ALOHA ʻĀINA ʻO LĀNAʻI

An Adaptative Curriculum for Cultural Literacy and Place-Based Learning on the Island of Lānaʻi

Prepared by:
The Lānaʻi Culture & Heritage Center and
The Pacific American Foundation
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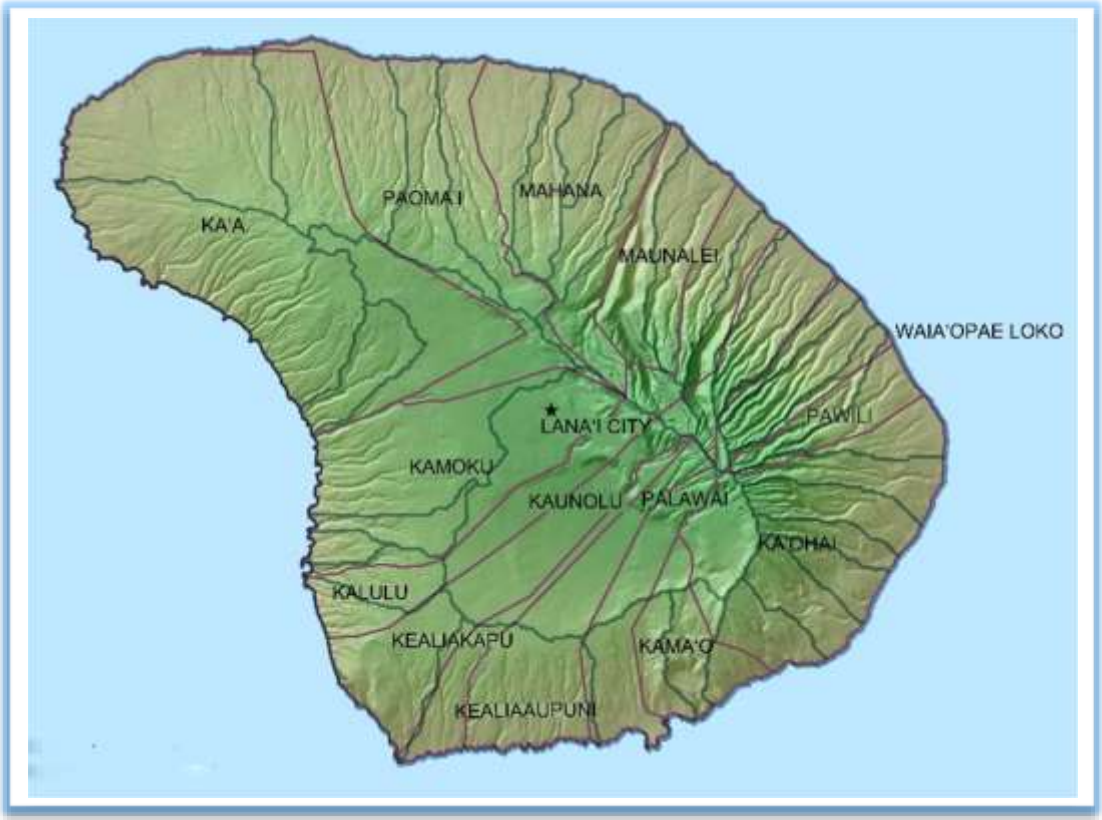
With Lessons for 4th, 7th and 10th Grades



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Aloha ʻĀina ʻo Lānaʻi – A Teacher's Guide for the Island of Lānaʻi – Grades 4, 7 and 10
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EXECUTIVE SUMMARY AND ACKNOWLEDGEMENTS

‘Āina- or Place- based curricula are effective tools for engaging students and making learning relevant. Studies show that place-based activities and education positively impact a young person’s socio-emotional wellbeing, which in turn has a positive impact on their experiences in what is known as “traditional” education. The ‘Āina-based approach to education is also culture-based education. For Hawaiians and many other people, culture is a direct reflection of the living environment from which the people grew. The ‘āina-based education approach increases Hawaiian cultural affiliation, civic engagement and stronger relationships between youth, teachers, families, and their communities (cf. Kana‘iaupuni, Ledward, Jensen, 2010).

Since 2007, the Lāna‘i Culture & Heritage Center (CHC) has been engaged in sharing the biocultural legacy of Lāna‘i with island students, the community at large, and guests to the island. The first efforts in providing curriculum resource materials to Lāna‘i High & Elementary School (LHES) teachers was the result of a collaboration between Martha Haia Evans (then Vice Principal at the school) and Kepā Maly. In 2011, Lāna‘i CHC developed a fund to foster place-based/cultural literacy learning initiatives on Lāna‘i and received a three-year grant through the U.S. Department of Education-Native Hawaiian Education Act to implement programs. At the close of the grant in 2015, Lāna‘i CHC continued offering cultural literacy programs and developing curricula resource documents with the help of funding partners.

In 2017, Lāna‘i CHC received a two-year grant from the Bay Watershed Education and Training Program-Hawai‘i, National Oceanic and Atmospheric Administration (NOAA) (Grant No. NA17NOS4730195), to develop project-based learning opportunities as a part of an initiative to restore Waia‘ōpae Loko I‘a (Fishpond). The initiative included development of curricula that integrated the natural and cultural history of Lāna‘i into learning experiences for LHES students. We are committed to programs that promote awareness of the natural and cultural history of Lāna‘i and prepare future generations of students to become leaders in island stewardship.

This program is supported by our partners: the Pacific American Foundation (PAF), Pūlama Lāna‘i, NOAA B-WET, the Hawai‘i Community Foundation, Honua Consulting, Kua‘āina Ulu ‘Auamo (KUA) and LHES. The program has continued to nurture and, more importantly, provide innovative educational opportunities to inspire generations now and in the future.

Curriculum expertise—funded through Honua Consulting—was shared by the PAF, which organized the “Aloha ‘Āina ‘o Lāna‘i Curricula.” The PAF cohort developed their original Kāhea Loko (Call of the Pond) and the Aloha ‘Āina curricula in 2000 and 2003. These curricula are meant to be a seed or a catalyst for others throughout the Hawaiian archipelago to nurture, enrich, and add to the ‘ike Hawai‘i (Hawaiian knowledge) pertaining to the ancient Hawaiian loko i‘a and ahupua‘a (traditional Hawaiian land division) concepts island by island.

PAF founder Herb Lee observed:

> “We are all being called in the 21st century to live ‘Aloha ‘Āina’ because our future depends on it.”

As a result of years of research into Lāna‘i’s history by Kepā Maly and collection of resource materials, the Lāna‘i CHC is able to make previously unavailable cultural literacy content

available for this cultural literacy/place-based initiative. The curriculum has been further promoted through the guidance and expertise of Diane Preza, Shelly Kaleialoha Preza, and many others who work tirelessly to promote awareness and appreciation for Lānaʻi's bio-cultural landscape and stewardship of its resources.

We have synthesized a number of documentary references that will provide easy access to information about Lānaʻi, which has time-depth. We do not presume to tell you how to teach your students, but simply provide you with some tools for use in your classes and in the field. This curriculum is meant to be adaptable across grades over the years. Lānaʻi has a rich natural and cultural history that lends itself to many fields of study. We hope that this curriculum will provide help and guidance as you bring new and exciting learning opportunities into your classroom for your students

Supplemental Notes: Teaching Concepts for Aloha ʻĀina ʻo Lānaʻi

Every teacher brings personal interests, talents, expertise and skills to the classroom. The Aloha ʻĀina ʻo Lānaʻi curriculum guide offers you and your students resources for learning about Lānaʻi and the great resources that are a part of our community—the legacy of place. The curriculum is a tool that will help engage your students in learning that draws upon each student's personal experiences and sense of place on Lānaʻi. A healthy relationship with one's own living landscape sets a foundation for continued education, stewardship and future leadership in our community. Several teaching concepts are shared below, and may be helpful as you plan out your own teaching opportunities.

Place-based education immerses students in local heritage, cultures, landscapes, opportunities and experiences, using these as a foundation for the study of language arts, mathematics, social studies, science and other subjects across the curriculum. Place-based education engages students in learning about their own history and how they fit into the larger bio-cultural landscape around them. Earlier methods of education focused learning on the lives and accomplishments of others, while place-based education emphasizes learning through interaction with the living environment and participation in project-based learning in the community. (See https://promiseofplace.org/.)

Teachable moments are unplanned opportunities in which teachers can provide students with useful insights. These fleeting opportunities should be seized while students remain interested. Often, these experiences are tangential and may be related to given units of study. Sometimes they can evolve into an entirely separate unit. Either way, there are always connections that students make while learning about the ʻāina, the universe around them. (See https://www.thoughtco.com/what-is-a-teachable-moment-2081657.)

Expository writing is **writing** that seeks to **explain**, illuminate or 'expose' (which is where the term '**expository**' originates). When writing an expository essay, it is important to write with the assumption that your audience has little to no background knowledge about the main topic. (See https://study.com/academy/lesson/what-is-expository-writing-definition-examples.html.)

An **informative essay** educates the reader on a topic. These essays can have one of several functions: to define a term, compare and contrast something, analyze data, or provide a how-to. They do not, however, present an opinion or try to persuade the reader. (See https://study.com/academy/lesson/informative-essay-definition-examples-structure.html.)

Persuasive writing is a form of nonfiction **writing** that encourages careful word choice, the development of logical arguments, and a cohesive summary. Young children can be guided through a series of simple steps in an effort to develop their **persuasive writing** skills. (See www.readingrockets.org/strategies/persuasive_writing.)

Interactive writing is a collaborative teaching/learning strategy in which teacher and students jointly compose and write texts. Not only do they share the decision about what they are going to write, they also share the duties of the scribe. (See https://www.smore.com/6yscm-interactive-writing.)

Shared reading is an interactive reading experience that occurs when students join in or share the reading of a book or other text while guided and supported by a teacher. The teacher explicitly models the skills of proficient readers, including reading with fluency and expression. (See http://www.readingrockets.org/strategies/shared_reading.)

Close reading is thoughtful and critical analysis of a text that focuses on significant details or patterns in order to develop a deep, precise understanding of the text's form, craft, meanings, etc. It is a key requirement of the Common Core State Standards and directs the reader's attention to the text itself. (See https://nieonline.com/tbtimes/downloads/CCSS_reading.pdf.)

Project Aloha ʻĀina Team

2007 Original Aloha ʻĀina Team

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INTRODUCTION
ABOUT THE ALOHA ʻĀINA SERIES

In 1837, Kamehameha III proudly spoke of his people and those who were supporting Hawaiʻi's education and spiritual well-being, saying

"E naʻlii a me na makaainana, he aupuni palapala koʻu,
a o ke kanaka pono a naauao oia koʻu kanaka."

O chiefs, and people of the land, mine is a kingdom of literacy,
the person who is righteous and intelligent is my person.
(Puuohau in Ka Nupepa Kuokoa. Mei 23, 1858:4)

A Cultural Foundation

The words aloha (love, respect, honor) and ʻāina (land, lit., "that which nourishes") are the heart and soul of Hawaiian culture. Memories of family pāʻina (parties), backyard jam sessions late into the night, spending time with grandma and grandpa and sunny days working in a loʻi (taro patch), mud squishing between your toes—these are just some of the things that might come to mind. Imagine the power of two simple words to say so much. But what do they mean?

The Spirit of Aloha ʻĀina – Lōkahi (Relationship)

Aloha ʻāina brings an understanding and perspective that shapes everything we do. Its spirit and essence begin with lōkahi (the sense of being connected to all things). Kupuna Malia Craver speaks of aloha as a 'triangle' of relationships between us as individuals and the creator/s and our ancestors (ke akua, nā akua, nā kūpuna), humanity (as caretakers), and creation (ʻāina, kai, lani). This mutuality between all things exists on many levels: spiritual, social, and the scientific.

Hoʻomaʻamaʻa (Practice)

The spirit and essence of aloha ʻāina invites each of us into the practice of love and respect within the "lōkahi-triangle." This idea can be seen in the Hawaiian word hoʻomaʻamaʻa, which translates to growing in familiarity with a person, place or idea. This practice must be holistic, affecting every corner of the triangle. To look at the ʻāina as simply a science project without growing in its spiritual dimension can be compared to needing reading glasses but choosing not to wear them! At the same time, the benefits of the ʻāina are for those who come with the proper mindset from kindergartener to kupuna! How can we grow in our understanding of aloha ʻāina, lōkahi and hoʻomaʻamaʻa? How would it shape our lives in ways that are meaningful? What source/sources might help us discover and understand these foundational elements? Words like ʻike (knowledge) and aʻo (to teach or learn) are good labels, but what are the sources of our learning?

Nā Kumupaʻa (The Sources) and Nā Palapala (Written Things)

Sources that help in understanding the concept and practice of aloha ʻāina are books and curricula like the one you're holding. The standard works, both Hawaiian and Western, play an important part. They also represent the partnering of two cultures. Yet these materials, though they enhance, cannot take the place of ke ala kahiko (the ancient way).

ʻOhana and Moʻolelo (Family Knowledge)

It is difficult to separate the two sources ʻohana/moʻolelo and wahi pana since neither can exist without the other when we speak of our ancient Hawaiian culture. ʻIke and aʻo grow from the context of ʻohana (family). For generations, from time immemorial, the relationship between the people and the sky, the land and sea, has been remembered and passed down within families. The meaning of the word moʻolelo (foundational story) comes from the word moʻo, often a reference to a person's family lineage or genealogy.

Knowledge of fishing patterns connected to the moon's (Hina) cycle, the planting of crops linked to the movement of the sun (lā)—families perpetuated these understandings. Many still do. At the same time, ʻike and aʻo, though they agree on major points of culture, can vary from family to family and region to region. Oʻahu, Kauaʻi and Niʻihau were unique from the southern islands in many ways. We must keep this in mind when we speak of 'Hawaiian culture.' Like this curriculum, Hawaiʻi always embraced different and often innovative ways. This too is a reflection of aloha ʻāina.

Wahi Pana (Sacred and Storied Landscapes)

We must keep our eyes on the land! As the most isolated pae ʻāina (archipelago) on the planet, Hawaiʻi stands out in many ways. The world comes here! Most would agree that its people, its style, and even its smells are beyond compare. We also use the words wahi pana to remind ourselves that the land is not just a resource—it is sacred, it is family. This too is foundational to understanding and experiencing aloha ʻāina.

ʻĀina – that which nourishes – encompasses land, ocean, heavens, land-based water systems, plants and animals. Aloha ʻāina is a way of life that is evident in Hawaiian practices such as:

- Treating land as a family member;
- Showing reverence and respect for all life forms and asking permission to take from the environment;
- Taking from the ʻāina only what is needed and using what is taken;
- Living with nature's cycles by refraining from harvesting during spawning cycles of marine life and planting, fishing or harvesting by phases of the moon; and
- Practicing protocol such as oli (chant) when visiting sites

Shaping the future while preserving a heritage, Project Aloha ʻĀina is working to provide Hawaiʻi's youth with culturally relevant curricula to inspire them to embrace aloha ʻāina as a way of life. This educational project fosters foundational learning experiences that reflect Native Hawaiian culture and core values. A major goal of the project is to inspire Hawaiʻi's youth to excel in science, math, social studies and language arts standards and to care for resources within their ahupuaʻa.

The lessons provided in each unit encourages students to explore their individual relationship to the ʻāina and ways that they can care for the place in which they live. This multidisciplinary journey will take them through readings, reflections in writing, interviews with kūpuna (elders), creative collaborative projects, problem solving in math and science, and investigations in their ahupuaʻa. Getting to know the place where they live and giving back to that place in a meaningful way through community service are essential elements for students participating in Project Aloha ʻĀina.

Project Overview

The lessons are designed to help students meet selected Common Core State Standards for English Language Arts and Math, Next Generation Science Standards, C3 Social Studies Standards, as well as Nā Honua Mauli Ola, Hawaiʻi Guidelines for Culturally Healthy and Responsive Learning Environments, developed by the Native Hawaiian Education Council in partnership with Ka Haka ʻUla O Keʻelikōlani College of Hawaiian Language, University of Hawaiʻi at Hilo. Also addressed in students' culminating projects are the original Hawaiʻi Department of Education's General Learner Outcomes (GLOs) along with Nā Hopena A'o, life-long learning outcomes, co-created by the Hawaiʻi Board of Education's Advisory Policy 4000 Work Group.

Project-Based Learning

The units in this teacher's guide are designed thematically and support integrated project-based learning that is anchored in the core curriculum. The units immerse students in scientific inquiry and into related social studies explorations. Math and language arts skills are incorporated as a means for students to interpret and express their findings.

To begin their Aloha ʻĀina o Lānaʻi journey, students are provided with an overview and tools to guide their way through student assessment initiatives. This document, which is provided in each Unit Introduction, lays out the individual and culminating group projects for students along with examples of standards that they will be striving to achieve. Students are given this document at the beginning of the unit so that they can chart their course and keep track of their progress as they journey through the lessons. Suggestions for students' culminating projects are provided in the unit, however the form of those projects is left up to the creativity of the students.

Assessment

The lessons employ formative assessments within each of the lessons and summative assessments at the end of the unit. The formative assessments are labeled as “Learning Log” sheets at the elementary level and as “Journal” sheets in the intermediate high school level. The sheets are an example of how each student documents their own learning experiences. For Grade 4, two summative assessment tools are provided with the unit: 1) the culminating project rubrics, and 2) a pre- and post-test (see Appendices) to help measure student growth. These tests were developed in cooperation with the Hawai‘i Department of Education as a means of helping students to reach standard benchmarks.

Organization of this Curriculum Guide

Instructional Activities

The Grade 4 section includes several lessons that are designed to be taught sequentially. The lessons include background information for teachers, rubrics for individual benchmarks, and a list of materials needed. Also included are pages that may be duplicated for students, such as:

- Student Readings
- Maps
- Learning Logs or Journal Sheets
- Data sheets
- Activity cards

The teaching suggestions included in each lesson and the estimated time for completing the lesson have been refined based on an Aloha ‘Āina/Kāhea Loko field test that was conducted with teachers during the course of the project. The teaching suggestions are designed to help students meet the standards, but they are, of course, only suggestions since there are many different and effective ways to approach the activities.

Appendices

Several appendices have been included with the curriculum guide. These resources may be used to help engaged students in classroom activities and for field learning experiences:

Additional Resources

Audio files of selected oli are available to introduce students to protocol at www.lanaichc.org.

Aloha ʻĀina Video – A video that was made a part of the original Aloha ʻĀina project. The 30-minute program portrays students discovering the gifts that the ʻāina provides in their ahupuaʻa may be requested from PAF (www.thepaf.org). It is a journey of discovery that includes moʻolelo, oli, wonderful music, beautiful places, and meaningful relationships between people and the place where they live.

Also visit www.lanaichc.org to view videos of Lānaʻi learning programs The videos include oral history interviews with elder kamaʻāina, island history, and share student learning initiatives on Lānaʻi.

Teacher Background Information

Most of the following text was adapted from the Lānaʻi Culture & Heritage Center's websites www.lanaichc.org and www.lanaiguideapp.org, which provide detailed information and guides users during their exploration of Lānaʻi's rich natural and cultural history.

Ahupuaʻa are traditional units of land in Hawaiʻi that vary in shape and size. They are political and ecological land units designed to meet a community's need for food and materials. In old Hawaiʻi, kō kula uka (people of the uplands) and kō kula kai (people of the sea) and neighbors shared food and supplies so that no one went without basic necessities. The general concept of the ahupuaʻa is that the human community living within its boundaries would be self-sufficient in obtaining the resources such as fish, water and land to grow kalo (taro), medicinal herbs, and trees for canoes and shelter.

Ahupuaʻa generally range from summit peaks or ridge crests extending down the mountain, becoming wider as the land slopes to the outer edge of the reef. The boundaries between adjacent ahupuaʻa usually conform to valley walls or ridges. They are called such because "the boundary was marked by a heap (ahu) of stones [also referred to as an altar] surmounted by an image of a pig (puaʻa), or because a pig or other tribute was laid on the altar as tax to the chief" (Pukui and Elbert, 1986).

Due to the wide range of elevation, rainfall, and topography in the islands, there are a number of ahupuaʻa that do not conform to this generalized idea. On Lānaʻi, four ahupuaʻa cross the entire island. The ahupuaʻa of Kalulu, Kaunolū, Pālāwai and Pāwili cross the mountain from fishery to fishery and are believed to have been designed to support the needs of residents and chiefly populations.

People also shared resources among ahupuaʻa to obtain plants that only grow in certain areas. Pili grass (*Heteropogon contortus*), which was prized for thatching, grows best in dry leeward areas. Hala trees (*Pandanus tectorius*), which provide materials for weaving, grow best in wet windward valleys. Koa trees (*Acacia koa*) large enough for canoes were found in koa forests that typically grow at elevations above 3,000 feet on the larger islands.

Politically, the ahupuaʻa were governed by a konohiki (land manager) who oversaw the right to use the resources within the ahupuaʻa and served as an intermediary between the chief

and the haku ʻohana, a representative of the resident families or makaʻāinana (commoners). Konohiki were responsible to chiefs of greater rank (aliʻi nui or aliʻi) who ruled over a moku (an island or district). Within the ahupuaʻa, individual families were allowed to cultivate and inhabit ʻili (smaller land sections, typically subdivisions of an ahupuaʻa). The konohiki also directed the people in the building, cleaning, and repair of loko iʻa whenever the aliʻi nui commanded.

During the Makahiki, an annual harvest festival which began about the middle of October and lasted about four months, an entourage of aliʻi sometimes numbering 100 or more would tour the island, traveling from one ahupuaʻa to another. At the boundary of each ahupuaʻa, the residents placed an offering of some of their food crops, fish harvest, and feathers from forest birds for the touring aliʻi.

The offerings were placed at an ahu that was adorned with the head of puaʻa. The people in each ahupuaʻa would provide shelter and food for the aliʻi and all those who traveled with them (Project Kāhea Loko, 2003).

BACKGROUND OF LĀNAʻI AHUPUAʻA

How were the people, land, and ocean connected in early Hawaiʻi?

The native people of Hawaiʻi have deep spiritual connections to the land, sea, sky and other elements of the natural world (Liliʻuokalani, 1897). The cultural traditions and the ways they were transferred to each new generation, through practice and example, ensured the continuation of healthy ecosystems.

Traditional Hawaiian cultural practices reflect a close relationship to the ʻāina. Āina — that which nourishes — is not just the physical environment that sustained the people in early Hawaiʻi, but also encompasses many manifestations of the gods. Plants, animals, and even the pōhaku (rocks) and rain clouds, are believed to have mana (spirit). The god Lono is manifested in the rain clouds, pigs, gourds and sweet potatoes. Kāne is embodied in taro, sugar cane, and bamboo. Kanaloa is manifested in bananas, squid and some other forms of marine life. And Kū is embodied in the coconut, breadfruit, and a variety of forest trees (Handy and Handy, 1991).

The most important food plant, kalo (taro), is the progenitor of the Hawaiian race and is still considered the greatest life force of all foods by Native Hawaiians. To them it is a manifestation of the first-born son of Wākea (sky father) and Papa (earth mother).

ʻO mākou nā keiki	We are the children
Nā keiki o ke kalo	The children of the taro
ʻO ka ʻai pulapula	Food of the offspring
E ola ke kanaka	Brings life to man
E ola ke kalo	The taro lives
E ola ke kanaka	Man lives

(Keola Morales, excerpt from Nā Keiki O Ke Kalo, 2003; Armitage, 2006)

Kalo symbolizes the importance of ʻohana (family). Its ʻohā (offshoots) are the keiki (children) that are connected to the corm, which is the makua (parent). When the keiki are separated from the parent, they are nourished by the land and water and grow to adults. ʻOhana also means “many offshoots.”

Loʻi Kalo (Taro Terraces)

Early Hawaiians developed an extensive and innovative irrigation system to grow kalo. They built ʻauwai (ditches) to transfer water from streams into their loʻi kalo and constructed small rock and earthen dams to regulate the flow. Fresh water was viewed as sacred and the rights to its use were directly related to the amount of labor that farmers contributed to building and constructing the ʻauwai (Handy and Handy, 1991). The traditional Hawaiian system of irrigating loʻi made intensive cultivation of kalo possible and ensured that water was distributed fairly and used wisely in the ahupuaʻa.

Loʻi Kalo on Lānaʻi

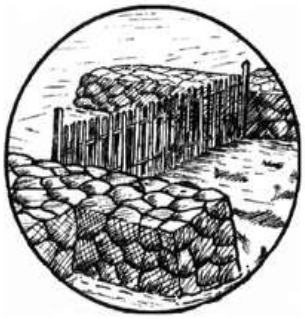
The ahupuaʻa of Maunalei on Lānaʻi was once home to the only perennial stream that flowed mauka to makai on the island. This stream enabled early Hawaiians to develop a sophisticated system of ʻauwai, loʻi kalo and māla (dry land planting fields) as early as the 1200s. These loʻi supplied kalo for the community, which at one time was estimated to be as many as 1,000 residents.

For centuries, the ahupuaʻa of Maunalei provided an important food crop for Lānaʻi's people until the 1830s, when goats and sheep were introduced to the island. This was when the landscape was forever changed. By the 1870s, feral herds of goats and sheep overran the island and Lānaʻi's population dwindled down to less than 300 people. Herds uncontrollably grazed and destroyed Lānaʻi's forests, including the forest above Maunalei Valley. The lack of forested lands caused the ʻāina to heat up so rain became less frequent. The hot dry environment eventually increased the frequency of rockslides, creating unsafe conditions for kalo farmers. The drastic change in environment from a forested flowing stream to an arid dry environment soon led to the demise of Lānaʻi's loʻi kalo, forcing farmers to abandon their crops.

Nearly two centuries later, Hui o Maunalei, a group of Lānaʻi native families and long-time residents, are working together to restore Maunalei Valley's ecology and culture by using the ahupuaʻa system of resource management as a guide for their work. Part of their efforts involves restoring the Maunalei pump house and historic garden complex to use it as a living history center. At the complex, they are working on opening the ancient loʻi kalo and restoring irrigation with the intention of eventually being able to feed their community once again and provide poi (kalo that is pounded and thinned with water) to Lānaʻi's elders and ʻohana.

As a part of the cultural literacy program at Maunalei on Lānaʻi, a new mele (song) "He Pua Au Na Ke Kalo" was composed, using traditional knowledge to help connect students to the legacy of kalo in Hawaiian life. Words for the mele, composed by Kepā Maly, may be found near the end of this curriculum and the melody may be heard by going to the following website or searching for "Puke Kamalii" on YouTube on the Lānaʻi Culture & Heritage Center's channel: https://youtu.be/HFgt1QBxSZg

Loko lʻa (Fishponds)



Hawaiian innovation extended to the shoreline with the development of loko kuapā (fishponds with a rock wall, unique to Hawaiʻi) and loko puʻuone (fishponds with a natural sand bank between the pond and the sea) that early Hawaiians engineered to cultivate fish. These Hawaiian structures were built to provide a steady supply of fish for the aliʻi. The loko kuapā were built on reef flats with the labor of many hands. Laulima, literally "many hands," refers to the cooperation that was necessary to pass the stones and construct the walls of the fishponds.

The ʻauwai kai (canals) that were constructed in both types of shoreline fishpond walls are an example of Hawaiian ingenuity. These canals had many important functions: they created currents that attracted fish, allowed water to circulate in the pond, and flushed out sediments and nutrients with the outgoing tide. The innovation of the mākāhā (gates) allowed young fish to enter the ponds where they would flourish and grow into adults that would not be able to escape. Since the fish were attracted to the current in the mākāhā, they were easily caught in the ʻauwai kai during outgoing and incoming tides. According to George Uyemura, a well-known manager of Mōliʻi loko kuapā, the mākāhā was and still is the most important feature of Hawaiian fishponds (Uyemura, 2007).

Loko lʻa on Lānaʻi

"ʻO nā loko iʻa, ʻo ia kekāhi mau mea e hoʻohiluhilu o ka ʻāina."
Fishponds are the things that beautify the land.
Samuel M. Kamakau, 1869

Lānaʻi's five known loko iʻa are found along the windward shore of the island. Three loko iʻa—Kaʻa, Kahōkeo and Waiaʻōpae—are in Pālāwai ahupuaʻa and two loko iʻa—Lōpā and Naha—are in Kaʻōhai Ahupuaʻa. In ancient times, these areas were home to many residents who took advantage of the sheltered coves and barrier reefs which provided the ideal conditions to build loko iʻa. The ancient fisheries along these shores were bountiful and helped feed the community. In fact, collectively, all of these fishponds once fed an island population of up to 6,000 people and there was also enough fish to trade with Lahaina on Maui.

The loko iʻa helped sustain the island's population, but quick and abrupt alterations in the environment caused this sustainable lifestyle to suddenly change. When the introduced goats, sheep and deer took over the landscape and denuded the forests in the 19th century, erosion occurred. Heavy rains caused sediment to flow into the ocean, depositing large amounts of soil into the loko iʻa. The sediment eventually smothered fresh water springs that fed the ponds and once the springs were clogged, the fishpond's ability to function properly was affected. At Waiaʻōpae Fishpond, once its springs disappeared, so did the ʻōpae (shrimp) for which it was named.

Waiaʻōpae Loko Iʻa. SIHP #50-40-98-00080, ca. 2000 (www.soest.hawaii.edu)

Waia‘ōpae Loko, Pālāwai ahupua‘a

While the environment changed, so did the population. In the early 1800s, widespread disease decimated Hawaiians throughout all the islands; on Lāna‘i, the population plummeted to a mere 125 residents by 1920. When James Dole began to aggressively plant pineapple on Lāna‘i and started to create the world’s largest pineapple plantation in 1922, most of the east shore residents moved to Lāna‘i City to work. As a result, no one remained to care for the fishponds and eventually Mother Nature took her toll on the ponds.

Today, nearly a century later, Lāna‘i’s community has come together to restore Waia‘ōpae loko i‘a and bring it back to its former glory. The kuapā foundation is still intact and many of the original rocks are still present. The community is relying on volunteers to help provide the manpower that is needed to restore the 2,000-foot long kuapā. Once completed, the loko i‘a will enclose more than a quarter mile of shoreline and extend 571 feet into the sea. Like many other fishpond restoration projects throughout Hawai‘i, Waia‘ōpae’s restoration is being done strictly by hand and with the original rocks. As of November 2018, about 20 percent of the wall has been reconstructed by volunteers. Once it is completed and the sediment flow is altered, the pond will be able to once again function properly and marine life will return, enabling the loko i‘a to once again feed its community of Lāna‘i as it was originally intended.

Traditional Land Units

Ahupua‘a are traditional Hawaiian land units that typically extend from mountain summits to the outer edges of reefs, typically taking in a fishery. On Lāna‘i, four ahupua‘a – Kalulu, Kaunolū, Pālāwai, and Pāwili – cross the entire island from the mountain to fisheries and are believed to have been designed to support the needs of residents and chiefly populations.

The water that coursed through the ahupua‘a carried nutrients through the lo‘i and downstream into the muliwai, loko kuapā, and loko pu‘uone where certain species of fish were attracted to the wai kai (brackish water). On Lāna‘i, most of the fresh water flowed underground in subsurface streams, so life on our island was different than on the larger islands of the Hawaiian archipelago. Only one stream, Maunalei, flowed with adequate water to reach the shore year-round. Water which appeared in near-shore springs carried nutrients that enriched the loko i‘a and coastal fisheries of the island.

Hawaiians relied on natural resources in the ahupua‘a to create the materials essential to survival. They tested various plant fibers for strength and flexibility and developed strong cordage from plants such as niu (coconut; *Cocos nucifera*), hau (*Hibiscus tiliaceus*), and olonā (*Touchardia latifolia*). Hawaiians developed various methods for making cordage by twisting plant fibers together. They used the cordage to tie the timbers of their houses together, to make their canoes, and to fashion weapons and a variety of innovative tools.

