the 1970s and during the 1987 Inspection Visit.

Cattle also caused surficial damage to these structures. In Stokes' 1909 photographs the land surface surrounding the heiau appears overgrazed and he speculated that cattle had caused surface disruptions to the Kahokukano temple platform (n.d.a:5). In later decades cattle fences were constructed across the Kahokukano and Pakui temple platforms; and pigs as well as cattle were penned at Kukui Heiau.

As early as 1909 Stokes noted potential vandalism/looting at Pu'u 'Olelo (n.d.a:3), which exhibited an unusual number of pits on its temple platform (Figure 2), and at Iliiliopae (n.d.a:8). At the latter site, surface features that had been evident several decades earlier were no longer identifiable.

At the time of NHL dedication, both Keawanui and Ualapue Fishponds were still operational, however, their operation and maintenance ceased in about the mid-1960s. Both fishponds have sustained further impacts as a result of historic alterations and the cumulative natural events that contribute to fishpond deterioration generally: siltation, mangrove infestation, and breached and/or deteriorated seawalls and sluice gates usually caused by tsunamis and sea storms.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 10

Ponds are settling basins for sediments carried down from over 4000 ft to the ocean by runoff; thus, with lack of maintenance they fill with terrigenous sediments plus off shore sand that moves in with storm and tidal action. In both cases, pond quality has been adulterated by mangrove growth which inhibits photosynthesis and the production of algae upon which various marine species feed.

Condition by Site

Kukui Heiau. This temple platform retains very little integrity. While the structural outlines are still visible, pigs and cattle were formerly penned at the site; it was also used as a garden plot; and much of the building stone has been removed for use in modern projects such as walled garden plots, property walls/fences, and nearby road and house foundation construction. Vegetational growth completely envelops the heiau (Photograph 3).

Pu'u Olalo Heiau. The condition of this site appears to be very good except for vegetational growth (Photographs 13 and 14) and the unusual number of pits (see Figure 2) on the platform surface. Pits for various ceremonial uses are a common feature of heiau platforms but such a large number suggests vandalism or attempted looting as discussed above.

Kaluakapi'ioho Heiau. Photograph 8 shows this temple platform as it appeared in 1909. Photograph 9 illustrates the vegetational growth that had occurred by 1987. A degree of slump is also visible in a comparison of the two photos. Photographs 11 and 12 illustrate the vegetational and structural changes that have occurred to the massive south wall of the temple platform between 1909 and 1987. Some damage to the north terrace may have resulted from cattle grazing.

Kahokukano Heiau and Pakui Heiau. Both sites are impacted by vegetational growth and each has a barbed wire cattle fence constructed across its main temple platform (Photographs 5 and 6).

Kalauonakukui Heiau. This site has not been visited in some years; however, because it is located inland away from developmental impacts occuring along Highway 65 and the coast, it is believed to be in reasonably good condition. Expected impacts, therefore, would consist of slump, vegetational growth, and perhaps historic cattle grazing.

Iliiliopae Heiau. This structure is still in good condition despite adverse impacts from vegetation growth and its location between two channels of Mapulehu Stream which threaten to erode its base. Photograph 17 shows the platform as it appeared in 1909 when overgrazing by sheep and cattle curtailed vegetational growth. Photograph 18 also illustrates the excellent condition of the multiple terrace construction of the south end of the east wall as it

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 11

appeared in 1909. Photograph 19, taken from the same angle, illustrates the increase in vegetational growth that had occurred by 1974. And finally, an 1987 NHL Inspection Visit photograph (20) shows the same area completely obstructed by vegetational growth and recently fallen trees that may have further impacted wall and terrace construction details. Photographs 22, 23, 24 and 25 illustrate disruptive vegetational growth atop the main temple platform and within pit features on the platform.

Keawanui Fishpond is heavily silted in and its landward perimeter overgrown with mangrove. The seawall has been breached along the southernly end of the pond and the makaha (of concrete historic construction) are in disrepair. The massive seawall was concrete filled several decades ago because the original building stone was eroding away (Photographs 29 and 30).

Ualapue Fishpond (Phototgraphs 27 and 28). Siltation and mangrove growth continue unchecked at this pond also. The makaha (2) are now in total disrepair and there appears to be at least one break in the seawall. In 1976, a section of the landward portion of the fishpond along the coastal highway was adversely impacted through the placement of unauthorized fill upon which a private home was constructed.

Department of Interior NHL Dedication Plaque

While it is in good condition, the dedication plaque for Hokukano-Ualapue is not publically accessible. It is located adjacent to Ualapue Fishpond but one must pass through private property to view the plaque and to approach the fishpond. The plaque is all but buried in shrubbery. This location is not suitable and the plaque should be moved.

NON-CONTRIBUTING PROPERTIES

The modern Hawaiian ranch style house constructed in 1976 on artificial fill introduced into Ualapue Fishpond is a non-contributing property.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 12

ILLUSTRATIONS

Photographs

1 View north. Kahokukano and Pakui Heiau on high ridge (right); Kapioho Heiau in gulch (left). Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 989.

2 View north. Closeup: Kahokukano Heiau (foreground) and Pakui Heiau (background). Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 1111.

3 View north. Pakui Heiau. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 1112.

4 View east. Pakui Heiau. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

5 View west. Pakui Heiau. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

6 View east. Kahokukano Heiau, fourth terrace. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

7 View west. Kahokukano Heiau, south retaining wall of third terrace. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

8 Aerial view (to west) of Kaluakapi'ioho Heiau taken from Kahokukano Heiau. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 1108.

9 Aerial view (to west) of Kaluakapi'ioho Heiau taken from Kahokukano Heiau. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

10 View west. Kaluakapi'ioho Heiau, east wall. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 988.

11 View north. Kaluakapi'ioho Heiau, south wall. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 987.

12 View north. Kaluakapi'ioho Heiau, south wall. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

NPS Form 10-900-a
(8-86)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 13

13 View east. Pu'u 'Olelo Heiau. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

14 View west. Pu'u 'Olelo Heiau. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

15 View south. Kukui Heiau, east wall. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

16 View west. Kukui Heiau, interior. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

17 Aerial view (to west). Iliiliopae Heiau. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 1124.

18 View west. Iliiliopae Heiau, south end of east wall illustrating multiple terrace construction. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 1130.

19 View west. Iliiliopae Heiau, south end of east wall illustrating multiple terrace construction. Photo by Bernice P. Bishop Museum Inventory Team, 1974.

20 View west. Iliiliopae Heiau, south end of east wall, recently fallen trees. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

21 View west. Iliiliopae Heiau, south end of east wall. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

22 View east. Iliiliopae Heiau, main platform surface with filled pit and recent disturbance. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

23 View east. Iliiliopae Heiau, banyan tree on main platform. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

24 View north. Iliiliopae Heiau, ferns growing in pit feature. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

25 View west. Iliiliopae Heiau, ti plant growing in pit feature. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

26 View south from Pakui Heiau. Kahokukano Heiau in foreground; Ualapue Fishpond in background. Photo by J. F. G. Stokes, 1909. Bernice P. Bishop Museum Negative 1113.

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 7 Page 14

27 View south. Ualapue Fishpond. Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

28 View east. Ualapue Fishpond, seawall. Photo by Bernice P. Bishop Museum Inventory team, 1974.

29 View southwest from Pakui Heiau. Keawanui Fishpond. Photo by Bernice P. Bishop Museum Inventory Team, 1974.

30 View east. Keawanui Fishpond, seawall and makaha (sluice gate). Photo by Earl Neller, Office of Hawaiian Affairs, September 23, 1987.

Figures

1 Kukui Heiau (Plan by Stokes, 1909).

2 Pu'u 'Olelo Heiau (Plan by Stokes, 1909).

3 Kahokukano Heiau (Plan by Stokes, 1909)

4 Pakui Heiau (Plan by Stokes, 1909)

5 Iliiliopae Heiau (Plan by Stokes, 1909)

6 Keawanui Fishpond (Plan by Evans, 1937).

7 Ualapue Fishpond (Plan by Evans, 1937).

8 A Hale o Lono, depicted by Bishop Museum artist Paul Lockwood (Ii 1959:57).

9 A luakini heiau, depicted by Bishop Museum artist Paul Lockwood (Ii 1959:34).

10 Kaneaki Heiau, Makaha Valley (Ladd 1973:frontispiece).

Tables

1 Hokukano-Ualapue NHL Architectural Summary

Maps

A USGS Kamalo, Hawaii 7.5 Quadrangle (1968)

B USGS Halawa, Hawaii 7.5 Quadrangle (1968)

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 2

Fishponds and great temple platforms became twin symbols of chiefly power. The builder of the first fishpond in Hawaii is traditionally reputed to be Ku'ula-kai, who lived in an undated period of heroes and gods (Kikuchi 1976:295). Since these structures became commonplace in legendary literature attributed to the 14th through the 19th centuries, it is conjectured that they were developed sometime prior to A.D. 1400. An estimated date of A.D. 1200 to A.D. 1400 seems reasonable in view of socio-political and concomitant religious changes that were taking place by that time.

Oral tradition tells us that Hawaiian religion was significantly altered by the arrival of a powerful priest, Pa'ao, from Kahiki (Tahiti) perhaps about the 12th century (Kirch 1985:259). Pa'ao brought with him the concept of human sacrifice and constructed the first luakini class heiau which functioned as a state level temple dedicated to the war god, Ku, who in one of his guises was Ku'ula, the fish god.

Oral tradition further attributes the construction of great heiau and fishponds to the menehune, a race of mythical, supernatural, and often mischievous dwarfs who were credited with creating such large scale public works in a single night. According to one legend, the stones used in the construction of Iliiliopae were carried by the menehune over the mountains of East Molokai from the beach at Wailau Valley, nearly ten miles distant. Each worker was allegedly paid one shrimp (opae) apiece for his labor, hence the name ili'ili (small stones) opae (shrimp), or " shrimp pebbles" (Thrum 1909b:50).

HISTORIC SIGNIFICANCE

Historic research on the Kona District has been hampered by the lack of contact period documentation that focusses on the area. The writers of primary ethnographic sources such as Kamakau (1961), Malo (1951), and Ii (1959) served kings from the Island of Hawaii, and while their writings remain invaluable accounts of the history and lifeways of the Hawaiian people in the late prehistoric period, they said little about Molokai, a land famed for its sorcerers and associated with the goddess Hina who presided over the sea and the medicinal arts.

Geneological data for the Island of Molokai are also sparse; however, most of the sites in the Hokukano-Ualapue NHL complex have associations with prominent individuals or events that were significant in the political evolution of Molokai and Hawaiian Culture. For example, Iliiliopae and Pakui Heiau have historic figures and legends associated with not only Molokai but Maui and Lanai as well. Future research with published and unpublished sources will expand considerably the information below which, unless specifically cited, is derived from Summers (1971) who relied almost exclusively on earlier

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 3

historical sources such as Thrum (1907; 1909a and 1909b); Kamakau (1961) and Stokes (n.d.a-f). It should be noted these sources provide no information on historic figures or events associated with Kukui Heiau, Kalauonakukui Heiau, and Ualapue Fishpond, although probably (by reason of proximity in adjoining ahupua'a) periodically they fell under jurisdiction of the same paramount (district) chief.

Kaluakapi'ioho Heiau

There are two versions for the origin of the temple name. In one account Kapiioho is said to have been an important kahuna kilokilo (seer) who was buried at Pakui Heiau on the ridge overlooking Kaluakapi'ioho Heiau (Stokes n.d.a:3,4).

According to another tradition (and the one favored by Pukui et al. 1974), a king of Oahu called Kapiioho was defeated and killed at the famous battle of Kawela, eight miles west of Kaluakapi'ioho Heiau. Survivors fled to their canoes, but the body of Kapiioho was probably taken and offered in sacrifice at some Molokai temple. Most likely it was Kaluakapi'ioho; however, prior to the sacrifice of an important invading chief, the Heiau would have had another name.

The temple is also believed to have been associated with Kumuko'a, an important chief of the district where the heiau is located. He was a contemporary of Kapiioho of Oahu and probably helped contribute to the latter's defeat (Stokes n.d.a:3,4).

Kahokukano Heiau

Stokes (n.d.a:5) states:

> Connected with the heiau were the names of Kaohele, a famous warrior and athlete, and Kumuko'a, a Molokai chief, son of Keaweikekahialii of Hawaii and his Molokai wife Kanealae.

Thrum (1909b:53) believed this temple to be a fish heiau at which sacrifices were offered:

> Mauka of it is a pond that used to be used for fish for a quartet of chiefs, Kumekoa [Kumuko'a], Halai, Mulehu and Kalaniahiikapaa, who lived at the heiau with one, Kaohele, a famous runner, as their guard and protector. In a battle with a force from Hawaii, Kaohele was killed. The invading chief from Hawaii then sought to kill the resident ali'i but they fled to refuge in nearby Kaluaaha and hid.

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 4

Pakui Heiau

Thrum (1909) listed Pakui as being a heiau of pu'uhonua character, although by the late prehistoric period it appears to have functioned for a time as a luakini or war temple that was destroyed during the time of Kamehameha I. Thrum also stated the heiau was built and occupied by the chief, Pakui, although according to Summers (1971:119) the original heiau probably dates prior to his time.

Kamakau (1961:22) called Pakui a pu'ukaua (fortress) and relates a 16th century tradition about Kiha-a-Pi'ilani (later an important paramount chief of Maui), who in trying to escape from the reigning Maui paramount chief, Lono-a-Pi-ilani, fled in secret to the fortress of Pakui on Molokai. When troops beseiged the site, Kiha fled Pakui by leaping into and hiding in a Kukui tree, later seeking refuge on the Island of Lanai.

Iliiliopae Heiau

Iliiliopae is Moloksi's largest and most important heiau, about which there are many traditions. The construction of the temple platform is attributed to a paramount chief, Ku-pa, whose lands encompassed the ahupua'ha of Mapulehu and Kaluaaha. Allegedly the original heiau covered almost three times the present area and was of a different type; possibly a walled temple. Thrum's informants (1909b:49-52) stated:

> ... it was enormous and was the stronghold for a numerous and powerful college of Kahunas [defined by Pukui and Elbert (1986) as priests, sorcerers, magicians, wizards, ministers, or experts in any profession], in which young men were trained and afterward sent out to work in other heiaus ... In the time of Kaalauoha, the regining chief, the heiau was rebuilt out of the stones gathered from the old one, and as best I could gather represented a different type of schcol or worship, and that is the temple as it now stands.

The two legends that Summers references (19/1:132; and Appendix D) to account for the construction, destruction, and subsequent rebuilding of this heiau are confusing. In one version, based on the missionary account of A. O. Forbes, who was stationed at Kaluaaha, Molokai from 1858 to 1868, Kupa was the builder of Iliiliopae. This chief had the children of his priest, Kamalo, put to death for alleged kapu (ancient system of taboos) violations against his sacred person. In retaliation, Kamalo obtained revenge through the assistance of the shark god, Kauhuhu, who caused a torrential downpour that ravaged Mapulehu Valley, destroying much of the original temple along with Kupa and all his people (who were washed out to sea and eaten by sharks) save Kamalo and his remaining family who were safe within their sacred enclosure.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 5

In a later version by Stokes (n.d.a:8-9), obtained from the 94 year old informant, Ohulenui, the heiau originally had been much larger, 920 feet long, and stretched across what is now the main Mapulehu stream. The stream formerly ran more to the west. In this version, the heiau was built in the time of Kaalauohua, who during his rule, sacrificed the ten sons of a man in his district. The priests who did the killing were Opiopio and Aiai. Vengeance was wrought through intercession of the shark god, Kauhuhu, who sent a flood to the valley. The flood not only destroyed the heiau, but also washed Kaalauohua, Opiopio, Aiai and all the other priests out to sea where they were eaten by sharks. The heiau was then rebuilt by the natives in the time of a king called Aikanaka, out of the stones of the original heiau.

Ohulenui, as well as Forbes' informants, would have been contemporaries, however, there are differences in the rendition of the legend. It is unclear whether we are dealing with one or two separate legends, or whether generations have been collapsed and events and/or associated personages blurred with the passage of time. Both versions have common components: a chief who is perceived to act dishonorably, death/sacrifice, vengeance/retaliation, intercession of the shark god, a flood, destruction of the temple, a change in political leadership and an implied change in temple function.