Lānaʻi's Traditional Land Divisions

In the centuries following initial Polynesian settlement of the Hawaiian Archipelago (earliest carbon dating on the larger islands ranges from ca. 175-300 A.D.), ancient Hawaiian land use and resource management evolved and adapted to the wealth, as well as the limitations of the natural resources found on each of the islands. By the 1500s, the mokupuni (islands) were subdivided into land units of varying sizes. The largest division was the mokuoloko (district), of which two occur on Lānaʻi, the "kona" (leeward) and the "koʻolau" (windward). The ancient Hawaiians further divided the mokuoloko into manageable units of land: ahupuaʻa.

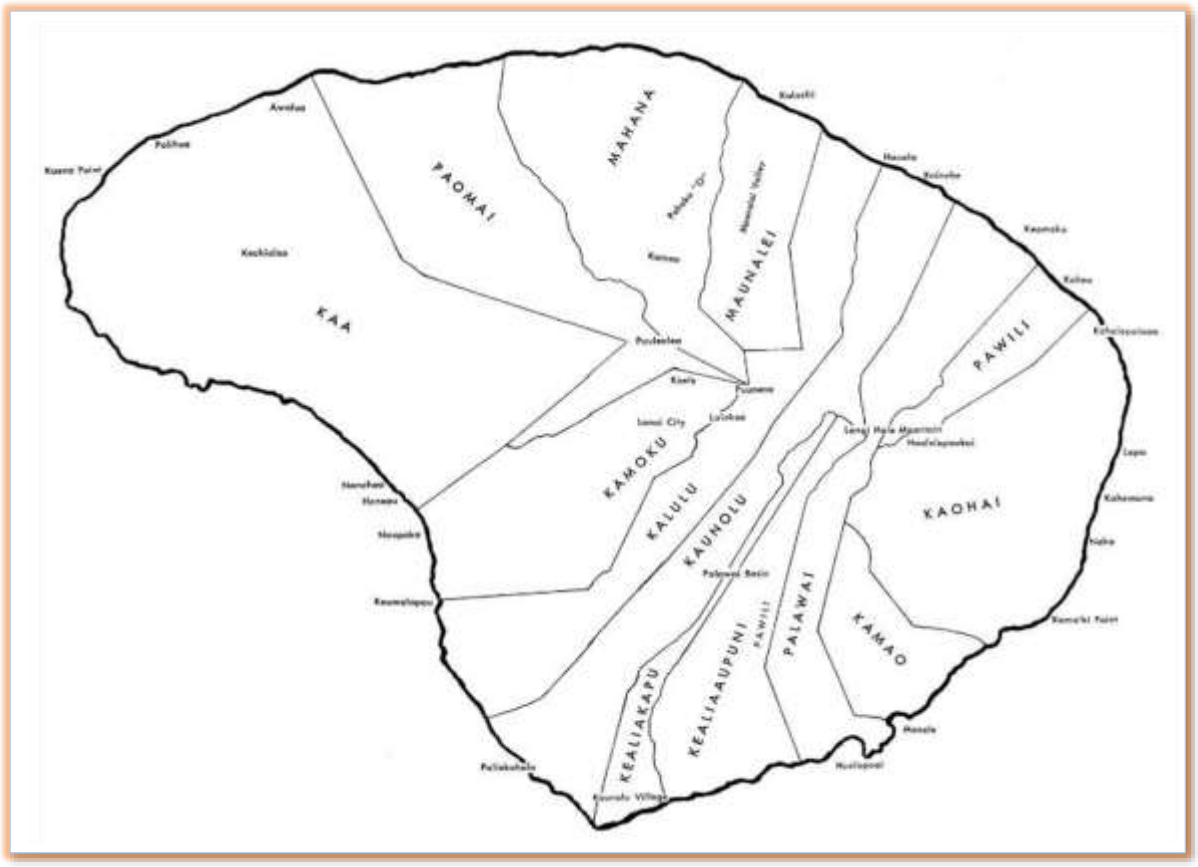
The location and relatively small size of Lānaʻi island coupled with its limited water resources (resulting from its sitting in the shadow of Maui) resulted in a small island population. Lānaʻi's aliʻi were almost always under the jurisdiction of Maui's aliʻi nui; as Maui formalized its land management system – in which ahupuaʻa and smaller political, religious and subsistence divisions were established – the island of Lānaʻi was also divided into ahupuaʻa.

Traditional lore and knowledge relate that Lānaʻi was divided into 13 ahupuaʻa. However, designation of four of the 13 ahupuaʻa created an anomoly, namely that these four ahupuaʻa cross the entire island from windward to leeward coast. This more generous form of land subdivision may have been necessary due to the stressed nature of Lānaʻi's environment. Regardless, it ensured residents access to all resources—from coast to mountains—necessary to sustain viable populations and to adapt to seasonal variations in weather, rainfall, and ocean conditions.

As a result of foreign pressures, the traditional system of land management and residency in the Hawaiian Islands was radically altered. In 1848, a system of fee-simple property rights—patterned after Western practices—was established in the Hawaiian Kingdom. This new land ownership system, known as the Māhele ʻĀina (Land Division), was codified under the Kuleana Act of 1850, where all claims were assigned Land Commission Award (L.C.A.) numbers as a part of the record. By the close of the Māhele ʻĀina, the ahupuaʻa of Lānaʻi and the claims of the native tenants had been settled. The following statistics summarize some of the key points of the Māhele ʻĀina:

- A total of 110 claims which could be verified for Lānaʻi were recorded, including both chiefly and commoner/native tenant claims;
- The combined claims from Lānaʻi represent 331 separate documents;
- 56 claims were awarded; of those awarded, five claimants were chiefly awardees, who received entire ahupuaʻa; and
- 51 awards made to native tenants and individuals of lower chiefly lineage totaled a little over 600 acres of the approximately 89,000 acres of land on Lānaʻi

The 13 Ahupuaʻa of Lānaʻi



Lānaʻi has 13 traditional ahupuaʻa: Kaʻā, Paomaʻi, Mahana, Maunalei, Kalulu, Kaunolū, Pālāwai, Pāwili, Kaʻōhai, Kamaʻo, Keālia Aupuni, Keālia Kapu, and Kamoku. The residents of these ahupuaʻa benefited from the resources that were found from mauka to makai. As water was often a limiting factor on the island, residents were keen about where, when and how to obtain their water for their personal use and to irrigate their agricultural fields.

Beginning with the northwestern section of the island is Lānaʻi's largest ahupuaʻa, Kaʻā (meaning "the rocky area"). Kaʻā includes the entire northern end of the island. It was known for its nearshore settlements and rich fisheries. At Polihua, the turtle population was an important resource for early Hawaiians. There were also many ceremonial sites within Kaʻā, including the island's largest heiau (temple). Makai residents obtained fresh water from nearshore springs while mauka residents were supported by an extensive dry land agricultural system in the Keahiakawelo-Kānepuʻu region. Keahiakawelo (erroneously called "Garden of the Gods") is one of the most popular landscapes on Lānaʻi and is connected to historical legends and early traditions.

To the east of Kaʻā is the ahupuaʻa of Paomaʻi (literally "sick Pao"). Here, the residents were sustained by major coastal villages which allowed access to fisheries and nearshore water sources. Further up mauka in the kula (plains) region was Paomaʻi's dryland forest where water was seasonally collected within its gulches. Paomaʻi was also noted as being a gathering place for chiefly and community events.

Next to Paomaʻi in the central northern section of Lānaʻi is Mahana (literally “warmth”). Water was collected in this ahupuaʻa through a variety of sources including springs, seasonal streams, and nearshore wells. Villages, ceremonial sites, and cultural features were scattered from mauka to makai. Mahana ahupuaʻa was known for its famous dry land forest of lehua trees (*Metrosideros* spp.) which produced unique purple blossoms, but this forest was destroyed when feral ungulates ran wild in the 1800s.

One of the most distinct ahupuaʻa of Lānaʻi is Maunalei, which was home to Lānaʻi’s only stream that flowed year-round. Appropriately named, Maunalei was known for the cloud banks that nestled into the mountain like a lei (garland) as the dense forest captured the clouds’ rains. The stream flowed through an expansive system of irrigated loʻi kalo for nearly six centuries up until the 1800s when wild goats and sheep destroyed the forest. Several major villages were found along the shores where springs helped support the residents and other smaller villages and ceremonial sites that were scattered mauka.

Moving eastward from Maunalei is Kalulu (literally “the shelter”), which is one of the unique ahupuaʻa that run over and across the island of Lānaʻi. Along its two coastlines were two significant fisheries, the deep fishing grounds at Pali o Kāholo and the nearshore reef fisheries on the windward coast. Kalulu was abundant with extensive agricultural and forest-sheltered dry land fields up mauka. Small valleys and gulches also provided sources for precious water sources.

The next unique island-spanning ahupuaʻa is Kaunolū (meaning uncertain), which has a storied landscape. This ahupuaʻa was the home of an extensive agricultural community from mauka to makai. On its leeward coast, Kaunolū was once the religious, political and social center of Lānaʻi because of the water that flowed from the Kaunolū-Keālia Kapu gulch. This coastline was also connected to the gods and is famous for the leeward point of Kealaikahiki (literally “the path to Tahiti) which was known as the landing place of the ancient gods on Lānaʻi. The deep-sea fishing grounds of Pali o Kāholo provided fish for the community while the upland forests and springs provided valuable ʻāina-based resources.

Continuing eastward is the third unique ahupuaʻa of Pālāwai (literally “fresh water moss”). It too was once a bountiful ahupuaʻa with thriving fisheries, dryland forests, agricultural fields, upland forests, numerous springs and intermittent streams which provided fresh water for the community. There were also several fishponds on this side of the island including Waiaʻōpae Loko that is currently being restored by Lānaʻi residents and volunteers.

On the windward side of Lānaʻi is Pāwili, which translates to “strike and twist” and describes the wind in this region. One of the unique features of this ahupuaʻa is that it contains the island’s only formal lele (a detached land division that includes a portion of another ahupuaʻa). The lele of Pāwili is located in the nearby ahupuaʻa of Keālia Aupuni where Pāwili residents could cultivate crops such as sweet potato in fertile lands. Like other ahupuaʻa on Lānaʻi, the coastline contained several villages and important nearshore fisheries and springs while the deep forested valley of Pāwili provided more seasonal water sources. Pāwili also had ceremonial sites including one of the island’s major heiau.

Along the southeastern region of Lānaʻi is the ahupuaʻa of Kaʻōhai (literally, “the ʻōhai [*Sesbania tomentosa*] plant”). Fishponds in this ahupuaʻa lined the coasts along with rich fisheries and springs. Mauka, seasonal water sources helped sustain the residents of Kaʻōhai and provided water for agriculture.

To the south is Kamaʻo ahupuaʻa (literally, “the maʻo [*Gossypium tomentosum*] plant”), where two-thirds of the sandy beach at Mānele Bay was used historically as a canoe landing site. This coastline also had springs where Hawaiians would dive along the shores and catch the water that escaped out of cap rocks with gourds. The village of Mānele was a significant site and was shared between the two ahupuaʻa of Pālāwai and Kamaʻo. Makai was where ceremonial sites, agriculture, and villages were found. Mauka was where dry land crops were grown, ʻuaʻu (dark-rumped petrel, *Pterodroma phaeopygia sandwichensis*) birds were harvested and a heiau and a major burial site was located.

Moving further towards the west of Kamaʻo and across the leeward coasts of Pālāwai and Pāwili is the ahupuaʻa of Keālia Aupuni (literally, the “salt beds of the people/nation”). Fishing villages and seasonal camps were found in coves along the makai region while water and agriculture was cultivated mauka. As previously mentioned, Keālia Aupuni also contained the lele of Pāwili.

To the west of Keālia Aupuni is the eleventh ahupuaʻa, Keālia Kapu (literally, the “restricted salt beds”). Although this is one of the smaller ahupuaʻa of Lānaʻi, it was traditionally significant as being the puʻuhonua (place of refuge) of the island. Mauka at Luahiwa was a rainmaking heiau and a major petroglyph field.

The final ahupuaʻa of Lānaʻi is Kamoku (literally, “the district”). As with many of the other ahupuaʻa, its shorelines were rich with fisheries and villages. In the uplands, extensive forested dry land agricultural systems were developed and springs provided water for the community.

To help learn the names of the ahupuaʻa on Lānaʻi and become familiar with some of the features of the moku, the mele on the following page was composed.

MOKUPUNI O LĀNAʻI **Mele Pana**	**ISLAND OF LĀNAʻI** **Place Name Chant —**
He ʻumi kūmākolu ahupuaʻa **O Lānaʻi a Kaululāʻau.**	There are thirteen ahupuaʻa On Lānaʻi of Kaululāʻau.
Holo a puni ʻoe ia moku ʻāina, **Aia la o <u>Kaʻā</u> ma Kona.**	If you travel to encircle the island, You will behold Kaʻā in Kona.
Pili mai ʻoe me <u>Kamoku</u>, **A ʻike aku iā <u>Kalulu</u>.**	Then you are close to Kamoku, And you see Kalulu.
Aia <u>Kaunolū</u> me <u>Keālia Kapu</u>, **A hiki mai i <u>Keālia Aupuni</u>.**	Then there is Kaunolū and Keālia Kapu, Then you arrive at Keālia Aupuni.
Komo mai ʻoe iā <u>Pālāwai</u>, **A pae i <u>Kamaʻo</u> i ka mālie.**	Next you enter Pālāwai, And then settle at Kamaʻo in the calm
(ʻAe pae mālie ka waʻa i Mānele!)	(Yes, the canoe lands gently at Mānele!)
Aia <u>Kaʻōhai</u> pili me <u>Pāwili</u>, **A komo ʻoe i ke Koʻolau.**	There is Kaʻōhai adjoining Pāwili, And you enter the Koʻolau.
Hui hou ʻoe me Pālāwai, **Aia hoʻi o Kaunolū pū.**	You again meet up with Pālāwai, And behold Kaunolū as well.
O Kalulu hou a e ʻike, **lā <u>Maunalei</u> i ka laʻi.**	Kalulu is also seen again, And then tranquil Maunalei.
A loaʻa ʻoe iā <u>Mahana</u>, **Me <u>Paomaʻi</u> i ka palena pau.**	You then get to Mahana, And the boundary's end at Paomaʻi.
(A ʻo wai ka inoa o ka piko kuahiwi?)	(And what is the name of the mountain summit?)
O ka piko kuahiwi o Lānaʻi Hale, **Ō mai Lānaʻi a Kaululāʻau.**	The summit of the mountain is Lānaʻi Hale Respond Lānaʻi of Kaululāʻau.
Aia hoʻi ka mokupuni aloha o Lānaʻi a Kaululāʻau	Behold the beloved island, Lānaʻi of Kaululāʻau

Pālāwai Ahupuaʻa

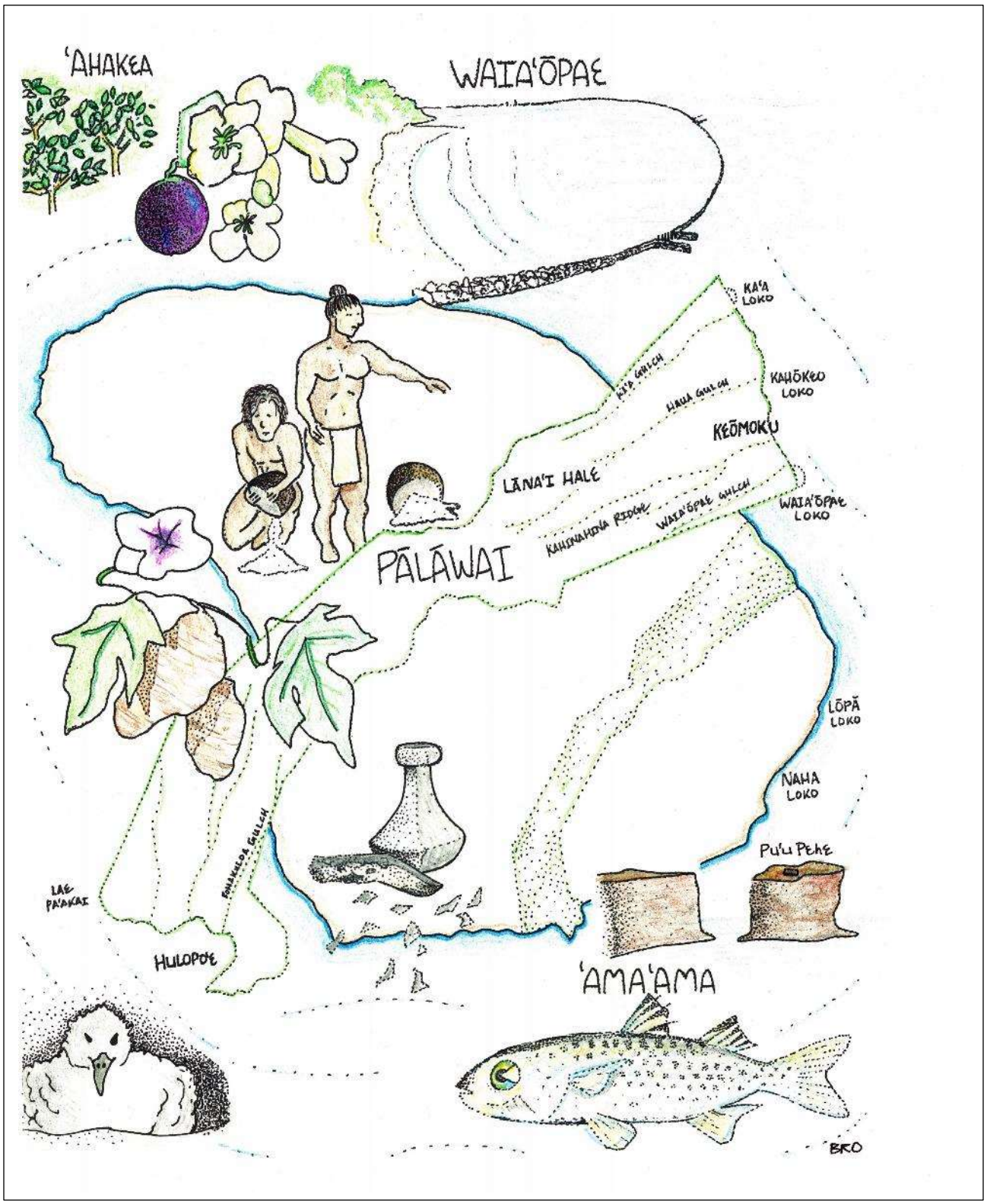
Pālāwai (literally “fresh water moss”) is one of four Lānaʻi ahupuaʻa that spans both the kona (leeward) and koʻolau (windward) sides of the island. It contains 5,897 acres, boasted fisheries (including fish ponds), kula (dry land) agricultural field systems, forest resources, and numerous fresh water sources with springs and intermittent streams. Potable water sources were developed in the nearshore sections of Pālāwai and villages could be found all along the coast. On the kona side of Lānaʻi, Pālāwai is bounded by Keālia Aupuni on the west and by Kamaʻo on the east. Pālāwai shares the highest peak, Lānaʻi Hale (site of a traditional spring), at the mountain top as a boundary point with Kaunolū and Pāwili. These same ahupuaʻa also run down the mountain and form the windward boundaries of Pālāwai down to the shore. The first foreign settlement on Lānaʻi, in the form of the original Mormon colony in the islands, was settled in the basin region of Pālāwai in 1854. Pālāwai was awarded to Chiefess Kekauʻōnohi during the Māhele and later inherited by her husband, Haʻalelea. The kapu fish was ʻanae (mullet, *Mugil cephalus*) and the kapu wood was ʻahakea (*Bobea* spp.).

Native Tenants of Pālāwai Ahupuaʻa who Filed Claims for Kuleana (fee-simple property rights) in 1847-1855

L.C.A. Helu	Claimant	Ahupuaʻa	Ili
4145	Kauihou	Palawai	Keomoku/ Keomuku
6892	Kaunele	Palawai	—
6893	(Kuaokaulu) Kuakaulu	Palawai	Paiwi
10025	Kaneakua	Palawai	Moouli
10038	Kaiole	Palawai	—
10040	Pohano	Palawai	Palawai
10041	Kanekeleia	Palawai	Palawai, Manele
10042	Nakalo	Palawai	—
10044	Kapahoa	Palawai	—
10045	Haalu	Palawai	—
10046	Nalei	Palawai	—
10058	Kaunele	Palawai	Kaa loko, Kaa kai
11216	M. Kekauonohi	Palawai	Ahupuaa

Ben Ostrander prepared ahupuaʻa boundaries in the map of Lānaʻi on the following page.

Can you identify storied places on the landscape of Pālāwai? Can you describe traditions being depicted in the sketch on the following page?



Boundaries of Pālāwai Ahupuaʻa on the Island of Lānaʻi — with details of noted natural resources, wahi pana and the loko iʻa of Waiaʻōpae indicated (original sketch by Ben Ostrander)

GRADE 4 UNIT OVERVIEW

How do Hawaiian practices nurture a healthy relationship to the ʻāina, and how can we give back to the ʻāina today?

Over the course of the unit, students explore this question through moʻolelo (traditions), models, maps, group projects and field excursions to loʻi kalo (taro terraces) and loko iʻa (fishponds) in the ahupuaʻa. The five lessons are:

Lesson 1 – Our Ahupuaʻa

Students learn how land was divided in old Hawaiʻi, drawing and labeling a diagram of their ahupuaʻa showing key geographic features. Students read a Hawaiian story of place and write a response about the life lesson in the story. Finally, students illustrate the characters, setting, and plot on their ahupuaʻa diagram.

Lesson 2 – The Case of the Strongest Cord

Students put their scientific investigation skills to the test as they discover the value of cordage in old Hawaiʻi. They make cordage from a variety of plant fibers, form hypotheses, and design experiments to test the strength and flexibility of various types of cordage.

Lesson 3 – Engineering Ingenuity

Engage students in building model fishponds and experimenting with changing water levels outside the pond wall to simulate what happens with the rising and falling tides. In this investigation, students discover the innovation of the mākāhā and its unique function in cultivating fish.

Lesson 4 – Mauka-Makai Connection

Students create, observe and analyze a model of the traditional Hawaiian irrigation system for growing kalo and draw insights and conclusions about water use in old Hawaiʻi and today.

Lesson 5 – Giving Back to the ʻĀina

Students have an opportunity to apply what they have learned in the unit. Students explore a loʻi kalo and a loko iʻa, taking part in service-learning projects to give back to the ʻāina. They also gather information to use in preparing their ahupuaʻa unit projects and final papers.

GRADE 4 LESSON 1 – OUR AHUPUA‘A

How were people, land, and ocean connected in old Hawai‘i?

Key Concepts

- Ahupua‘a are traditional Hawaiian land units usually extending from mountain summits to the outer edges of reefs.
- In old Hawai‘i, food and other supplies were shared between kō kula uka (people of the uplands) and kō kula kai (people of the sea).

Activity at a Glance

Students learn how land was divided in old Hawai‘i and draw and label a diagram of their ahupua‘a, displaying key geographic features. Students read a Hawaiian story of place and write a response about the story. Finally, students illustrate the characters, setting, and story on their ahupua‘a diagram.

Assessment

Students:

- Construct an enlarged map of an ahupua‘a and label important geographic characteristics and Hawaiian place names.
- Explain the patterns and relationships among geographic features depicted on their maps.
- Read ‘Ai‘ai Visits Lāna‘i, an excerpt from “Aiai, Son of Ku-ula: Part II of the Legend of Ku-ula, the Fish God of Hawai‘i” and write a response about the story.
- Illustrate the story ‘Ai‘ai Visits Lāna‘i on an enlarged map of the island.

Time: 4 - 5 class periods

Materials

Provided:

- Student Assessment Overview (provided in the Unit Introduction)
- Learning Logs 1 and 2
- Student Reading
- Lāna‘i Ahupua‘a map with labels
- Our Ahupua‘a: ustainable living in traditional Hawaiian culture poster

Needed:

- chart paper and colored markers
- large sheet of blank chart paper (for each pair of students)
- folders or large construction paper folded in half (one per student to use as Learning Log)
- overhead projector(s)

- colored markers

Advance Preparation

- Make a copy of the Learning Log cover and Student Assessment Overview (provided in the Unit Introduction).
- Make a copy of the Learning Logs and student reading for each student.
- Be ready to project the Our Ahupua‘a poster and the Lāna‘i Ahupua‘a map provided with this lesson.

Vocabulary

- ahu – heap, pile, mound, altar
- ahupua‘a – traditional Hawaiian land unit usually extending from mountain summits to the outer edges of reefs; this system ensured that everyone living in the ahupua‘a had access to natural resources
- aku – a deep sea fish also known as bonito or skipjack (*Katsuwonus pelamis*)
- ali‘i – chief
- economy – the way that people produce and exchange products and services in their geographic region
- imu – underground oven
- kai – the ocean or sea
- kapu – forbidden or prohibited
- kō kula uka, kō kula kai – the exchange system of early Hawai‘i in which “those of the uplands” [kō kula uka] exchanged food and other supplies with “those of the sea” [kō kula kai] (Abbott, 1992)
- kona – leeward side of the island, also the name of the leeward mokuoloko of Lāna‘i
- ko‘olau – windward side of the island, also the name of the windward mokuoloko of Lāna‘i
- kula – the region inland of the coast where Hawaiians grew many of their crops
- lawai‘a – fisherman
- mahi‘ai – farmer
- Makahiki – annual harvest festival that began approximately in the middle of October and lasted about four months, with sports, religious activities, and a kapu on war; this is now replaced by the modern-day Aloha Week (Pukui and Elbert, 1986)
- makai – toward the sea
- mauka – toward the mountain
- mokuoloko – large districts or land divisions on the Hawaiian Islands that were further subdivided into ahupua‘a; there are two mokuoloko on Lāna‘i – kona and ko‘olau
- mokupuni – island
- ‘ohana – family
- pua‘a – pig
- pu‘u – hill, peak, cone
- uka (also mauka) – mountains and upland regions that Hawaiians depended upon for important forest products

Pālāwai Ahupuaʻa

Portion of leeward Pālāwai Ahupuaʻa viewed from Lānaʻi Hale

The ahupuaʻa of Pālāwai spans both the kona and koʻolau sides of Lānaʻi. It contains 5,897 acres and hosted fisheries (including fish ponds), kula (dry land) agricultural field systems, forest resources, and numerous fresh water sources with springs and intermittent streams.

In the nearshore sections of Pālāwai, potable water sources were developed and villages established all along the coast. On the leeward side, Pālāwai is bounded by the ahupuaʻa of Keālia Aupuni on the west and by Kamaʻo on the east. At the mountain top, Pālāwai shares the highest peak, Lānaʻi Hale (site of a traditional spring), as a boundary point and adjoins Kaunolū and Pāwili from the mountain to the windward coast.

In the basin and bench lands, the residents cultivated sweet potatoes, dry land taro, clumps of sugar cane, gourds, bananas and the paper mulberry. They also quarried stone to make adzes and cutting tools; wood for canoes, houses, tools and images; plants for medicines; and birds for both food and the making of royal emblems. Residents of the uplands often exchanged their goods for fish and various resources with people who lived along the coast, and there was regular travel between the uplands and lowlands.

Hiʻi is one of four major “benches” that outlines the upland region of the Pālāwai Basin. In this elevational zone of the bench land, varying between 1,600 to 1,800 feet above sea level, signs of ancient agriculture are found across the land. There was a wide range of plants which served ceremonial, medicinal, craft, and food purposes, and the forest canopy provided the right amount of sunshine and moisture for the cultivation of important food and utilitarian crops. Hiʻi and the neighboring bench lands were of vital importance to the ancient Hawaiians who settled Lānaʻi. The forest zone provided wood for the construction of their hale. The valley sides revealed exposed dikes from which dense basalt lava could be easily quarried to make tools such as koʻi (adzes or chisels) and pahi (basalt knives). Remnants of an ancient heiau are also present, although little is known about the purpose of this ceremonial site.

Hulopoʻe along the leeward shore of Pālāwai Ahupuaʻa.

Along the windward shore of Pālāwai is the ancient nine-acre fishpond of Waiaʻōpae. It is one of five fishponds on the island. Collectively, these fishponds supplied up to 6,000 of the island’s residents with fish but as time progressed and the environment changed, the nature of Waiaʻōpae changed as well. The fishpond was originally built 800 years ago and provided bountiful fish. However, when

goats, sheep, and deer overran the island and denuded the forests in the late 1800s, the land easily eroded during heavy rains. Sediment eventually smothered the fresh water springs that fed the pond and once the springs were clogged, the fishpond's ability to function properly was affected. At Waiaʻōpae Fishpond, once its springs disappeared, so did the ʻōpae (shrimp) that it was named for.

In the early 1800s, widespread disease decimated Hawaiians throughout the islands; on Lānaʻi, the population plummeted to a mere 150 residents by 1920. When James Dole created the world's largest pineapple plantation in 1922, most of the east shore residents of Pālāwai who were living in the Keōmoku area moved to Lānaʻi City to work. As a result, Waiaʻōpae and the other four fishponds were neglected for nearly a century.

Keōmoku Shoreline of Pālāwai Ahupuaʻa (ca. 1920).

Today, Lānaʻi's community has come together to restore Waiaʻōpae fishpond and bring it back to its glory. The kuapā's foundation is still intact and the rocks are still present. The community relies on volunteers to help provide the manpower that is needed to restore the 2,000-foot long kuapā. Once completed, the fishpond will enclose more than a quarter mile of shoreline and extend 571 feet into the sea. Like many other fishpond restoration projects throughout Hawaiʻi, Waiaʻōpae is being restorated by hand and with the original rocks. As of November 2018, about 20 percent of the wall has been reconstructed by volunteers. Once it is completed and the sediment flow is altered, the pond will once again be able to function properly and marine life will return, enabling the fishpond to once again feed its community of Lānaʻi as it was originally intended.

(See "An Ancient Fishpond Resurfaces." Maui No Ka Oi Magazine, mauimagazine.net/lanai-fishpond/2/.)

Teaching Suggestions

1. Introduce the Learning Log and the Student Assessment Overview for this lesson.

- Pass out one folder and copies of the Learning Log cover sheet and the Student Assessment Overview to each student.
- Instruct students to glue the cover sheet to the outside of their folder and to glue the assessment sheet to the inside cover of the folder—this will serve as each student's Learning Log or portfolio.
- Go over the information on the assessment sheet as a class (unit essential question, standards, assessment procedures and expectations for culminating projects).

2. Find out what students know about the ahupua‘a where they live.

- Initiate a class discussion focusing on the geography of their ahupua‘a, especially Hawaiian place names.
- Create a K-W-L chart and record what students know (K) and what students wonder (W) about their ahupua‘a and life in early Hawai‘i. Students may record what they have learned (L) at the end of the activity.

Discussion Questions:

- Where are we located? What is the name of the place where we live? What is the name of the area where our school is located? What other Hawaiian place names are known in our area or that we enjoy visiting?
- How was land divided in early Hawai‘i? Has anyone previously heard of the term ahupua‘a? Has anyone heard of the term moku or mokuoloko?
- What do you think life was like in early Hawai‘i?
- Why do you think it was important for early Hawaiians to maintain exchange between the uka or mauka (mountain) region and the kai or makai (sea) region?

3. Introduce students to the geography of an ahupua‘a using a diagram or poster that illustrates habitat zones and cultural uses; add key vocabulary words to the “word wall” or “word bank.”