This ritual continuity of theme/components suggests in fact that the legend may have functioned as a revalidation myth for changing religious and political regimes. Over time, Illiliopae had changing religious functions. If legend is correct it was initially a functional temple as well as religious center for priestly training, a precinct three times its size today. It was rebuilt at least once and underwent an unspecified functional change. The fact that Kaalauohua eventually sacrificed humans at the temple site suggests it became an early luakini temple. By the early historic period, according to Ohulenui, it was dedicted principally to Lono, the god of agriculture and general prosperity, but with special areas demarcated for seasonal worship of other major as well as minor deities. Ohulenui specifically mentions a former wooden idol representing Kukailimoku, the personal war image (Ku) of Kamehameha I. This suggests that Kamehameha I may have claimed the temple in the conquest of Molokai, using it for luakini sacrificial rituals that were also performed following a successful campaign.

Keawanui Fishpond

According to the original theme study for Hawaii's National Historic Landmarks (USDI 1963:107), Keawanui was built about A.D. 1575 by a ruling chief, Lohelohe, however, no source is cited for this information. The Hawaii Statewide Inventory Form for the property further states that it is possibly the oldest fishpond on Molokai, that it was built around A.D. 1500, and that it operated continuously until at least the early 1960s.

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 6

The pond lies off the land division of Ka'amola, but belongs to the ahupua'a of Keawanui. According to Land Commission Award testimony following the Great Mahele of 1848-54 (In Summers 1971:108) and (Barrere 1971):

> ... the pond of Keawanui belonged to Ka'mola in the time of Pohano. Hekilikaakaa was the konohiki [land manager]. Kaaoaoa stole the food [taro]. He was a man of Ka'amola. The food was hidden in the harbor of Keawanui. The konohiki of Keawanui sought the food and found it. The name of the thief was told to him and a trial was held and the pond was taken for Keawanui. It was taken from the time of Kihapiilani [16th century] to this time. It was never returned to Ka'amola.

When Kamehameha I conquered Maui and Molokai, the latter island became the land of Kaheiheimalie (later called Hoapili-wahine) and her daugher Kekauluohi, or Auhea. In 1837, Kamehameha III gave the island to his favorite ali'i companions to divide among themselves. A Maui chief, Paulo Hinau, became owner of the ahupua'a of Keawanui and the fishpond. Hinau died in 1868 and willed Keawanui to Lot Kamehameha, then Kamehameha V. When the king died in 1872 his lands went to his half-sister Ruth Ke'elikolani, daughter of M. Kekuana'oa, Lot's father. Ruth's estate passed to her cousin, Bernice Paushi Bishop in 1883, and to Paushi's estate in 1884 (Barrere 1971).

SACRED AND RELIGIOUS SIGNIFICANCE

Ancient places of worship are especially sacred to people of native Hawaiian descent. They are built on the places of the people of old and are imbued with the Polynesian concepts of mana (supernatural and divine power) and kapu, dual organizing principles of Hawaiian religion and social life. Mana was a gift of the gods passed down from father to children in inherited fashion. Everyone had some mana but chiefs had more of it. Mana was important in kinship, especially ali'i marriages. The offspring of certain marital preferences produced more mana than others, i.e., full sibling matings. Thus, mana was why a paramount chief had a geneologist who could, at appropriate functions, recite his links back through the generations to the gods who gave his ancestors the original mana. There was no civil code of laws. Kapu, an elaborate system of religious taboos, served to protect and reinforce the sacred mana. Coral offerings in temples, and even fragments worked into heiau construction and fishpond walls, symbolized the sanctity of these structures and their relationship in the case of the larger class of heiau, through the chief who owned or constructed them, with the geneological ancestors and ultimately, the gods.

The concepts of mana and kapu must have been an integral part of the social and ritual lives of the first Hawaiians, but the precise nature of those beliefs and the manner of their expression is now lost. Probably the earliest

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 7

shrines were simple, constructed by families and small communities and dedicated to the gods of peace, health, fertility and a good harvest of the products of the land and the sea. From the time of the arrival of the legendary Pa'ao, however, Hawaiian religion changed dramatically over time, particularly as the power of the chiefs and priests grew along with substantial population increases. With increased population growth and social organizational complexity, religion, the legitimizing sanction of directed social and political change, evolved becoming integrated with government at the state level as well as at the local and personal level. Larger increasingly complex temples were constructed for public ceremonies dedicating major events. Sometimes the ceremonies lasted for days. Between these events, the temple might be maintained by a kahu (keeper of the heiau) or simply left untended.

In general, men of high rank, the ali'i, worshipped the four major gods in public or temple ceremonies: Lono (peace, agriculture, fertility, etc.), Kane (the creator and ancestral dieties) and Kanaloa (the ocean, healing and general well-being), and Ku (war). Only the ali'i class was responsible for state level observances for the well-being of the entire population.

Commoners worshipped individual family gods at private family shrines as well as observances of the four major gods at the direction of the high priests. Women, because they were considered periodically unclean, were not allowed to participate in temple ceremonies; however, they worshipped the major gods as well as their own distinct and separate gods.

A number of gods and spirits were also associated with fishponds. The primary fishing shrine at which rituals and offerings were dedicated to attract fish to the pond and to insure procreation was the ko'a at which the fish god must be propitiated otherwise the fish might not appear. Simple upright stones (pokaku ku'ula) also functioned as shrines that required proper care and offerings in order to keep fish in a pond.

The ancient Hawaiians also believed that walled fishponds of the loko kuapa (Type I) form were inhabited by mo'o (water spirits) who were also akua (gods) and kia'i (guardians) and relied upon them to protect the ponds from ritual and physical pollution in order to assure an abundance of fish. Ritual pollution included the violation of kapu (i.e., women could not fish nor be involved in the work of the pond), neglect of ritual obligations associated with the pond, poaching, and so on. Pollution of the pond by sewage, rubbish or offal also violated the religious sanctions guarding an area.

ARCHITECTURAL SIGNIFICANCE

Architecturally heiau are large structures containing houses and platforms, or altars, composed of one or more terraces or enclosures, or both, and upon

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 8

which ceremonies took place. Prior to European contact in 1778 and the breaking of the kapu in 1819, there were thousands of functional shrines and temples, all of which were heiau, in Hawaii. Native Hawaiians distinguished many heiau types, each with its particular function and used by particular segments of society; thus, the term is broad, covering many types and subtypes which range in size from single upright stones that were worshipped (pohaku a Kane), up to the massive and complex state level luakini (heiau po'okanaka), where human sacrifices were offered by a ruling paramount chief or king for success in war. In discussing the proliferation of heiau ground plans, Buck (1957:514-515) states:

> ...new heiaus were built frequently enough to create a profession of temple architects whose services were called upon when a chief wished to build a new temple. The professional architect was termed a kahuna kuhikuhi pu'uone because he showed (kuhikuhi) his proposed plan to the chief by drawing it or moulding it in sand (pu'uone). Professional pride impelled him to plan something different than the work of others, though in his professional education he studied the history and form of existing historical heiaus. When a temple was built for a specific purpose and success followed its construction, the architect naturally attributed the success to the form of the heiau. In planning a new heiau, the architect was able to cite the form of a temple which had been successful and to advise incorporating some part of its plan in the proposed new construction. It is no wonder, then, that variations in ground plans continued to multiply. Only the reconditioning and alteration of old temples prevented them from being more numerous than they are.

Further information is available from first hand traditional sources such as Ii (1959) and Malo (1951), as well as work by earlier researchers who recorded and studied these structures (Stokes n.d.a-f; Thrum 1907, 1909a and 1909b; Bennett 1931; McAllister 1933; and others); however, there are frustrating gaps in our knowledge of traditional types and seeming contradictions in the available sources. Traditional writers such as Malo and Kamakau functionally classified heiau in a general twofold division, the political and religious type at which human sacrifices occurred, called luakini or po'okanaka, and the husbandry or economic type of heiau. Later, Bennett (1930;1931) attempted to classify Hawaiian heiau according to architectural features (i.e., shape of heiau, platforms, enclosures, number of terraces, etc.) but this did not result in a usable scheme that also allows for interpretation of functional type.

A heiau can refer to any place of worship, but Valeri (1985:173) and Pukui and Elbert (1986:64) see the term as derived from the word "hai" which means to

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

sacrifice; therefore the temple is defined by function rather than form and can refer to any place where sacrifices are made.

Valeri (1985:183) further believes the Hawaiians had two heiau classification systems that have not been clearly distinguished and that have therefore resulted in some confusion. One system was based on function with two major classes: ho'ouluulu or temples for fertility, growth, and production, and kaua, temples of war. Cross-cutting this was an architectural typology that included the classes: ko'a, (fishing shrines and temples also dedicated to Ku, who in one of his guises was the war god), pohaku a Kane (upright stones that were shrines dedicated to Kane), unu and waihau (which appear to be agricultural heiau dedicated to Lono and Kane), and luakini (war temples dedicated to Ku). In this scheme the functional classification could be combined with the architectural to produce a combined array of subtypes.

Domestic temples, the hale mua, or simply mua, refers to the men's house within a group of habitations occupied on a kin basis. It is a place where guests are received and business is transacted. The hale mua contains an altar for offerings and god images (Valeri 1985:173-74).

Pohaku o Kane, essentially shrines that were often associated with domestic temples or a fishing temple, were the locus of expiatory rites. These erect stones with a kuahu (altar) were usually located at points of transition, boundary passes and cliffs. Barkcloth wrapped offerings were made by passersby (Valeri 1985:174-75).

Koa (coral) are heiau associated with Ku'ula, the god of fishing. It may be only a simple altar of coral or rock cairn with coral, or it can also be a true temple with platforms or small courtyards (Kamakau 1961:201; 1964:33). These are usually built close to the sea, or along streams, taro patches and ponds. Koa can also be built on little islands inhabited by seabirds which are used by the bird catcher.

Some Lono temples or ko'a belonged to the lesser nobility or even commoners, but Valeri (1985:185) states: "the king owns the most important temples of these types in each district. Only mua shrines are permitted to everyone and thus this unmarked temple is the only one that all commoners may build".

In general, the larger heiau were constructed by prominent persons such as the chief of an ahupua'a; they may include walled enclosures, stepped terraces, and combinations thereof. The most complex and largest of all temples the luakini, could be constructed and dedicated only by a paramount chief (ali'i ai moku, or ali'i nui). The dedication of such a temple by another chief was considered as an act of rebellion against the ruling polity. Although these heiau were dedicated primarily to Ku, Lono was not entirely absent from these state temples and agricultural or even rituals to the various fish and sea

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 10

gods might also be performed there (Valeri 1985:184-85). The reason being that successful conquest and victory make possible peaceful activities, i.e., fertility, prosperity, etc. such that Lono, Kane, or fishing rituals may also be conducted at the designated luakini temple during the monthly ritual cycle or at the appropriate point in the annual ritual season.

Luakini temples did not function as local temples that served the one local community in which they were located, but usually a district. Frequently they were built in elevated locations selected to impress; locations that along with the immensity of the structure, would convey a sense of power and awe. The information summarized in Table I substantiates that on the basis of size, structural complexity and location, all the heiau in the Hokukano-Ualapue NHL complex could have functioned as luakini at some point in the late prehistoric period. The structures range in size from ca. 4,464 sq. ft. (Kaluakapi'ioho) to about 24,882 sq. ft. (Iliiliopae). The size of Kaluakapi'ioho is in fact not small when one considers the volume of fill and the immensity of its east wall (Photographs 8 and 10). In some cases, traditional sources and/or oral histories confirm the pre-contact function of the structures. For example, the fact that an important Oahu chief was sacrificed at Kaluakapi'ioho leaves little doubt that it functioned at that time as a luakini. In others, such as Kukui Heiau and Kalaunokukui Heiau, designation as an agricultural or Lono temples is suspect on size alone. Depending on the time period of their initial construction, and subsequent rebuilding cycles, all the heiau in the group may have functioned as Lono temples or as fish heiau seasonally or during one political regime but not the next. Future archival research and excavation may make it possible to subtype these structures as proposed by Valeri.

One important means for distinguishing between these types of structures, in the absence of traditional information, is through study of the interior layout of the platform or enclosures, the locations and types of carved wooden god images displayed; and the particular construction materials used which had sacred implications and varied with the type of temple and rituals being observed. Because much of this material is perishable (i.e., wooden images, wood structures atop the platform, roofing thatch etc.), and platform surfaces become disrupted over time due to vegetational growth or vandalism, information may have to be partially reconstructed through sources such as John Papa Ii (1959), who served in the court of Kamehameha II. Some indication of the differences between these two temple types can be perceived in Figures 8 and 9 which are simplistic renditions based on Ii's descriptions, and Figure 10, a reconstruction of Kaneaki Heiau (Ladd 1973). For example, the principal features of a luakini included an 'anu'u tower where priests received inspiration, a semi-circular arrangement of wooden images surrounding the lele or offering platform, thatched houses (on individual platforms) with special functions i.e., drum house, oven house, and the house of mu, the body catcher who provided victims for sacrifice, etc. (Ii 1959:35-48).

Another distinguishing feature commonly found on luakini temple platforms and noted by Stokes (n.d.a:3,8) at Pu'u 'Olelo and Iliiliopae is pits. Buck (1957:525) has summarized what little is known about these enigmatic features:

> The refuse pit (lua-kini or lua-pa'u) was another feature of the heiau and it was used for the disposal of decayed offerings when the offering stands were needed in another temple ceremony. Emerson, in a note to Malo's text (1951:178), states that the name lua-kini was derived from lua (hole) and kini (400,000) and that the pit gave its name to the luakini type of temple. Malo (1951:162) says that the pit was within the oracle tower, but it is evident that it was not confined to that site. Bennett (1931:44), in describing the Kauai temple remains, states that the pits were located either inside or outside the temple structure. Those found were usually round and 5 to 15 feet in diameter ..... all were carefully made and most of them were lined with stones. The pits McAllister (1933:14) saw on Oahu were small, shallow, rectangular depressions artificially faced with stone. He also noted rough round pits which he suspected of have been made by curio hunters.

Tradition hints that Iliiliopae may be not only the largest but the oldest heiau on southeast Molokai. It is tempting to speculate that Kukui Heiau, the second largest heiau in the NHL complex and one that is also located at lower elevation closer to the coast, may also be an older structure whose initial stage may have been built before population expanded and the inland higher elevated temples were constructed. According to Kamakau (1961), the large state level heiau were constructed on the sites formerly built on by the people of old. Studies by Ladd (1969, 1970, 1972 and 1986) have further verified that these temples were constructed in a series of stages. Each rebuilding episode may commemorate a significant event, such as an expanding chiefdom, in the reign of a particular chief or king. The stylistic changes embodied in these structures, therefore, not only document evolutionary changes in social organization and the evolution of religion, but potentially may be stylistically identifiable with prominent persons.

ENGINEERING SIGNIFICANCE

The invention of fishponds was a unique achievement of the ancient Hawaiians for nowhere else in Polynesia was true aquaculture developed. The beginning date for the construction of the first fishponds in Hawaii is unknown although it is believed to be sometime after A.D. 1200, a time period during which other socio-political and religious changes, manifested in large scale constructions such as the luakini heiau, were also taking place.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 12

Aquacultural technology allowed the ancient Hawaiians to move beyond mere harvesting of fish and other marine products (i.e., crustaceans, shellfish, and seaweed) to intensive fish production and husbandry. Kikuchi (1973) reported a total of 449 ponds that were constructed prior to A.D. 1830. They were built on all the major islands but were most extensive on Kauai, Oahu and Molokai where broad shallow reef flats or natural embayments provided an environment in which ponds could be constructed easily in sweeping semicircular arcs out from the shoreline. Certain inland ponds, especially lava basins along the the shoreline, were also modified with walls (kuapa, or pa), sluices ('auwai) and sluice gates (makaha) to convert them into operational fishponds. The distinctive feature of the ponds was the sluice gates. The makaha was stationary with no moveable parts. This was the technological innovation, probably an adaptation from an earlier form used in irrigation agriculture, that enabled the prehistoric Hawaiians to progress from tide-dependent fishtraps to artificial fishponds that could be controlled at all times of the tide (Apple and Kikuchi 1975:6).

Ponds (loko) varied in form, construction, and methods of operation. They were divided into two major categories: shore and inland ponds. Apple and Kikuchi (1975:7) further subdivided these categories:

Type I — Loko kapa whose main characteristic is a seawall as its artifical enclosing feature and which usually contains one or more sluice gates. Both Keawanui and Ualapue are examples of this type of fishpond.

Type II — Loko pu'uone, an isolated shore pond usually formed by a barrier beach building a single elongated sand ridge parallel to the coast.

Type III — Loko wai, a freshwater fishpond located inland from the shore.

Type IV — Loko i'a kalo, another inland fishpond which utilized an irrigated taro plot (fish were grown in the waters flowing among the earth mounds planted with taro corms.

Type V — Loko 'ume 'iki is similar in shape and construction to Type I, however, it is a fishtrap characterized by numerous stone flanked lanes which led fish into netting areas with the ebb and flow of the tide. This is the only known form that may have a prototype elsewhere in Polynesia. It is also the only pond where women were permitted to net.

The first three types were royal fishponds owned exclusively by the ruling chiefs and managed by a caretaker, or (kia'i loko), or in some cases by a lesser chief, the konohiki, who served as a managerial overseer of both the pond and the adjacent ahupua'a agricultural lands. The last two types of ponds, while technically owned by the ruling chiefs, were the domain of families, hence commoners had some access to them but at the chief's discretion.

The most important of the shore ponds was the loko kuapa (Type I) which consisted of an arc-shaped wall extending out from the shore onto a reef flat and back again; these ranged in area from one acre to over 500 acres. The morterless walls were constructed of basalt cobbles, blocks and coral (the latter was probably included as a sacred offering). These were usually at least 6 or 8 ft. thick and projected 2 or 3 ft. above the highest tide level. Clearly only a high chief could command the labor necessary to construct such monumental structures. For example, the widest and most massive reported by Kikuchi (1975:17) had a 750 ft. seawall, was 6.5 ft. high, and measured 35 to 40 ft. wide at its base. The structure contained an estimated 150,000 cu. ft. of stacked rocks. The longest seawall recorded by Kikuchi was 6,300 ft. Some loko kuapa had secondary walls within the pond to form pua (fry ponds). Other engineering aspects of the Hawaiian seawalls were also of merit. The interstices in the mortarless masonry walls made them permeable and served to reduce stress from tidal, wave and current energy. The construction of seaward versus interior pond wall flanks was equally sophisticated. Seaward flanks were inclined slopes which further permitted the seawall to withstand wave energy and to absorb, per square inch, more energy than a more vertical batter (Apple and Kikuchi 1975:20).

Seawalls were gapped in one or more places with makaha which permitted the flow of seawater. Gates were blocked with slatted wooden panels that allowed fry to enter from the sea, but kept the larger, mature fish from escaping. Sluices (water channels or ditches usually lined with stone) ranged in length from several feet to several miles. The placement of sluices and gates ('auwai o ka makaha) appears to have been "according to prevailing water-related energy patterns so as to provide flow into and draining out of the pond to effectively reduce silting and inhibit stagnation. Nutrients also entered ponds through the sluice gates" (Apple and Kikuchi 1975:23). Mature fish, ready for harvest, congregate on the pond side of the sluice gate during the incoming tide, and on the sea side of the makaha during an outgoing tide. The commonest method of harvesting was the use of scoop nets on the pond side of the makaha on the incoming tide.

Associated with most Type I and Type II fishponds was a guard house or hale kia'i situated close to the makaha. Rather than a residence, this structure was a shelter for the caretaker while he was on poaching patrol. Ponds with several makaha also had several guard houses. Other structures included

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

fishing shrines and net houses. None of these associated structures has been recorded for Keawanui and Ualapue Fishponds although surely they must have existed at one time. This is probably due principally to lack of intensive survey in the vicinity of the ponds, as well as historic alterations to the surrounding landscape.

POLITICAL SIGNIFICANCE

The evolution of luakini temples and fishponds into symbols of a paramount chief's status and power is politically significant in the development of complex society, the consolidation of chiefdoms, and what may have been an incipient state level of socio-political organization in Hawaii in the late prehistoric period. Heiau size and overall pond size clearly indicate that the labor force involved in the construction and upkeep of the ponds and in the building/refurbishing of temples must have been considerable. Only an individual of very high status could command such a labor force.

Fishponds, in particular, became symbols of the chiefly right to conspicuous consumption and to ownership of the land as well as coastal marine resources. Selected fishponds, especially the loko kuapa type, played an important symbiotic role in the development of the Hawaiian chiefdoms and the royal court (Kikuchi 1976:298). A paramount chief's court, which might number several hundreds of persons, consisted of relatives, servants, specialists, priests, warriors, entertainers and hangers-on. The court was mobile in the sense there was no single permanent seat of government; thus, a chief's fishponds and intensively irrigated agricultural plots provided a constant supply of food for the court in residence, and for religious offerings at temples as well, without unduly burdening commoners by reducing their own food supplies. Periodic court moves also served to insure that local district chiefs did not remain isolated or unsupervised long enough to gather support for a revolt.

Administration of a paramount chief's fishponds and irrigated fields was vested in a well defined bureaucracy of lesser chiefs. A priest-architect was consulted and advised the paramount on all construction or alteration projects relating to his ponds and taro fields. The konohiki, or land and water manager, acted as a resident superintendent of the paramount chief's ahupua'a, a pie-shaped section of land that extended from an apex inland out into the sea. He also commanded the local labor force for building and repair projects. In addition, each loko kuapa had one or more caretakers, or kia'i'loko, who lived with their families at the pond site, cleaning and patrolling it, and when instructed, harvesting the selectively bred species of fish reserved only for chiefly or religious use.

Similarly, the luakini heiau was the evolutionary and symbolic end product of an increasingly complex and politically interwoven religious world view. They

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

were the focus of great public events. Their rituals, the longest and the most arduous of temple ceremonies, were undertaken only by the highest ranking ali'i priests.

A paramount chief's temples were central to the annual four month long (October to February, the wet season) makahiki festival dedicated to Lono (Malo 1951:141-152). At the end of this cycle, the paramount would decide, based on complex social and economic factors, whether or not his political course of action for the coming year was to be peace or war. If the latter, a luakini temple to Ku was either built, or reactivated through a rebuilding cycle, and dedicated to the event.

Hommon (1976:168-171) further theorizes the makahiki cycle had evolved as an important administrative arm in the functional integration of an emergent state level political unit. The ali'a nui would initiate this important religious cycle from the location he had chosen as a temporary residence and seat of government. An important function in the culmination of the festival was the ritual procession of priests throughout the chief's ahupua'a or district and the collection of tribute and taxes by which he could maintain his court and display his power through sacrifices of produce and material goods.

ARCHEOLOGICAL SIGNIFICANCE

Archeologically Molokai is still poorly understood. The Hokukanu-Ualapue complex, however, is geographically bracketed between two recent archeological project areas that have produced important chronological data: Halawa Valley east of the NHL on the windward eastern coast of the Island, and Kawela to the west on the leeward south central coast of Molokai. These are also zones of pronounced environmental contrast. Historically, Halawa Valley was famous for its extensive taro fields. Kawela was agriculturally marginal, although its coast supported extensive fishponds (Kirch 1985:27, 280-281). Excavations undertaken at the Halawa Dune Site (MO-A1-3) in 1969-70 revealed that initial settlement of the windard side of Molokai had occurred by A.D. 650. Later excavations at Kawela confirmed that the arid leeward zone was not occupied until about two centuries prior to European contact.

The sites comprising the Hokukano-Ualapue NHL are located in an intermediate environmental zone between Halawa and Kawela, -- within the proposed 25 square mile Southeast Molokai Archeological District (Hawaii Register of Historic Places 1974:2). The area is known to possess a quantity, quality, and concentration of features not seen elsewhere on Molokai. Over 600 structures and features so far have been recorded within one mile of the coast and probably many more would be revealed with intensive survey. These structures and features include: village sites, 27 fishponds, 36 heiau, sacred places (rocks, cave, bellstone etc.), hundreds of agricultural features, and trails.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 16

The seven temple platforms that are incorporated in the NHL discontiguous district are the most massive and structurally complex heiau in the proposed Southeast Molokai Archeological District. It is probable that most functioned as luakini in the late prehistoric period. They also command spectacular views of the southeast coast of Molokai with its fishponds as well as the neighboring Islands of Maui, Lanai and Kahoolawe. Southeast Molokai contains the largest concentration of fishponds in the Islands (1974:17). By the 1970s, 17 of the ponds had been destroyed due to natural agencies or by developers, however, 10 were still considered intact including Keawanui and Ualapue.

Clearly the area that encompasses the NHL sites once supported a dense population under the aegis of important high chiefs who could command the necessary labor force to construct and/or rebuild the twin edifices of chiefly power: fishponds and massive heiau. Although an initial settlement date for the ahupua'a containing these properties is unknown, the land divisions immediately east of Kawela may have been more favorable environmentally. If so, settlement may have occurred one to two hundred years earlier than at Kawela, perhaps by A.D. 1300-1400.

Both fishponds and heiau have information potential with respect to chronology and classification as well as for analyses of settlement pattern and social organization. A few fishponds are known to have associated stratified and dateable archeological deposits, but there is no indication that any survey has been undertaken to locate potential sites in the immediate vicinity of Keawanui and Ualapue Fishponds. Excavation, or testing and stabilization of heiau, on the other hand, has broader research implications. They can provide datable material (charcoal from hearths associated with building sequences and basaltic glass artifacts) that is useful in the development and interpretation of local chronological sequences.

Heiau, especially the luakini type, were, for the most part, independent of the immediate local community. Fishponds were also the property of a high chief who used their produce to support his court when in residence and for sacrificial propitiation of the gods at his temples. At the same time, these dual chiefly structures were articulated in a regional or district settlement pattern. The evolutionary development of such structures with respect to political land divisions, the tribute network and the greater settlement pattern, however, has been a neglected area of research and one that is critical to interpreting the processes that led to the consolidation of chiefdoms and an emergent state order in the Hawaiian Islands. Changing political and religious functions over time also can be addressed through study and interpretation of the architectural building sequences contained with heiau.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 8 Page 17

Because chiefs were sometimes interred in heiau, these structures have the potential to provide information on social stratification. According to Kirch (1985:241-42), sacrificial victims (which included rival chiefs and ali'i captured in battle) were also interred in luakini platforms, a practice confirmed by Ladd (1969; 1970). This suggests important status differences in the burial treatment of commoners or criminals, defeated chiefs and resident chiefs.

INTEGRITY

With the exception of Kukui Heiau, and the intrusive modern house at Ualapue Fishpond, the scenic integrity of the Hokukano-Ualapue National Historic Landmark is high.

The integrity of the individual components comprising the NHL complex has been impacted to varying degrees; nevertheless, the structural outlines, walls, platforms and terraces are, with the exception of Kukui Heiau, still in good condition. Building sequences are also believed to intact; thus, the archeological information potential of these structures is excellent. Although the platform surfaces and other interior features of the heiau have suffered impacts, additional information for the reconstruction of interior features/functions and construction materials of different types of heiau is availble in existing archives, ethnohistoric sources and oral histories.

Based on the in-depth discussion of impacts to the various components of the Landmark provided in Item 7 above, individual site integrity is estimated as follows:

Sites	Estimated Integrity
Kukui Heiau	Less than 50%
Pu'u 'Olelo Heiau	75-80%
Kaluakapi'ioho Heiau	75-80%
Kahokukano Heiau	75-80%
Pakui Heiau	75-80%
Kalauonakukui Heiau	Expected to be 75-80%
Ilifiliopae Heiau	75-80%
Keawanui Fishpond	65-75%
Ualapue Fishpond	65-75%

NPS Form 10-900-a
OMB

OMB No. 1024-0018
Expires

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 9 Page 2

BIBLIOGRAPHY

Apple, Russell A. and William K. Kikuchi
1975 Ancient Hawaiian shore zone fishponds: an evaluation of survivors for historical preservation. Honolulu: U.S. Department of the Interior, National Park Service.

Barrere, Dorothy
1971 Keawanui Fishpond. Typescript on file, Bernice P. Bishop Museum, Honolulu.

Bennett, W. C.
1930 Hawaiian heiaus. Unpublished Ph.D. dissertation, University of Chicago.

1931 Archaeology of Kauai. Bulletin Number 80, Bernice P. Bishop Museum, Honolulu.

Buck, Peter H. (Te Rangi Hiroa)
1957 Arts and crafts of Hawaii. Special Publication Number 45, Bernice P. Bishop Museum, Honolulu.

Cobb, J. N.
1902 "Commercial fisheries of the Hawaiian Islands." U. S. Fish Commission Report for 1901. Washington, D. C.: Government Printer.

Emory, Kenneth P.
1952 Field notes. On file at the Department of Anthropology, Bernice P. Bishop Museum, Honolulu.

Evans, Thomas J. K.
1937 Government fish ponds, Island of Molokai. Regional Map No. 3010. On file at the Hawaii State Survey Office, Honolulu.

Handy, E. S. Craighill and Elizabeth Green Handy
1972 Native planters of old Hawaii. Bulletin 233, Bernice P. Bishop Museum, Honolulu.

Hommon, Robert J.
1976 The formation of primitive states in Hawaii. Unpublished Ph.D. dissertation, University of Arizona, Tucson.

NPS Form 10-900-a
(8-86)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 9 Page 3

Ii, John Papa
1959 Fragments of Hawaiian history. Translated by Mary Kawena Pukui. Special Publication Number 70, Bernice P. Bishop Museum, Honolulu.

Kamakau, Samuel M.
1961 Ruling chiefs of Hawaii. The Kamehameha School Press, Honolulu.

1964 Ka po'e kahiko: the people of old. Special Publication Number 51, Bernice P. Bishop Museum, Honolulu.

Kelly, Marion A.
1986a "Annotated list of pu'uhonua in the Hawaiian Islands. In Edwin H. Bryan, Jr. and Kenneth P. Emory (eds.), The natural and cultural history of Honaunau, Kona, Hawaii. Departmental Report Series 86-2, Bernice P. Bishop Museum, Honolulu.

1986b "The concept of asylum." In Edwin H. Bryan, Jr. and Kenneth P. Emory (eds.), The natural and cultural history of Honaunau, Kona, Hawaii. Departmental Report Series 86-2, Bernice P. Bishop Museum, Honolulu.

Kikuchi, William K.
1973 Hawaiian aquacultural systems. Unpublished Ph.D. dissertation, University of Arizona.

1976 "Prehistoric Hawaiian fishponds." Science 193:295-99.

Kirch, Patrick V.
1985 Feathered gods and fishhooks: an introduction to Hawaiian archaeology and prehistory. University of Hawaii Press, Honolulu.

Ladd, Edmund J.
1969 "Alealea temple site, Honaunau: salvage report." In Archaeology on the Island of Hawaii, R. D. Pearson, editor. Asian and Pacific Archaeological Series, No. 3. Social Science Research Institute, University of Hawaii, Honolulu.

1970 "Kaneaki temple site: excavation report." Makaha Valley Historical Project, Interim Report No. 4. Manuscript on file, Bernice P. Bishop Museum, Honolulu.

1972 Test excavations at Wahuala - Structure C - Hawaii Volcanoes National Park, Hawaii.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

[redacted]

Continuation sheet Item number 9 Page 4

1986 Pu'ukohola Heiau - ruins stabilization and restoration record: Pu'ukohola Heiau National Historic Site, Kawaihae, Hawaii. U.S. Department of the Interior, National Park Service, Pacific Area Office, Honolulu.

Ladd, Edmund J., editor
1973 Makaha Valley Historic Project, Interim Report No. 4. Department of Anthropology, Pacific Anthropological Records Number 19. Bernice P. Bishop Museum, Honolulu.

Ladefoged, Thegn, Gary F. Somers and M. Melia Lane-Hamasaki
1987 A settlement pattern analysis of a portion of Hawaii Volcanoes National Park. Western Archeological and Conservation Center Publications in Anthropology No. 44, U.S. Department of the Interior, National Park Service, Tucson, Arizona.

Lau, L. Stephan
1973 "Water." In Atlas of Hawaii, edited by Warwick R. Armstrong, pp. 212-216. Honolulu: University of Hawaii Press.

Malo, David
1951 Hawaiian antiquities. Translated by Nathaniel B. Emerson in 1898. Special Publication No. 2, Bernice P. Bishop Museum, Honolulu.

McAllister, J. Gilbert
1933 Archaeology of Oahu. Bulletin 104, Bernice P. Bishop Museum, Honolulu.

Price, Saul
1973 "Climate." In Atlas of Hawaii, edited by Warwick R. Armstrong, pp. 53-60. Honolulu: University of Hawaii Press.

Pukui, M. K. and S. H. Elbert
1986 Hawaiian dictionary. Honolulu: University of Hawaii Press.

Pukui, M. K., S. H. Elbert and E. T. Mookini
1974 Place names of Hawaii. Honolulu: University of Hawaii Press.