- Project the Conservation Council for Hawai‘i poster – Our ahupua‘a: sustainable living in traditional Hawaiian culture – provided with this activity. Ask students to identify any Hawaiian terms that are familiar to them.
- Ask students to identify the activities illustrated on the poster.
- Introduce the terms kai (ocean), kula (the region inland of the coast where many important crops were planted) and uka (the forested mountain areas); add these words to the “word wall” or “word bank.”
- Discuss students’ ideas about life in early Hawai‘i and how life today is different from life in pre-contact Hawai‘i.

4. Teach students the names of mokuoloko and ahupuaʻa on the island using the two maps provided at the end of this lesson. Begin a "word wall" or "word bank" of key vocabulary words.

- Add new vocabulary words to a "word wall" or "word bank" on chart paper (mokupuni, mokuoloko, kona, koʻolau, ahupuaʻa).
- Project the Lānaʻi Mokuoloko Map and identify the kona and koʻolau sides of the island.
- Distribute Learning Log 1 to students and explain to students that they will be creating their own map of the ahupuaʻa of Lānaʻi. Ask students to follow the directions on the sheet and identify their mokuoloko and ahupuaʻa.
- Encourage students to memorize place names, especially mokuoloko and ahupuaʻa names, and to write in their Learning Log using this new vocabulary.

5. Project a map of your ahupuaʻa onto chart paper using an overhead projector. Demonstrate how to create an enlargement of the map and then instruct pairs of students to create their own enlarged maps using overhead projectors.

- Tape a large sheet of blank chart paper to the wall.
- Using an overhead projector, project a slide of the unlabeled Lānaʻi Ahupuaʻa Map from Learning Log 1 onto the chart paper.
- Trace the lines of the projected map onto the chart paper. (Be careful not to move the overhead projector since it becomes difficult to match the lines up once the image has moved.)
- When you have finished tracing the lines of the map, turn off the projector and show students the enlarged illustration on the chart paper.
- Instruct students to create their own enlarged maps to be labeled, illustrated and colored during this activity. (NOTE: It takes approximately 10 minutes for a pair of students to create an enlargement of the map using an overhead projector. If possible, set up more than one projector where students can work. You could set these up as independent work centers and have students take turns at the projectors while doing other activities during the day.)

6. Have students read, discuss, and write a response to the story, ʻAiʻai's Visit to Lānaʻi.

- Hand out the Student Reading 1 and Learning Log 2 for students to read and respond to the story. (You might have students complete this in language arts class or for homework.)
- Instruct students to read the story and to write a response on Learning Log 2.
- Before or after students write their response, discuss the story.

Discussion Questions:

- Name two places that ʻAiʻai visited on Lānaʻi. Find these places on a map. (He first visited the southern shores of the ahupuaʻa of Kaunolū, then journeyed to the northern shore of Polihua within Kaʻā ahupuaʻa.)
- What is Polihua? (Polihua is the sandy beach located along the northern shores of Kaʻā ahupuaʻa and ʻAiʻai's legend indicates that it is the birthplace of turtles in Hawaiʻi.)
- What did ʻAiʻai do at Polihua? (He placed a stone on the sand and as he chanted, the stone entered and exited the ocean and turned into a turtle.)

7. Have students illustrate the story of ʻAiʻai's Visit to Lānaʻi and label the names of shorelines and other important geographic features on their ahupuaʻa diagram.

- Project the Lānaʻi Ahupuaʻa Labeled Map as a reference for students.
- Orient students to the ahupuaʻa by discussing its location on the island.
- Label Kaunolū, the shoreline described in the student reading. Point out ahupuaʻa boundaries and explain that Kaunolū is an ahupuaʻa that spans across the island, covering both leeward and windward sides of the island.
- Label Kaʻena, Polihua and the boundary that the ahupuaʻa of Paomaʻi and Kaʻā.

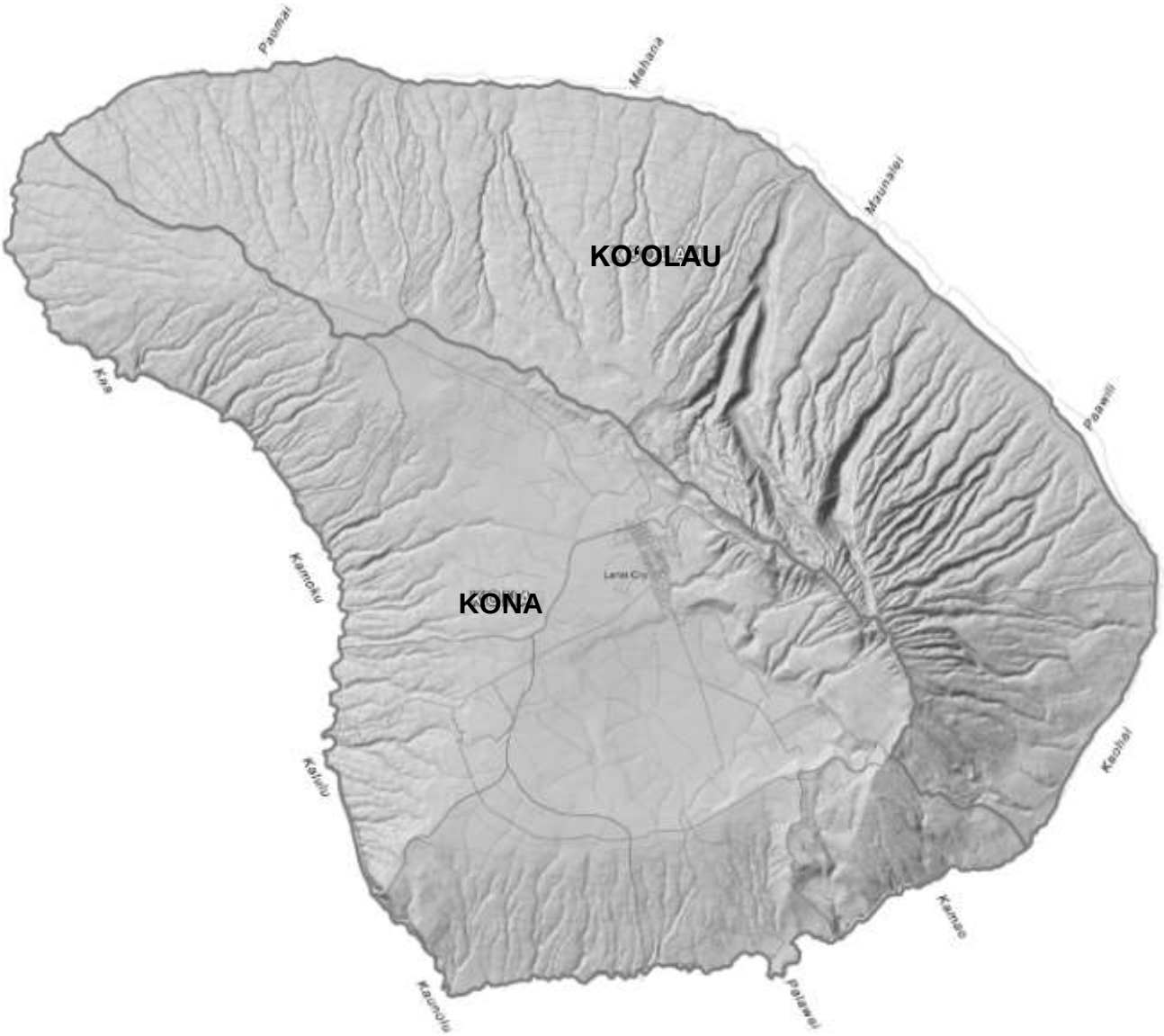
8. Complete the K-W-L chart by asking students to record what they learned about the ahupuaʻa and early Hawaiian life.

9. Assess students' ahupuaʻa diagrams and reading responses.

Adaptions/Extensions

Have students listen to the oli, Mele Mokupuni o Lānaʻi, and read along with the words that are located in Appendix 1 – Mele Oli. Have the students identify place names and other familiar words in the oli and discuss their significance.

Our Ahupua‘a
Lāna‘i Ahupua‘a Mokuoloko Map



Our Ahupua‘a

Learning Log 1 –
Mapping An Ahupua‘a

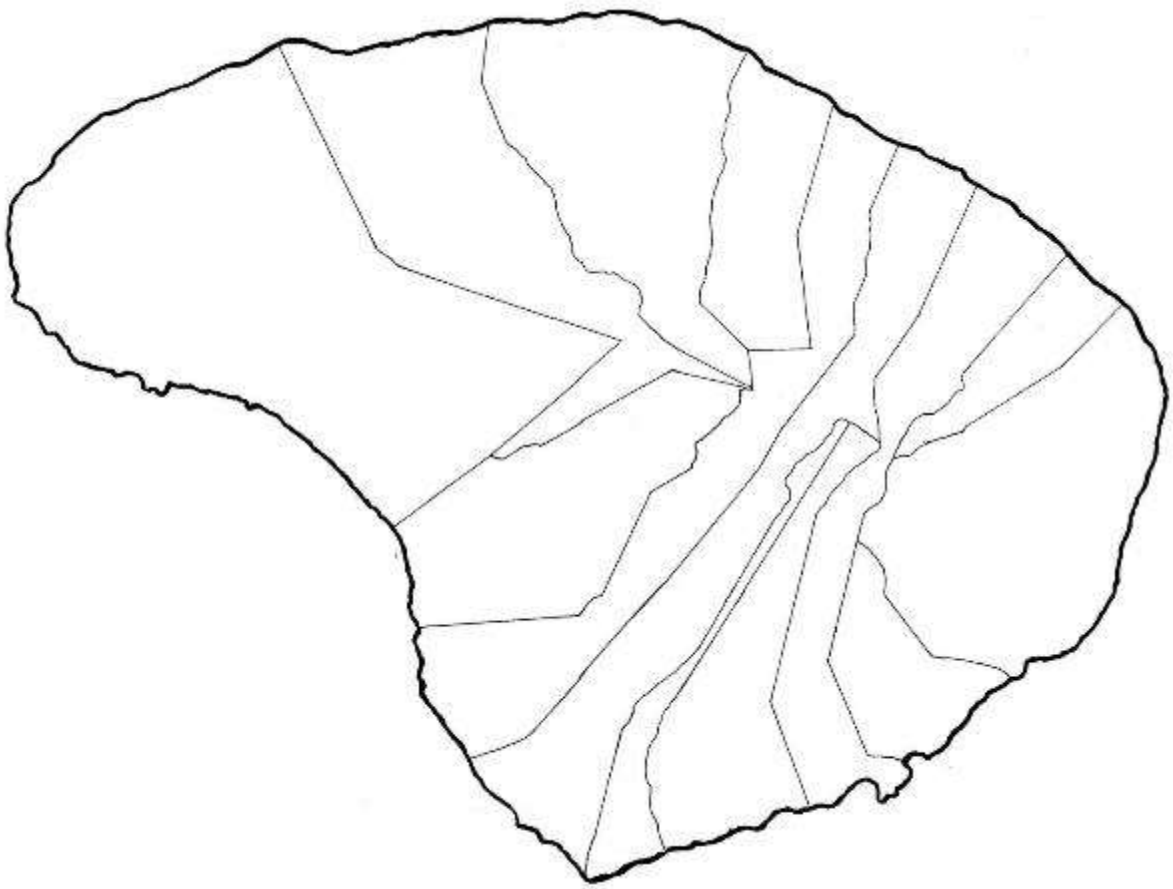
Name_____ Date_____

1. Create a poster-map by tracing your teacher’s projected image onto chart paper.

2. Return to your desk and:

    - Label the names and boundaries of the different ahupua‘a on Lāna‘i
    - Label significant Hawaiian place names and locations that you are familiar with, including where you live
    - Color code mokuoloko areas. Use green for ko‘olau and red for kona. Be sure to label the names of these areas too.

3. Below, write one or two paragraphs about where you live within your ahupua‘a. Be sure to include the words ahupua‘a, mokupuni, mokuoloko, and place names in your writing.

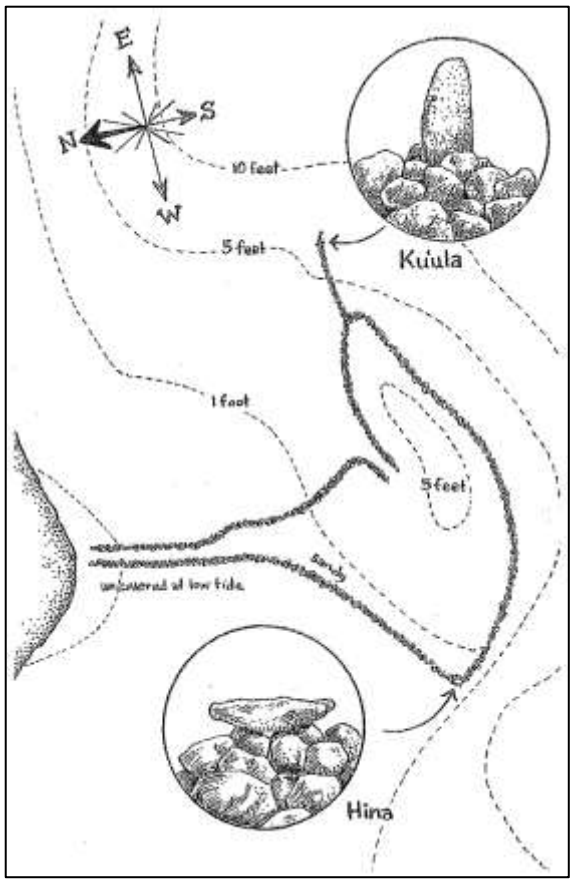


Our Ahupuaʻa

Student Reading 1 –
ʻAiʻai's Visit to Lānaʻi

ʻAiʻai was the son of Kūʻulakai and Hina. Kūʻulakai and Hina were gods of fishing and as ʻAiʻai grew up in Hāna on Maui, he became an excellent fisherman. He was known for building shrines dedicated to his father called kūʻula, where prayers were offered to promote the abundance of fish and give thanks for successful catches. He also traveled around the islands dedicating koʻa (fishing stations on land and in the sea). Like his parents, ʻAiʻai had supernatural powers. When he got older, he traveled around the islands sharing his knowledge of fisheries with the people.

After a visit to Kahoʻolawe, ʻAiʻai went to Kaunolū along the southern coast of Lānaʻi. There, he used his pāuhi (as supernatural pearl fishhook) to catch aku. Aku typically live in the deep sea, but ʻAiʻai's prayers and pāuhi made it possible to catch aku along the cliffs of Kaunolū. At the front of the cliffs is a rocky peninsula that juts out from the shore. It is named Kāneʻāpua for a deity who established a fishing shrine there as a place for offerings to encourage more fish to Kaunolū.



From Kaunolū, ʻAiʻai went on to Kaʻena in the ahupuaʻa of Kaʻā. When he was on the shore, he took a stone and carved a figure on it. He placed it on the sandy beach and called out to the spirits of his parents. While he was chanting, the stone moved toward the sea and eventually disappeared under the water. He continued to chant and when he was finished, the stone reappeared and moved toward him until it reached its original position. At that moment, the stone transformed into the first turtle to touch Hawaiian shores. Today, a long stretch of sandy beach within the ahupuaʻa of Kaʻā is known as Poli-hua (cove of eggs) and it is because of ʻAiʻai that turtles were brought to Hawaiʻi and are said to go up on this beach to lay their eggs then return to sea.

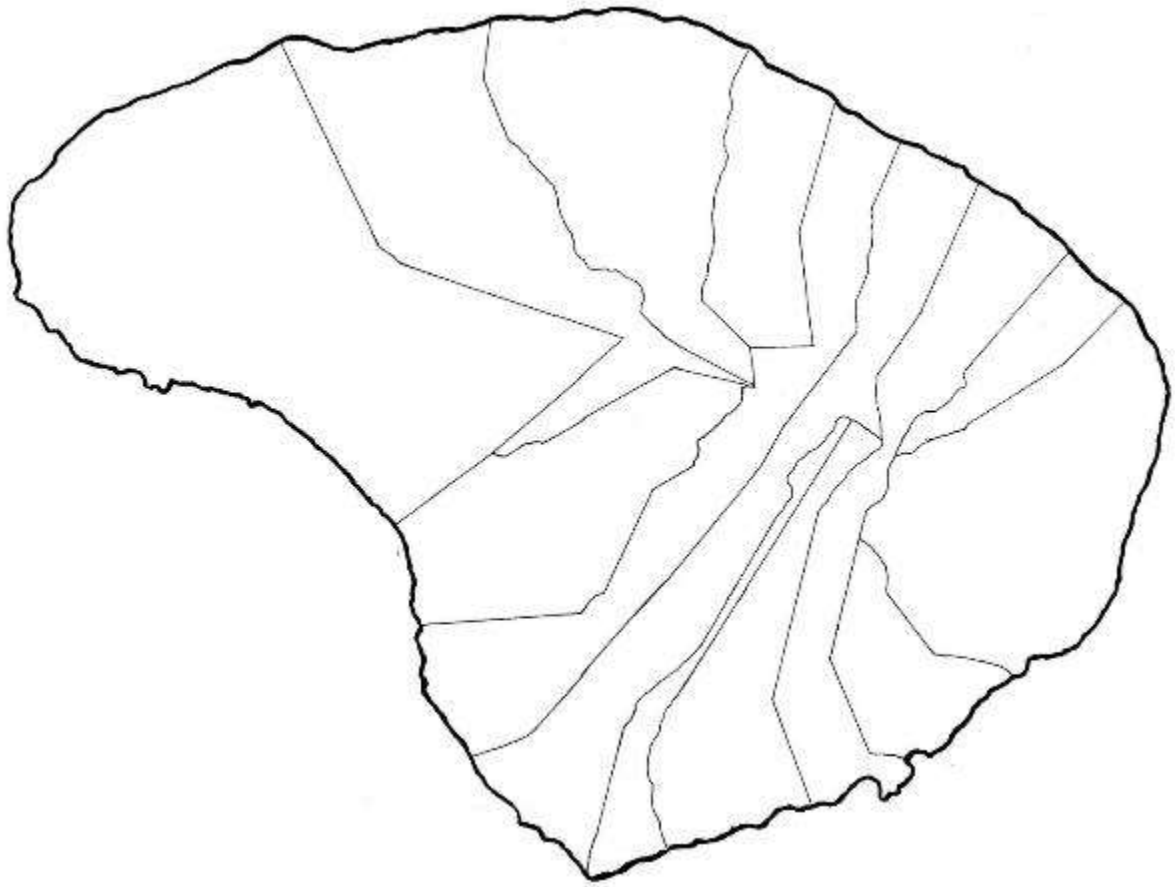
Our Ahupua‘a

Learning Log 2 –
‘Ai‘ai’s Visit to Lāna‘i

Name_____ Date_____

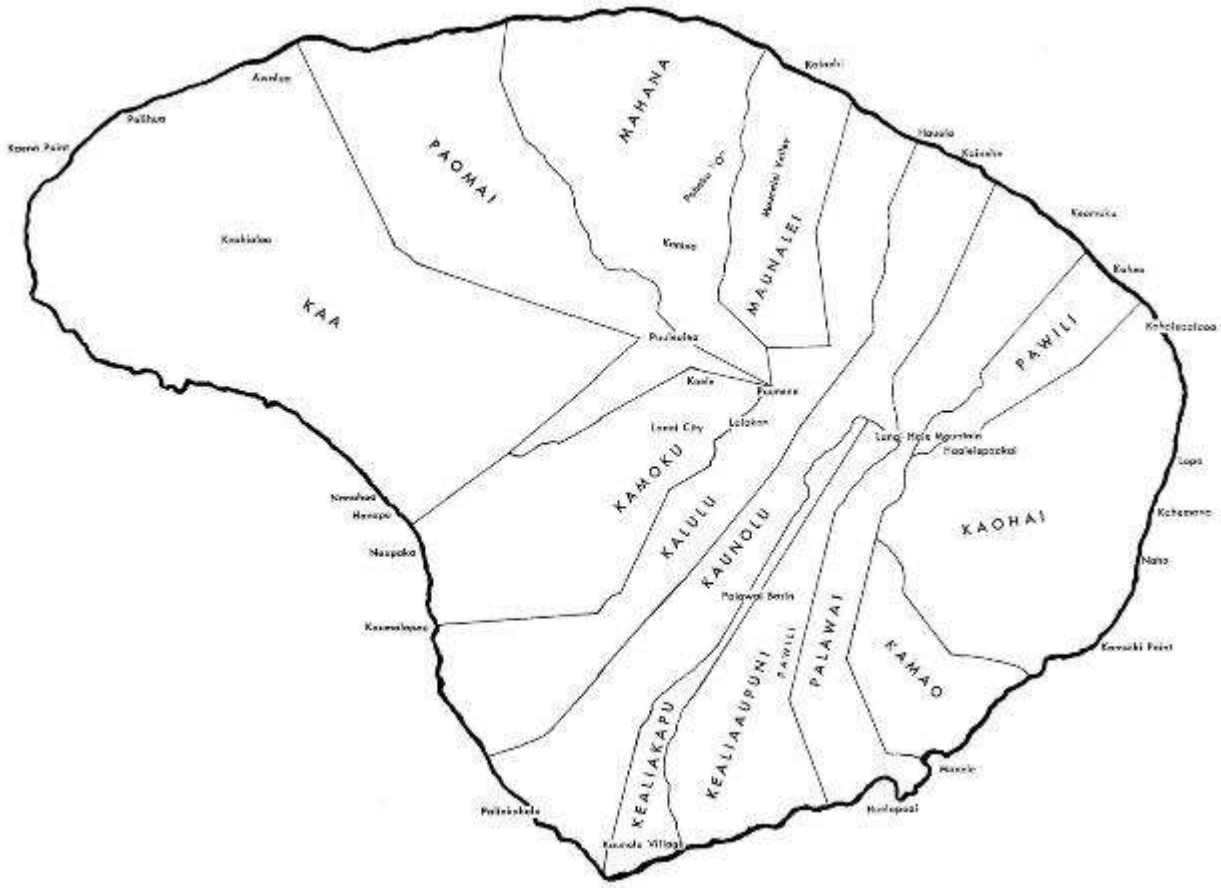
Using the map below, label places that were mentioned in the story of ‘Ai‘ai Visits Lāna‘i. Think about the characters and setting of the story. Was there a timeline of events? Were significant places mentioned that you may recognize?

On the back, write at least one paragraph explaining the timeline of events and mention where these events occurred within the story.



Our Ahupua‘a

Lāna‘i Ahupua‘a Labeled Map



GRADE 4 LESSON 2 – THE CASE OF THE STRONGEST CORD

Why was cordage valuable in old Hawai‘i and what properties make cordage strong and flexible?

Key Concepts

- Hawaiians depended on plants and other natural resources in the ahupua‘a for survival.
- Strong cordage was made by twisting plant fibers together, and specific plants were used for their strength, stretch and “non-slip” qualities.

Activity at a Glance

Students discover the value of cordage in old Hawai‘i. They make cordage from a variety of plant fibers, form hypotheses, and design experiments to test the strength and flexibility of various types of cordage.

Assessment

Students:

- “Manufacture” cordage by twisting, and/or braiding natural fibers.
- Form hypotheses and design and carry out experiments to test the strength and flexibility of cordage.
- Explain how standard units of measuring were important when testing the strength and flexibility of different cordage.
- Describe a typical day in the economic life of a Hawaiian in the ahupua‘a system, including a reflection on the value of cordage in old Hawai‘i.

Time: 7 - 8 class periods

Skills

Following directions, conducting investigations, measuring, twisting and braiding plant fibers to make cordage, using scientific methods, predicting outcomes, collaborating in a cooperative group.

Materials

Provided:

- cordage research stations handout
- Student Readings 2, 3 and 4
- cordage testing handout
- Learning Logs 3 and 4
- cordage-making instruction sheets

Needed for research:

- reference books on early Hawaiian life (see Resources at end of this lesson)
- index cards (for students to take notes from readings)
- Post-it® Notes (for students to flag illustrations of cordage examples)

Needed for cordage science investigations:

- raffia (for each student)
- a variety of plant fibers (coconut husks, hau bark, grasses and ti leaves)
- a variety of weights (such as dumbbell and barbell weights, rocks, books, bags of rice, bags of sand)
- a heavy-duty spring scale (30 kg), triple beam scale, bathroom scale or other scales for measuring weight
- bucket with a strong handle
- dowel (such as broom stick, from which to hang spring scale and weighted bucket)
- extra string or twine
- rulers
- sandpaper

Advance Preparation

- Make a copy of the cordage research stations handout for each student (optional).
- Make a copy of the student readings and the Learning Log sheets for each student.
- Make a few copies of the cordage-making instructions to share with students.
- Gather resource books on life in old Hawai‘i, especially with illustrations showing different ways that cordage was used (fish hooks, fish line, fish nets, houses, canoes, weapons, musical instruments, games, feather work, basketry, and tools such as the adze).
- Purchase a bag of raffia.
- Gather a variety of plant fibers (coconut husks, hau branches, grasses, ti leaves).
- Assemble materials needed to test the strength and flexibility of cordage—a variety of weights, scales for measuring weight, buckets with strong handles, rulers, and extra string or twine.
- See Teaching Suggestion 6 for advance preparation of fibers.

Vocabulary

- ‘aha – sennit or cord braided from coconut husk fibers
- cordage – string, rope and twine made from natural plant fibers; cordage was a valuable trade item in old Hawai‘i
- economy – activities related to the production and distribution of goods and services in a particular geographic region
- hau – an important plant in Hawai‘i; plant of the hibiscus family. Cordage made from the inner bark was used to carry water gourds, tie sandals on the feet, sew kapa (bark cloth) bed sheets together, fasten the covers of lau hala (pandanus leaf) baskets, and bundle rolls of kapa or lau hala.

- niu – the coconut tree; fibers from the coconut husks were twisted into strong sennit called ʻaha. Some of the uses of ʻaha were as lashing in canoe-building, net-making for calabashes and to fasten the handle to an adze.
- olonā – the inner bark of this small Hawaiian tree provided the strongest cordage in Hawaiʻi used for fish lines and fish nets and nets for feather capes and feather images.
- tensile – capable of being stretched
- ply – a strand or layer of material
- technology – the ways in which people use natural resources for their needs and wants

Teacher Background Information

Background information is provided in the student readings that accompanies this lesson. Excellent information about cordage in old Hawai‘i is available in the Resources suggested at the end of this lesson, especially, Lā‘au Hawai‘i: Traditional Hawaiian Uses of Plants by Dr. Isabella Abbott.

Teaching Suggestions

1. Show students how to research Hawaiian cordage. Distribute the cordage research stations handout to each student if you set up stations (optional).

- Challenge students to use resource books, magazines and computers to find examples of how cordage was used in old Hawai‘i.
- Distribute index cards for notetaking and teach students how to cite their source and take notes. Require students to complete up to four index cards with a different cordage example on each card. (Refer students to the sample note cards shown on the cordage research stations handout.)
- Alternatively, provide small groups with a large piece of chart paper and colored markers, and have students record their discoveries through illustrations and/or webs.
- Collaborate with your school librarian!

2. Share and summarize what students discovered about cordage in old Hawai‘i.

- Have students conduct small group discussions of their findings or share their discoveries with the whole class.
- Students could tape their index cards onto the wall in different categories.
- If students have worked on large pieces of chart paper, post these on the wall and have a spokesperson from each group share their “poster.”
- Summarize what students have discovered in a large class discussion, and/or by having individual students write a brief reflection about what they have learned.

3. Pass out Student Reading 2 and have students read and discuss the mo‘olelo, Māui Snares the Sun.

- Ask students to summarize how Māui used cordage to snare the sun.

4. Send students on a cordage “scavenger hunt” and assign Student Reading 3.

- Instruct pairs or small groups of students to find one sample of modern-day cordage on the school campus (such as thread, string, twine, yarn, rope, fishing line) and bring it back to class. Students may do this at recess by visiting different classrooms and asking teachers for a small sample. Alternatively, ask students to bring samples from home.
- Add an exercise on measurement by requiring that all samples be 12 inches long (or any other length you choose).

5. Display cordage samples and plant fibers and discuss the student reading.

Discussion Questions

- How is cordage made? What differences can we observe in modern-day cordage?
- How was cordage made in old Hawai‘i?
- Direct students' attention to sections on making cordage in the student reading. Instruct students to identify methods of preparing niu (coconut) and hau fibers for cordage-making. (Both need to be soaked in water for at least a couple of weeks.)

6. Prepare raw fibers of niu (coconut) and hau for cordage-making.

- Demonstrate how to peel the bark off of hau branches (using an ‘ōpihi shell, nail or knife). Invite students to try peeling the bark themselves using shell or fingernails.
- Let students try separating individual niu fibers from the husk.
- Soak niu and hau in buckets of cold water for two to three weeks. Change water daily to prevent the fibers from rotting.
- You may want students to take niu and hau fibers home to soak in water, or you may want to soak fibers a couple weeks in advance so that students can get right to cordage-making.

7. Make cordage! Refer to the Student Cordage-making Instruction Sheet provided with this lesson, or let students explore their own techniques.

- Give each student a single strand of raffia and let students try to break it. Ask if they would want to sail in a canoe lashed together with raffia? How could they make stronger cordage from raffia?
- Use raffia to practice cordage-making techniques.

Making Cordage from Raffia

- Give each pair of students two strands of raffia tied together at one end.
- Have one student hold the knot and have the other student twist the fibers in the following way:
    - Roll both strands to the right 3 times
    - Then cross one strand over to the left 2 times
- Continue this rolling and crossing to make the cordage.
- Have pairs switch jobs after a few minutes so that everyone experiences making cordage.

- Challenge students to test the strength of their cordage through pulling contests!
- Challenge students to make their own cordage from niu, hau or other natural materials such as grasses, sedges, vines and ti leaf.
- Discuss why it is important to soak, pound, separate and dry fibers for cordage-making.

8. Introduce the cordage science investigation.

- Challenge students to think of factors affecting the usefulness of cordage for a variety of tasks in old Hawai‘i (for example, net fishing, line fishing, canoe-building, hauling logs, house construction, lashing tools and weapons).
- Lead students to identifying the following factors: breaking point (tensile strength), knot strength, stretch, abrasion resistance and water resistance. All of these can be tested with simple experiments in class.
- Display the pieces of cordage that students made and ask students to think of questions they would like to answer or problems they would like to solve using the hand-made cordage.

Some examples of problem questions: What I wonder...

- Which is stronger, 2-ply hau cordage or 2-ply niu cordage?
- What is the difference in breaking point between twisted cordage and braided cordage?
- How much does cordage made from coconut fiber stretch? How does it compare to the stretch of hau fiber?
- Which is more abrasion-resistant, hau or niu cordage?

9. Distribute Learning Log 3 and review scientific procedures.

- Show students how to write a testable hypothesis.

10. Challenge students to devise methods of testing cordage (breaking point, knot strength, stretch, abrasion-resistance).

- Display all of the materials that students could use in cordage science investigations. (See Materials list.) Encourage students to devise their own testing methods using standard weights and measures.
- Assign Student Reading 4, “How to Test Cordage.” This will give students more guidance in devising cordage-testing devices.
- Discuss why it is important to use standard units of measurement when testing cordage.

Simple Cordage Testing Methods

- Hang weights to finished cordage. Gradually add more weight until the cordage breaks and record how much weight it held before breaking. NOTE: Cordage is strong and will hold substantial weight! Use a heavy-duty/30-kg spring scale, bucket with a strong handle, and weights from a weight set! Use cordage to hang the bucket from the spring scale. Add weights into the bucket until the cordage breaks. Alternatively, add objects into the pail and weigh the pail on a bathroom scale at cordage breaking point. **Be sure to have students keep their feet away from the area where the bucket will fall!**
- Test the stretch of cordage by measuring the length of cordage before and after hanging weights from it. Try this with both wet and dry cordage pieces.
- Hang a heavy weight to a piece of cordage and drop the weight from a specified height. Repeat the drop test until the cordage breaks, record the weight and number of falls.