Ripperton, J. C. and E. Y. Hosaka
1955 "Soils and vegetation." In Soil Survey of the Territory of Hawaii, pp. 89-95. U.S. Department of Agriculture and the Hawaii Agricultural Experiment Station, Washington, D.C.

NPS Form 10-900-a
OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 9 Page 5

State of Hawaii
[1974] Statewide Inventory Form: Southeast Molokai Archaeological District (proposed). On file, Bernice P. Bishop Museum, Department of Anthropology, Honolulu.

Stokes, J. F. G.
n.d.a "Heiau of Molokai" [1909]. Typescript, Bernice P. Bishop Museum, Honolulu.

n.d.b Miscellaneous field notes [1909]. Manuscript, Bernice P. Bishop Museum, Honolulu.

n.d.c Collection of notes [1909]. Manuscript, Bernice P. Bishop Museum, Honolulu.

n.d.d Molokai, survey of heiau [1909]. Manuscript (Field Notebook), Bernice P. Bishop Museum, Honolulu.

n.d.e Field notebook [1909]. Manuscript, Bernice P. Bishop Museum, Honolulu.

n.d.f Partial plans of Molokai sites [based on 1909 survey]. Bernice P. Bishop Museum, Honolulu.

Summers, Catherine
1964 Hawaiian archaeology: fishponds. Special Publication No. 52, Bernice P. Bishop Museum, Honolulu.

1971 Molokai; a site survey. Pacific Anthropological Records 14, Department of Anthropology, Bernice P. Bishop Museum, Honolulu.

Thrum, T. G.
1907 "Heiau and heiau sites throughout the Hawaiian Islands." The Hawaiian Annual for 1907:36-48

1909a "Heiaus and heiau sites." Hawaiian Almanac and Annual for 1909, pp. 40-41. Honolulu.

1909b "Tales from the temples." Hawaiian Almance and Annual for 1909, pp. 49-54. Honolulu.

U.S. Department of the Interior
1963 The national survey of historic sites and buildings, Theme XVI, indigenous people and cultures: Hawaiian aboriginal culture. National Park Service, Washington, D.C.

NPS Form 10-900-a
OMB

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 9 Page 6

Valeri, Valerio
1985 Kingship and sacrifice: ritual and society in ancient Hawaii. Translated by Paula Wissing. University of Chicago Press.

Walker, Winslow M.
1931 Archaeology of Maui. Manuscript on file, Bernice P. Bishop Museum, Honolulu.

Weisler, Marshall and P. V. Kirch
1985 "The structure of settlement space in a Polynesian chiefdom: Kawela, Molokai, Hawaiian Islands." New Zealand Journal of Archaeology 7:129-158.

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet | Item number 10 | Page 2

GEOGRAPHICAL DATA

Map A: Quadrangle name: USGS Kamalo, Hawaii 7.5' (1968)

Quadrangle scale: 1:24000

Kukui Heiau

Acreage of nominated property: - 1/2 acre

UTM References: A: Zone 04 Easting 724125 Northing 2330300

Pu'u 'Olelo Heiau

Acreage of nominated property: - 1/4 acre

UTM References: A: Zone 04 Easting 724190 Northing 2331110

Kaluakapi'ioho Heiau

Acreage of nominated property: ca. 1/10 acre

UTM References: A: Zone 04 Easting 724045 Northing 2331440

Pakui Heiau

Acreage of nominated property: ca. 1/3 acre

UTM References: A: Zone 04 Easting 724200 Northing 2331540

Kahokukano Heiau

Acreage of nominated property: - 1/2 acre

UTM References: A: Zone 04 Easting 724210 Northing 2331300

Kalauonokukui Heiau

Acreage of nominated property: - 1/4 acre

UTM References: A: Zone 04 Easting 724450 Northing 2331290

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received
date entered

Continuation sheet Item number 10 Page 3

Ualapue Fishpond

Acreage of nominated property: 25 acres

UTM References:	A:	Zone 04	Easting 724860	Northing	2330630
	B:	Zone 04	Easting 725035	Northing	2330820
	C:	Zone 04	Easting 725380	Northing	2330645
	D:	Zone 04	Easting 724940	Northing	2330450

Keawanui Fishpond

Acreage of nominated property: 70 acres

UTM References:	A:	Zone 04	Easting 722765	Northing	2330350
	B:	Zone 04	Easting 722985	Northing	2330425
	C:	Zone 04	Easting 723275	Northing	2330260
	D:	Zone 04	Easting 723375	Northing	2329880
	E:	Zone 04	Easting 723020	Northing	2329630

Map B

Quadrangle name: USGS Halawa, Hawaii 7.5' (1968)

Quadrangle scale: 1:24000

Iliiliopae Heiau

Acreage of nominated property: 1/2 + acre

UTM References:	A:	Zone 04	Easting 727490	Northing	2332400

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 10 Page 4

VERBAL BOUNDARY DESCRIPTION AND JUSTIFICATION

The 1962 registration form for the Hokukano-Ualapue National Historic Landmark contained two major errors: (1) in the listing, location and naming of the individual components comprising the Landmark, and (2) in the boundary estimates established for the component sites. For example, the heiau of Hokukano were described as being located linearly between the Kahananui and Manawai land divisions; however, Kalauonakukui Heiau is not in this alignment but east of Kahananui Gulch in the land division of Ualapue. On the other hand, Pu'u 'Olelo, an impressive heiau, is located within this linear alignment of temples but was omitted. This may be because Pu'u 'Olelo was also omitted from the USGS map (Map A) and the other temples were not. The earlier registration form also stated there were 10 to 12 fishponds associated with the NHL complex, however, only Keawanui and Ualapue were named. This is clearly an error for most of the fishponds in the vicinity of Keawanui and Ualapue have either been destroyed or contain less integrity.

The original boundary estimates for the Hokukano-Ualapue Discontiguous NHL District (taken from the U.S. Department of the Interior, Survey of Historic Sites and Buildings, 1962:82-84) further overestimated the size of the properties:

-- The five heiau of Hokukano (Kukui, Kaluakapi'iohe, Kahokukano, Pakui, and Kalauonakukui) were grouped contiguously in a 50 acre land parcel. Pu'u 'Olelo is also located within this parcel.

-- Iliiliopae Heiau was estimated at 8 acres.

-- Keawanui Fishpond allegedly covered 73 acres.

-- The size of Ualapue Fishpond as listed in NPS file documents varies from 15 to 25 acres.

These acreage estimates are not supportable. For example, grouping the heiau of Hokukano together within a contiguous 50 acre parcel is not realistic. Large luakini temples did not function as local temples that served a particular community, but rather as state temples that served a district or a kingdom. They also appear to have been used sporadically; thus, it is possible that not all the heiau were in contemporaneous use or constructed and rebuilt under the same political aegis.

There is no clear indication that the ali'i priests or peripatetic paramount chiefs and their mobile courts actually resided at the temple sites. Nevertheless, there probably were adjacent ancillary structures/features such as huts, house platforms, pens, etc. that were used for religious preparations and paraphernalia, or for temporary storage of the great quantities of

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet | Item number 10 | Page 5

material goods (i.e., pigs, fowl, fish, and agricultural produce) that were used in connection with the ceremonial cycle, or sacrificed in addition to human sacrifices.

Aside from the plan maps of Stokes [1909], there has been no archeological testing or excavation conducted at any of the heiau, at any nearby archeological sites, or at the fishponds. Therefore, no other conclusively demonstrated contiguous or contributing properties can be established at this time and the boundary must be based on known structural dimensions alone.

The following boundaries, therefore, are proposed for the six heiau of Hokukano and Iliiliopae Heiau:

Site	Square Feet	Acreage
Kukui Heiau	20,400	- 1/2 acre
Pu'u 'Olelo	10,730	- 1/4 acre
Kaluakapi'ioho Heiau	4,464	ca. 1/10 acre
Kahokukano Heiau	16,800	- 1/2 acre
Pakui Heiau	15,725	ca. 1/3 acre
Kalaunokukui Heiau	9,600 to 10,625	- 1/4 acre
Iliiliopae Heiau	24,882	1/2 acre +

A legal survey of Keawanui Fishpond in 1972 (R. M. Towill Corporation, Honolulu) verified pond size to be 51.346 acres, however, the data points for the survey are unknown. Moreover, vegetational creep and sand migration may account for some reduction of the original pond size especially on the landward portions of the pond where the remains of archeological sites and features (i.e., shrines, caretakers huts, etc. known to be associated with pond operation) are expected to occur as surface and/or buried deposits. We therefore estimate this Landmark component to encompass approximately 70 acres. Because the scale of the 1937 plan map (Figure 6) inaccurately depicts the size of Keawanui Pond, this estimate was calculated from the scale of the USGS Kamalo 7.5' Quadrangle (Map A) using a National Register of Historic Places acreage estimator: beginning at the northwest corner (Point A), proceed northeast 800 feet to Point B, then southeast 1100 feet to Point C, then south 1200 feet to Point D, then southwest 1400 feet to Point E, and finally 2200 feet northwest to the beginning.

NPS Form 10-900-a
(8-82)

OMB No. 1024-0018
Expires 10-31-87

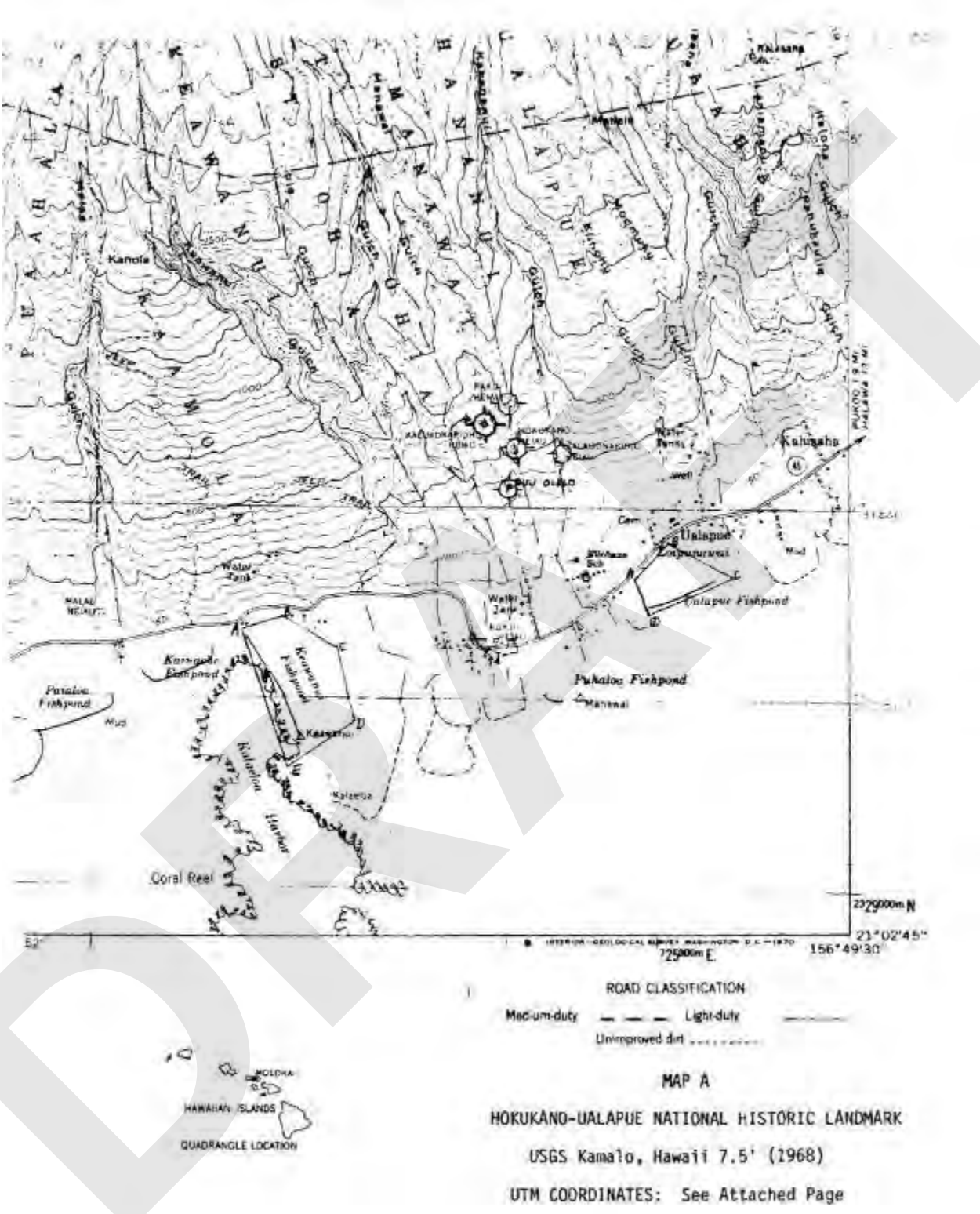
United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

Continuation sheet Item number 10 Page 6

Ualapue Fishpond probably comprised 25 acres originally, however, introduction of fill for house construction on its landward side, plus vegetational creep and sand migration have reduced its present size to no more than 15 acres. Nevertheless, intact or partially intact archeological features associated with prehistoric pond operation may still exist along what would have been the original pond perimeter; therefore, this Landmark component is estimated to encompass 25 acres, again calculated with the USGS scale and a National Register of Historic Places acreage estimator. Beginning at the northwest corner (Point A), proceed northeast 1050 feet to Point B, then southeast 1250 feet to Point C, then southwest 1350 feet to Point D, and finally northwest 750 feet to the beginning.

Should future archeological investigations verify the presense of additional contributing properties associated with either the heiau or the fishponds in the Hokukano-Ualapue complex, the existing property boundaries must be reassessed and the National Historic Landmark documentation revised.



MAP A

HOKUKANO-UALAPUE NATIONAL HISTORIC LANDMARK

USGS Kamalo, Hawaii 7.5' (1968)

UTM COORDINATES: See Attached Page

MAP B

HOKUKANO-UALAPUE NATIONAL HISTORIC LANDMARK

USGS Halawa, Hawaii 7.5' (1968)

UTM COORDINATES: See Attached Page

Mapped, edited, and published

Control by USGS, USC&GS, and H

Topography by photogrammetric me taken 1950. Field checked 1952

Selected hydrographic data compile Charts 4121 (1966) and 4130 (19 This information is not intended for

Polyconic projection. Old Hawaiian datum
10,000-foot grid based on Hawaii coordinate system, zone 2
1000-meter Universal Transverse Mercator grid ticks, zone 4, shown in blue

TRUE NORTH MAG NORTH APPROXIMATE MEAN DECLINATION, 1968

UTM COORDINATES: HOKUKANO-UALAPUE NATIONAL HISTORIC LANDMARK

Map A: Quadrangle name: USGS Kamalo, Hawaii 7.5' (1968)

Quadrangle scale: 1:24000

Kukui Heiau

Acreage of nominated property: - 1/2 acre

UTM References: A: Zone 04 Easting 724125 Northing 2330300

Pu'u 'Olelo Heiau

Acreage of nominated property: - 1/4 acre

UTM References: A: Zone 04 Easting 724190 Northing 2331110

Kaluakapi'ioho Heiau

Acreage of nominated property: ca. 1/10 acre

UTM References: A: Zone 04 Easting 724045 Northing 2331440

Pakui Heiau

Acreage of nominated property: ca. 1/3 acre

UTM References: A: Zone 04 Easting 724200 Northing 2331540

Kahokukano Heiau

Acreage of nominated property: - 1/2 acre

UTM References: A: Zone 04 Easting 724210 Northing 2331300

Kalauonokukui Heiau

Acreage of nominated property: - 1/4 acre

UTM References: A: Zone 04 Easting 724450 Northing 2331290

Ualapue Fishpond

Acreage of nominated property: 25 acres

UTM References:						
	A:	Zone 04	Easting	724860	Northing	2330630
	B:	Zone 04	Easting	725035	Northing	2330820
	C:	Zone 04	Easting	725380	Northing	2330645
	D:	Zone 04	Easting	724940	Northing	2330450

Keawanui Fishpond

Acreage of nominated property: 70 acres

UTM References:						
	A:	Zone 04	Easting	722765	Northing	2330350
	B:	Zone 04	Easting	722985	Northing	2330425
	C:	Zone 04	Easting	723275	Northing	2330260
	D:	Zone 04	Easting	723375	Northing	2329890
	E:	Zone 04	Easting	723020	Northing	2329630

Map B

Quadrangle name: USGS Kalawa, Hawaii 7.5' (1968)

Quadrangle scale: 1:24000

Iliiliopae Heiau

Acreage of nominated property: 1/2 + acre

UTM References:						
	A:	Zone 04	Easting	727490	Northing	2332400

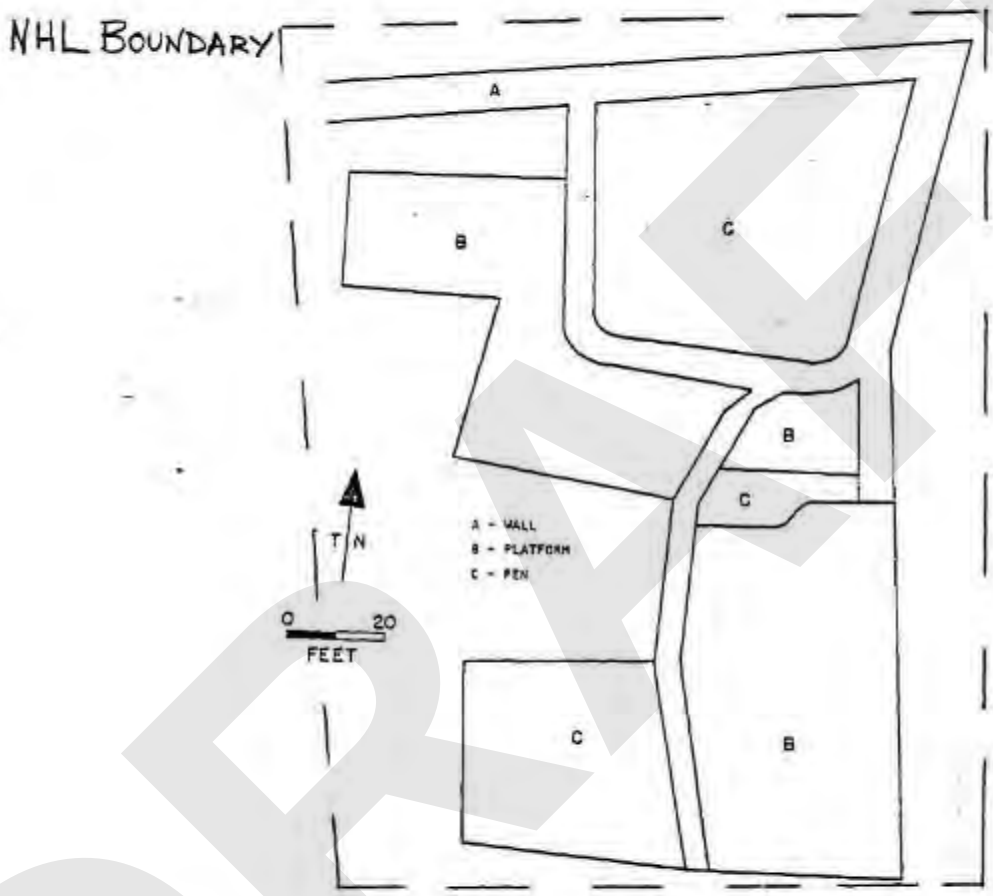


Figure 1: Plan of Kukui Heiau (Plan by Stokes, 1909)

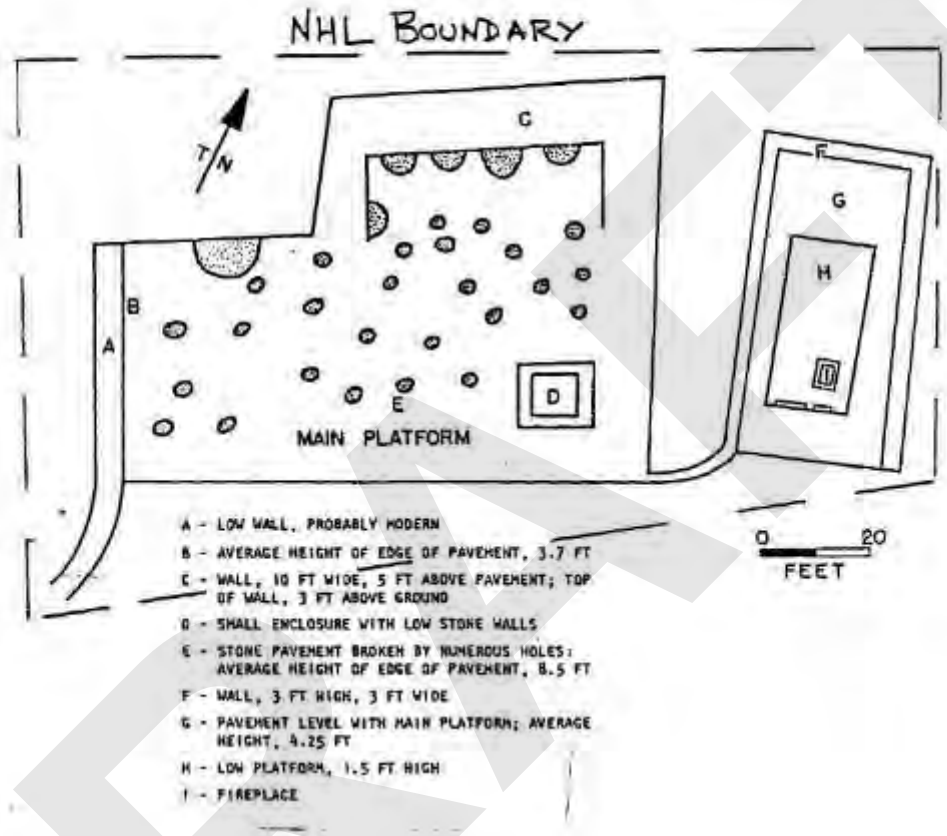


Figure 2: Plan of Pu'u 'Olelo Heiau (Plan by Stokes, 1909)

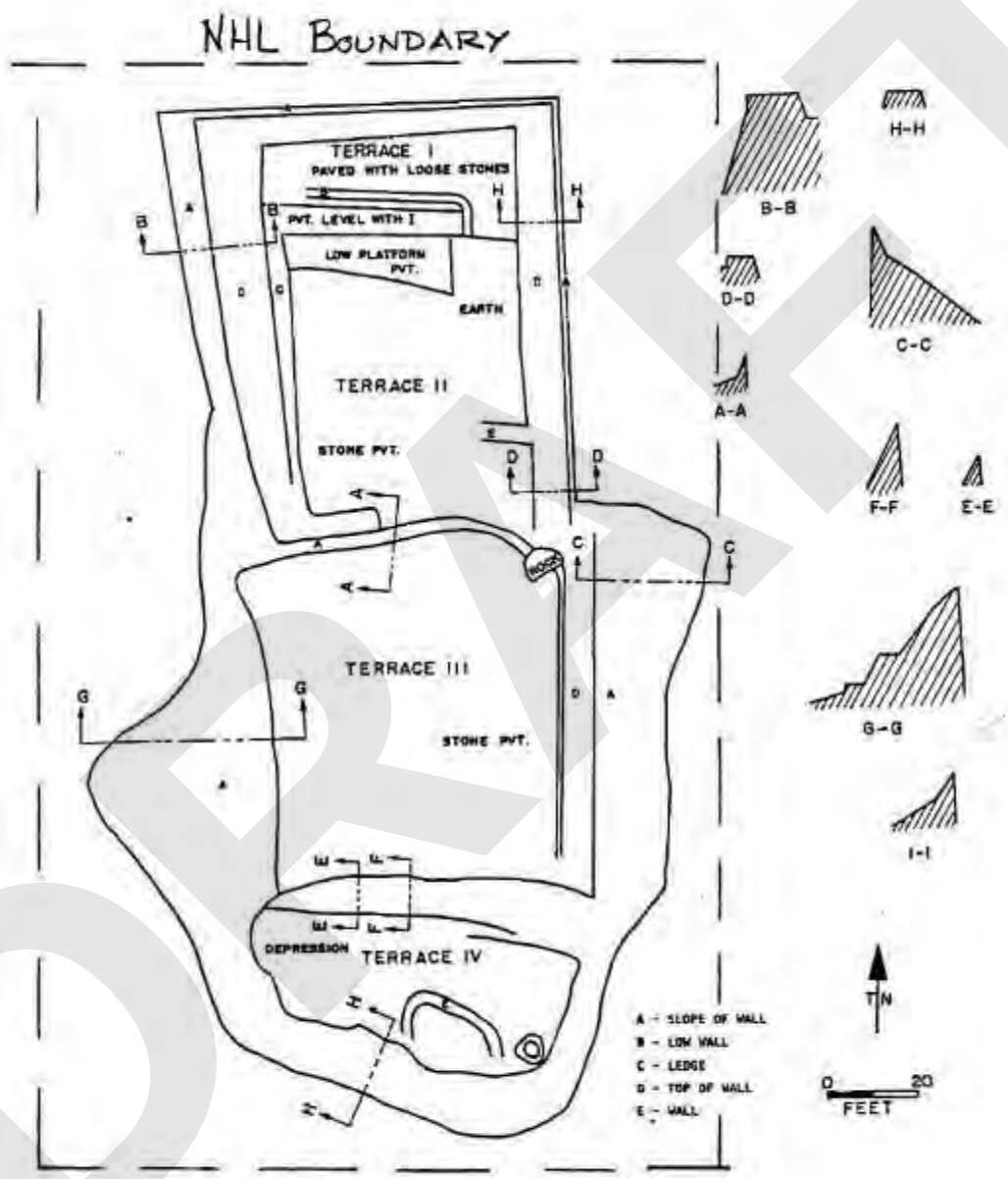


Figure 3: Plan and Cross Sections of Kahokukano Heiau (Plan by Stokes, 1909)

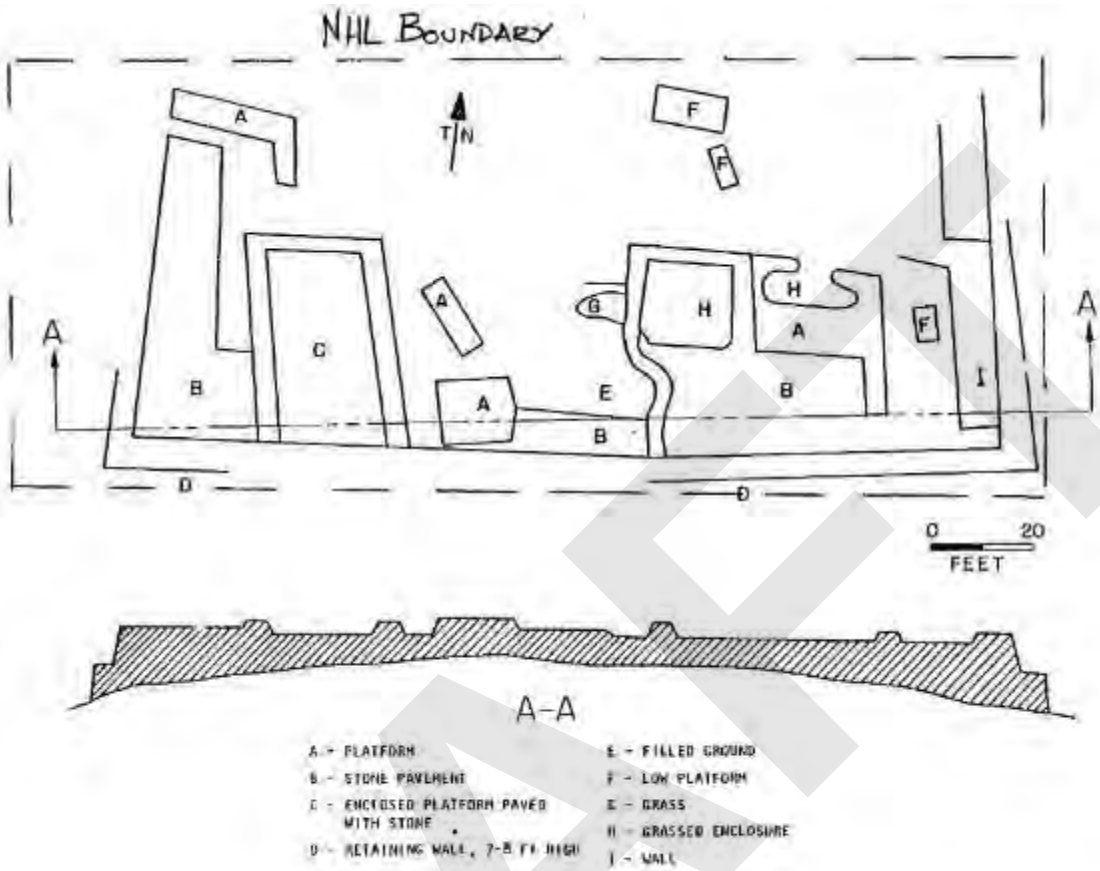


Figure 4: Plan and Cross Section of Pakui Heiau (Plan by Stokes, 1909)

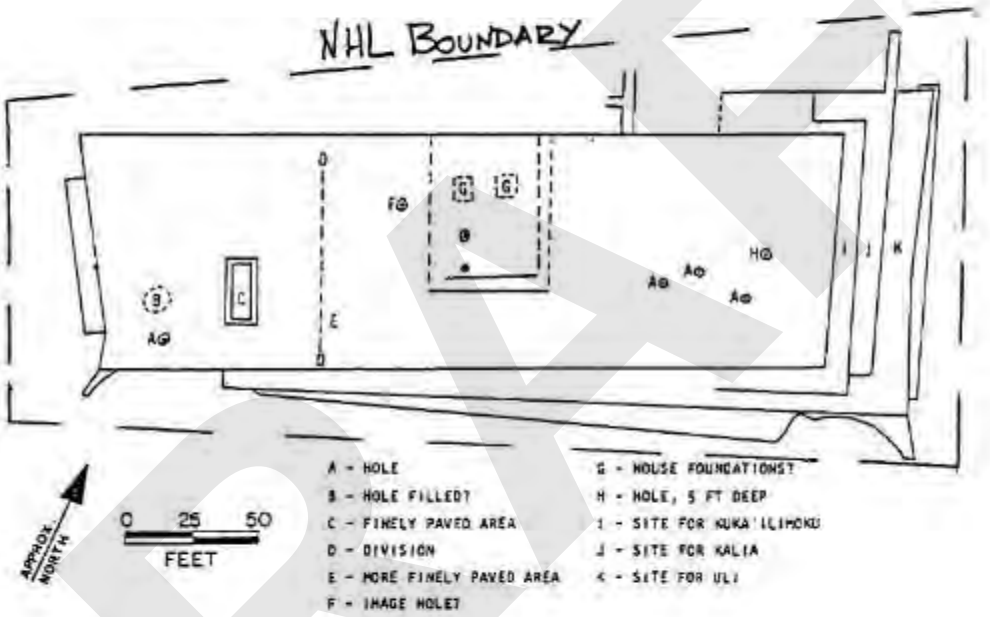


Figure 5: Plan of Iliilicpae Heiau (Plan adapted from Stokes, 1909, and Emory, 1952)

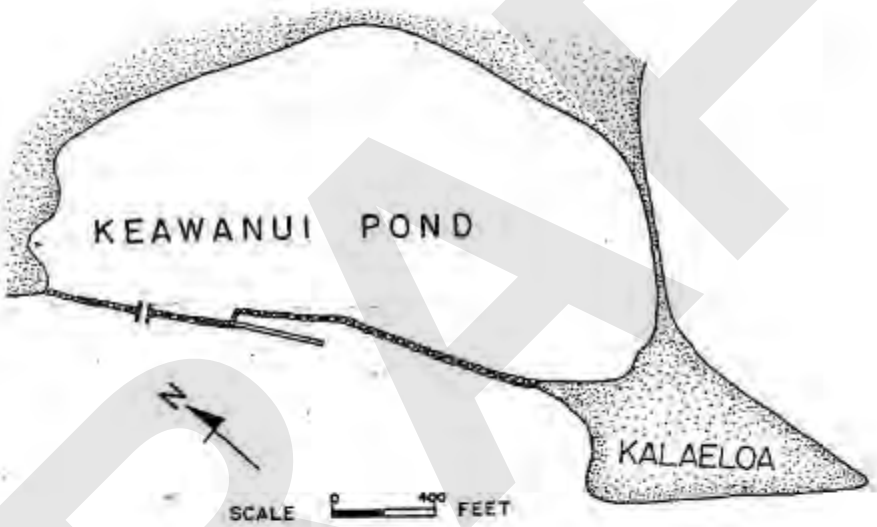


Figure 6: Plan of Keawanui Pond (Plan by Evans 1937)

Note: Boundaries are plotted on Map A because the above scale appears inaccurate and cannot be reconciled with the scale of the USGS Kamalo, Hawaii 7.5' Quadrangle.