- Test for abrasion resistance by hanging a weighted piece of cordage over a rough edge (e.g., sandpaper) and passing the cordage back and forth over the rough surface. Record weight and the number of times you can pull the cordage back and forth before breaking.
- Test knot strength by hanging weights from pieces of cordage knotted together.

11. Allow students time to design and carry out their experiments, and to complete Learning Log 3. You may want to assign a final science report or display.

- Group students into science investigation teams of 3 to 4 students per team. Instruct students to design and carry out their cordage science investigations.
- Show students how to record data using a data chart. Display a sample data chart on a large piece of chart paper posted in the room.
- Assess students' ability to create and/or describe a testable hypothesis and an experimental procedure to test it.
- Also assess how students describe the need to use standard units of measurement.

12. Summarize what students have learned in this cordage activity and have students complete Learning Log 4.

The Case of the Strongest Cord: Student Cordage Research Stations

Let's Find Out! How was cordage used in old Hawai‘i?

You will be assigned a group (A, B, C or D) and visit 4 different stations with your group (10 minutes per station). At each station, find pictures showing how cordage was used in old Hawai‘i. Pick one cordage example at each station to record on an index card. Complete your index cards following the instructions and samples below. You are required to complete four index cards total!

We'll rotate in four rounds:

	Round 1	Round 2	Round 3	Round 4
Computers	A	D	C	B
Table 1	B	A	D	C
Table 2	C	B	A	D
Table 3	D	C	B	A

On your index card, include source and information such as:

What is the example?
What is it used for, or how is it used?
Who used it?
Draw a simple sketch.

Example index card notes for a book:

Dunford, Betty. (Year published). *The Hawaiians of Old*. The Bess Press. Honolulu, HI. pages 95-96.
Example: gill nets
Used to: catch fish
Used by: fishermen

Your sketch here

Example index card notes for a Web site:

www.primitiveways.com/olona.html (today's date)
Example: thread/*olonā* cord
Used for: lei-making
Used by: crafter/hula dancer

Your sketch here

The Case of the Strongest Cord

Student Reading 2 –
Māui Snares the Sun

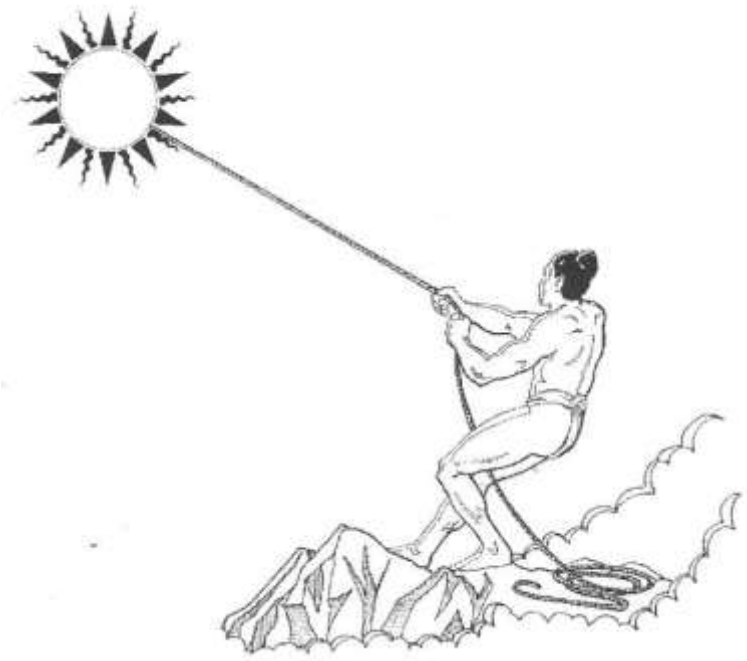
In this moʻolelo about the demi-god Māui, what is the importance of cordage in the story? Where does this story take place?

Māui the demi-god (part god, part human; possibly a human with superhuman strength) was the son of Hina. They lived in Kahakuloa, near Waiheʻe, Maui. Hina made kapa (traditional Hawaiian cloth made of bark). Every day, Hina pounded her kapa and set it out to dry. But the sun traveled so quickly across the sky! By the time Hina finished laying her kapa out, it was soon time to pick it up and bring it inside for the night.

Hina complained to Māui that her kapa could not dry because the sun traveled too fast across the sky. Māui wanted to help his mother. He observed the path of the sun from ʻĪao (Mauna Kahālāwai). He found that the sun passed directly over the other large mountain across the plain.

Māui then went to Paeloko in Waiheʻe. There, he cut down niu (coconut) trees and gathered up the plentiful coconuts. He broke open the coconuts and cleaned the fibers together to make ʻaha (strong cord made of coconut husk).

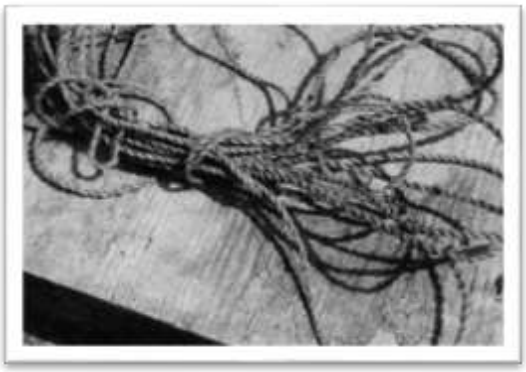
Once Māui finished braiding his ropes, he climbed the large mountain and waited for the sun to rise. He made a lasso with the ropes. When the sun traveled over the mountain, Māui threw his strong cordage up into the sky and used his ʻaha to snare the sun. The sun, once captured, agreed to slow his motion during the summer but not during the winter. The place where Maui captured the sun is named Haleakalā, “the house (hale) of the sun (lā).”



Adapted from A.O. Forbes’ Legend of Maui – Snaring of the Sun, Hawaiian Annual for 1881; as reported in E. Sterling’s Sites of Maui.

The Case of the Strongest Cord

Student Reading 3 – Preparing Cordage



How would you build a house without nails or secure things without screws or strong glue? Early Hawaiians were skilled at constructing many things using cordage (string and rope) made out of fibers from plants. The cordage was used to fasten, bind, lift and pull things. For example, instead of building a house using nails, Hawaiians used cordage to construct their houses of wood and pili grass. Hawaiians made tools, nets, fish lines, fish hooks, musical instruments, games, weapons and more using cordage. Their feather capes, helmets, and containers were made with cordage. They even hauled huge koa logs down the mountain to hālau waʻa (canoe house) in Hulopoʻe and Kaunolū using ropes made from plant fibers.

Niu husks make some of the best cordage and this cordage is called ʻaha. It was used in canoe-building because it does not slip and it gets tight when wet. Samuel Kamakau, a native Hawaiian historian who lived in the 1800s, wrote that when building a canoe "half the task was in making the coconut cordage" (Kamakau, 1964). What did he mean?

Hawaiians made fishnets and fish lines from strips of bark from the olonā plant because it is resistant to water and does not stretch. When Western sailors first came to Hawaiʻi, they discovered the strength of olonā cordage. They encouraged Hawaiians to manufacture a lot of it and the cordage became a valuable trade item. In fact, well-made cordage was one of the most valuable trade items in early Hawaiʻi. It was so valuable that those who grew the plants did so in a secret location. The olonā farmer was one of the wealthiest. Besides niu and olonā, hau, ʻukiʻuki, lāʻī and ʻākia were also used for cordage, depending on the purpose or planned use of the cord. Do you know where these plants could be found on Lānaʻi?

Before twisting or braiding fibers to make cordage, the plant fibers must be prepared. The husks of niu are soaked in salt water then pounded, cleaned, separated and dried. Preparing olonā fibers also takes time and skill. Hawaiians used shells to scrape strips of olonā on long hardwood boards. Hau bark, another plant fiber used to make cordage for nets, bowls and gourds, also had to be peeled and prepared.

Information about how to make niu cordage and hau cordage can be found on the Polynesian Voyaging Society Web site in an article entitled Plants Used for Building Canoes (Babayan et al., n.d.). Sections of that article are adapted and reprinted below with permission from Polynesian Voyaging Society.

ʻAha (Sennit) – Made from Coconuts
People have made and used cordage for centuries. It has been used to attach one object to another and to lift, pull, or secure things into place. Cordage is useful as well as decorative. ʻAha (coconut sennit cordage) is still being made in many places in the Pacific. Both the green and dry husks of the coconut are used.

Polynesian Methods for Preparing Cordage Fibers

Method 1

Break the husk apart into sections. Turn over each section to expose the slick outer skin.

- Pound this outside portion, breaking the inner fibers away from the outer skin.
- Soak the sections in sea water for several weeks, then remove the long fibers to use for making cordage.

Method 2

- Break the husk apart. Remove some of the long fibers.
- Soak the fibers in sea water for eight weeks.

Pacific Islanders who use the green husk remove the long fibers by pulling the husk apart and working the fibers into cordage.

Sennit used for canoe lashing must have a very tight braid and is extremely difficult to make. Because of the roughness of the fibers, only a few lengths can be made in a day.

Several different kinds of cordage were used throughout Hawai‘i and the Pacific region. Bark from the hau (hibiscus) was easier to work with than coconut fibers. Hau bark strips are longer and when braided or twisted are very strong. Hau cordage was used for securing items such as ‘umeke (bowls/calabashes), or rolls of kapa (bark cloth) or lau hala (pandanus leaf).

Making Coconut Cordage (Sennit)

1. Husk mature dry coconuts and break into 8 to 10 sections. Remove shorter fibers next to outer shell, at both ends of the husk, and discard.

2. Soak sections for two weeks, or until they are easy to work. Soaking fibers in running water helps in the cleaning process. Weigh them down with a brick or stone when soaking.

3. Remove sections. Work sections by twisting or use table edge and press sections over the edge; peel and discard outer skin.

4. Beat each section with a wooden mallet. Use a piece of hard wood or a flat stone for an anvil.

5. Start beating. Beat sections starting from the center and working to the edge. Turn section around, repeat process to remove extra matter.

6. Rinse to “separate chaff” from fibers. Shaking the bundle helps to remove the “chaff.” Tools like shells or a strong comb help in removing extra material. Work through fibers. This process cleans and untangles fibers. Tie each section around the middle. This is for easy handling.

Making Hau Cordage

1. Ask an adult to help you cut a hau (hibiscus) branch. Select a straight branch with few branch scars.

2. Ask an adult to help you strip the outer bark (bast) using a sharp instrument (ōpihi shell or knife). **Do not use a knife without adult assistance!** Peel the bark away from the branch.

3. If fine cordage is desired, scrape off the outer bark.

4. Soak the bark in water for about a week. Running water such as in a stream would work best. You can also place the fiber in tap water. Change the water every few days to prevent the bark from rotting. The object of soaking is to soften the fibers so they can be separated into layers.

5. Take strips of the material and braid or twist to make cordage.

- Take three strands of fiber, start each one about one inch from the other.
- Place right palm over fibers. Place fibers on your leg.
- Firmly roll the fibers downward towards your knee.
- Keep adding fibers to lengthen the single fiber thread.

Another Method for Making Hau Cordage:

1. After all the fibers are cleaned, tie 15 fibers together with a knot. This will be used to make cordage.

2. Divide the fibers into three groups of five fibers. It is better if the groups of fibers are not the same length.

3. The knot may be held between your toes or tacked at the edge of a table. Braid the fibers.

Before you reach the end of a fiber group, add in a new group of 5 fibers. Individual fibers may also be spliced in as needed.

Cordage Making Instructions

Finger Twinging Method

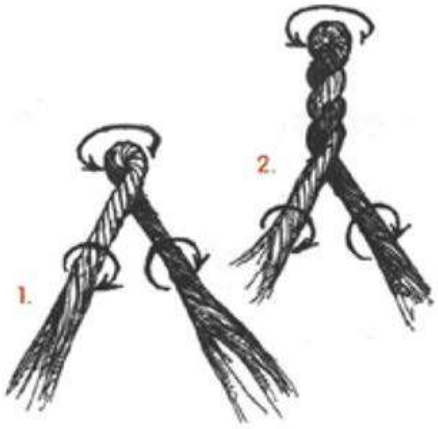
1. A bundle of plant fiber half the thickness as the finished cordage was prepared.

2. Both hands were placed one third from the ends of the fiber bundle. There would be six to twelve inches of fiber between the hands.

3. The fiber bundle was twisted (twined), in a clockwise direction, using both hands. See image above. Twisting the fibers tightly made a single, even strand of cordage.

4. After twisting, a kink would form in the middle of the strand. See image above.

5. As the twisting continued, the kink brought the single strand together and made a double cord. (See numbers 1 and 2 in image at right.)



6. Twining the fibers in a clockwise direction produced a S-twist to the strand.

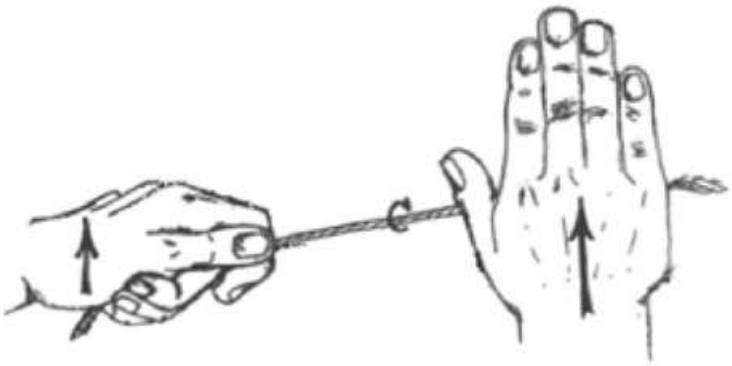
7. Twining the fibers in a counter-clockwise direction produced a Z-twist.

Leg Rolling Method

1. The leg rolling method was started with a few plant fibers.

2. Using the right hand, the fibers were rolled under the palm against the right thigh.

3. Rolling was done with a pushing motion towards the knee. This made a one-ply strand with a S-twist

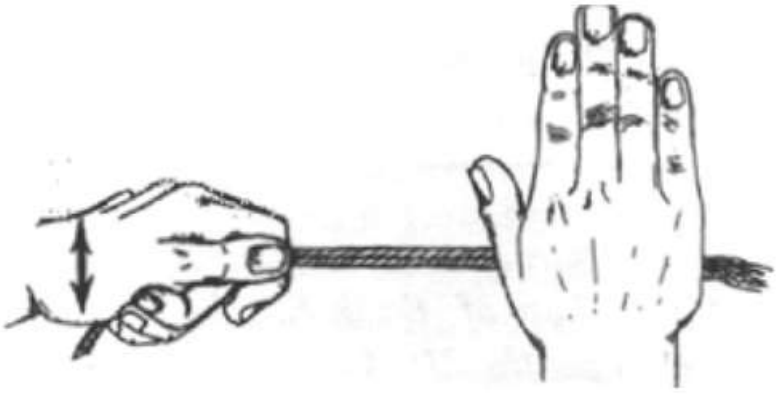


4. More plant fibers were taken and twined with the same method.

5. Then the two sections of cordage were held together with the left hand.

6. The right hand pulled the two strands together towards the hip.

7. Pulling the strands together towards the hip made a two-ply cord with a Z-twist.



Splicing to Lengthen Cordage

A problem with making cordage was that the fiber lengths were too short for the production of long strands of cordage.

Splicing in new lengths of fiber made long strands of cordage possible. Splicing is a technique where, before the first strand of fibers had run out, new fibers were added into the twining process.

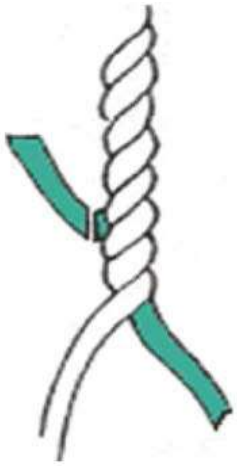


Figure 1: Using either the finger method or the leg rolling method, the strands of fibers were twined until three to six inches remained. Somewhere between three to six inches from the end, a new strand of fibers was placed parallel with the original. These new fibers overlapped an inch or two beyond the cordage.

Figure 2: The new strand was twined in with the original.

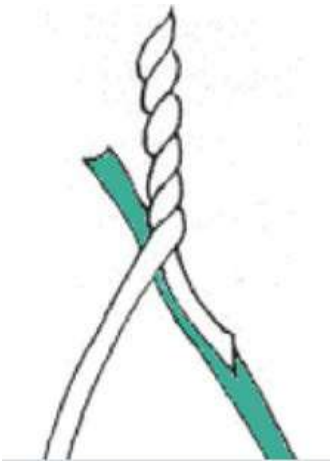


Figure 3: The twining continued as before. The excess overlap fibers were cut or clipped so that the cord was smooth and strong.

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The Case of the Strongest Cord

Learning Log 3 –
A Scientific Investigation

Name_____ Date_____

A. Problem: (What I want to find out)

Hypothesis: (If… then… because…)

B. Materials: (What I used to do this investigation)

C. Procedure: (Step-by-step directions for what I did)

D. Data: (What happened, my results)

E. Analysis of data: (True statements about my data)

F. Conclusion: (What the answer to my question is, and an explanation of the outcome)

G. Measurement: Explain how you tested the strength and flexibility of your cordage. Why was it important to use standard units of measuring when comparing different types of cordage?

The Case of the Strongest Cord

Student Reading 4 –
How to Test Cordage

People use cordage (rope, string, line) for many purposes such as in fishing, boat rigging, carrying loads, climbing, hauling and lashing. Picking the right cordage for the right job requires knowledge of tensile strength (or breaking strength), stretch, flexibility, abrasion resistance and durability. If you will be using the rope with your hands, then the way the rope feels in your hand is important too!

Rope manufacturers use special machines called tensile test machines that pull rope in opposite directions. The machine records the breaking point of the rope—we can think of the breaking point in kilograms or pounds of force on the rope. We do not have a tensile test machine, but there is another way we can test breaking point of cordage using scales and weights. Can you design a testing device in class?

Climbers test rope strength using a drop test. Climbers want to be sure their safety lines will hold their weight in case they fall! For a rope to pass the drop test, it must not break after five test falls. A weight is attached to the rope and the rope is dropped a specific number of meters. Can you design a drop test for our cordage materials in class?

To test for abrasion resistance, the cordage needs to rub against a rough surface. You could pass a length of cordage over sandpaper fixed to the edge of a desk, load the cordage with a weight, and then rub the cordage back and forth across the edge. Record the number times you rub the cordage back and forth before it breaks.

Another important quality to think about is knot strength. How well does your cordage hold a knot? Test this by knotting two pieces of cordage together and loading the cordage with weight. Be sure to use the same knot for each trial of an experiment. Does wetting the cordage affect knot strength? How?

To discover how much cordage stretches, measure the length of your cordage. Then tie a weight to the cordage, allow the cordage to hang for a set amount of time, and then measure the length of cordage again. What is the difference in length before and after hanging weight to the cordage?

- What would you like to find out about cordage? Decide on one or two variables you would like to test and design an experiment using Learning Log 3 to guide you.

The Case of the Strongest Cord

Learning Log 4 –
A Day in the Life of Old Hawai‘i

Name_____ Date_____

Imagine you live in old Hawai‘i. Think of all the ways you rely on cordage for daily living. Answer the following questions:

- Where in the ahupua‘a would you live to be able to find materials for making cordage?
- What would you do each day? Would you need cordage for any of your activities?
- What materials, foods and supplies would you need to survive, and where would you get them?
- What kind of trading would you do with other people and why would you trade?

Use your ideas to complete a pre-writing exercise. Then write a short essay that describes a typical day in the life of a Hawaiian in the ahupua‘a system. Be sure to include information that you learned about cordage in old Hawai‘i.

GRADE 4 LESSON 3 – ENGINEERING INGENUITY

How did Hawaiians engineer shoreline fishponds to grow fish while maintaining water quality and preventing siltation?

Key Concepts

Hawaiians constructed ʻauwai kai (channels) in the walls of shoreline fishponds to create currents that circulated water and attracted fish with each tidal change. They placed mākāhā (sluice grates) in the ʻauwai kai to trap fish. The circulation of water in the pond aerates the pond with oxygen and flushes out excess sediments and nutrients that can accumulate to unhealthy levels.

Activity at a Glance

Students build model fishponds in shallow pans and experiment with changing water levels outside the pond wall to simulate what happens with the rising and falling tides.

Assessment

Students:

- Sketch a loko kuapā and diagram how the flow of water through the mākāhā at both rising and falling tides affects water quality and pond life.
- Describe their observations after working with a fishpond model and the inferences that they make from those observations.
- Write a one-paragraph display label with a clear topic sentence describing the technology of Hawaiian fishponds.

Time: 1 - 2 class periods

Skills

Modeling, reasoning, interpreting

Materials

Provided:

- Kāhea Loko video
- Learning Log 5
- Student Reading 5

Needed (per group of students):

- small foil pan
- 1 block modeling clay
- toothpicks or popsicle sticks
- cordage from Lesson 2 (or use raffia or florist wire that can be cut with scissors)
- 2 cups clear water

- 2 cups water, colored blue
- empty 2-liter soda bottle or other container for water
- 2 to 3 feet of flexible tubing or meat baster
- yellow food coloring
- 15 small leaves (to represent large fish)
- oregano or other spice (to represent small fish)

Advance Preparation

- Make a copy of the Learning Log and student reading for each student.
- Gather the materials for student groups to create models.

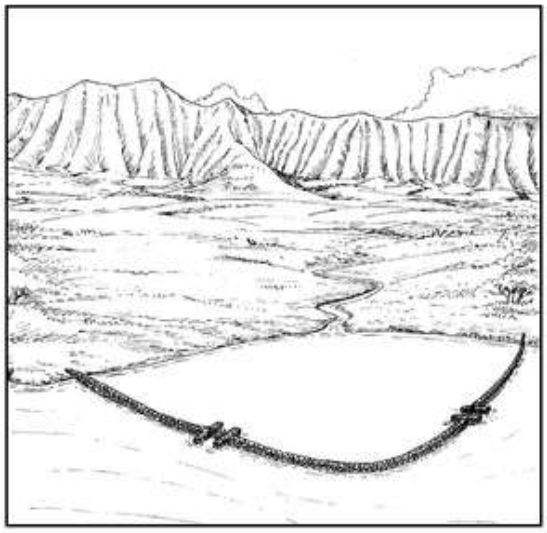
Vocabulary

- ʻauwai kai – ditch connecting the fishpond to the sea (Kikuchi, 1973)
- ʻauwai o ka mākāhā – the ditch of the sluice grate (Kikuchi, 1973)
- circulation – the moving or flowing of something from place to place or in a circle
- inference – the act of drawing a conclusion based on observations or evidence
- ingenuity – cleverness or skillfulness of conception or design
- kahuna – priest or expert
- lama – all endemic kinds of hardwood ebony trees (*Diospyros*)
- loko kuapā – shoreline fishpond with an outer seawall of rock and coral built on reef flat; a fishpond whose main characteristic is an outer rock seawall with a rock-lined
- loko puʻuone – fishpond with a natural sand bank separating the pond from the sea
- mākāhā – sluice grate
- nutrient – matter that sustains a living organism and promotes growth
- nutrient flushing – the washing away of nutrients
- ʻōhiʻa ʻai – mountain apple tree
- siltation – to become filled or choked with silt
- sluice – an artificial channel for conducting water, often fitted with a grate for regulating the flow of water and removing solid matter
- stagnation – to become stale or foul from standing, as a pool of water

Teacher Background Information

The Hawaiian fishpond of the loko kuapā style is unique to Hawai‘i because of two features: the ‘auwai o ka mākāhā (Kikuchi, 1973) / the ‘auwai kai and the mākāhā. Hawaiians created these innovative structures by building massive stone walls that extended onto the reef flat. In these walls, they built ‘auwai kai (channels) that allowed the exchange of water with each changing of the tide. The tidal changes that occur each day are controlled by the gravitational pull of the sun and moon on the oceans. Our knowledge has evolved to the point where we can now predict when and how high or low the tide will be for any given day of the year, and we can access that information by simply looking at a tide calendar. During ancient times, the exact mechanism of tidal fluxes may not have been fully understood. However, ancient Hawaiians knew that the ebb and flow of the seas correlated with the phases of the moon around which they planned much of their daily activities related to planting crops and fishing.

The Mākāhā



Hawaiians knew that most fishes are attracted to currents that maximize their food intake, so the ‘auwai o ka mākāhā (ditches or channels) were constructed in the walls of the ponds to create currents with each tidal change. In this manner, fish could be harvested from either within the pond or from the ocean depending on which direction the current flowed as the tide changed. The fishpond mākāhā (sluice grate) and pond walls were designed to allow water circulation from the tides. They functioned like a “filter” to help control water circulation and prevent stagnation and the build-up of sediments, which is critical to maintaining a healthy, balanced fishpond ecosystem. The mākāhā was constructed of a wooden grate with pieces of wood spaced a half inch apart to prevent larger fish in the pond from escaping and small fish to enter (Uyemura, 2007).

The shallow depth of Hawaiian fishponds provided the optimal light conditions for plankton and limu growth. Limu and microscopic plankton provide food for the herbivorous fish grown in the pond: the ‘ama‘ama (mullet) and awa (milkfish).

Caring for the Pond

The kia‘i loko (fishpond keeper) cared for the pond, just as a farmer tends his pastures for cattle. The kia‘i kept the pond walls intact and checked for excessive limu growth and build-up of pond sediments. If the mats of limu in the pond grew too thick, the limu was thinned by hand. This helped to prevent the depletion of dissolved oxygen in the pond which occurs when large amounts of limu decay. If the bottom sediments of soil and decayed organic matter got too thick, commoners were called upon to help clear this layer of sediment. This is when they would have access to the fish and limu, otherwise reserved exclusively for the ali‘i. The sediments were stirred up and the pond was flushed as the incoming tide circulated in the

pond through the mākāhā, and the outgoing tide washed some of the sediment out to sea.

The ancient mākāhā, made from lama or ʻōhiʻa ai wood in the days of early Hawaiʻi (Kikuchi, 1973), did not have the movable water gates that appeared at the turn of the twentieth century. Therefore, the location of the different mākāhā in the early ponds was critical to water circulation. During the late 1800s, the Chinese and Japanese introduced separate water gates made from wooden planks of different sizes on the ocean side of the ʻauwai o ka mākāhā that allowed them to cut down the rate of water exchange and manipulate the plankton density. As with an aquarium of guppies that lacks filtration, fishpond water with no circulation will start to turn green in a few days. Excessive phytoplankton will grow due to the nutrients (excrement/fertilizer) that build up and deplete the oxygen in the water.

Teaching Suggestions

1. Introduce students to the essential question and the standards they will be working on. Introduce fishponds using Student Reading 5 and the video provided.

- If students have not seen the Kāhea Loko (Pacific American Foundation, 2003) introductory video, have them view it before conducting this activity.
- Have students read the student reading and discuss how the pond functions.

Discussion Questions

- What is the purpose of the ʻauwai kai (sluice or channel in the wall) and the mākāhā (sluice grate)?
  (The ʻauwai kai provides a current that attracts fish and during the incoming tide, it allows water to flow into the pond and circulate. During the outgoing tide, the sediments and excessive nutrients can be flushed out of the pond. The mākāhā, placed between the walls of the ʻauwai kai, traps the fish in the pond.)
- How was it easier to catch fish from a pond than in the open ocean?
  (Fish can be caught easily from a fishpond because the fish are concentrated into a confined area, unlike in the open ocean where the fish are widely dispersed. The fish tend to gather by the ʻauwai kai to swim toward the current that is created by the tides flowing through the channel to get nutrients. The fish can be scooped with nets at this location.)

2. Set up the fishpond model-building activity.

- Divide the class into groups of “agricultural engineers.”
- Explain to students that a prospective client, Kupuna Kuʻulei, is searching for an engineering firm to rebuild her fishpond. The fishpond has not been in use since her father passed away. It is 10 acres large and the pond is filling in with silt that washes

down from the stream that feeds into the pond. She has also been told that the water is becoming stagnant because nutrients are building up and depleting the oxygen in the water. The walls and the mākāhā have fallen apart and she needs to have the pond rebuilt. Kupuna Kuʻulei is requesting that each engineering firm present its model and show how the pond will work to circulate water once again and allow the young fish to enter, but the bigger fish to be trapped.

3. Distribute model-building materials and challenge groups to design their models.

- Challenge each group of engineers to design and build a kuapā with an ʻauwai kai and a mākāhā.
- Give each group a pan to build the pond and have students select materials from those provided or acquire additional materials to fit their designs.
- Challenge them to use the cordage (in place of wood) made in the previous lesson to make the mākāhā.

4. Test students' models.

- Once students' ponds are built, give each group two cups of water to add to the pan as low tide.
- After the water has equalized on both sides of the mākāhā, ask each group to add a few drops of yellow food coloring to the pond side of the model to represent the stagnant water in Kupuna Kuʻulei's pond.
- Give each group a container with two cups of blue-colored water and a meat baster. Ask students to raise and lower the “tide” on the ocean side of their models and report what happens to the stagnant water in their ponds.
- Provide some small leaves or other lightweight objects to represent large fish and some oregano to represent small fish. Have students add these “fish” to their ponds and create a current to move the fish toward the ʻauwai o ka mākāhā.

5. Help students to differentiate between what they observe in their models when they raise and lower the tide, and what inferences they can make based on those observations.

- Ask students to make observations of what happens to the “fish” in their models and what happens to the color of the water when they raise and lower the tide. Do they observe that the large leaves (fish) do not move past their mākāhā? What inference do they make about the function of the mākāhā based on this observation? (The mākāhā prevent large fish from escaping from the pond but allow small fish to enter.)
- Explain that the adult fish in the pond are drawn to the ʻauwai kai on the incoming tide and will actually swim against the current. This is so they can catch the most amount of food.
- Do they observe changes in the color of the water in the pond when they raise the “tide”? What inference do they make about the function of the ʻauwai kai in preventing stagnation and siltation from this observation?

6. Ask groups to present their models for Kupuna Kuʻulei.

- Have each group describe how their models will work: a) circulate the water and prevent stagnation, and b) allow small fish to enter and big fish to be retained.

7. Ask students to complete Learning Log sheet 5.

- Have students work individually to create diagrams showing how the circulating water with the changing tide affects water quality and pond life.
- Collect the students' written labels for their models, review them and have the students make any necessary corrections, before placing the labels next to their models.

Discussion Questions

- Why are tidal fluctuations important to a fishpond?
  (They circulate the water between the ocean and the pond, aerating the pond, flushing silt and distributing nutrients.)
- How would cementing the rocks of the fishpond wall in place affect the pond?
  (It would keep water from seeping through the walls of the pond, so the only place where the water could circulate and flush silt and nutrients would be through the ʻauwai kai. This could negatively affect water quality in the pond.)
- How are your models different from a real situation?
  (As always, models are simplified representations of reality. With a real fishpond, you would have the effects of wind and waves on the water and human activities upstream, as well as the changing tides.)
- How are observations different from inferences?
  (Observation is an act of watching attentively; inference is the act of concluding based on the evidence from observation.)

Adaptations/Extensions

Follow this activity with a field trip to Waiaʻōpae Fishpond (see Lesson 5), and have the students do the Hawaiian practice of kilo, to observe. Have them sit by themselves for 10 minutes and observe the natural environment, waves, winds, clouds, etc. Have them write 2 to 3 paragraphs about what they observed.

To help your students learn more about Hawaiian fishponds, conduct some of the lessons from Kāhea Loko: The Call of the Pond (Pacific American Foundation, 2003) teacher's guide developed by the Pacific American Foundation (PAF). The units are available online at www.ulukau.org. The lessons from Unit 2, "Life in the Pond", are designed to help students reach the Next Generation Science Standards.

Engineering Ingenuity

Student Reading 5

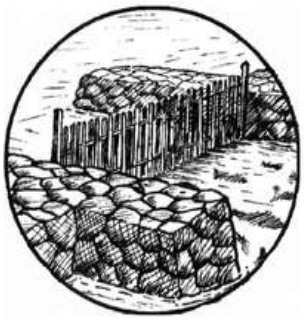
Fishponds were built in old Hawai‘i to raise and harvest edible fish. Loko kuapā are fishponds with kuapā (seawalls) built of stone and coral and ‘auwai o ka mākāhā. This type of pond with a mākāhā is found only in Hawai‘i. Hawaiians built these fishponds on a reef flat near a freshwater stream or spring. Many loko kuapā had natural freshwater springs inside the pond, like Waia‘ōpae Loko on Lāna‘i which has the water come from underground rather than from a nearby stream. The fresh water brings minerals and nutrients into the pond. Nutrients are like fertilizer for phytoplankton (tiny plants) and algae. Fish like the ‘ama‘ama (striped mullet) and awa (milkfish) feed on the plants.

How did Hawaiians fill their fishpond with fish? Their method was brilliant! They used knowledge of nature's own “technology” to grow fish. The pua (baby) of fish like awa come to the brackish water inside the fishpond. They are attracted by the large amount of food and the safety of the habitat. While still small, the pua can easily squeeze between the individual bars of the mākāhā spaced one-half inch apart (Uyemura, 2007). When the fish grow up, they are too big to fit through the mākāhā.

The fish are attracted to the current in the ‘auwai kai, which brings food directly to them. They are easy to catch in the ‘auwai kai when the tide changes. The construction of fishponds using mākāhā was a major change in fishing technology. Instead of just catching fish, Hawaiians began growing or farming fish.

When the stone walls of the kuapā shore ponds were completed, then the task remained to find the proper wood for the sluice gate or mākāhā. This was selected by the kahuna of the aumākua, who increased fish in the ponds (kahuna aumākua ho‘oulu i‘a loko kuapā). The wood was ‘ōhi‘a ‘ai, lama (Kikuchi, 1973) or some other suitable hardwood. When the wood

for the mākāhā was ready and the proper day had arrived for its construction, the kahuna was fetched to set up the first piece of timber. For this important duty he offered a pig or a dog suitable to this work of inspiring an increase of fish, and prayers appropriate to this work. Then he reached for a timber and set it up for the mākāhā and offered pule hoʻonā (the prayer that released the kapu and allowed the work to proceed). Then the men built the mākāhā, binding it together with ʻie cords (aerial root of the ʻieʻie plant), after which they arranged (hoʻonohonoho) foundation stones with the mākāhā and poured in pebbles. It was in this way that all mākāhā were built (Kamakau, 1964).



Hawaiians built loko kuapā for their aliʻi (chiefs). The makaʻāinana (commoners) harvested and ate fish from the loko iʻa kalo (taro fishponds). These are ponds that they built in the mountains next to streams. The fishponds of old Hawaiʻi were like the “refrigerator” of today. The fish grown in fishponds were there when people needed them.

Engineering Ingenuity

Learning Log 5 –
Loko I‘a Model

Name_____ Date_____

On the back of this page, sketch a loko kuapā (shoreline fishpond with an outer seawall built with rock and coral). Diagram how the flow of water through the mākāhā at both rising and falling tides affects water quality and pond life. Use the student reading as a reference.

What observations did you make when you raised and lowered the tide on your model?

What inferences did you make about the fishpond based on your observations?

What is the difference between an observation and an inference?

What is the function of the ‘auwai o ka mākāhā?

Why was the mākāhā important in a loko kuapā?

Write one paragraph with a clear topic sentence that describes the technology of Hawaiian fishponds and display it next to your model.

GRADE 4 LESSON 4 – MAUKA-MAKAI CONNECTION

How did the Hawaiian system of irrigating loʻi allow people to use water wisely in their ahupuaʻa?

Key Concepts

The traditional Hawaiian system of irrigating loʻi made intensive cultivation of kalo possible and ensured that water was distributed fairly and used wisely in the ahupuaʻa. Models provide a geographic representation to help us analyze how people used and cared for water resources.

Activity at a Glance

Students create, observe, and analyze a model of the traditional Hawaiian irrigation system for growing kalo (taro), drawing insights and conclusions about water use in old Hawaiʻi and today.

Assessment

Students:

- Create a model that shows how water was distributed in ahupuaʻa of old Hawaiʻi.
- Identify the major problem or primary conflict in a moʻolelo and describe how the problem or conflict is worked out.
- Compare the effects of land and water use in the ahupuaʻa and how similar practices are carried out today. Assess the positive and negative consequences of such uses on the environment and make connections to current environmental practices.

Time: 3 - 4 class periods

Skills

Observing, analyzing, inferring, writing

Materials

Provided:

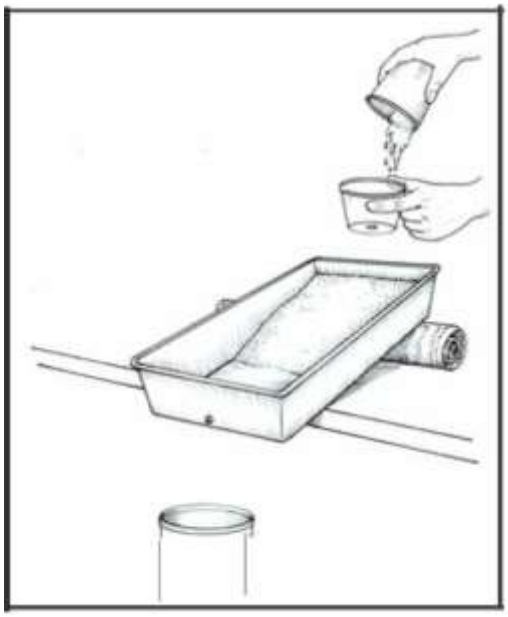
- Learning Logs 6 and 7
- Model-building instructions
- Student Reading 6
- Aloha ʻĀina video (provided on DVD)
- Mauka - Makai Connection PowerPoint (provided on CD)

Needed (per group; see Advance Preparation):

- earth material (sand, soil, ceramic clay, grout, thinset mortar, powdered clay)
- tiny rocks or gravel
- large 9” x 13” foil pan (inexpensive pans are available in bulk at Costco stores)

- 3 containers
- container for water source (such as a Styrofoam™ saimin bowl or plastic cup with a small hole poked through the bottom)
- container to pour water into the water source (water pitcher or cup)
- container to catch water from the pan (bucket, tub, pan or dish)
- props to elevate pan at a “slope” (wood blocks, folded newspaper)
- digging stick (chopstick or any other stick, plastic knife or spoon)
- old newspaper
- large mixing stick or spoon
- index cards

Advance Preparation



- Assemble earth materials. The best models for this activity are models that do not easily “erode.” Water should be able to flow over the earth material so that students can experiment with water diversion. Materials that work well are combinations of sand with soil, clay, and grout and/or thinset mortar. (Find grout and thinset mortar in the ceramic tile section of a hardware store.) IMPORTANT: This model is not intended to demonstrate erosion, so very sandy earth material does not work well.
- You might want to pre-mix the grout and thinset mortar with water before you start the activity, as it is quite messy. Or you could ask a couple of your most reliable students to premix it for you. Mix with a large mixing stick or spoon since the mix takes time to wash off the skin if mixed by hand.
- Collect small rocks for students to use in building dams and channels or purchase a bag of small gravel or cinders from your local garden store. (You can easily find tiny pieces of gravel at the edges of paved parking lots.)
- Use a sharp pencil to poke a very small hole through the bottom of each Styrofoam™ cup. This provides a steady water source for the “stream” in the student models.
- Plan for clean-up! If students are using grout and/or thinset, you will need to have a place outside for clean-up such as outdoor faucet and/or hose.
- Plan your system for how students will get their materials and organize the supplies accordingly.
- Preview Web sites students will be using for their research. See Resources at the end of this lesson.
- Optional: Make a model to use as a demonstration for students
- Copy Learning Logs 6 and 7 and the moʻolelo for each student.
- Copy the model-building instructions for each student group.
- Optional: View the YouTube video, “Ka Wai, Water of Life”, from the Hawaiʻi State Department of Education's “Na Kiʻi Hana Noʻeau” series of videos at https://vimeo.com/233715911.

Vocabulary

- ahupuaʻa – traditional Hawaiian units of land (use definition from Lesson 1 in this Unit)
- ʻāina – land, earth
- ʻauwai – channels or ditches built between streams and loʻi kalo that distributed water through the wetland agricultural system of old Hawaiʻi
- erosion – the process by which the surface of the earth is worn away
- inference – the act of drawing conclusions from evidence or knowledge
- kahawai – the Hawaiian word for stream; streams were the source of water for loʻi kalo
- kānāwai – the Hawaiian word for law; it translates as the equal sharing of water
- laulima – to work cooperatively
- loʻi – shallow pond for growing wetland taro
- loko iʻa – Hawaiian fishpond
- mālama – care for
- mahiʻai – farmer
- ʻohana – family
- poʻowai – a dam built to divert water from the stream into ʻauwai; the literal translation of this word is "water head, or water source" (mānowai and paniwai are other terms used for the dam)
- wai – fresh water
- waiwai – wealth or prosperity

Teacher Background Information

"From a very early time in their history, Hawaiians, to a greater extent than any other Polynesians, exhibited engineering and building skill, ingenuity, industry, and planning and organizing ability in three types of construction: the grading and building of terraces for growing wet taro; construction of irrigation ditches and aqueducts to bring water to these terraces; and construction of fresh-and salt-water fishponds" (Handy et al., 1972).

As the above quote so clearly states, early Hawaiians demonstrated exceptional organizational and engineering skills in their construction of irrigation systems and fishponds. The engineering involved constructing multiple stone loʻi (terraces) for growing kalo (taro) and extensive ʻauwai (ditches) to transport water from the streams into the many terraces. The flow of water was diverted from the stream into the loʻi, then back into the stream, and finally down to the fishpond, where the combination of fresh and salt water attracted fish. This system of using water allowed for sharing of the resource among farmers within the ahupuaʻa. Water was used wisely and returned to the stream, which allowed the fishpond or other nearshore fisheries to flourish. In more recent times, technology has enabled us to divert water out of wet windward ahupuaʻa and transport it to drier leeward areas. While this has advantages to leeward developers and farmers, it can have negative consequences to windward farmers and to stream plants and animals that require a steady flow of cool, running water.

Teaching Suggestions

1. Discuss the water connection between mountains and reef on islands in the Pacific Ocean.

- Write the essential question for this lesson on the board and review the standards on which students will be working.
- Have students read Student Reading 6. Ask students to identify the theme in the story and support their opinion with details from the story. Here are a few possible themes students may identify:
    - Water was a valuable resource in old Hawaiʻi.
    - In old Hawaiʻi, water was considered a gift from the gods.
    - People in old Hawaiʻi valued ʻohana (family).

2. Show the Aloha ʻĀina DVD to students and discuss what "Aloha ʻĀina" means.

- Refer to the DVD reflection in the Introduction to this teacher's guide for discussion questions.

3. Review the most important ideas students discovered about water in old Hawaiʻi.

- Add key vocabulary words to a word wall or word bank.
- Distribute Learning Log 6.
- Review discussion questions with students.

4. Introduce the model-making activity.

- Divide the class into small groups of three to four students.
- Distribute the instructions for model building to each group and carefully go over the procedures and expectations. (If needed, demonstrate what you expect students to do, or show them a model constructed ahead of time.)
- Write the key objectives of this activity on the board or chart paper and emphasize them:

How was water distributed in ahupua‘a of old Hawai‘i? What materials work best to create a model of this system?

5. Make the models! (Encourage scientific inquiry by having students examine each “earth material” in the context of permeability, porosity and erosion.)

- Students will need a full hour for gathering materials, building and trying their models, then clean-up.
- This is a very engaging activity for students, but it is important that you keep them focused on the main objective. Monitor groups carefully and keep them moving towards completion.
- Make sure students have designed their system before applying the water.
- At the 30-minute mark, students should begin pouring water into their Styrofoam™ cups.
- If any models are not working well because the earth material is eroding, challenge the students to problem-solve and figure out a way to make the model work. (Most likely they will need to add more clay or they are pouring on too much water.)
- Give students 15 minutes for clean-up and remind them not to wash grout or thinset in the indoor sinks.
- Find a place in the room to display the models. The students will be talking about them when you're not looking!

6. Discuss the model-building activity with students and review the main ideas of this lesson.

- Ask students to share their models with the class and answer the essential question for the lesson in their presentations.
- Have students write a reflection about what they learned on an index card and ask them to display their reflections next to their models.

7. Instruct students to complete Learning Log 7.

Adaptation/Extension

- Have students search the Lāna‘i Water Company’s website for more information about the development and timeline of water on Lāna‘i.
- Show the YouTube video, Ka Wai, Water of Life, from the Hawai‘i State Department of Education’s, Nā Ki‘i Hana No‘eau, series of videos (https://vimeo.com/233715911). Ask students to identify the most important ideas and to take notes.
- Arrange a field trip to see lo‘i kalo and loko i‘a on Lāna‘i (see Lesson 5 in this unit).

Mauka-Makai Connection

Student Reading 6 –
No Hea Mai Ko Kākou Wai: Where Does Our Water Come From

According to Hawaiian legend, the islands of ʻāina (land that which feeds and sustains us) were born to the "akua" (gods) of old. After the birth of the islands, all forms of nature came to fill the environment. Then, Hāloa, the first ancestor of the Hawaiian people, was born and from Hāloa the population grew. Over the span of centuries, the people of Lānaʻi developed a wide range of practices and skills adapted to their diverse environmental zones, from makai to mauka. The hoaʻāina (native tenants) lived by caring for and wisely using the wealth of ʻāina, wai (fresh water) and kai (sea). No container ships brought foods and supplies from distant shores and barges did not make weekly calls to Lānaʻi to bring in supplies for stores. Everyone possessed knowledge of cultivating the living environment to ensure that there was always food available to sustain the population. In the period prior to western contact, it is estimated that 6,000 people lived on Lānaʻi and they grew or caught everything they needed to eat. Without wai, life would not have thrived.

Lānaʻi's water and sustainable food history is different than that of other islands in the Hawaiian archipelago. Wai is the source of life. While Lānaʻi had few surface streams, potable water also flowed underground, appearing at spring sites on the land and in springs that bubbled up along nearshore ocean waters. Moʻolelo (traditions) from Lānaʻi tell us about the origins of pūnāwai (springs) and food sources on our island.

Ko Naimu ʻIke (Knowledge from Naimu)

In 1865, native Hawaiian writer Naimu shared a series of articles with the Hawaiian language newspaper *Kuokoa*. Among the stories is a description of how a pūnāwai on Lānaʻi was made and how the food crops of old were brought to Hawaiʻi:

> **"Ua moolelo o Kane, ame kona mana, ame kana mau hana"**
> **(The tradition of Kāne, his power and his deeds)**
>
> Here is the tradition of these gods. Kane the elder, and Kanaloa, his younger sibling, and their younger sibling, Kaneapua. They came from the Foundations of Kahiki and dwelled here in Hawaiʻi. The Hawaiian people worshiped them as their gods in ancient times. These are some of the things they did, they planted vegetable foods, and when matured, they cooked them. When the food was ready, they prayed thus. "Here is the food o gods, Kāne and Kanaloa. Here are the vegetable foods, here are the fish, that I might have life, and my descendants, till

the tapping of the cane is heard, till the skin is like the dried pandanus leaves, I plant and fish, and build a house (temple) for you, in which I might worship you the gods."

And if it is a woman, she worships in this way, "Here is the food, o gods, here are the vegetable foods, here are the fish of Kane and Kanaloa, that I and my descendants may live, till the tapping of the cane is heard, and the skin looks like the dried leaves of the pandanus; to cultivate foods and to fish, till things are heaped for you o gods, indeed I worship you."

About his Power

Here is his power, when they two were traveling about Hawai'i, and they reached a place where there was no fresh water, Kane thrust his staff into the earth, and fresh water poured forth. Such places were called "The water thrust forth of Kāne and Kanaloa…"

His Deeds

Drinking awa is what they did, from Hawaii to Kauai, and this is why the thrust forth to make the water, to have water for the mixing of their 'awa, at the places they stayed. This is how they came to stay at Lanai. And when they finished visiting Hawaii, they returned to where they had come from, Lau-ena-a-Kane (in Kahiki). Those sands are the sands which are tossed upon them during their periods of sleep.

Now their younger sibling (Kaneapua), was left at Kaunolu on Lanai, watching from the point, which is named Lae o Kaneapua. There came a time when Kanewahanui sailed from Hawaii, seeking out those things which he desired. Kaneapua called out to him, "Where is the canoe traveling to?" Kanewahanui answered, "The canoe seeks to tread upon the bosom of Kane and Kanaloa." Kaneapua, responded, "Is that so! The bosom of the gods that you a mortal shall tread upon. How about if I join you as well?"

Kanewahanui agreed, and they traveled to the Foundations of Kahiki, and his desire was satisfied. Kaneapua led Kanewahanui to see the net of Makalii, and it was at that time that the net of Makalii was gnawed by the rat of Kanewahanui, and that all kinds of foods were obtained in Hawaii. So, I have heard. Naimu [Translation, K. Maly]

About Kāne'āpua and the Spring of Miki

In another mo'olelo, native historian Samuel Kamakau added to the story of Kāne, Kanaloa and Kāne'āpua, and how the upland spring at Miki was made (*Nupepa Kuokoa*, January 5, 1867).

"He Moolelo no Wahanui me Kaneapua ma Lanai"
(A Tradition of Wahanui and Kāne'āpua on Lāna'i)

Wahanui was a chief of Oahu who went to Kahiki. Wahanui was the chief, Kilohi was the astronomer, and Moopuaiki was the navigator. They sailed and landed at

Haleolono, Molokai. In the early morning, they sailed along the cliff of Kaholo, on Lanai, at daylight, they passed by the point of Kaunolū. Just a little to the southeast of there, is the Point of ʻĀpua. That is the name of this place to the present day. There was dwelling there a man by the name of Kāneʻāpua. The man called out, thus, "The canoe, whose canoe is it?" "It is for Wahanui."

"So Wahanui is the chief, who is the priest?" "It is Moʻopuaiki." "So, Moʻopuaiki is the priest, who is the astronomer?" "It is Kīlohi." "Where is the canoe sailing to?" "The canoe, is sailing to Kahikikū, Kahikimoe, and Kahiki of the rain drops of Kāne, to tred upon the bosom of Kāne." "Your chest is that of a man, and to tred upon the bosom of Kāne, is the end of life, only death will remain. How about if I become one of them upon the canoe?"

Kīlohi, the astronomer said, "The canoe is completely loaded, you cannot come." As they sailed on by, passing a certain point, a storm arose, along with a wind and water spouts. Lest the canoe be overturned, they sheltered the canoe at Kaunolū, and then landed at Kaumālapaʻu.

In the story of this man, Kaneapua, it is said that he came here from Kahiki. He came with his elder brothers, and because there was no water, they sent him to the uplands at Miki, to get some water. It is there in the uplands of Lānaʻi…

Now, Wahanui folks continued trying (to sail), and frequently came close to dying, as storms came upon the canoe at Kealaikahiki, Kahoʻolawe, where one sails to Kahiki. It is said in the tradition of Wahanui's sailing to Kahiki, that there was much trouble that came upon them in the sea. When Kāneʻāpua became the steersman, they reached the lands of Kahiki. He was foremost of the navigators, and knew all of the stars of the sky and heavens… [Translation, K. Maly]

A Famine on Lānaʻi—
An Ancient Prayer Offered by Pakeaulani to the God Kānepaʻina

In 1862, John Puniwai published a tradition describing events in the lives of two ancient residents on Lānaʻi. The moʻolelo describes a period of famine across the islands when nearly the entire population of Lānaʻi had died. The translation of Puniwai's account shares the following details from Lānaʻi:

"No na Akua o ka Wa Kahiko..."
(About the Gods of Ancient Times…)

Here is a little tradition pertaining to observances for a certain angel (guardian), angels, or perhaps men. The story is this.

There was residing on Lānaʻi, Kaimumahanahana there were many people living on Lānaʻi at that time. There came a time of famine, and all the people died, leaving only Kaimumahanahana and his son, Pakeaulani, and there were many people living on Lānaʻi at that time. There came a time of famine, and all the people died, leaving only Kaimumahanahana and Pakeaulani, though the father was close to death. Here is what Pakeaulani did. He went and dug up some scraggly sweet potato runners and got a few small sweet potatoes and baked them. He took these things to a heiau and did the following, he worshipped, made the offerings, and

prayed. This is a portion of his prayer:

Forty thousand gods
Four hundred thousand gods Assembly of gods
Alignment of gods
Those that change, those that move about
O women that lie face up
Here is your food, prepared by Pakeaulani,
Son of Kaimumahanahana.

When he finished praying, he went again and sought out food for the evening. He cooked the food and took it, doing the same with all the food until it was done, and set there (at the temple), and he prayed as he had before. He prepared the food in a small imu, and his father smelled the scent of the sweet potatoes! He said, "Where are your sweet potatoes that I smell, my son?"

He answered him, saying, "It is the food of my god." The father then answered, "I don't have a god, but you do?" Five days passed in his (Pakeaulani) doing this same thing, then on the fifth night, an angel, Kānepa'ina, spoke. He said, "Heed me, this night go and close the very littlest of the holes in the house of you two, and stay calm, do not speak with your father." When they two were finished speaking, the angel departed. His father asked him "Who was the companion with whom you were speaking?" He answered, "My god whom I have been worshipping."

Not long afterwards, a great rain fell. It rained night and day, and through several nights and days until there was calm, then the rains fell lightly. Looking outside to see what had transpired, there was seen ripe bananas, sugar cane lying upon the ground, sweet potatoes spread all about, ape (mountain taro) with long stalks leaning to the side; Kalo (taros) which filled the gardens, banana stalks were used as the channels (to irrigate) for the taro. He then cooked the food and made an offering to his God. When finished, they two ate the sweet potatoes, taro, and bananas until filled. This is how Hawaiians came to once again be spread across Hawaii, only from Lāna'i. So this is one tradition of how one of the Kāne (gods), was worshipped by these men...

I am with appreciation. John Puniwai. [Translation, K. Maly]

The Changing Landscape

D.S. Keliihananui, born on Lāna'i in ca. 1845, provided testimony about conditions on Lāna'i and changes in the environment during his lifetime at legislative hearings held in April 1907. Articles in local newspapers covering the court proceedings as a part of the "Lanai Land Case" include excerpts of Keliihananui's testimony. Lawrence K. Gay, then a young man, was impressed with Keliihananui's description of changes on the island and published an account in 1965. The narrative below is cited from Gay's "True Stories of Lanai (1965):

"Piha kanaka o Lanai nei ika wa kahiko. Noho na kanaka ina wahi a pauloa o keia aina. Lako o lakou ina mea ai. Ulu na mea ai ina wahi a pau o Lanai nei. Aole moloo ka aina e like me keia manawa. Kahe mau ka wai o na kahawai liilii e pili a'e nei i ke kuahiwi. Kahe mau ka wai o Maunalei a komo iloko o ke kai. Make ka

aina i ka hoomaumau ole mai o ka ua. Moloo ka aina, make na ulu-laau o Lanai nei. Ano e no hoʻi keia manawa."

> Lanai was full of people in the olden days. People lived in all parts of this island. They had lots of food. Food crops grew in all parts of Lanai. The land was not dry as it is today. Water flowed constantly in the gulches that were close to the mountain. The Maunalei stream flowed into the sea at all times. The land is dead, because of the long intervals between rainfall. The forest died from the dryness of the land. Things are different now.

By the 1880s uncontrolled ungulates had stripped so much vegetation from the mountain and valley walls that reports of landslides filling loʻi kalo were made in communications and paper articles. With the loss of vegetation, water levels diminished. Water from Maunalei began to be tapped for commercial purposes in the 1890s, with pumps being installed by ca. 1905 to draw water from wells up to Kōʻele. In 1924, Hawaiian Pineapple Company completed construction of wells and a new pump house and drew water up to supply all of Lānaʻi City. In 1948, the last trickle of water to flow regularly above surface in the valley disappeared.

Maunalei – He ʻĀina Wai

One ahupuaʻa on Lānaʻi was known as a land with water, where a stream flowed year-round. Hundreds of loʻi kalo and a system of ʻauwai (water dispersal channels) were developed and remained in use through the late 1800s.

During the Māhele ʻĀina (Land Division) of 1848, two claims for the ahupuaʻa of Maunalei were registered by chiefess Pane Kekelaokalani and eighteen native tenants made claims for smaller kuleana parcels. Through the Māhele, the title of Maunalei was confirmed to Pane. Heʻe (octopus) was listed as her kapu (restricted) fish, and the kukui tree (*Aleurites moluccana*) was listed as her kapu tree.

Ancient Loʻi Kalo Remnants at Maunalei (1911)

The eighteen native tenants identified more than seventy-one loʻi kalo[1] and an ʻauwai (irrigation channel to convey stream water to cultivated fields) while registering their claims for fee-simple property rights. In 1853 a visitor to Maunalei Valley reported that "Water karo is raised in it, than which none is sweeter" (*The Polynesian*, August 6, 1853:50). Subsequent historical

[1] In addition to the seventy-one specific, or numbered loʻi kalo parcels cited in Maunalei, other Māhele applicants also claimed loʻi, but simply stated in Hawaiian (as translated into English), "I have some..." or "I have several..." loʻi kalo, at such and such a place in Maunalei Ahupuaʻa. Thus, those numbers are not counted. It is likely that some 100 loʻi kalo may have been tended in 1848.

accounts of Maunalei offer the following descriptions of this storied place—

Ianuari 23, 1869 (aoao 4)
Nupepa Kuokoa
Naue ana e ike i ka Mokupuni o Kaululaau

Maunalei – Ua aneane like me Waimanu i Hawaii ke ano o keia aina kahawai kunono. He aina momona o Maunalei, uala, ko, maia, alani, kalo, ua ai makou i kekahi o na hua momona o keia wahi a ua hoihoi na kamaaina o ka hale, kalo, alani, ko na mea i hoihoi ia.

Maunalei – the character of this valley something like Waimanu on Hawai‘i. Maunalei is a rich land with sweet potatoes, sugarcane, bananas, oranges, and taro, and we ate some of the sweet produce of this, and the natives sent us back with some of the taro and oranges of this location.

Ma keia wahi wale no o Lanai i ulu ia e ke kalo. Ua paa i na kaupapalaoi kalo, ma kai iho o kahi i hu mai ai ka wai a kahi i nalowale ai. He mau hale maikai no ke ku ana, he mau luahine wale no ka i loaa aku ia makou…

This is the only place on Lanai where taro is grown. Where the taro patches are found, the water flows and then disappears. There are some good houses there, and some old women were the only ones we found…

Choose a moʻolelo and share your opinion of what the main themes are. Describe what has changed on the land and how we sustain ourselves. Propose actions for stewardship of our water resources and support your stance with evidence and details from the story.

There are nearly 50 place names on Lānaʻi that have survived the passing of time, which identify water resources. The following place names are among those found in historical texts which describe water resources of the Pālāwai Ahupuaʻa:

- Kaiholena – "Kaiholena, he wai ia, oia ka wai e inu ai mai Palawai mai, Kealii a me Pulehuloa, Kihamanienie, Kiekie, Nininiwai, a oia ko lakou wai auau, a hoohainu lio." (Kaiholena is a water source, it is the drinking water of the people from Pālāwai, Kealiʻi, Pūlehuloa, Kihamānienie, Kiʻekiʻe, Nininiwai. It is also their bathing water and where they water their horses.)
- Kehewai – A watered gulch in Pālāwai Ahupuaʻa.
- Lānaʻihale – A pūnāwai (spring), boggy area of nearly two acres in Pālāwai Ahupuaʻa.
- Mānele – "Along the shore of Mānele, there are places where fresh water escapes through cracks in the surface rock into the near shore waters. The people of old, who lived at Mānele knew of these places, and to collect fresh water, would dive into the ocean, carrying an empty ipu (gourd container). Once they were at the place where the fresh water escaped through the rocks, they would tilt the ipu mouth over the spring source, to allow it to fill up with the fresh water. This way, the native residents of Mānele had access to drinking water year-round, even when regular rains failed. This practice was commemorated by the elders who expressed it as "Maikaʻi Mānele i ka wai kaohi ipu" (Life at Mānele is good, for there is water found, which was caught in the gourd).
- Pālāwai – Named for fresh water moss which grows in the "boggy" basin; Pālāwai Ahupuaʻa.
- Pūloʻu – Upland spring in Pālāwai Ahupuaʻa.
- Waiakaʻiole – Mountain spring in gulch located in Keālia Aupuni-Pālāwai Ahupuaʻa.
- Waiakeakua – Mountain spring in gulch located in Pālāwai-Kaʻōhai Ahupuaʻa.
- Waiaʻōpae (Waiʻōpae) – Valley, nearshore spring and fishpond close to the boundary of Pālāwai and Pāwili Ahupuaʻa.
- Waikekeʻe – Spring in lower gulch between Keālia Aupuni and Pālāwai Ahupuaʻa.
- Wailehua – Spring along coast of Lānaʻi in Pālāwai-Pāwili Ahupuaʻa.

Mauka-Makai Connection

Learning Log 6 –
Wai in the Ahupua‘a

Name_____ Date_____

How did the Hawaiian system of irrigating lo‘i allow people to use water wisely in their ahupua‘a?

Vocabulary:

- ‘auwai – channels built between streams and lo‘i kalo that distributed water through the wetland agricultural system of old Hawai‘i
- kahawai – the Hawaiian word for stream; streams were the source of water for lo‘i kalo
- kānāwai – the Hawaiian word for law; it translates as the equal sharing of water
- laulima – to work cooperatively
- lo‘i – shallow pond for growing wetland taro
- mālama – to care for
- mahi‘ai – farmer
- ‘ohana – family
- po‘owai – a dam built to divert water from the stream into ‘auwai; the literal translation of this word is “water head, or water source” (mānowai and paniwai are other terms used for the dam)
- wai – fresh water
- waiwai – wealth or prosperity

Answer the following questions using the vocabulary above:

1. What words indicate the importance of water in old Hawai‘i?

2. What words name the parts of the irrigation system?

3. What Hawaiian values are associated with the way that water was distributed in old Hawai‘i?

4. What words refer to the people who take care of the ‘auwai?

Mauka-Makai Connection

Model-Building Instructions

Name_____ Date_____

Create and analyze a model of water distribution in old Hawai‘i!