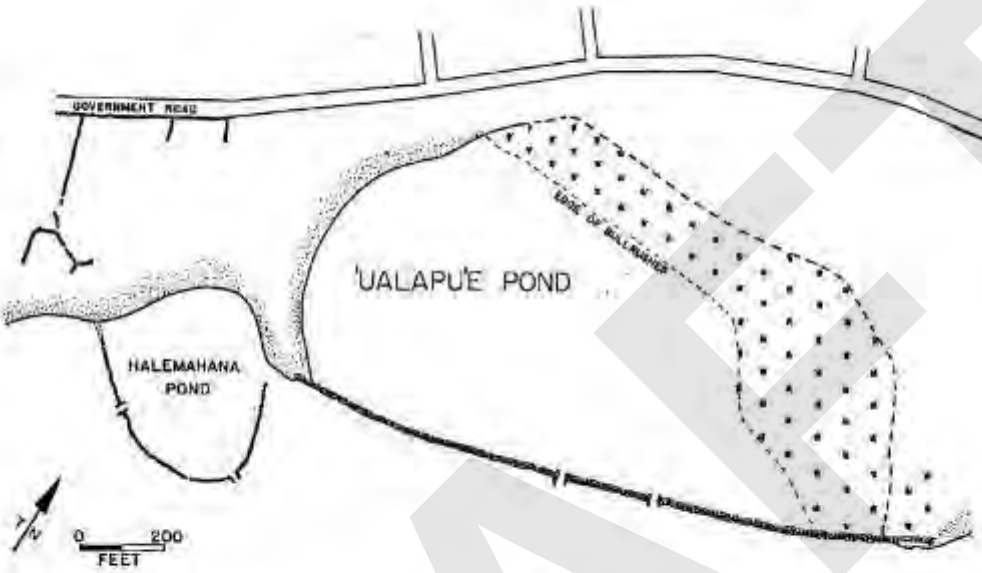


Figure 7: Plan of Ualapue Fishpond (Plan by Evans 1937)

Note: Boundaries are plotted on Map A because the above scale appears inaccurate and cannot be reconciled with the scale of the USGS Kamalo, Hawaii 7.5' Quadrangle.

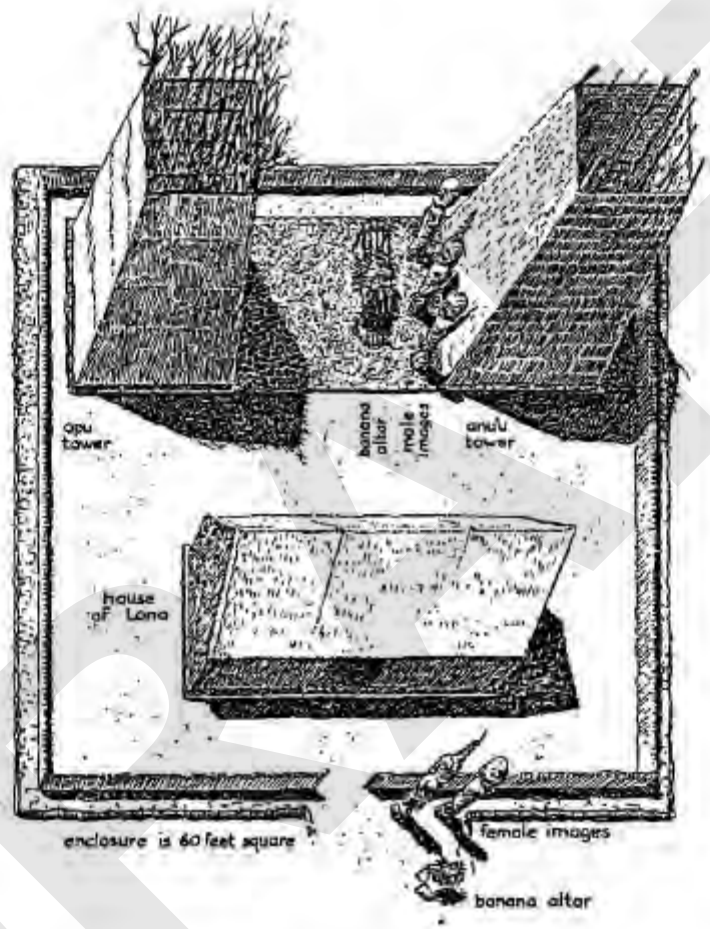


Figure 8: A Hale o Lono, depicted by Bishop Museum artist Paul Lockwood (Ii 1959:57)

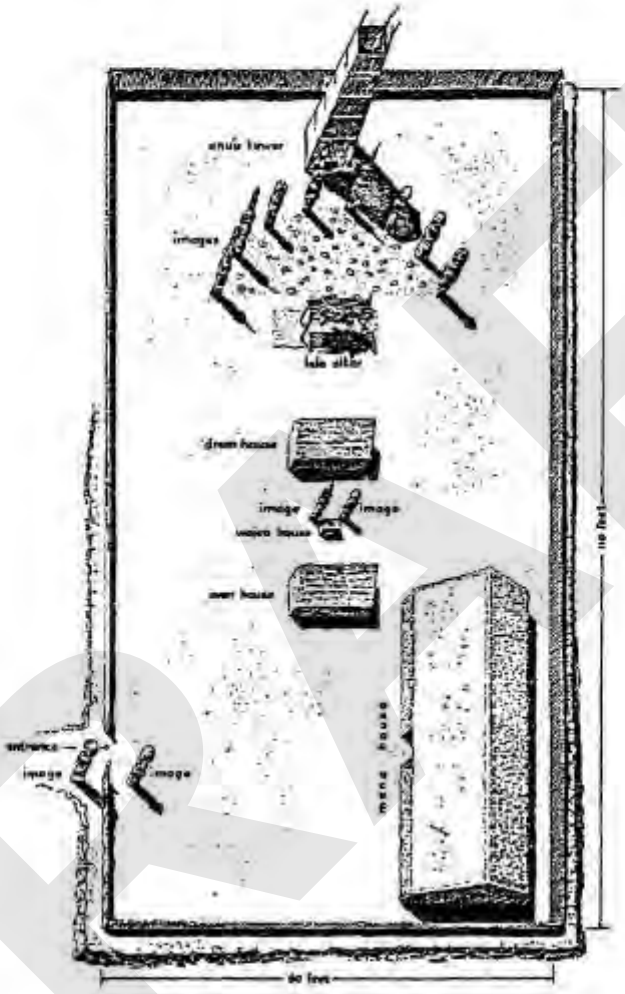


Figure 9: A luakini heiau, depicted by Bishop Museum artist, Paul Lockwood (Ii 1959:34)

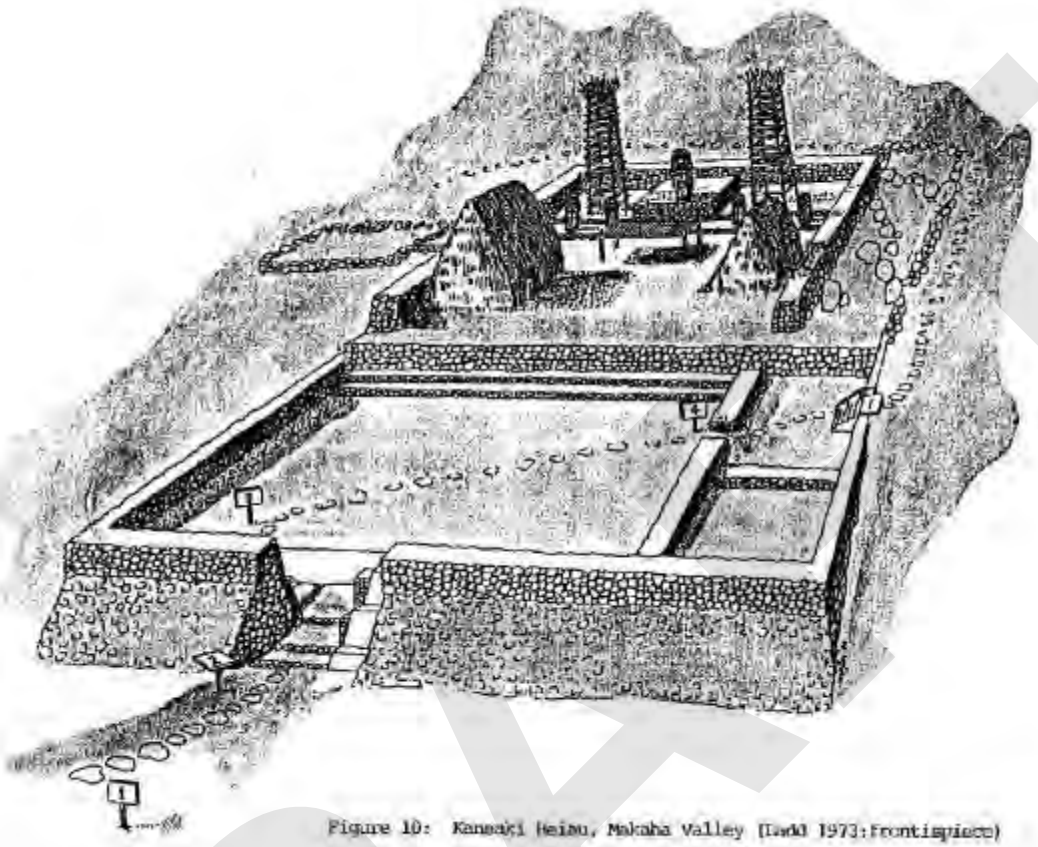


Figure 10: Kaneaki Heiau, Makaha Valley (Ladd 1973:Frontispiece)

Table I Hokukano-Ualapue NHL Architectural Summary

Site	Size/Square Feet	Structural Features	Functional Type
Kukui Heiau	170 x 120 ft. (20,400 sq ft.)	Collection of enclosures and low platforms (Figure 1).	Stokes (n.d.a:2) disputes that it is an agricultural temple. Size suggests luakini.
Pu'u'Olelo Heiau	145 x 74 ft. (10,730 sq. ft)	Rectangular platform built walled enclosure (Figure 2).	Size and location suggests luakini.
Kaluakapi'ioho Heiau	Terrace: 54 x 24 ft. Platform: 96 x 33 ft (4,464 sq. ft.)	Rectangular platform built on slope with massive retaining wall. One terrace 1 ft. higher than platform.	Probably a luakini because Oahu chief Kapioho allegedly was sacrificed here by Kumuko'a. (Stokes n.d.a:3,4).
Kahokukano Heiau	200 x 80 ft. (16,800 sq. ft.)	Rectangular structure with terraces; upper two walled on west; no walls on east (Figure 3).	Probably a luakini. Thrum (1909b:53) says four chiefs associated with the temple including paramount chief Kumuko'a who sacrificed Oahu chief Kapioho.
Pakui Heiau	185 x 85 ft. (15,725 sq. ft.)	Rectangular platform with internal activity areas and low platforms (Figure 4).	At various times a luakini, place of of refuge, and/or a fortress (Thrum 1909a:40; Kamakau 1961:22). Associated with Chief Paki'i and Kiha-a-Pi'ilani of Maui.
Kalauonakukui Heiau	Var: 120 x 80 ft. (Thrum 1909a:40) 125 x 85 ft. (Summers 1971:119) (9,600 to 10,625 sq ft.)	Referenced as a walled heiau (Thrum 1909a:40) NPS 1962 registration form refers to it as a "small platform heiau."	Thrum (1909a:40) suggested this was an agricultural temple.
Iliiliopae Heiau	286 x 87 ft. (24,882 sq. ft.)	Massive rectangular platform with three step terraces. (Figure 5).	Construction attributed to Kupa, with later rebuilding by Kaalaneo. Functioned alternately as a center for priestly training, a Lono temple, and a luakini. (Thrum 1906b:49-52; Stokes n.d.a:8-9).

Appendix E

Sustainable, Community-Based Economic Development, 2022

Sustain Hawaii

Sustainable, Community-Based Economic Development

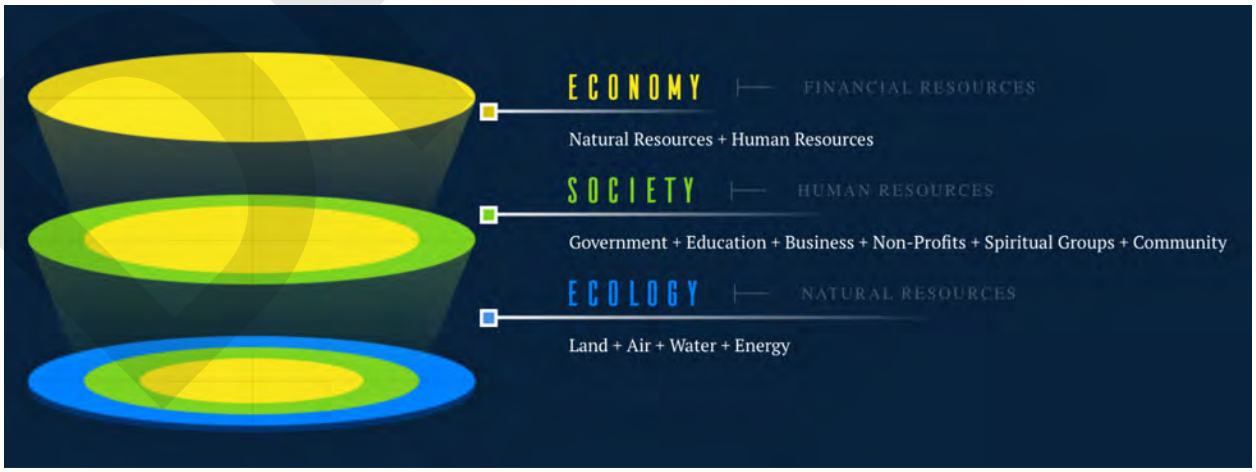
Sovereignty, self-reliance, self-sufficiency and/or sustainable health & security are primary goals of community-based, economic development. To most efficiently accomplish such ends, a needs-based, local economy must be created, which can optionally evolve to engage in a wants-based global economy.

- Needs are finite & satiable (i.e. food, shelter, clean water, clean air)
- Wants are infinite & insatiable (i.e. products & services that aren't required for survival)

Sustainable, community-based, economic development intends to meet the needs of the present without compromising future generations' ability to meet their needs.

Design and development begin with intention or an instance of mentally determining an action or result. To be sustainable, such actions must be pono and should minimize negative impacts on present or future generations. Due to the complexities that quickly arise given such considerations, it'd be helpful to create a decision-making framework that more simply defines the parameters we'd benefit from working within.

Sustainability is often correlated to triple-bottom line analyses, which include people, place and profits/prosperity or ecological, socio-cultural and economic factors. These three dimensions provide insights on the parameters, if looked at hypothetically, where one of the dimensions ceases to exist. For example, if the economy completely crashed, society and the environment would still exist. If society collapsed, the economy would necessarily collapse, but the environment would still exist. If the global ecosystem collapsed, society and the economy would, as well. This is a nested hierarchy in which one sub-system emerges from a larger, more foundational system.



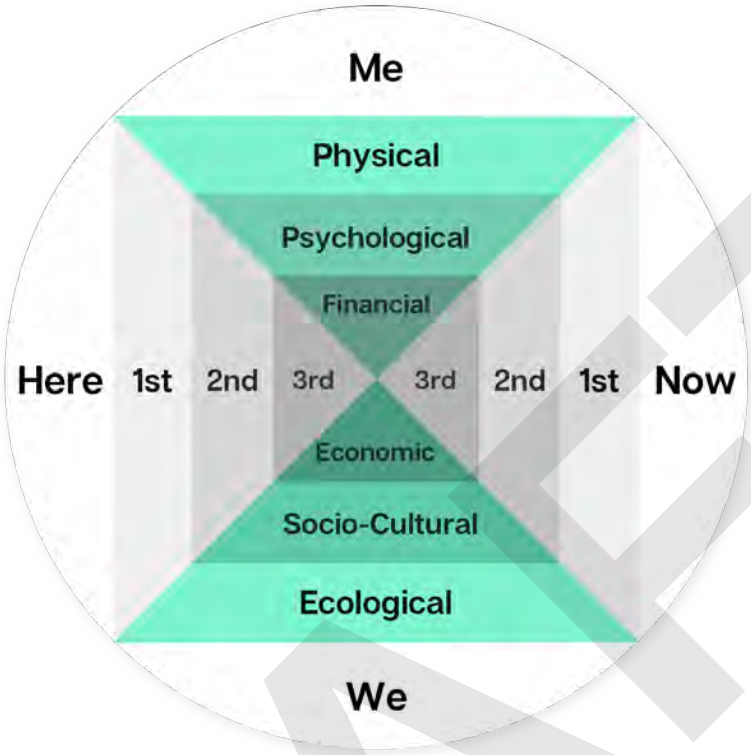
This natural prioritization suggests our planet's health is the most important and fundamental for humanity and the innumerable other interdependent, living beings to survive and thrive. The Laws of Nature govern the global ecosystem. Nature is AWE-inspiring… as such, the acronym Natural LAWE (Land, Air, Water, Energy) seems appropriate. These LAWEs, fundamentally, are the laws of physics and/or thermodynamics.