Supplies
- ✓ Earth material
- ✓ Handful of gravel
- ✓ Large pan
- ✓ Styrofoam™ cup with hole poked in the bottom
- ✓ Container for pouring water
- ✓ Bucket or pan to catch water that comes out of the pan
- ✓ Wood blocks or rolled up newspaper to prop up one end of your pan a little “digging stick” (chopstick)

1. **Instructions: In your group, decide who will be responsible for each job:**
   - one person gathers supplies
   - one person completely clears off the desktops or table
   - one person spreads newspaper on the desktops or table and on the floor
   - one person gets water at the sink as needed
2. **As a group, decide what “earth material” you will use to build your model. List your “earth materials” below and give a reason why you chose the materials.**
3. **Start setting up when the teacher says, “Go!”**
4. **Before you begin making your model, make sure you have all your supplies and that the desktops and floor are covered with newspaper!**

5. Steps to build your model (use the illustration as a guide):

a) Mix the earth material inside the pan.

b) Push the earth material against one end of the pan—NOT the end with the hole in it because that is where the water comes out!

c) Form a gentle “mountain slope” with the earth material

d) When you are satisfied with the slope, carve a stream into the slope.

e) Try running water through the stream! MAKE SURE YOU HAVE A BUCKET or PAN UNDER YOUR MODEL TO CATCH THE WATER! Place the Styrofoam™ cup at the top of the slope above the stream and slowly pour water into the cup. A small stream of water will begin to flow out of the hole in the cup. (Be sure to hold the cup in place so water flows only in the stream.)

f) After observing how water flows through your stream, make any adjustments you think the model needs.

g) Now decide where to build your lo‘i and start digging out a little of the earth material to create shallow ponds where the lo‘i will be.

h) Dig ʻauwai from the stream to the loʻi and back to the stream.

i) Place small rocks to make a dam in the stream and line the ʻauwai with small rocks.

j) When you think your loʻi and ʻauwai are complete, try running water through the system. (Follow the same procedure as in "e" above.)

k) How does your model work? Does it accurately show how water was distributed in old Hawaiʻi? Make any adjustments you need.

6. Save your models for discussion!

7. Follow your classroom clean-up procedures.

On an index card, write a reflection about what you learned from this model-building activity. Place the index card next to your model.

Work with your team to present your model to the class. Be sure to answer the essential question for this lesson when you present.

Essential Question: How did the Hawaiian system of irrigating loʻi allow people to use water wisely in their ahupuaʻa?

Mauka-Makai Connection

Learning Log 7 –
From Mauka to Makai

Name_____ Date_____

In the picture below, illustrate how water was distributed through a system of loʻi kalo in old Hawaiʻi and include the loko iʻa (fishpond).

On a separate sheet of paper, describe the changes that Hawaiians made to the land in order to produce food. Explain how these changes affected the water. How does this compare to the way we use land and water today?

GRADE 4 LESSON 5 – GIVING BACK TO THE ʻĀINA

How do Hawaiian practices nurture a healthy relationship to the ʻāina, and how can we give back to the ʻāina today?

Key Concepts

- Hawaiian practices such as offering oli, taking from nature only what is needed, and using what is taken reflect a close relationship to the ʻāina.
- Models provide a geographic representation to help us analyze how people used and cared for resources within their ahupuaʻa.

Activity at a Glance

Students participate in a field trip to a loʻi kalo (taro patch) and a loko iʻa (fishpond) where they take part in service-learning projects to give back to the ʻāina and gather information to use in preparing their ahupuaʻa unit projects and final papers.

Assessment

Students:

- Work cooperatively to create a mural that:
  - Illustrates and describes how the use of technology influenced people, land and the economy in the ahupuaʻa system of old Hawaiʻi.
  - Describes a typical day in the economic life of a Hawaiian in the ahupuaʻa system
- Present their mural to their classmates.
- Individually create a model, diorama, mural or map that demonstrates their understanding of the geography of the ahupuaʻa and life in old Hawaiʻi.
- Individually complete a "newspaper" that includes four articles and addresses the unit essential question and reflects on how people can care for the ʻāina today.

Time: 4 - 6 class periods, plus two field trips

Skills

Collaborating, constructing, interpreting, reporting, speaking, writing

Materials

Provided:

- rubrics for culminating project (Provided in Unit Introduction)
- group project instructions
- Learning Logs 8 and 9
- Student Reading 7 (optional to be used with Extensions/Adaptation)

Needed:

- An assortment of materials for students to use in making large-scale models, dioramas, murals or maps (poster board, butcher paper, boxes, markers/paints, scissors, cloth scraps and such.)
- name tags for students

Student Checklist for Field Trip:

- hat
- sunscreen
- tabis or old shoes
- old clothes
- bottled water in backpack

Advance Preparation

- Assemble materials for students to use in producing their final projects.
- Copy the group project instructions for each group of students.
- Copy the Learning Log sheets for each student.
- Copy the rubrics for culminating projects provided in the Unit Introduction for each student (optional: make one transparency to use for group discussion).
- Contact Pūlama Lānaʻi's Culture & Historic Preservation Department and Lānaʻi Culture & Heritage Center to set up a field trip to Hiʻi to explore the mauka region and Waiaʻōpae Fishpond in the makai region of Pālāwai ahupuaʻa.
- Organize your class into four teams and give each student a name tag that includes the team number.
- Copy one or more of the oli (chants) that you would like students to learn before going on the field trip. (See the Appendix 1 for written copies of mele oli and visit www.lanaichc.org for audio versions of the mele oli.)
- Refer to Appendix 2 for more information and suggestions for a successful field trip.

Teaching Suggestions

Before the Field Trip

1. Revisit the unit essential question. Distribute Learning Logs 8 and 9. Discuss the individual project and the "newspaper" students are to write to address this question.

- Distribute the rubric and review the criteria that will be used to evaluate the student newspapers.
- Discuss the descriptors for the 1-4 scale. (Optional: project the rubric using an overhead projector.)

2. Discuss the ahupua'a mural group project that students will be presenting to other students.

- Divide the class into 'ohana groups of three to five students per group.
- Distribute the group project instructions and review them.
- Set a date for the presentations and have students invite parents and kūpuna, if desired.
- Show students the sample rubric and discuss criteria for evaluating their presentation.

3. Encourage teams to think about information and images they want to collect for their projects and presentations during their field trips to the lo'i kalo and loko i'a.

4. Discuss community service that students could do to give back to the 'āina when they visit the fishpond and the lo'i.

Sample service projects:

- Help to maintain and/or rebuild the fishpond walls.
- Pick up rubbish that could enter the ocean and harm marine life.
- Help to plant native plants near the loko i'a.
- Help to plant, weed, or harvest kalo from the lo'i.

Let students know that a part of each field trip will be devoted to service and discuss why it is important to give back to the communities where we live.

5. Prepare protocol for the field trip. Discuss safety, appropriate behavior and what to wear and bring.

- Ask a kupuna to help teach your students an oli (chant) to present when they go on their field trip. See the mele oli provided in Appendix 1.
- Discuss the meaning of the chant and why it is part of the protocol for visiting the site.
- Review appropriate clothing to wear for the field trip (clothes that you do not mind getting dirty such as old shorts and t-shirt, shoes, socks, and hat) and what to bring (backpack with drinking water and snack, sunscreen, insect repellent).

During the Field Trip

Following is a general outline for the field trip to Waia'ōpae Loko. The visit to Hi'i would have a similar agenda of activities with adjusted times.

Waiaʻōpae Loko

8:00 am	Depart from school
9:00 am	Arrival and greeting
9:15 am	Cultural and historical overview of landscape
9:30 am	Project learning activity
11:00 am	Lunch
11:45 am	Board van
12:45 pm	Return to school

After the Field Trip

1. Discuss what students learned on the field trips. Review the Pālāwai ahupuaʻa map and the role of fishponds and agriculture in society.

- Ask students to share their reflections from the field site visits.
- Refer students to their ahupuaʻa maps to review the physical features of the ahupuaʻa.
- Reinforce the role that the loʻi system and Hawaiian fishponds played in the lives of people living here by referring students to their loʻi and loko iʻa models.
- Emphasize the interdependence between people, land and the ocean, and make comparisons between the economy of old Hawaiʻi and the economy today.

Discussion Questions

- How might the restoration of the loko iʻa help Lānaʻi's economy?
- How has erosion, introduced ungulates and lack of native plants affected the landscape of Lānaʻi?

2. Allow time for ʻohana groups to work on their large-scale mural of the ahupuaʻa.

- Challenge students to create a replica of the ahupuaʻa of Pālāwai, using a variety of craft materials, paints and/or objects from nature.
- Remind students of your expectations for cooperative group work and classroom clean-up.

3. Repeat the deadline for submitting their individual model, mural, diorama or map, final newspaper, and oral presentation.

- Allow students to complete their individual projects either in class or for homework. (Be aware that if you assign the projects for homework some students may receive assistance from parents that will skew your assessment of the student gains.)

4. Complete the K-W-L chart that was established in Lesson 1.

- Ask students to record on the chart what they learned about ahupuaʻa and early life in Hawaiʻi.
- Celebrate the students' accomplishments!

Adaptation/Extension

Math 4 – Measurement: For an extra challenge, introduce scale and the Hawaiian system of measurement. Plot features in the Pālāwai ahupuaʻa on a large-scale representation outside in the field.

a) Have students read the Measuring Length and Distance student reading. Discuss the importance of measurement and its relationship to technology.
b) On the school field: Outline to scale the Pālāwai ahupuaʻa, using natural materials or safety cones. Orient students to the four cardinal points (north, south, east, and west) and indicate the boundaries of the ahupuaʻa.
c) Establish the scale that is being used for the map on the field. (For example, how many kilometers or miles are represented by measures such as poho, kīkoʻo or piʻa. The measure you use will depend on the scale of your map.)
d) Have ʻohana groups plot fishponds, loʻi and other physical features in the ahupuaʻa according to the scale.

Further In-Depth Investigation: Have students further investigate the connection and effects of erosion, sedimentation and lack of native plants. Have them present several solutions to the class of how they would help mitigate these problems on Lānaʻi.

Giving Back to the ʻĀina

Learning Log 8 –
Group Project

Name_____ Date_____

Create a large color mural of an ahupuaʻa that shows:

- The main parts of an ahupuaʻa:
    1. Mountains
    2. Streams
    3. Loʻi kalo and the ʻauwai system
    4. Loko iʻa
    5. Ocean

- Three sections of the ahupuaʻa:
    1. Uka (Mauka)
    2. Kula
    3. Kai (Makai)

- People working and exchanging food, materials and products.

- Label all parts of the mural including short descriptions of how Hawaiian practices affected the people and their ahupuaʻa.

- Be prepared to present your project to the rest of the class.

    - Project due on: _____

Giving Back to the ʻĀina

Learning Log 9 –
Individual Project

Name_____ Date_____

Unit Essential Question:

How do Hawaiian practices nurture a healthy relationship to the ʻāina and how can we give back to the ʻāina today?

1. Create your own model, mural, diorama or map that illustrates what you have learned about the geography of your ahupuaʻa and life in old Hawaiʻi.

2. Write your own newspaper with four amazing, informative and captivating articles:

Two required ahupuaʻa articles:

- Ahupuaʻa Article – a feature article focused on the theme "From the Mountains to the Sea"
- Botany Column – a non-fiction/research article about a native or Polynesian-introduced plant of your choice

Two free choice articles (choose your own topic from the following and be sure you answer the unit essential question above):

Old saying by Lānaʻi natives in 1873:

> "Ke noho nei mākou me ka hoʻomanawanui i ka wī no ko mākou, no ko mākou aloha i ka wahi i maʻa iā mākou, a mai ko mākou mau kūpuna mai, a mau mākua, a hiki wale iā mākou…"
> We live here in patience though we are yet in famine, it is out of our love for the place with which we are familiar, coming from our ancestors, to our parents, and to ourselves...
> [Excerpt from a letter of native Lānaʻi residents of Paomaʻi to their King. Mei 16, 1973]

- Service Learning – a personal narrative reflecting on public service
- Loʻi Kalo: Past, Present and Future – an informative piece demonstrating what you have learned about growing taro in Hawaiʻi
- Loko Iʻa: Fishponds of old Hawaiʻi – an informative piece demonstrating what you have learned about fishponds in Hawaiʻi
- The Case of the Strongest Cord – an informative piece about cordage made from natural materials in Hawaiʻi and/or a personal narrative reflecting what you experienced doing science investigations and making cordage
- People and the Land – an informative piece about society in old Hawaiʻi
- A Day in the Life of Old Hawaiʻi – realistic fiction piece including character, setting and plot set in a believable old Hawaiʻi

3. Format your newspaper (see the illustration below).

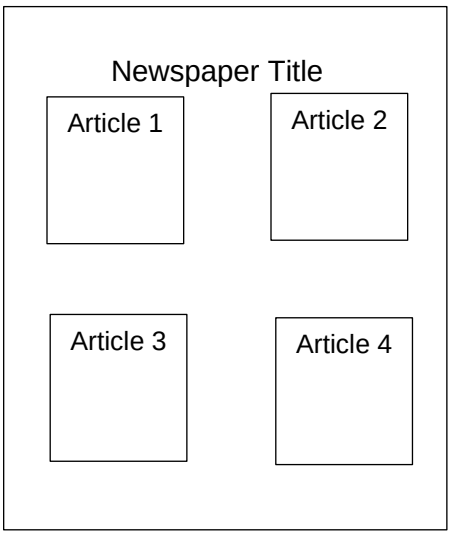
- Your four articles and any artwork must fit on a 11” x 17” page.
- The font size for column text should be 12-point.
- Include one photo or illustration with your Ahupua‘a Feature Article.
- Include an illustration of the plant featured in your Botany Column.
- Make sure that there is an appropriate balance between the text, white space, and graphics. (Look at a regular newspaper for a guideline!)
- The length of your articles is less important than strong writing traits. Make sure you have written enough in each of your writing pieces to fully develop your content and ideas.

4. Give yourself a score on a scale of 1 to 4 using the rubric provided.

My score for science: _____

My score for social studies: _____

My score for language arts: _____



Giving Back to the ʻĀina

Student Reading 7 –
Measuring Length and Distance

Name: _____ Date: _____

A long time ago, people did not have rulers, meter sticks or tape measures. So, they used parts of their bodies to measure things. Measurement is important when building houses, canoes irrigation systems or clothing. Measurement is also important in fair trading. Can you think of some reasons why? For example, what standards did people use to trade things like cordage, kalo and fish?

Converting Measurement from Early Hawaiian System to U.S. Units

Hawaiian Units	U.S. Units
poho A measure of half the span of kīkoʻo	1 inch (approximately)
kīkoʻo From the end of the thumb to the end of the index finger	2 inches (approximately)
pīʻā A measure of one hand's distance 	6 inches (approximately)
haʻilima Distance from the elbow to the middle finger	18 inches (approximately)
iwilei Distance from the collarbone to the tip of the middle finger with the arm extended	36 inches (approximately) (3 feet = 1 yard)
anana Distance from the tip of both middle fingers with the arms extended 	72 inches (approximately) (6 feet = 2 yards)

GRADE 7 – OUR AHUPUA‘A

How do cultural landscapes within our island’s ahupua‘a tell the historical stories of Lāna‘i?

Key Concepts

- Ahupua‘a are traditional Hawaiian land units typically extending from mountain summits to the outer edges of reefs. Unlike other islands, Lāna‘i has unique ahupua‘a and moku.
- Ahupua‘a had different environmental characteristics which dictated the types of Hawaiian cultural uses of those regions.
- Lāna‘i is known for its storied landscapes which have rich cultural history.
- Historical accounts and individuals have influenced Hawaiian place names and created storied landscapes on Lāna‘i over time.

Activity at a Glance

Students learn how land was divided in old Hawai‘i and draw and label a diagram of Lāna‘i’s ahupua‘a showing key environmental and cultural features. Students conduct and summarize a short interview about a specific cultural site and compare its history to modern day. Finally, students read a Hawaiian story of place and write a response about the story.

Assessment

Students:

- Construct a map of an ahupua‘a and label important geographic and environmental characteristics and Hawaiian place names.
- Explain the patterns and relationships among geographic features depicted on their maps.
- Conduct a short interview about a specific cultural location and present information to the class.
- Read a short story about a historical person from Lāna‘i and write a response about the story.
- Compare and contrast how life today is different from life in early Hawai‘i.

Time: 5 - 6 class periods

Materials

Provided:

- Journal Sheets 1, 2 and 3
- Student Reading
- Lāna‘i Ahupua‘a map with labels
- Our ahupua‘a: sustainable living in traditional Hawaiian culture poster

Needed:

- colored markers or crayons
- projector

Advance Preparation

- Make a copy of the Journal Sheets and Student Reading for each student.
- Be ready to project the Lāna‘i Ahupua‘a map provided with this lesson.

Vocabulary

- ahu – heap, pile, mound, altar
- ahupua‘a – traditional Hawaiian land unit usually extending from mountain summits to the outer edges of reefs; this system ensured that everyone living in the ahupua‘a had access to natural resources
- ali‘i – chief
- ‘awa – a ceremonial drink made from the kava (Piper methysticum) plant
- economy – the way that people produce and exchange products and services in their geographic region
- imu – underground oven
- kai – the ocean or sea
- kapu – forbidden or prohibited
- kona – leeward side of the island, also the name of the leeward mokuoloko of Lāna‘i
- ko‘olau – windward side of the island, also the name of the windward mokuoloko of Lāna‘i
- kula – the region inland of the coast where Hawaiians grew many of their crops
- Makahiki – annual harvest festival that began about the middle of October and lasted about four months, with sports, religious activities, and a kapu on war; this is now replaced by the modern-day Aloha Week (Pukui and Elbert, 1986)
- makai – toward the sea
- mauka – toward the mountain
- moku – large districts or land divisions on the Hawaiian Islands that were further subdivided into ahupua‘a
- mokuoloko – a sub-category of moku that are specific to Lāna‘i and describe the leeward and windward sides of the island
- mokupuni – island
- ‘ohana – family
- pua‘a – pig
- pu‘u – hill, peak, cone
- uka (also mauka) – mountains and upland regions that Hawaiians depended on for important forest products

Common Core Standards

Language Arts
Reading Informational Text – Key Ideas and Details

7.RI.2 Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

7.RI.3 Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).

Writing – Production and Distribution of Writing

7.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3.)

7.W.9a Apply grade 7 Reading standards to literature (e.g., "Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history").

7.W.9b Apply grade 7 Reading standards to literary nonfiction (e.g., "Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound, and the evidence is relevant and sufficient to support the claims").

C3 Social Studies Framework

Social Studies:
Geographic Representations

D2.Geo.1.6-8. Construct maps to represent and explain the spatial patterns of cultural and environmental characteristics.

D2.Geo.2.6-8. Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions, and changes in their environmental characteristics.

D2.Geo.3.6-8. Use paper based and electronic mapping and graphing techniques to represent and analyze spatial patterns of different environmental and cultural characteristics.

Nā Hopena Aʻo Models of Behaviors and Outcome (Hā)

HĀ: Strengthened Sense of Hawaiʻi

c. Learn the names, stories, special characteristics and the importance of places in Hawaiʻi

d. Learn and apply Hawaiian traditional world view and knowledge in contemporary settings

e. Share the histories, stories, cultures and languages of Hawaiʻi

Nā Honua Mauli Ola (NHMO)

NHMO 8-4: ʻIke Mauli Lahui * Cultural Identity Pathway

4. Apply the cultural and traditional knowledge of the past to the present.

8. Engage in activities independently or collaboratively with community members to perpetuate traditional ways of knowing, learning, teaching, and leading to sustain cultural knowledge and resources within the learning community.

Teacher Background Information

Ahupuaʻa are traditional units of land in Hawaiʻi that vary in shape and size. They are political and ecological land units designed to meet a community's need for food and materials. Ahupuaʻa generally range from summit peaks or ridge crests, extending down the mountain, becoming wider as the land slopes to the outer edge of the reef. The boundaries between adjacent ahupuaʻa usually conform to valley walls or ridges. They are called such because "the boundary was marked by a heap (ahu) of stones [also referred to as an altar] surmounted by an image of a pig (puaʻa), or because a pig or other tribute was laid on the altar as tax to the chief" (Pukui and Elbert, 1986).

In old Hawaiʻi, food and other supplies were shared between people of the uplands and people of the sea (kō kula uka, kō kula kai) as well as between neighbors so that no one went without. The general concept of the ahupuaʻa is that the human community living within its boundaries would be self-sufficient in obtaining the resources needed for survival such as fish, water and land to grow kalo (taro), medicinal herbs, and trees for canoes and shelter. However, due to the wide range of elevation, rainfall, and topography in the Islands, there are a number of ahupuaʻa that do not conform to this generalized idea.

On Lānaʻi, four of the island's thirteen ahupuaʻa cross the entire island. The ahupuaʻa of Kalulu, Kaunolū, Pālāwai and Pāwili cross the mountain from fishery to fishery and are believed to have been designed to support the needs of residents and chiefly populations. Politically, the ahupuaʻa were governed by a konohiki (land manager) who oversaw the right to use the resources within the ahupuaʻa and served as an intermediary between the chief and the hakuʻohana, or representative of the resident families or commoners (makaʻāinana). Konohiki were responsible to chiefs of greater rank (aliʻi nui or aliʻi) who ruled over a moku (an island or district). Within the ahupuaʻa, individual families were allowed to cultivate and inhabit smaller sections of land or ʻili. The konohiki also directed the people in the building, cleaning, and repair of fishponds whenever the aliʻi nui commanded.

During the Makahiki (annual harvest festival which began about the middle of October and lasted about four months), an entourage of aliʻi (chiefs) sometimes numbering 100 people or more would tour the island, traveling from one ahupuaʻa to another. At the boundary of each ahupuaʻa, the residents placed an offering of some of their food crops, fish harvest, and feathers from forest birds for the touring aliʻi. The offerings were placed at an ahu that was adorned with the head of a pig (puaʻa). The people in each ahupuaʻa would provide shelter and food for the aliʻi and all those who traveled with them (Pacific American Foundation, 2003).

Kaunolū Ahupuaʻa

The ahupuaʻa of Kaunolū is one of four ahupuaʻa which spans across the island from the koʻolau to kona sides. It is a storied landscape and has significant cultural and historical values. It was the home of an extensive agricultural community from mauka to makai and home to rich fishing grounds.

On its leeward coast, Kaunolū was once the religious, political and social center of Lānaʻi because of the water that flowed from the Kaunolū-Keālia Kapu gulch. Along its kona shores was Kaunolū Village. This village was one of Kamehameha the Great's favorite fishing locations and was where he retreated after he conquered Maui, Molokaʻi and Lānaʻi. Many Hawaiian rulers and important leaders also visited this area. Kaunolū was the location of Lānaʻi's only puʻuhonua (place of refuge), Halulu Heiau, and many ancient petroglyphs. Two

villages along the ridges of Kaunolū Gulch were also present.

This coastline was also connected to the gods and is famous for the leeward point of Kealaikahiki, meaning “the path to Tahiti,” which was known as the landing place of the ancient gods on Lānaʻi. The deep-sea fishing grounds of Pali o Kāholo provided fish for the community while the upland forests and springs provided other valuable resources. Kaunolū Village was known as being a bountiful fishing village from as early as the 1400s until the 1880s when it was eventually abandoned.

Today, Kaunolū Village has great cultural and historical values as being the largest surviving ruins of a prehistoric Hawaiian village. To acknowledge its incredible importance, the ancient fishing village was designated as a U.S. National Historic Landmark in 1962 and later added to the National Register of Historic Places in 1966.

Note: For more information about other ahupuaʻa on Lānaʻi, refer to the Grade 4 Unit Introduction section.

Teaching Suggestions

1. Find out what students know about the ahupuaʻa where they live.

- Initiate a class discussion focusing on the geography of their ahupuaʻa, especially Hawaiian place names.
- Create a K-W-L chart and record what students know (K) and what students wonder (W) about their ahupuaʻa and life in early Hawaiʻi. Students may record what they've learned (L) at the end of the activity.

Discussion Questions

- Where are we located? What is the name of the place where we live? What is the name of the area where our school is located? What other Hawaiian place names are known in our area?
- How was land divided in early Hawaiʻi? Has anyone heard of the term ahupuaʻa? Has anyone heard of the term moku or mokuoloko?
- What do you think life was like in early Hawaiʻi?
- Why do you think it was important for early Hawaiians to maintain exchange between the mauka (mountain) region and the makai (sea) region?

2. Introduce students to the geography of an ahupuaʻa using a diagram or poster that illustrates habitat zones and cultural uses and add key vocabulary words to the “word wall” or “word bank.”

- Distribute the Conservation Council for Hawaiʻi poster (Our ahupuaʻa: sustainable living in traditional Hawaiian culture) provided with this activity. Ask students to identify any Hawaiian terms that are familiar.
- Ask students to identify the activities illustrated on the poster.
- Introduce the terms kai (ocean), kula (the region inland of the coast where many important crops were planted) and uka (the forested mountain areas) and add these words to the “word wall” or “word bank.”
- Discuss students' ideas about life in early Hawaiʻi and how life today is different from

life in pre-contact Hawai‘i.

3. Teach students the names of mokuoloko and ahupua‘a on the island using the two maps provided at the end of this lesson. Begin a “word wall” or “word bank” of key vocabulary words.

- Add new vocabulary words to a “word wall” or “word bank” on chart paper (mokupuni, mokuoloko, ko‘olau, kona, ahupua‘a).
- Project the Lāna‘i Mokuoloko Map and identify the kona and ko‘olau sides of the island.
- Distribute Journal Sheet 1 to students and explain to students that they will be creating their own map of the ahupua‘a of Lāna‘i. Ask students to follow the directions on the sheet and identify their mokuoloko and ahupua‘a.
- Encourage students to memorize place names, especially mokuoloko and ahupua‘a names and to write in their learning log using this new vocabulary.

4. Teach students how to conduct a short interview and collect information about a specific cultural site on Lāna‘i. Have students summarize their findings in a short report and share the information with the class.

- Review Journal Sheet 2 with students so that they may become familiar with the types of information that they need to record in their interviews.
- Ask students to develop a set of questions and review them with one another before requesting interview time with family members or others in the community.
- Discuss proper ways to approach a person for an interview and the importance of thanking them for their information and time.
- A polite gesture is to offer a makana (gift) to the interviewee. It could be something the student made or gathered from his/her wahi (place). This simple act honors the person who is providing the student with valuable information and opens the door to a successful interview.
- Discuss the importance of taking notes during an interview and checking to see that the information recorded was heard correctly. Students may want to ask permission to tape record the interviewee for later reference.
- Ask students to report their findings from the interviews.

5. Have students read, discuss and write a response to the story, Kāne‘āpua.

- Hand out the Student Reading and Journal Sheet 3 for students to read and respond to the story.
- Instruct students to read the story and to write a response on Journal Sheet 3.
- Before or after students write their response, discuss the story.

Discussion Questions:

- What are some of the historic places that are associated with Kāne‘āpua within the ahupua‘a of Kaunolū? Can you find these places on a map?
- How do mo‘olelo or historical events influence places over time?
- How would you compare and contrast life in early Hawai‘i to today at these places in Kaunolū?

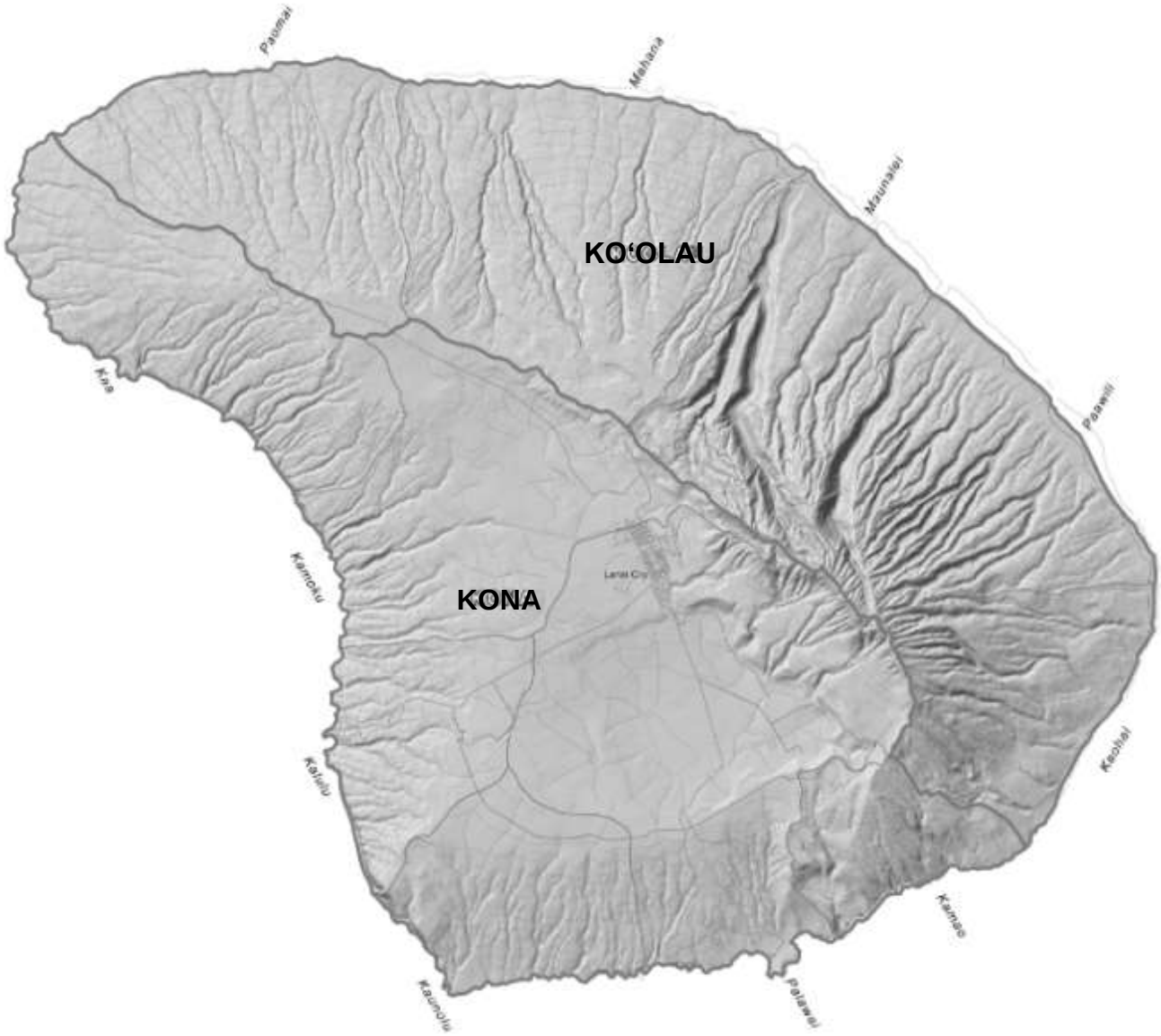
6. Complete the K-W-L chart by asking students to record what they learned about the ahupuaʻa of Lānaʻi and early Hawaiian life and how history has created storied landscapes.

7. Assess students' ahupuaʻa diagrams, interview summaries and reading responses.

Adaptions/Extensions

Have students listen to the oli (Mele Mokupuni o Lānaʻi) and read along with the words found on page 16 and in Appendix 1. Have the students identify place names and other familiar words in the oli, discuss their significance and locate them on a map.