In physics, thermodynamic equilibrium is another way of saying maximum entropy, which is a frozen or dead universe that's in stasis because it no longer has the ability to exchange energy (mana) and/or present information (ike). Fortunately, in this universe, there are pockets of negative entropy or syntropy, which is the fundamental attribute of abundant and thriving life. Our shared Earth is a syntropic system because excess energy comes to us from the Sun. This overabundance of energy is the engine of evolution and its magnificent blooms of creation.

In other words, health and wellness can be partly defined via the lens of physics, specifically entropy, from optimal health to ultimate death.

Back to the nested hierarchy… since the laws of physics are immutable or unchanging, any subsystems that emerge from it will naturally adopt and be subjected to these same laws. As such, human or social laws should be based on the LAWEs of Nature. And, again, since the economy emerged from society, economic laws should also be rooted in the laws of physics. All living beings would be better served if all other mutable, human and economic laws were consistent with these immutable laws. This would naturally lead to a truly healthy (syntropic or regenerative) economy or pono "mana-tary" system since all externalities (i.e. pollution, toxicity, embodied energy) would be internalized.

There's a tightly correlated nested hierarchy at the individual level, which is akin to that made famous by Abraham Maslow. Maslow, less famously, in his later years also described a next stage in his hierarchy beyond self–actualization to include self-transcendence. We took a few creative liberties with both concepts, as shown in the graphic below. Self-transcendence of the traditional "Me" orientation can be considered the transition to becoming more "We" oriented. "Me:Physical" correlates to "We:Ecological"; "Me:Psychological" correlates to "We:Socio-Cultural"; and, "Me:Financial" correlates to "We:Economic". Our prioritization "here and now" starts with 1st set of physical-ecological needs, then 2nd (psychological-sociocultural), then 3rd (financial-economic).



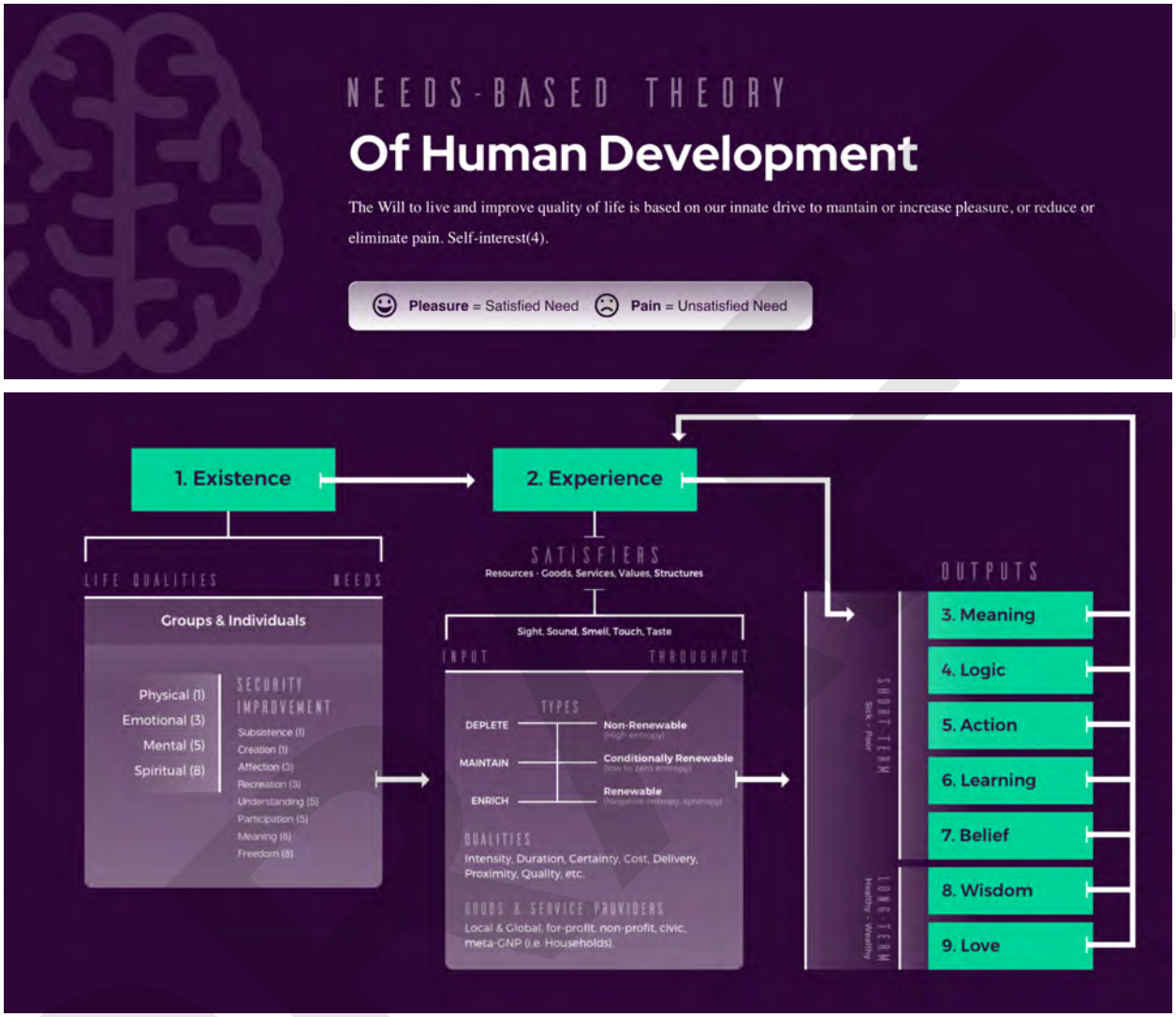
These three tiers of needs can be accommodated by “satisfiers”, which most commonly come in the form of goods and services in the global marketplace. Satisfiers come in three main types:

1. Depleters - negatively impact the health of the environment, are primarily non-renewably sourced and/or harm the health of the consumers and bystanders (i.e. smoking or mutually assured destruction as a remedy to nuclear proliferation)
2. Maintainers - usually satisfy a single need without negative impacts on the planet or people (i.e. fairtrade, organically grown food)
3. Enrichers - synergistically satisfy two or more needs concurrently (i.e. breastfeeding provides nourishment/subsistence and love/nurturing/security) and, if syntropic or regenerative, then also enhance the ecosystem’s and consumer’s health & wellbeing

These satisfiers can be measured via carbon, water & chemical footprints and materiality, as well as caloric & nutritional content in relation to personal biometrics to determine which type of satisfier they are. Such footprints usually include supply chain analyses from resource extraction to disposal, recycling and reuse. Much data exists in public and private repositories.

The following flow diagram generalizes what happens when beliefs are formed due to primarily having needs satisfied by goods and services that are depleters, as opposed to enrichers. Individuals tend to become physically, psychologically and financially healthier when their needs

are satisfied by goods and services that are primarily enrichers and overall become unhealthier when they tend to consume depleters.



Since design & development begins with intentions, it'd be most pono to be as systemically healthy, sustainable and/or regenerative as possible. Natural LAWE helps us prioritize physical-ecological decision-making and suggests that the laws of thermodynamics can define health via the quantifiable measures of entropy and exergy. Optimal health would be considered the most negative entropic or syntropic system. We also saw that some goods and services can satisfy two or more needs concurrently. Syntropic, synergistic satisfiers then are the sustainable sweet spots for regenerative design & development in a local, needs-based economy.

(An appendix is included to share a description of the process,
as well as tangible examples of sustainable sweet spots.)

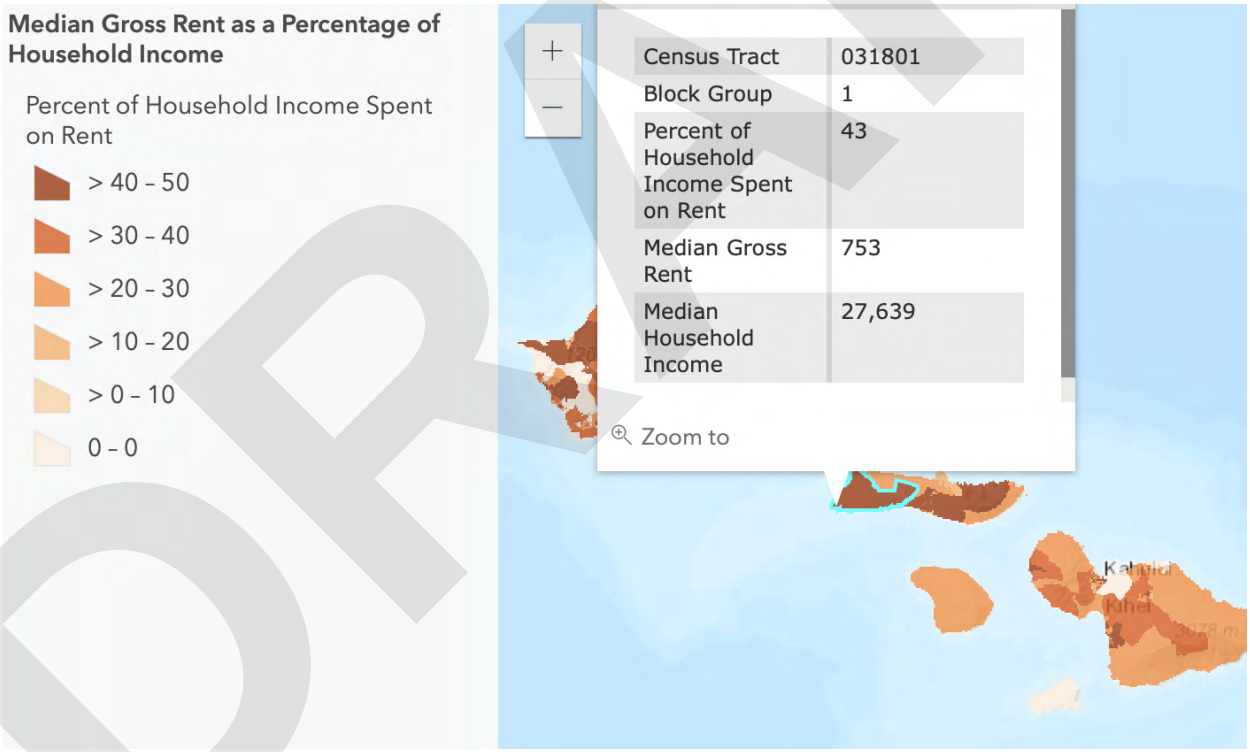
APPENDIX

Sustainable, community-based, economic development begins by looking at each household and each family member within that household (furry, four-legged friends included). Immediately thereafter, we look into businesses, innovation and entrepreneurship.

As the example datasets below suggest (and we all painfully know), the cost of living in Hawaii is high, with over 70% of average household income going to rent/mortgage, food, utilities and transportation.

- Average Monthly Household Expenses: rent $1400; food $1200/mo (3 people); utilities $600 (water $70.39, energy $342.24, internet $60, cell $127.37); transportation $370

Since DHHL mortgages will likely be set for 30 years, the greatest opportunities for financial savings (while also improving personal and ecological health), are food, utilities and transportation.



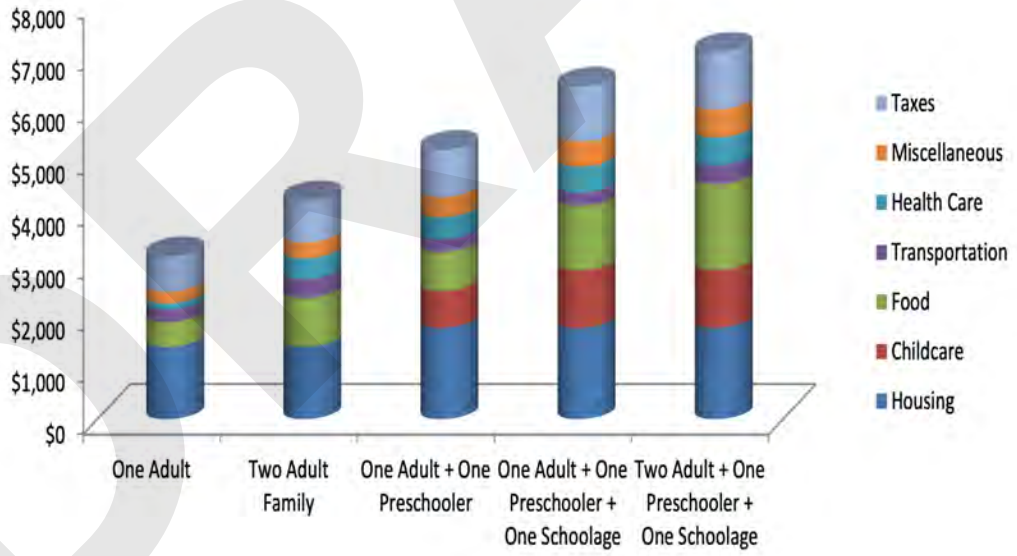
https://www.civilbeat.org/2019/04/where-hawaii-renters-spend-half-their-incomes-on-housing

https://livingwage.mit.edu/counties/15009

Table 4. Monthly Self-Sufficiency Family Budgets for Selected Family Types, Maui County, 2020

Category	Family Type				
	One Adult	Two Adult Family	One Adult + One Preschooler	One Adult + One Preschooler + One School-aged child	Two Adult + One Preschooler + One School-aged child
Housing	$1,394	$1,394	$1,759	$1,759	$1,759
Childcare	$0	$0	$705	$1,110	$1,110
Food	$470	$940	$757	$1,235	$1,646
Transportation	$246	$370	$246	$246	$370
Health Care	$122	$394	$413	$509	$532
Miscellaneous	$223	$310	$388	$486	$542
Taxes	$684	$798	$909	$1,052	$1,109
Total	$3,140	$4,206	$5,177	$6,397	$7,066
Self-Sufficiency Income Requirement					
Hourly	$17.84	$11.95	$29.41	$36.34	$20.07
Monthly	$3,140	$4,206	$5,177	$6,397	$7,066
Annual	$37,676	$50,467	$62,124	$76,760	$84,794
% by Which Self-Sufficiency Income Is Above or Below (-) Selected Income Benchmarks					
Poverty Threshold	156.6%	154.5%	213.3%	207.3%	181.4%
Minimum Wage	79.3%	20.1%	195.7%	265.4%	101.8%

Figure 4. Monthly Self-Sufficiency Family Budgets for Maui County, 2020



https://files.hawaii.gov/dbedt/annuals/2021/2021-read-self-sufficiency.pdf

ʻĀINA

FOOD, FEED, FIBER, FUEL, FLORAL, FARMACEUTICAL, FERTILIZER & FURTHER FANTASTIC FUNCTIONS (i.e. adhesive, cleaner, furniture, utensils, art)

Prior to colonization, Native Hawaiians were very healthy, with hardly any chronic health conditions. It's time to feel better and save on medical costs… say no to the unhealthy western diet, and yes to traditional Hawaiian foods… among the most wholesome in the world:

- Kalo/paiai/poi
- ʻUala, yams
- Cooking bananas, cassava, arrowroot, etc.
- ʻUlu
- Fruit - mai'a/banana, niu/coconut, ʻohia ʻai/mountain apple, noni, etc.
- Leafy Vegetables - kalo leaves, limu, hāpu'u ʻi'i, ho'io, etc.
- Seafood: i'a, opihi, he'e, wana, etc.
- Additional ʻai and la'au: ʻolena, ʻawa, mamaki, ko, ground kukui nut, pa'akai, ʻohe, etc.