Our Ahupua‘a –
Lāna‘i Ahupua‘a Mokuoloko Map



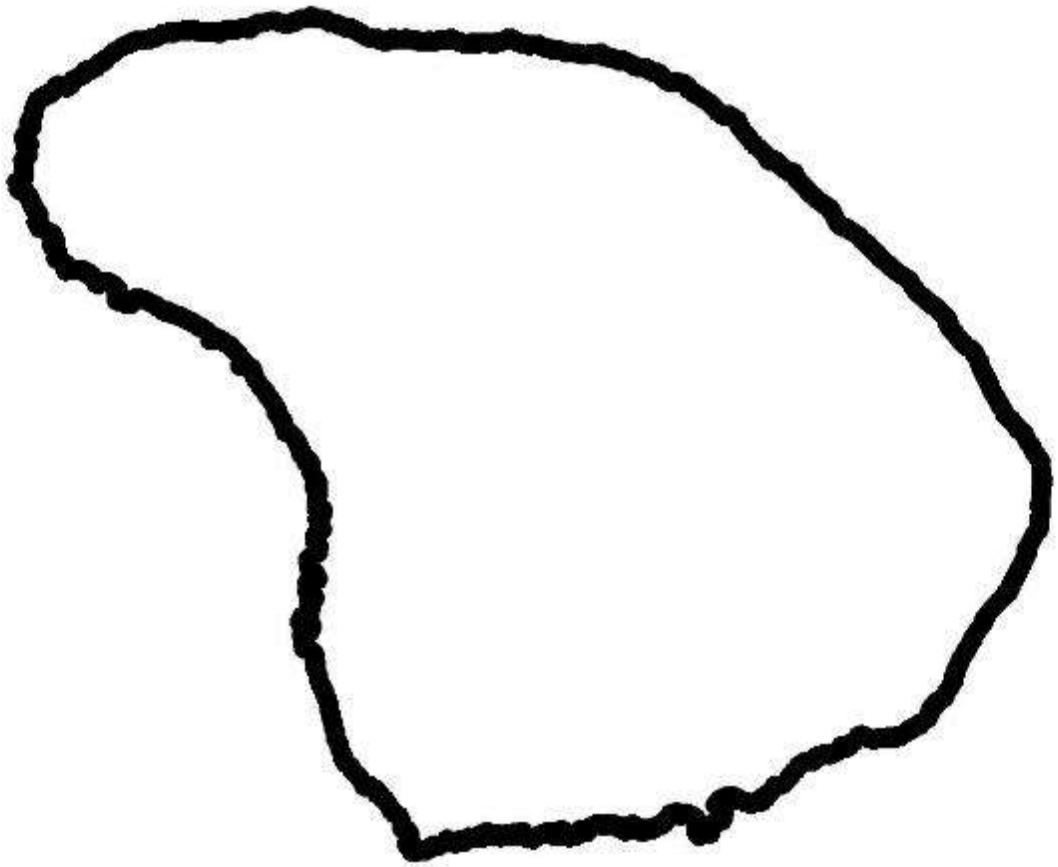
Our Ahupuaʻa

Journal Sheet 1 –
Mapping an Ahupuaʻa

Name_____ Date_____

On the map below, illustrate and label the boundaries of mokuoloko and the ahupuaʻa of Lānaʻi. Label significant Hawaiian place names and locations with which you are familiar, including where you live. Color code your map to identify environmental characteristics. (For example, use shades of green to identify forested areas and shades of brown to identify arid areas.) On the side, include a labeled color code key and title.

On the back of this sheet, write at least four paragraphs describing these boundaries, their environmental characteristics, significant landmarks, and possible Hawaiian cultural uses. Where do you live in relation to these boundaries? Be sure to include the words ahupuaʻa, mokupuni, mokuoloko, kona and koʻolau and place names in your writing.



Our Ahupuaʻa

Journal Sheet 2 –
Conducting Oral History Interviews

Name_____ Date_____

Traditionally, Hawaiians passed information orally from one generation to another. Conduct a short interview with someone who is very familiar with the island of Lānaʻi such as a family member, community member, or staff at the Lānaʻi Culture & Heritage Center or the Lānaʻi Culture Historic Preservation Office to learn more about a specific Hawaiian cultural location on Lānaʻi. After completing your interview, summarize this information in a short report and present it to the class. Use pictures and/or maps to help describe your story to others.

The summary of your interview should include several kinds of information, including, but not limited to:

Hawaiian cultural site name: _____

Ahupuaʻa location: _____

- Description of the site's name
- Historic story of the site
- Special geographic characteristics that identify the site
- Significant cultural uses that occurred historically and in modern days
- Pictures of maps of the location

Background on Conducting Oral History Interviews

The following notes are meant to provide teachers and students with an overview on how to approach doing oral history interviews. The student projects can be as detailed as they wish. The following points are among those which have facilitated the detailed recording of oral historical documentation:

- Identify the interviewee's family and ancestral lands;
- Identify locations where the interviewee lived and worked (including background of work, subsistence practices, community life, home…); and
- Discuss family practices and traditions heard from elders while growing up. Remember to specify when such things occurred.

Several points should be recorded at the beginning of the interview, and the beginning of the interview should follow a basic format, such as:

Name of Interviewee(s):_____

Interview Date:_____ Location:_____

When were you born? _____

Where were you born?_____

Parents? (father) _____

(mother) _____

Grew up where?_____

Also lived at? _____

Additional information such as —

- Family background—grandparents; generations of family residency in area... (time period)?
- Kinds of information learned/activities participated in, and how learned...?
- Sites and locations visited, worked and played at…
- Who were your early neighbors?
- What was the neighborhood/community like in those early years?

When someone says something like "It was about this big" and then they gesture a size, confirm the size by saying something appropriate like "so about two feet long… or about the size of this room, so 12 by 14…" Confirming these details will provide readers with visual references to the items being discussed.

Additionally, if the interviewee nods or shakes their head in response to something, confirm it with a verbal response. The readers of the transcripts will not see the interviewee.

Whenever possible, try to place a time frame around events or activities that are being discussed. For example, when the interviewee says, "I moved here with my family when I was about five years old." You know that the interviewee was born in 1930. You might say, "So around 1935?" This will cause the interviewee to think about the timing and give you a fairly accurate time frame.

If the interviewee does not remember a particular date, you might suggest things that could trigger their memory. For example, you inquire about what year someone passed away and the interviewee does not recall. You might say, "About how old were you at the time?"

Various little questions or confirmation of items will make the interview transcript a better resource for future generations.

Oral History Interviews with Lāna‘i Elders

Perhaps the most fragile and precious source of information available to us, and the one most often over looked (particularly in academic settings), are our elders — *kūpuna,* those who stand at the source of knowledge (life's experiences) and *kama‘āina* who are knowledgeable about the tangible and intangible facets of the living environment and the history of our community. For the most part, the paper trail—the archival-documentary records—can always be located and reviewed, but the voices of our elders, those who have lived through the

histories that so many of us seek to understand, are silenced with their passing. The Lānaʻi Culture & Heritage Center has been engaged in an oral history initiative for the last 14-plus years. In this curriculum guide, we share several interviews that have been conducted with elder Hawaiians who described their relationship with lands, resources and families of the windward region of Lānaʻi. While the questionnaire outline above and the interviews below focus on the experiences of native Hawaiian families of Lānaʻi, Lānaʻi CHC has also conducted many interviews (both audio and video) with members of various ethno-cultural populations represented on Lānaʻi. The questionnaire format and approach to interviews by students may be adjusted to fit any particular focus of study.

One short interview is cited below and several additional interviews may be found in Appendix 9. These interviews provide students with background on the living environment, changes that have occurred over the last 100+ years, and call present and future generations to engaging in stewardship of our bio-cultural landscape.

Marian Kuʻuleialoha Kaopuiki Kanipaʻe

E pili ʻana nā loko a me ke kahakai o Keōmoku
Lānaʻi Culture & Heritage Center Oral History Program
March 1, 2014 with Kepā Maly (KM)

Kupuna Kuʻuleialoha Kaopuiki Kanipaʻe (MK) (1915-2017) recalled the low walls of the loko iʻa fronting the Keōmoku vicinity and fishing customs practiced when she was a child, and how things changed as the plantation community grew. She supported the Waiaʻōpae Loko restoration program.

MK: I ko mākou wā kamaliʻi, ua kamaʻāina mākou me kekāhi loko iʻa ma ka ʻaoʻao o Keōmoku. O Kaʻa loko kekāhi, a me kekāhi ma mua o Keōmoku, a me Waiaʻōpae. Ua ʻike wau i nā pā, aʻole kiʻekiʻe loa, akā i ka manawa kai maloʻo ʻike nō. Ua hele mākou a lawaiʻa ma loko o nā loko.

Ma mua, nui no nā lae ʻiliʻili ma kahakai, mai Kalaehī ā i Kahalepalaoa. I kēlā manawa ua ola kuʻu kupunahine, o Lahapa. Ua aʻo mai ʻoia iā mākou, "Pono iā mākou ke mālama i nā lae ʻiliʻili." Ua hana mākou i mau hale ʻōpae, a he nui no nā ʻōpae ma mua. Ua hōʻiliʻili mākou i nā pōhaku, nā ʻiliʻili, a kūkulu i mau hale i noho ai nā ʻōpae. Hele mākou a ʻohi i nā ʻōpae. Ua hele wau a hōʻike i kuʻu kaikūnane o Sam i kēlā hana a mākou. I ka manawa i hele mai ai nā Pilipino, ua nāhāhā lākou i ka mākou mau hale no nā ʻōpae a me nā iʻa liʻiliʻi. Aʻole lākou i maopopo ko mākou hana.

KM: O ka hale no ka ʻōpae a me nā iʻa he umu a i ʻole he imu iʻa?

MK: ʻAe ʻoia ko mākou hana mamua.

KM: Pehea kou manaʻo e pili ʻana ka hoʻoponopono ʻana i kāhi loko iʻa.

MK: Maikaʻi, akā he nui ka hana.

KM: ʻAe, mamake nō mākou e hana i kēia mau mea no nā ʻōpio. A laila hiki iā lākou ke maopopo i ka hana, a e loaʻa ʻana lākou i ka ʻai…

Translation

MK: During our youth, we were familiar with some of the fishponds on the side by Keōmoku. Kaʻa loko was one, and also one in front of Keōmoku, as well as Waiaʻōpae. I saw the walls, though they weren't high. It was at low tide and you could see them. We went to get fish within the ponds.

Before, there were many little pebble points along the shore, from Kalaehī to Kahalepalaoa. At that time, my grandmother Lahapa was living. She taught us that "we were supposed to care for the little pebbly points." We would make houses for the shrimp, and there were lots of shrimp then. We would gather stones and pebbles and make houses for the shrimp to live in. Then we would go gather the shrimp. I went and showed my brother Sam how we did that. But when the Filipinos came, they broke our houses for the shrimp and little fish apart. They didn't know how we did things.

KM: Those houses for the shrimp and the fish were umu or imu?

MK: Yes, that's what we did before.

KM: What do you think about us restoring some of the fishponds?

MK: It's good, but a big job.

KM: Yes, we want to do these things for the youth. Then they will understand how to do the work, and they'll have food to eat…

Our Ahupuaʻa

Student Reading –
Kāneʻāpua: Peninsula and Ceremonial Site

Kāneʻāpua is almost an islet that juts out from the shore of Kaunolū. With the passing of time, it will be a lava stack detached from the main shore. This section of Kaunolū was named for a god sibling of the elder gods Kāne (a life-giving god) and Kanaloa (a god of the sea).

Tradition states that Kāne, Kanaloa and Kāneʻāpua first came from Kahiki and stepped upon Lānaʻi at the shore of Kaunolū. Being thirsty, the elders sent Kāneʻāpua to the forested lands above here, situated in Pālāwai Basin, to fetch some water with which to prepare a refreshing drink of ʻawa for them. Kāneʻāpua reached a place called Puʻu o Miki and found a spring from which he gathered water.

Returning to the shore, the ʻawa drink was prepared, but the elder brothers found the water to have been polluted. They punished Kāneʻāpua by leaving him here at Kaunolū and returned to their ancestral homeland, via Ke Ala i Kahiki (The canoe sailing path to Kahiki).

During his time on Lānaʻi, Kāneʻāpua met a local woman and together they had children. The people of old claim the god-man Kāneʻāpua as their ancestor. Kāneʻāpua was also a noted canoe navigator and he eventually hailed a voyaging canoe which picked him up and returned him to Kahiki.

The ceremonial sites dedicated to Kāneʻāpua may be seen at the top of the point, but no access to the site has been made since earthquakes in the 1860s caused the cliff-trail to collapse. A stone image of Kāneʻāpua was also erected as a place for offerings to ensure a great abundance of fish in the waters of Kaunolū.

Excerpt and photo from Lānaʻi Guide, 2016, www.lanaiguideapp.org/, an online website and mobile application which provides detailed information and guides users during their exploration of Lānaʻi's rich natural and cultural history

Our Ahupuaʻa

Journal Sheet 3 –
Kāneʻāpua Reflection

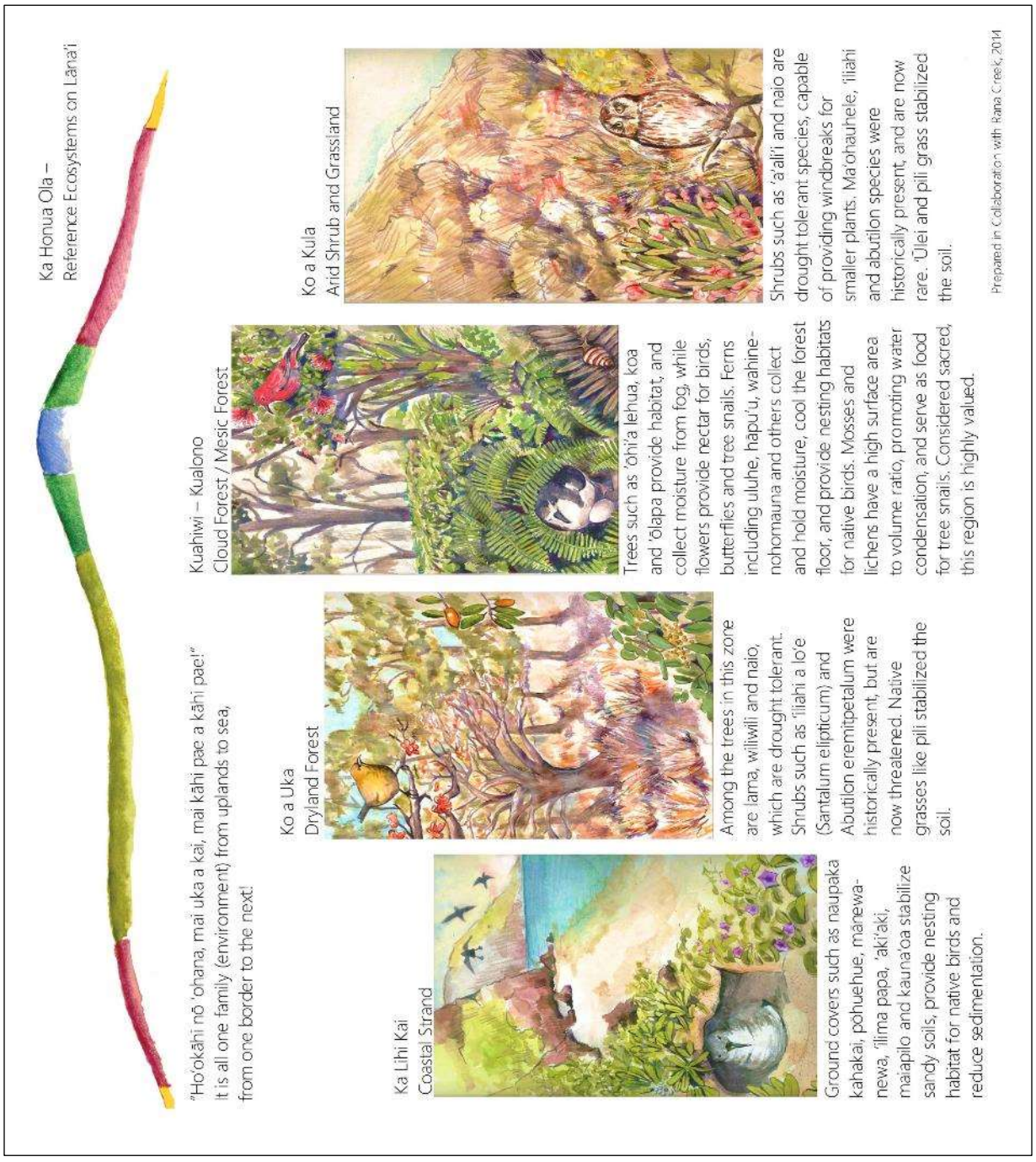
Name_____ Date_____

Think about the characters and setting of the story of Kāneʻāpua in the ahupuaʻa of Kaunolū. Was there a timeline of events? Were there significant places mentioned?

Write a reflection (at least four paragraphs) about what you learned from the Student Reading. Who was Kāneʻāpua? Summarize at least two main events that occurred during his time at Kaunolū. How did Kāneʻāpua's presence influence sites in this area? Describe the historic sites that now honor Kāneʻāpua and why. Be sure to include in your reflection an introduction, body and conclusion.

Ka Honua Ola – Lāna‘i’s Living Environment

Ahupua‘a on Lāna‘i are made up of several important environmental zones. In a healthy ecosystem, these zones include diverse resources which contribute to the health and well-being of the island. Four primary regions from mauka to makai are identified below. What can we do to help restore Lāna‘i’s environment?



GRADE 10 – BUILDING AHUPUA‘A MODELS

How does the flow of water and nutrients through the ahupua‘a affect the fishpond?

Key Concepts

- The flow of water and nutrients through the ahupua‘a by means of cycles such as the water cycle and nitrogen cycle is critical to the productivity of the fishpond.
- Hawaiians built their loko kuapā (shoreline fishponds) in areas where streams would carry nutrients to the pond and help to flush out the build-up of sediments.

Activity at a Glance

Students build ahupua'a models using diatomaceous earth, small rocks, and large plastic bottles with drip systems. They use these models to simulate the flow of water and nutrients through Pālāwai ahupua‘a into Waia‘ōpae fishpond. They then alter their models to reflect changes to the pond, where soil is eroded into the pond.

Assessment

Students:

- Completion of model and details
- Diagram the water and the nitrogen cycle
- Explain the importance of these cycles in the productivity of the fishpond.

Time: 3 class periods

Skills

Observing, predicting, inferring, model building, diagramming

Materials

Provided:

- Model-building directions
- Pālāwai ahupua‘a map
- Journal sheet
- Journal answer sheet – nitrogen cycle diagram
- Student Reading

Needed:

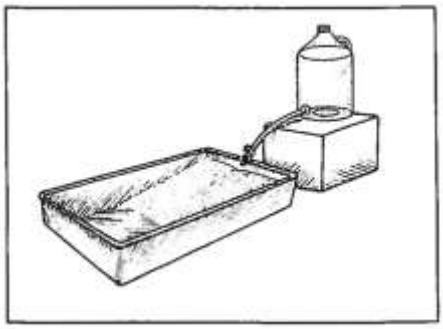
- dust mask (for Advance Preparation)
- blue food coloring
- measuring cup or scooper
- hot glue gun

- small jar of oregano and thyme
- paper towels or rags
- old newspaper
- sponges
- model building materials (for each team of 3 - 4 students)
- plastic blanket boxes (approx. 20” x 15” x 3”)
- diatomaceous earth (at pool supply store – need 5-6 lbs. per team)
- spray bottles
- blocks of wood (approx. 2” x 4” x 6”)
- buckets (for waste water)
- old newspaper or sheets (to cover lab tables)
- pancake spatulas or trowels
- sandwich-size plastic bag full of small cinders (to build fishpond walls)
- drip system materials
- one-gallon plastic jugs (use sturdy jugs such as shoyu or distilled water containers)
- two-ft. length of 1,4 in. flexible drip line tubing (hardware store)
- adjustable drip valve (2-gallons per hour; available at sprinkler supply or hardware store)

Advance Preparation

- Make a copy of the student reading and Journal Sheet for each student.
- Make a slide of the Journal Sheet answer sheet – nitrogen cycle diagram.
- Make a copy of the model-building directions sheet and Pālāwai ahupua'a map for each team.
- Preview some of the water and nitrogen cycle Websites listed under Resources at the end of this lesson.
- Prepare to project the Pālāwai ahupuaʻa map.
- Prepare materials for students' ahupuaʻa models.

Preparing Ahupuaʻa Boxes



- Measure out the diatomaceous earth (DE) into the blanket boxes. Caution: this is silica dust, which can irritate the lungs when it is dry, so use a dust mask.
- Measure out enough DE to fill approximately 1/3 of each blanket box.
- Add about 1.5 gallons of water to the DE and mix with hands. Continue to add water slowly until it begins to appear on the surface of the DE when you jiggle the box.
- The DE mixture should look solid and dry, but liquefy when you tap on it gently and rapidly with fingers. Note: have a bucket of water handy to rinse your hands. Do not wash them in the sink since the DE can clog drains! Once the water evaporates, the DE from the bucket can be reused.
- Fill the spray bottles with water.

Preparing Drip Systems

- Use the hot tip of the glue gun to melt a tiny hole through the thickest portion of the lower rim of the plastic jug. Alternatively, poke a hole with the small nail and a hammer.
- Attach the adjustable drip valve to one end of the drip tubing.
- Insert the tubing through the hole so that at least 1 cm is sticking into the jug and use the glue gun to seal around the connection to prevent leaks. If this method does not create a tight seal, wrap the tubing with plumber's tape to cover about 1 inch at the end where it is inserted into the jug.
- Turn the emitters off. Fill the jugs with water and add about 20 drops of blue food coloring to each jug.

Vocabulary

- ahupuaʻa – traditional Hawaiian land unit, typically extending from mountain summits to the outer edges of reefs
- ammonia – a colorless gas composed of nitrogen and hydrogen atoms
- ʻauwai o ka mākāhā – ditch or channel in a fishpond wall containing a mākāhā
- denitrification – the process where anaerobic bacteria convert nitrates to nitrogen gas
- diatomaceous earth (DE) – a naturally occurring, soft, chalk-like sedimentary rock that is easily crumbled into a fine white to off-white powder; it consists of fossilized remains of diatoms, a type of hard-shelled algae
- ecosystem – a system formed by the interaction of a community of organisms with their environment
- mākāhā – sluice grate in a fishpond; more recent mākāhā have movable parts like a gate
- nitrogen cycle – the process where atmospheric nitrogen is converted to ammonia or nitrates and then back to nitrogen gas.
- nitrogen fixation – the process by which bacteria convert nitrogen gas to nitrates nitrification – the process by which bacteria convert organic nitrogen (ammonia) to nitrites and nitrates
- nitrates (NO_3) – nitrogen molecules that have been combined with oxygen molecules into nutrients that plants can absorb
- nutrients – any matter that, taken into a living organism, serves to sustain it, promote growth, and provide energy
- productivity – in this context, the fishpond's production of fish for human consumption
- ungulates – hoofed animal (introduced)
- water cycle – the cycle of water between the atmosphere and the earth

Common Core State Standards

- RST.11-12.1. Cite-specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- WHST.9-12.5. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Next Generation Science Standards

- HS-LS2. Ecosystems: interactions, energy, and dynamics
- HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.
- Cycles of Matter and Energy
- Emphasis is on conceptual understanding of the role of aerobic and anaerobic respiration in different environments.
- Understand the unity, diversity, and interrelationships of organisms, including their relationship to cycles of matter and energy in the environment.

Nā Honua Mauli Ola (NHMO)

- 14-7: Plan for meaningful learner outcomes that foster the relationship and interaction among people, time, space, places, and natural elements around them to enhance one's ability to maintain a “local” disposition with global understandings.
- Be familiar with and respectful of places within their community.

Loko I‘a of Lāna‘i

Waia‘ōpae Loko, Pālāwai Ahupua‘a

Along the windward shores of Lāna‘i lie the island’s loko i‘a, Ka‘a, Kahōkeo, Waia‘ōpae, Lopā and Naha. In ancient times, these areas were home to many residents who took advantage of the sheltered coves and barrier reefs which provided the ideal conditions to build loko i‘a. The ancient fisheries along these shores were bountiful and helped feed the community. Collectively, these fishponds once fed an island population of up to 6,000 people and there was also enough fish to trade with Lahaina on Maui.

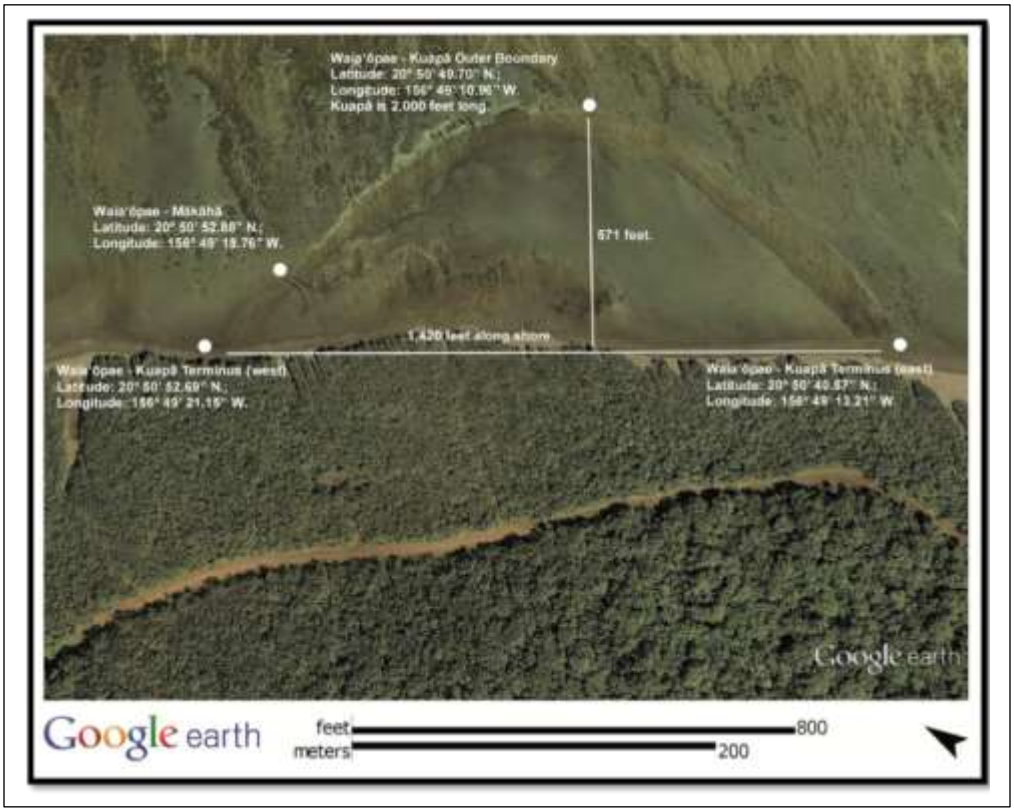
The loko i‘a helped sustain the island’s population, but over time, quick and abrupt changes in the environment caused this sustainable lifestyle to suddenly change. When the introduced goats, sheep and deer took over the landscape and denuded the forests in the 19th century, erosion occurred. Heavy rains caused sediment to flow into the ocean, depositing large amounts of soil into the loko i‘a. The sediment eventually smothered fresh water springs that fed the ponds and once the springs were clogged, the fishpond’s ability to function properly was affected. At Waia‘ōpae Fishpond, once its springs disappeared, so did the ‘ōpae (shrimp) for which it was named.

Waia‘ōpae Loko is situated in the ahupua‘a of Pālāwai. Waia‘ōpae may be translated as “Shrimp spring” and Pālā-wai as “Fresh water moss.” The ahupua‘a of Pālāwai crosses Lāna‘i from the ko‘olau (windward) coast to the kona (leeward) coast. Pālāwai contains 5,897 acres and had dedicated fisheries (including the fishponds of Ka‘a, Kahōkeo and Waia‘ōpae), kula (dry land) agricultural field systems, forest resources, and numerous fresh water sources with springs and intermittent streams. In the near shore sections of Pālāwai, potable water sources were developed and villages were established all along the coast. On the leeward side, Pālāwai is bounded by Keālia Aupuni on the west and by Kama‘o on the east. At the mountain top, Pālāwai shares the highest peak – Lāna‘i Hale – as a boundary point and adjoins Kaunolū and Pāwili from the mountain to the windward coast. During the Māhele ‘Āina, Pālāwai was awarded to Chiefess Kekau‘ōnohi and later inherited by her husband, Ha‘alelea. The kapu fish was ‘anae (mullet) and the kapu wood was ‘ahakea (*Bobea*).

The population of the island was changed along with the environmental changes in the 19th century. In the early 1900s, widespread disease decimated Hawaiians throughout all the islands and on Lāna‘i, the population plummeted to a mere 150 residents by 1920. When James Dole began to aggressively plant pineapple on Lāna‘i and started to create the world’s largest pineapple plantation in 1922, most of the east shore residents moved to Lāna‘i City to work. As an end result, no one remained to care for the fishponds and eventually Mother Nature took her toll on the ponds and they were neglected.

Today, nearly a century later, Lāna‘i’s community has come together to restore Waia‘ōpae

fishpond and bring it back to its glory. The kuapā's foundation is still intact and the rocks are still present. The community is relying on volunteers to help provide the manpower that is needed to restore the 2,000-foot long kuapā. Once completed, the fishpond will enclose more than a quarter mile of shoreline and extend 571 feet into the sea. Like many other fishpond restoration projects throughout Hawai'i, Waia'ōpae's restoration is being done completely by hand and with the original rocks. As of November 2018, about 20 percent of the wall has been reconstructed by volunteers. Once it is completed and the sediment flow is altered, the pond will be able to once again function properly and marine life will return, enabling the fishpond to once again feed its community of Lāna'i as it was originally intended.



Teaching Suggestions

Part 1: Model-Building

1. **Introduce students to the essential question and the standards that they will be working on in this lesson and give a brief background about Pālāwai ahupuaʻa and its history at Waiaʻōpae Loko.**

2. **Write the following questions on the board and explain that students will be building models to try and answer these questions.**

    - What parts of the water cycle affect the ahupua'a and how is this important to the functioning of the pond?
    - How do nutrients from the land end up in the pond?

3. **Divide the class into teams of three to four students. Distribute the model building directions and Pālāwai ahupuaʻa map to each team of students.**

    - Review the ahupuaʻa map and ask students to locate Waiaʻōpae Loko and the three gulches that are within this ahupuaʻa. Explain that these are some of the features that will be displayed in the students' models and that Waiaʻōpae Gulch flows into Waiaʻōpae Loko.
    - Show students a sample set-up of the model, explain what diatomaceous earth is, and give each group the materials they will need.
    - Walk them through the steps outlined on the direction sheet. Ask all teams to hold off on using water on the models until you check their set-ups.

4. **Ask students to use the cinders provided to create Waiaʻōpae Loko fishpond at the makai end of their models.**

5. **Have students observe the effects of runoff and compare the pond before and after.**

    - Show students how to hold the drip valve at the top of Waiaʻōpae Gulch and carefully turn on the drip system so that water flows at the rate of 5 or 6 drops per second.
    - Turn the drip valve on and watch what happens to the flow of the water and nutrients. This shows how water flowed before erosion took place.
    - Have students add some soil to the gulch and turn on the drip system once more. Students then record their observations of what happens after the introduction of ungulates caused the landscape to change and become susceptible to erosion.
    - Have students turn off the drip valves. Return to the questions on the board and discuss students' responses.

    Discussion Questions

    - What is the cycle of fresh water through Pālāwai ahupuaʻa into the fishpond before ungulates were introduced?
      (Stream water and surface water runoff flows through the fishpond and out to sea. Finish the cycle by reviewing evaporation, condensation, and precipitation.)
    - How is this cycle important to the functioning of the pond? What happened to the sediments that washed into the pond?

(The flow of water flushes the sediments out through the mākāhā. The mixing of fresh and salt water creates brackish water that attracts young fish to the pond.)

- What happened to the pond when it became filled with sediments? How might this buildup of sediments be a problem in the pond?
  (The cloudy water blocks the sunshine that the algae and the phytoplankton need to grow resulting in lower dissolved oxygen in the pond. Sediment fills fresh water springs that may be present within the fishpond floor.)
- What are the limitations of this model for accurately showing natural processes?
  (The models do not accurately demonstrate the accumulation of sediments since we do have tidal action.)
- How did the changes in the mauka environment affect the flow of nutrients from the land into the pond?