Before growing anything, it's important to understand:

1. Soil: structure for water retention, nutrient transport and microbial habitat; biology for diversity, health and nutrient density; and chemistry for pH level
2. Water: the quantity and quality of groundwater and rainfall and average and in extreme weather events
3. Sunlight: average hours of (in)direct solar radiation throughout the solar year
4. Topography: the slope, elevation
5. Temperature: average changes throughout the year… from morning to evening in the different seasons
6. Plant selection: Once the microclimatic conditions are identified, the best plants can be chosen for the needs. As a side note, it's always preferable to plant functional endemics or native plants. Otherwise, choose the best food, fertilizer and farmaceutical plants for highest nutrient density and variety to cover all nutrient needs, and keep in mind how much maintenance and resources (sun, water, nutrients) are required and how long they take before harvest. If you still have space and want to grow more, feel free to choose from fuel, fiber, floral, feed and further fantastic functions.

Household Level: Create a regenerative home garden and get your feet and hands back in the ʻāina. Besides growing more affordable, healthier, tastier, traditional food, you'll also get exercise (aka functional farm fitness), while additionally benefiting from the stress-relieving electro- and neurochemical properties in the soil. Learning how to harvest, store and reuse seeds is helpful, as well. And if you harvest more seeds and grow more food than your ʻohana

needs, you can share with loved ones or sell it to a grocer, restaurant or at a farmer's market. Now that's a wonderful set of sustainable sweet spots (aka syntropic synergistic satisfiers)!

Business and/or Community Level: Depending on the level of motivation by community members, it may be worth considering cottage industry development. But be honest about how willing and able you are to work for your overall health and freedom… this is not for the weak of body, mind or spirit.

Example 1: Biochar… any invasive trees can be removed, cut up small enough to run into a chipper, then burned in a cone kiln, imu or pyrolysis unit to create a locally sourced, carbon negative, soil amendment/fertilizer called terra preta, or biochar, that does wonders for the structure, biology and chemistry of the soil. Pyrolysis or bio-gasification unIts are the most expensive and technical of the options, but also most compelling because they can also create energy via a heat exchanger which can be harvested and stored in a mobile, battery bank. It may also be possible to create partnerships with tree-trimming businesses to bring their invasive stocks for ongoing biochar creation, as well as mulch and compost creation.

Example 2: Ulu-based food forest edges… agroforestry is a remarkably effective approach to very high food production, biodiversity reestablishment and evapotranspiration enhancement while supplying its own green fertilizer via prudent pruning. Food forest edges are the most productive zones of an agroforest creating the greatest yields. The ulu would be the overstory, bananas could be the understory, then there could be shrubs, vines, groundcover, tubers, spices, herbs, flowers to attract pollinators, etc. These food layers attract greater biodiversity which is a key to healthier and more stable ecosystems. Ulu has innumerable uses… the small fruit can be pickled to taste like artichoke hearts; the mid-sized fruits is fairly bland and mild in taste and can be boiled as a base starch for innumerable dishes; the large mature fruit becomes very sweet and almost becomes a custard or can be used as a base for desserts. The mid- to late-sized fruit can also be sliced and air fried or dehydrated. If dehydrated, it can then be ground into the most nutrient-dense, gluten-free flower in the world, with a shelf life of over 1 year, which is perfect for Hawaii since we don't grow grains very effectively or efficiently here. Ulu can also be used to create adhesive, insect repellant, la'au lapa'au, wood/ timber, etc. In order to accomplish these tasks and be economically viable, some requirements include: a certified commercial kitchen, a walk-in refrigerator (Cool-bot and solar powered), a solar dehydrator container, a commercial/industrial grinder or flour mill and a packaging and distribution service. A community-owned agricultural or food coop would be ideal for something of this scope and scale.

Sidenote: All businesses require similar needs like - Name, FEIN, DCCA, bank account, legal, accounting/bookkeeping, business plan (visioning, marketing, implementation), corporate identity/logo, website/ecommerce and associated collateral, PR, social media, strategic

partnerships, funding - venture clients, grants, contracts, crowdfunding, crowdsourcing, buildings, utilities, materials, supplies, equipment, etc.

ENERGY

Most structures require some form of energy to enable various products and services to function. In this case, we'll focus on electricity. Creating the cleanest energy portfolio for a household or business usually follows a few basic steps:

1. Energy Audit - Perform an energy audit to determine how many kWhs each device in the home or business is consuming and compare it to the utility bill to see if there are any gaps in identified consumption. If so, find and fill the gaps until all are accounted for.
2. Energy Efficiency - Evaluate and prioritize available energy efficiency solutions by high EROEI (Energy Returned on Energy Invested). The assessment can also include a calculation of the total cost of the product (cost of product plus utility cost of electricity in kWhs over projected lifespan or use of product) divided by total kWhs to determine the total cost per kWh for the solution.
3. Renewable Energy - now that the energy use has been normalized to the consumer's reasonable level of efficiency, the renewable energy system can be properly sized in water mix of renewables as makes most economic sense based on Federal, State, Municipal and Utility tax credits and rebates.
4. Energy Storage - becoming microgrid neutral or offgrid is the goal for a sustainable home, business and/or community. Sizing the battery bank to the renewable energy system and identifying the most ecologically and economically friendly solution is the final step.

Household Level: Energy efficient appliances, renewable energy and energy storage to be able to be offgrid is the ultimate goal. The easiest way to get there is to invest in the lowest hanging fruit solutions that cost the least and save the most over their lifespan, then put those savings into the rainy day fund until it is enough to pay for the next clean energy solution on the prioritized list.

Example 1: LED lightbulb - a 6w (40w incandescent equivalent) LED costs $5 and has a projected lifespan of 50,000 hours or about 300kWh of us. Each kWh is $.30 (and produces around 1.4 lbs of CO2e), so the total lifespan cost is *$95 and 420 lbs of CO2e*. Incandescent bulbs last about 1,000 hours and cost about $.50. So 50 incandescents would need to be purchased for the same hours of use as the LED, which would cost $25 in bulbs (more waste) and 2,000kWh or $600 for a total of *$625 and 2,800 lbs of CO2e*. This single bulb change equates to $530 saved over the comparable lifespan and 2,380 lbs of CO2e reduced. Since the

average household has 40 lightbulbs, the household savings with 50,000 hours of use total becomes $20,120 and over nearly 100,000 lbs of CO2e.

Example 2: Hot Water Heater - old units are inefficient and amongst the biggest energy hogs in a household. There are often rebates for more efficient units. There are also utility incentives to control their energy usage during peak demand.

Example 3: Solar Hot Water - rebates and incentives are often available. Even with an efficient hot water heater, this is still amongst the best investments with the quickest payback.

Example 4: Photovoltaic System - rebates and incentives are often available. Particularly in Hawaii, this is one of the best investments over the long haul, with full payback within 5 years and free electricity for 15+ years thereafter.

Similar calculations can be made of all clean energy solutions as had been with the LED example.

Business and/or Community Level: Besides becoming an energy auditor and/or helping households and organizations become more energy efficient with rightly sized renewables and storage, the other main business opportunities lie in solar, wind, biomass, biodigesters, microturbines, geothermal, biofuel and energy storage. Becoming a coop like KIUC would be of significant interest. It'd be interesting to understand the legal requirements if the entire development under DHHL is considered one asset. Would the residents and/or DDHL need to be approved as a utility by the PUC or is DHHL able to operate outside of those requirements? It'd also be interesting to determine at what point a microgrid would be more advantageous than individual household and business clean energy systems.

WATER

Creating access to high quality and sufficient quantity water usually follows a few basic steps:

1. Water Audit - Perform an audit to determine how many gallons each device in the home or business is consuming on average per day and compare it to the utility bill to see if there are any gaps in identified consumption. If so, find and fill the gaps until all are accounted for.
2. Water Efficiency - Evaluate and prioritize available water efficiency solutions. The assessment can include a calculation of the total cost of the product (cost of product plus utility cost of water in 1000s of gallons over the projected lifespan or use of product) divided by total gallons to determine the total cost per gallon for the solution.

3. Water Harvesting - now that the water use has been normalized to the consumer's reasonable level of efficiency, the water harvesting system can be properly sized as makes most ecological and economic sense.
4. Water Storage - becoming microgrid neutral or offgrid is the goal for a sustainable home, business and/or community. Sizing the water storage system to the water harvesting system and identifying the most ecologically and economically friendly solution is the final step.

Household Level: examples include low-flow faucet aerators, showerheads, spigots and hoses; energy star dishwashers and laundry machines; dual flush toilets; rainwater harvesting with solar powered pump and filtration; atmospheric water dispenser

Business and/or Community Level: gravity-fed or solar-powered pump, pressurized drip irrigation system; hydrophilic membranes; retention ponds; swales; catchment systems with solar powered pumps and filters; container-sized atmospheric water systems.

DEEPER DIVE INTO THE FRAMEWORK

This extension of this program includes a quantifiable, systems-based framework that: 1) integrates Hawaiian epistemology, methodology and/or values, principles, practices and perspectives; 2) is founded upon the laws of thermodynamics to optimize the health of the land, air, water and use of energy (ecological); 3) uses the Biosocial Needs and Satisfiers model to determine the level of entropy and types of satisfiers of goods and services (socio-cultural); and 4) uses thermoeconomics or embodied energy accounting and true cost pricing models to internalize all economic externalities (i.e.: pollution, valuation of ecological services) (economic).

All future-oriented plans for land assets should carefully consider the relationship between people and environmental resources. They have very different roots, but both the Hawaiian and scientific understanding of those relationships are fundamentally the same. This convergence creates an opportunity to formulate plans within a systems-based framework unique to Hawai'i but with global significance.

Ahupua'a-based Cosmology, Epistemology, and Methodology: In traditional Hawaiian cosmology, people and nature are intimately related – landforms, plants, animals, and humans compose a family of life and creation. The 'āina (land), wai (water), kai (ocean), and lewa (sky) are the foundation of life and the source of the spiritual relationship between people and their environs.

All things reflect the presence of akua (the gods), and mana (energy) expresses the essence of each being. Akua represent different aspects of nature, and evidence of their presence takes many forms in nature. Similarly, the worship of ʻaumākua (ancestral figures) links the current generation to generations past, thereby weaving individual stories into the larger fabric of creation and culture. The stories of the akua and ʻaumakua reflect the core values of the society: respect for the land, sea, waters and one another; care and stewardship of plants and animals; and striving for balance, structure, and unity.

This cosmology is directly reflected in Hawaiian epistemology – how we know the world. In traditional Hawaiian epistemology, knowledge flows from the mana that connects all beings, past, present and future; from interdependent relationships with the family of life; from the ʻāina, the environment, that which feeds; from physical, sensory experience with the world; from purposeful, functional practices and activity; and from the union of mind and body, of intelligence and feeling.

This cosmology and epistemology are reflected in Hawaiian methodology, or practice, which is exemplified by the ahupuaʻa system and its core principles of aloha ʻāina and mālama ʻāina – stewardship of the source of energy and nourishment. The ahupuaʻa system is a land, resource and behavior management model that enabled a large population to thrive while conserving its natural resources. An ahupuaʻa is both a physical place resembling a watershed and a way of thinking and behaving – it's a place-based way of life dedicated to meeting current and future socio-cultural, ecological and economic needs.

The parallels between Hawaiian worldviews and management systems with contemporary, western sustainability science to account for the economic dynamics among ecological and social systems are striking.

	Hawaiian Worldview	Sustainability Science
Cosmology	Natural, human, and spiritual interdependence	Interdependence among natural biogeochemical and thermodynamic systems and human systems and their biosocial needs
Epistemology	Knowledge flows from practical experience with interdependence, mana (energy), and ʻāina (environment)	Thermoeconomics and true cost accounting evaluate systems dynamics by measuring the quality of embodied energy and how efficiently it is used for work, exergy and entropy

Methodology	Aloha ʻāina and mālama ʻāina (stewardship of the source of energy and nourishment) through the ahupuaʻa system	21st century ahupuaʻa solutions: watershed management, green building, sustainable agriculture, clean energy, zero waste, community based economic development

The Science of Sustainability

Using western epistemologies, contemporary science has developed cosmological and methodological frameworks that mirror those of traditional Hawaiʻi.

The concepts described below are the basis of the decision-making framework, and can ultimately measure the seven levels of health (i.e.: ecological, socio- cultural, economic, physical, psychological, financial, spiritual). For example, it will be used to help evaluate the health of the structure, biology and chemistry of the soil, plant physiology, the Living Building Challenge Cultural & Educational Center, and modular Industrial Machinery. Thus, all of the solutions should strive to be zero entropy to syntropic, and singular to synergistic.

Biogeochemical and Thermodynamics (Ecological):

Laws of Thermodynamics: Ecosystems have many biogeochemical cycles operating as a part of the system. These chemical elements cycle through organisms as well as water, land, and/or the air. All the nutrients used in ecosystems by living organisms (e.g., carbon, nitrogen, oxygen, phosphorus, and sulfur) are a part of a closed system; therefore, these chemicals are recycled instead of being lost and replenished constantly, such as in an open system.

In contrast, from an energy perspective, ecosystems are open systems – the sun constantly delivers the planet energy in the form of light, which plants use to make food energy, which is eventually used and lost in the form of heat throughout the food web. However, energy is never destroyed – it changes from one form to another (First Law of Thermodynamics).

In thermodynamics, exergy is the energy that is available for work before bringing open systems into equilibrium. After the system and its surroundings reach equilibrium, the exergy is zero.

But the second law of thermodynamics states that, in general, subsystems spontaneously evolve towards thermodynamic equilibrium, which is the state of maximum entropy (or minimum exergy) or the death of the universe. However, the entropy of a system may decrease (and exergy increase) by increasing the entropy of some other system.

This export of entropy or import of excess energy from one system to another is called syntropy, and can be considered optimal health.

According to the Maximum Power Principle developed by Dr. Howard Odum, during self-organization of open systems, system designs develop and prevail that maximize power intake, energy transformation, and those uses that reinforce production and efficiency. In other words, the principle predicts that systems that capture previously untapped energy with high entropy have less thermal energy available to do work (i.e., are cooler). So ecological systems need lower entropy (i.e., higher exergy) to function, and those with the highest syntropy, slow the natural tendency toward maximum entropy (and preserve the most exergy).

Exergoecology evaluates natural energy fluxes, including the degradation of natural capital, providing a means to quantify and compare entropy, exergy, syntropy, and embodied energy of competing systems (including agricultural and other economic systems).

Likewise, entropy is a measure of the availability of the energy in a system to do work (often taken to be a measure of "disbursement" in the universe").

Biosocial Needs and Satisfiers (Socio-Cultural):

Humans have an innate drive to increase pleasure and reduce pain. The relative degree of pleasure and pain experienced is proportionate to the level of need satisfaction.

Human Need(s): Fundamental human needs, according to the school of Human Scale Development, are few, finite, and classifiable, as opposed to "wants," which can be infinite and insatiable. Needs are also constant through all human cultures and across historical time periods. What changes over time and between cultures is the strategies by which these needs are satisfied.

Manfred Max-Neef and his colleagues developed a taxonomy of human needs and a process by which communities can identify their "wealths" and "poverties" according to how their fundamental human needs are satisfied. Needs are physical (subsistence, protection), emotional (affection, leisure), intellectual (learning, understanding, creation), and spiritual (identity, meaning).

Human needs can be understood as a system – that is, they are interrelated and interactive. In this system, there is no hierarchy of needs (apart from the basic need for subsistence or survival) as postulated by Western psychologists such as Maslow. Rather, complementarity and trade-offs are features of the process of needs satisfaction.

Economics from the Greek oikonomia, or "management of the household" – describes the relationships among natural and social systems that produce the goods and services needed to survive and thrive. These goods and services are need "satisfiers" and are a reflection of the

trade-offs a culture makes to satisfy human needs. And because individuals, households, communities, and the various public and private organizations used to organize them are all dependent on natural systems, these satisfiers either enrich, maintain, or deplete natural systems.

By enriching natural systems – that is, efficiently recycling ecosystem nutrients and maximizing syntropy – synergistic satisfiers ultimately maximize true economic returns.

Thermoeconomics and True-cost Accounting (Economics):

The intent is to ensure that all goods and services used and produced for any project will ultimately be syntropic, synergistic satisfiers that provide ecological and socio-cultural benefits while remaining competitive with current market costs, quality and conveniences.

Thermoeconomics or embodied energy accounting, uses exergy, emergy, and entropy/syntropy as measures of value to track the energy associated with the extraction, production, distribution, consumption, and disposal of goods and services.

True Cost Accounting (also known as full cost accounting) is a conventional method of cost accounting that collects and presents information about environmental, social, and meets needs of sustenance, protection, affection, identity etc.).