6. Clean up the models using the buckets for rinsing hands.

- Use paper towels to remove the spices and use sponges to mop up excess water.
- Leave the DE in the boxes and remove the fishpond walls. [Note: the models can be used by another class following the same steps above. When all classes are finished, allow the DE to dry and store the boxes with the dried DE for later use.]

Part 2: Cycles

1. Distribute the Student Reading and Journal Sheet.

- Introduce the nitrogen cycle and discuss each step in the process, defining vocabulary and helping students to understand the role of bacteria in nitrification and denitrification.
- Ask students to complete the Journal Sheet as homework.

2. Check students' Journal Sheets for accuracy.

- Project the answer sheet of the nitrogen cycle and discuss any areas that need clarification.
- Project one of the animations of the nitrogen cycle listed under Resources at the end of this lesson.

Adaptations/Extensions

Students could use Monopoly houses, toothpicks, plastic piping, and strips of heavy fabric as small houses, trees, culverts, streets and other objects in their models.

Have student teams conduct research into the water cycle, carbon cycle or the nitrogen cycle and create a poster to share with the rest of the class. See recommended Websites for research under Resources below. Have students do a gallery walk and share their information with one another.

Building Ahupua‘a Models

Model-Building Directions

Team Challenge: Build a model of Waia‘ōpae Gulch and the ocean using diatomaceous earth, water, cinders, and the materials provided to your team.

Vocabulary

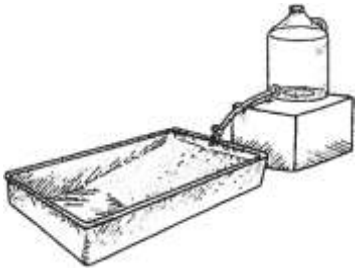
ahupua‘a – traditional Hawaiian land unit, typically extending from mountain summits to the outer edges of reefs
diatomaceous earth (DE) – a fine powder that is made up of the skeletons of diatoms (tiny marine organisms)

Directions

1. Each team will receive a box with DE, a block of wood, a water jug with a small drip valve, a spatula, a spray bottle, and newspaper. Spread newspaper over the surface of the lab table and place your box of DE on the newspaper.

2. Use the spatula to loosen the DE and scrape the DE away from what will be the makai edge of the model and mound it on the mauka edge.

3. Place the makai edge of the model box on a block of wood and bang it gently. This will help to create the gulch and make the DE the right consistency.

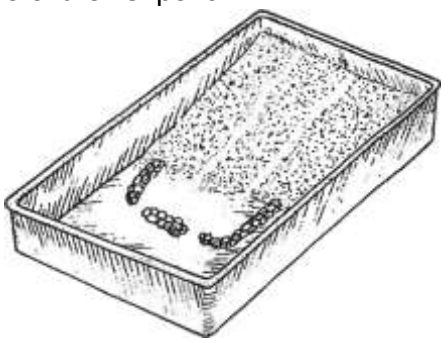


4. Once the DE looks like it is turning to liquid you will be ready to begin.

5. Remove the block of wood and place the water jug with the emitter on another block above the mauka end of the model (see drawing at right).

   Remember: Use the water bucket to rinse your hands once you handle DE since it can clog the sink drain.

6. Build the fishpond walls with at least two openings where the mākāhā would have been. Leave approximately two inches of space on either side of the fishpond.



7. Use the spatula to create the grooves of Waia‘ōpae gulch; these will provide the source for the stream that flows into Waia‘ōpae Loko.

8. Hold the drip valve over one of the stream grooves in the gulch. Carefully turn on the drip system so that water flows at the rate of 5 or 6 drops per second. Watch what happens.

9. Sprinkle a small amount of oregano on the model land surface, especially near the streams. This will represent nutrients that are found on the land as a result of the recycling of wastes and other organic material.

10. Use the spray bottles and increase the flow from the drip valves to simulate a rainstorm. What happens to the "nutrients"?

11. Sprinkle some thyme onto the model to represent nitrate fertilizers being applied to the land. Make another rainstorm and observe what happens.

12. Add some soil within the gulch. This will represent land that was present before ungulates arrived.

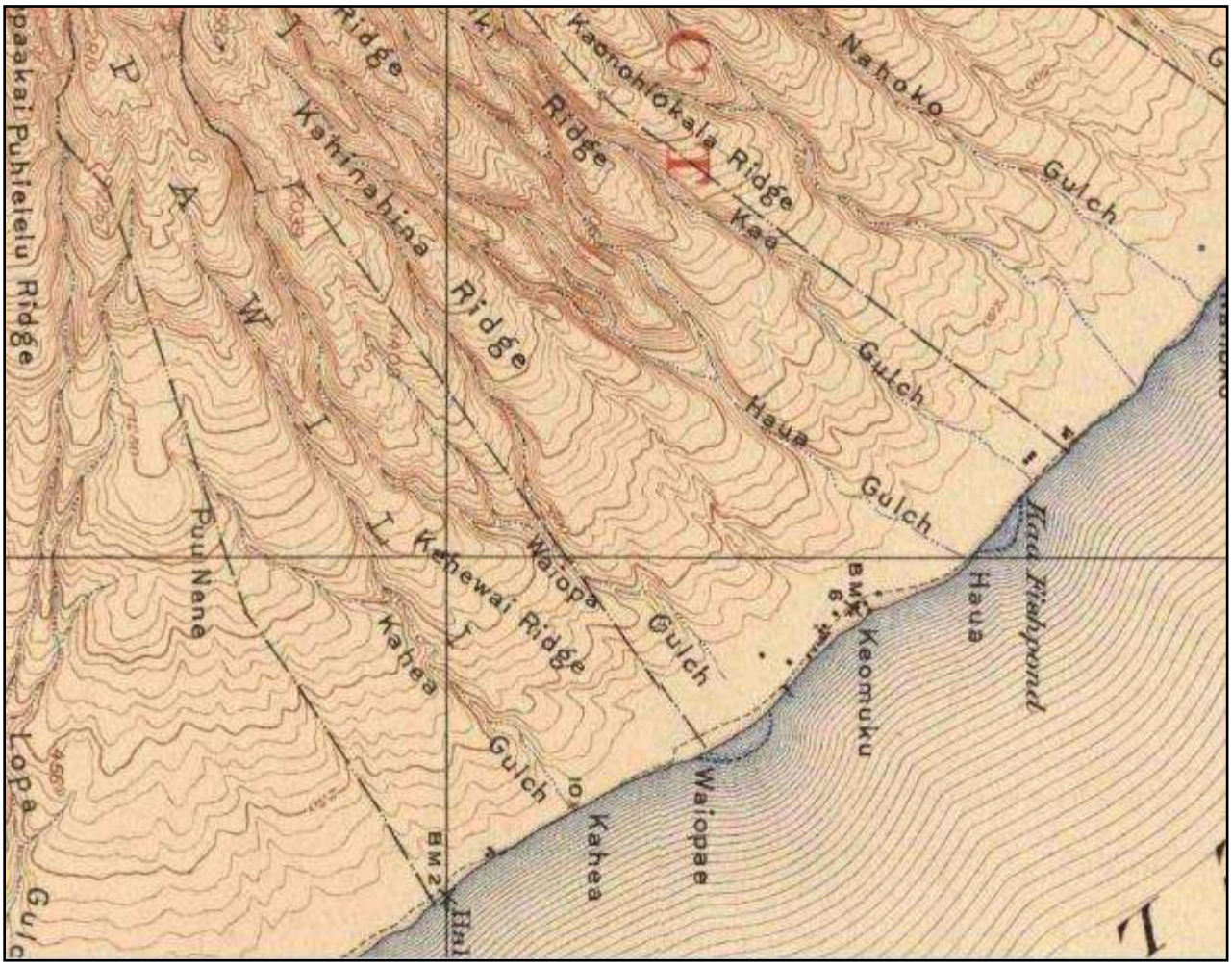
13. Carefully turn on the drip system so that water flows at the rate of 5 or 6 drops per second. Watch what happens.

14. Use the spray bottles and increase the flow from the drip valves to simulate a rainstorm. What happens to the soil now? What happens to the fishpond?

Building Ahupua‘a Models

Pālāwai Ahupua‘a Map

Pālāwai Ahupua‘a – general boundaries



Windward Portion of Pālāwai Ahupua‘a with Waia‘ōpae Loko

Building Ahupua‘a Models

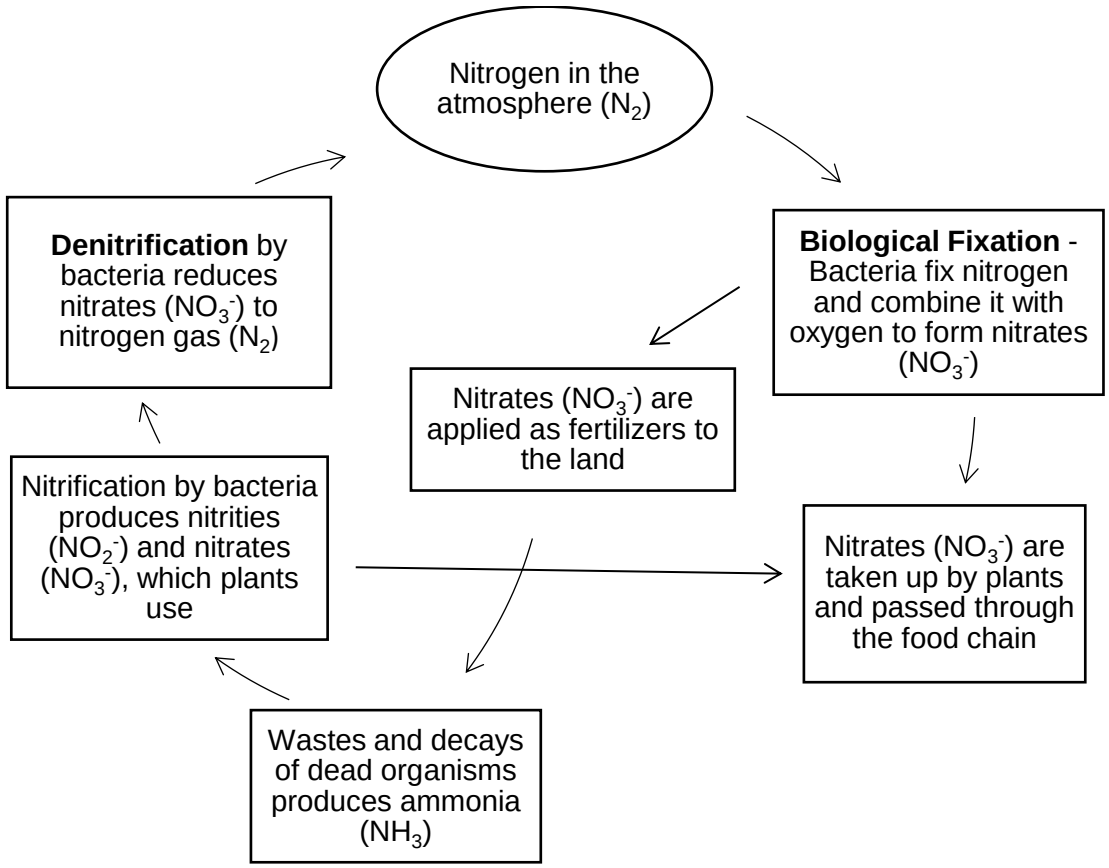
Student Reading – Cycles

The Nitrogen Cycle

We all need nitrogen to survive. We take in nitrogen in the form of proteins we get from our food. If we catch and eat a fish from the fishpond, what are the steps that get that protein to us? How did the nitrogen get into the body of the fish?

Most nitrogen (79%) on Earth is in the form of stable, diatomic nitrogen gas in the atmosphere. In order for this nitrogen to be used by plants to start the food chain, it has to be “fixed.” This means that the nitrogen molecules have to be broken apart so that they can combine with oxygen or hydrogen into forms that plants can take up through their roots as nutrients. The energy required to break apart the nitrogen can come from lightning, but this is rare in Hawai'i. The main way that nitrogen becomes fixed is through biological fixation. Bacteria that live in the soil and water and on some plant roots fix nitrogen and combine it with oxygen to form nitrates. The nitrates are taken up by the limu and phytoplankton in the pond (and by plants on land). The nitrates pass through the food chain when we or other organisms eat the fish that ate the plants.

THE NITROGEN CYCLE



Another way that nitrates are provided to plants is through the process of decay. When organisms in the fishpond excrete wastes or die, bacteria break down the waste and dead organisms into ammonia. The ammonia can be taken up by plants, but most of it is converted to nitrates by two groups of nitrifying bacteria. This process of nitrification takes place in two steps:

1. Bacteria (Nitrosomonas) oxidize the ammonia to nitrites (NO_2).
2. Bacteria (Nitrobacter) oxidize the nitrites to nitrates (NO_3).

Farmers, home gardeners, and commercial landscapers also play a role in the nitrogen cycle. Fertilizers containing nitrogen in the form of ammonia, urea, or ammonium nitrate are applied to farmer's fields, gardens, lawns and golf courses. Plant roots take up the fertilizer. However, if too much fertilizer is applied, nitrates can leach into the ground water and be carried by surface water runoff during rains. Eventually, the excess nitrates may end up in the ocean where they upset the balance of life in the fishpond and on coral reefs.

How does nitrogen get back into the atmosphere?

To make the nitrogen cycle complete, the process of denitrification reduces nitrates to nitrogen gas, back to the atmosphere. How does this happen? Bacteria that live deep in the soil and in the sediments of the fishpond where there is no free oxygen (anaerobic conditions) will use nitrates in their respiration. In this process they reduce the nitrates (NO_3) to nitrogen gas (N_2) and free oxygen.

The Water Cycle

Water also cycles between the atmosphere and the land. The trade winds blow moisture-laden air to our islands. As the air rises, it cools and condenses, forming precipitation. The rain flows to the ocean and into the fishpond through the streams and as surface water runoff. Some of the rain percolates through the porous layers of lava rock and becomes part of the groundwater. Plants take up this groundwater through their roots. The water cycles back to the atmosphere through the respiration of plants and animals and through evaporation from the ocean, streams and surface water. The sun is the powerhouse that drives this cycle.

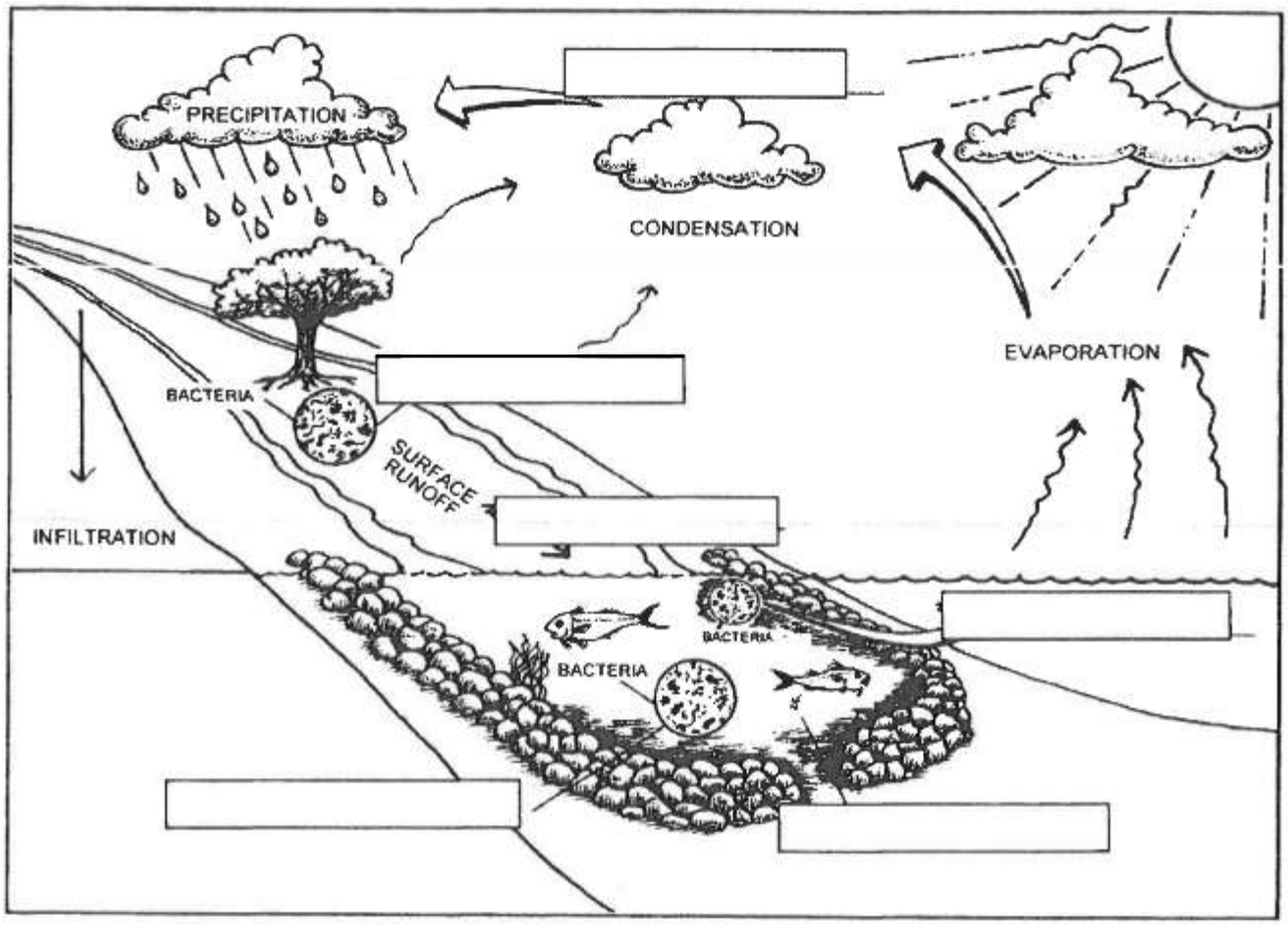
Building Ahupua‘a Model

Journal Sheet

Name: _____ Date: _____

Use the information from the student reading to complete this diagram of the water cycle and nitrogen cycle by labeling it with the following terms in the boxes provided.

biological fixation **decay** **denitrification**
nitrates (from fertilizer) **nitrification** **nitrogen in atmosphere**



Write a summary for the diagram explaining why these cycles are important for the productivity of the fishpond.

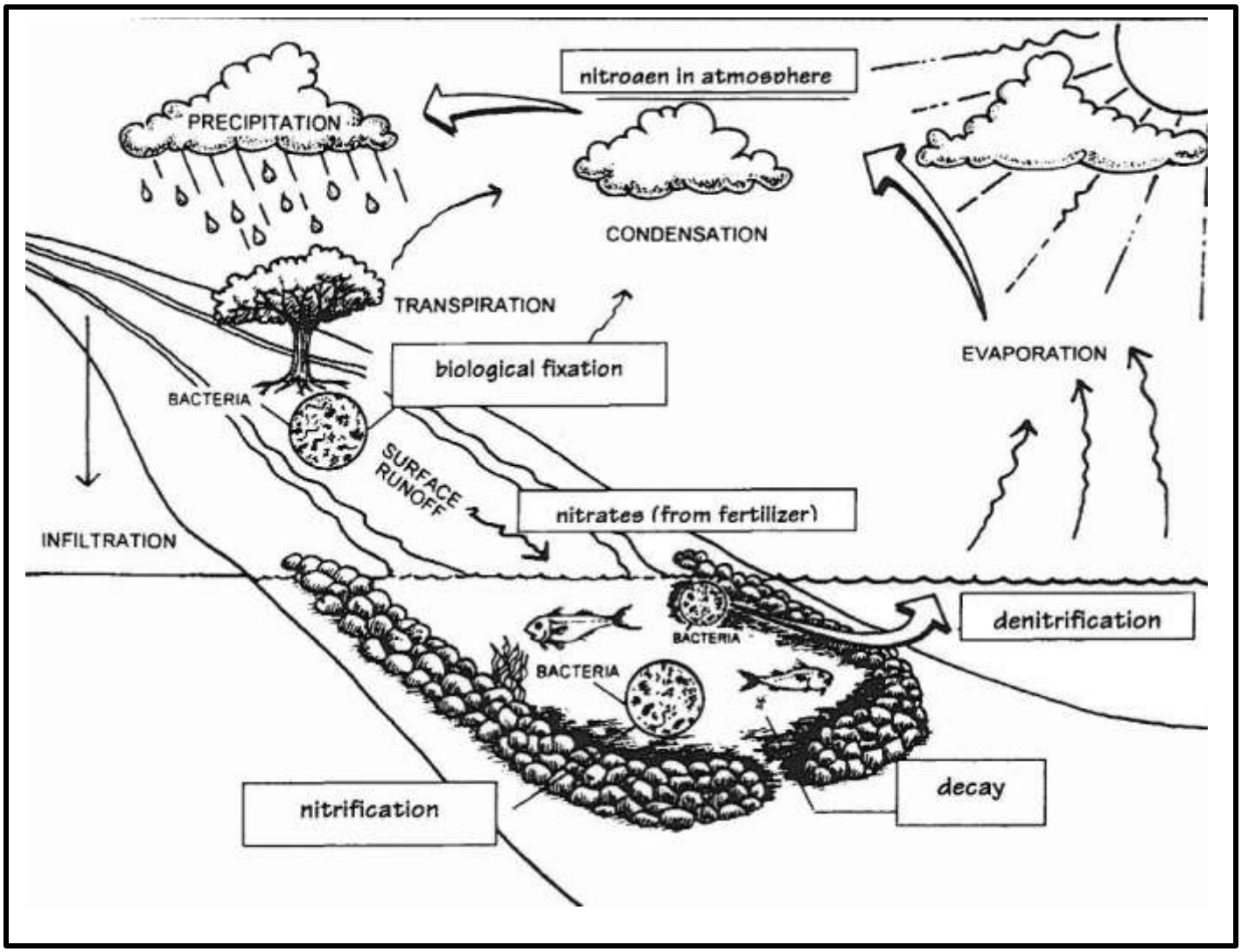
Building Ahupua‘a Model

Journal Sheet Answers

Name: _____ **Date:** _____

Use the information from the student reading to complete this diagram of the water cycle and nitrogen cycle by labeling it with the following terms in the boxes provided.

biological fixation **decay** **denitrification**
nitrates (from fertilizer) **nitrification** **nitrogen in atmosphere**



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APPENDICES

APPENDIX 1.
MELE OLI – HOʻOMAIKAʻI I KA ʻĀINA ALOHA

Early Hawaiians recorded their literature in memory, not writing. They composed and maintained an extensive oral tradition, a body of literature covering every facet of Hawaiian life. Chants, called mele and oli, recorded thousands of years of ancient Polynesian and Hawaiian history, celebrating the relationship shared between Hawaiians and their bio-cultural landscape.

Chants also recorded the daily life of the Hawaiian people, their love of the land, humor or tragedy, and the heroic character of their leaders. A mele chant is a poetic form of song that tells a story. They can be classified into two general categories, mele oli and mele hula.

Mele Oli
Unaccompanied chants, usually performed by one person at ritual occasions such as a birth, a death, or the departure of a ranking chief. Mele oli also recount historical events and tell stories and legends.

Mele Hula
Chants accompanied by dance movements alone, or by dance movements with musical instruments such as the ipu, pahu, ʻulīʻulī, and ʻiliʻili.

Mele Oli – Aloha ʻĀina

Track	Oli
# 1	A Nānaʻi Kaulahea (Traditional)
# 2	Hiki Mai ka Lā (Traditional)
# 3	E Ulu (Traditional)
# 4	Hanohano Lānaʻi (Traditional)
# 5	E Hō Mai (Kumu Edith Kanakaʻole)
# 6	Mokupuni o Lānaʻi (Kepā Maly)
# 7	He Pua Au Na Ke Kalo (Kepā Maly)
# 8	Oli Mahalo (Kehau Smith and Malia Nobriga)

Track #1: A Nānaʻi Kāulahea

An early version of this mele honoring Pele and the migration from Kahiki may be found in the Memoirs of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History: Volume 6, Bishop Museum Press, 1920. This version of the mele comes from the collection of Kupuna Hoʻohila Kawelo (Maly, 1976). The descriptive translation with the insertion of Hawaiian diacritical marks was prepared by Kepā Maly.

A Nānaʻi Kāulahea,	It was on Nānaʻi of Kāulahea
A Mauna-lei, kui ka lei,	At Mauna-lei that the wreath was made
Lei Pele i ka ʻieʻie la,	Pele wore the ʻieʻie as her adornment
Wai hinu poʻo o Hiʻiaka,	And Hiʻiaka's head glistened with water
Hōlapu ʻili o Haumea,	Haumea's skin was burned
Ua ʻono Pele i kāna iʻa,	And now Pele desires to eat her fish
O ka honu iki o Polihua,	The turtle of Polihua
Honu iki ʻāʻī noʻunoʻu,	A small turtle with a thick neck,
Kua pāpaʻi o ka moana,	Crab backed turtle of the deep sea
Ka ʻea nui kua wakawaka,	The great hawksbill turtle with its razor-like back
Hoʻolike i ka ʻai na Pele,	Made into food for Pele
I nā oaka ʻoaoaka ʻoaka i ka lani la	As lightning flashes skyward
Elieli kau mai	Awe possesses me.

Background

In the epic tale of Hiʻiakaikapoliopele, Pele and her family were traveling throughout the islands in search of a home where Pele could keep her fires dry. They searched in the northern islands of Hawaiʻi and down the island chain, but no place was suitable. When she arrived at Lānaʻi, legend states that she took rest at Polihua on the shores of the ahupuaʻa of Kaʻā. Known for the honu (sea turtles) that frequented its shores, Pele enjoyed eating the honu at this sandy beach (meaning "cove of eggs"). Areas of Nānaʻi (Lānaʻi) are mentioned in this mele and it speaks of the land being home of Kāulahea, progenitor of Lānaʻi.

Track #2: Hiki Mai Ka Lā

From “Pele and Hiiaka – A Myth from Hawaii” by Nathaniel B. Emerson (1915)

Hiki mai, hiki mai ka lā	Here it comes, here comes the Sun
Aloha wale, ka lā e kau nei	How I love the Sun in the sky
Aia malalo o Kawaihoa	There below is Kawaihoa
A ka lalo o Kauaʻi	On the incline of Kauaʻi
O Lehua	Is Lehua

Background

Pele's sister Kapoʻulakīnaʻu danced this hula on the island of Niʻihau. It is considered one of the earliest of hula: a hula kiʻi.

This oli was shared with the Windward Ahupuaʻa Kūpuna by Anakala Kimo Awai of Hilo along with the Hilo district's kūpuna. He also taught its motions. It is both a chant of welcome to the morning Sun in the sky as well as a request for inspiration from ke akua, the creation, or our ancestors.

Track #3: E Ulu

From Nathaniel B. Emerson “Unwritten Literature of Hawaii: The Sacred Songs of the Hula” (1909)

E ulu, e ulu	Grow, grow
Kini o ke Akua	In the multitude of God
Ulu Kāne me Kanaloa	Grow with respect to the forest and sea
Ulu ʻōhiʻa lau koa me ka ʻieʻie	Grow with ʻōhiʻa, koa and ʻieʻie
Aʻe mai a noho i kou kuahu	Inhabit your place O God
Eia ka wai, he wai e ola	Here is the water, the water of life
E ola nō e!	Life forever!

Background

Kumu hula master and Hawaiian cultural and language expert, John Keola Lake, taught this oli to Kumu Hula Kaʻanohi Aipā. In her hālau, it is often used as a gathering chant when haumāna (students) enter the forest to collect greenery for costumes or hoʻokupu (offerings). It may also be used when entering the forest for inspiration or guidance.

Track #4: Hanohano Lānaʻi

Hanohano Lānaʻi i ke kaunaʻoa,	Lānaʻi is distinguished by the kaunaʻoa,
Kohu kapu ʻahuʻula, kau poʻohiwi,	Which rests like a feather cape upon its shoulders
E ola Lānaʻi a Kaululāʻau,	Let there by life for Lānaʻi of Kaululāʻau,
Hea aku mākou, e ō mai ʻoe!	We call to you, now you respond!

Background

This traditional mele is part of a longer chant from Lānaʻi, honoring the lineage of the family who controlled the ahupuaʻa of Pālāwai after the Māhele ʻĀina in 1848. The mele honors the ancient chief Kaululāʻau, whose deeds made it possible for people to live on the island, asking that there be life/well-being for those of the island. The mele may be used to greet the land and those who you wish to welcome to Lānaʻi.

Track #5: E Hō Mai

Composed by: Edith Kekuhikuhipuʻuoneonaaliʻiokohala Kanakaʻole

E hō mai ka ʻike mai luna mai e	Grant us the knowledge from above
ʻO nā mea huna noʻeau o nā mele e	Concerning the hidden wisdom of songs.
E hō mai	Grant,
E hō mai	Grant,
E hō mai, e	Grant us these things.

Background

Kumu hula master and Hawaiian cultural and language expert, Edith K. Kanakaʻole (affectionately known as Aunty Edith), composed this oli for her hālau hula, Hālau o Kekuhi. The chant was originally performed by students at the beginning of class to request knowledge and wisdom from the ancestral deities to accomplish the task at hand.

Today, this oli is commonly used at the start of an event or small gathering to focus a group's energies and ultimately carry out the kuleana (responsibility) they have undertaken. It is recommended that haumāna use this chant to help them seek knowledge and clear their minds of any negativity.

Track #6: Mokupuni o Lānaʻi

Composed by: Kepā Maly

He ʻumi kūmākolu ahupuaʻa O Lānaʻi a Kaululāʻau.	There are thirteen ahupuaʻa On Lānaʻi of Kaululāʻau.
Holo a puni ʻoe ia moku ʻāina, Aia la o Kaʻā ma Kona.	If you travel to encircle the island, You will behold Kaʻā in Kona.
Pili mai ʻoe me Kamoku, A ʻike aku iā Kalulu.	Then you are close to Kamoku, And you see Kalulu.
Aia Kaunolū me Keālia Kapu, A hiki mai i Keālia Aupuni.	Then there is Kaunolū and Keālia Kapu, Then you arrive at Keālia Aupuni.
Komo mai ʻoe iā Pālāwai, A pae i Kamaʻo i ka mālie.	Next you enter Pālāwai, And then settle at Kamaʻo in the calm
(ʻAe pae mālie ka waʻa i Mānele!)	(Yes, the canoe lands gently at Mānele!)
Aia Kaʻōhai pili me Pāwili, A komo ʻoe i ke Koʻolau.	There is Kaʻōhai adjoining Pāwili, And you enter the Koʻolau.
Hui hou ʻoe me Pālāwai, Aia hoʻi o Kaunolū pū.	You again meet up with Pālāwai, And behold Kaunolū as well.
O Kalulu hou a e ʻike, Iā Maunalei i ka laʻi.	Kalulu is also seen again, And then tranquil Maunalei.
A loaʻa ʻoe iā Mahana, Me Paomaʻi i ka palena pau.	You then get to Mahana, And the boundary's end at Paomaʻi.
(A ʻo wai ka inoa o ka piko kuahiwi?)	(And what is the name of the mountain summit?)
O ka piko kuahiwi o Lānaʻi Hale,	The summit of the mountain is Lānaʻi Hale
Ō mai Lānaʻi a Kaululāʻau.	Respond Lānaʻi of Kaululāʻau.
Aia hoʻi ka mokupuni aloha o Lānaʻi a Kaululāʻau	Behold the beloved island, Lānaʻi of Kaululāʻau

Background

This mele pana was composed by Kepā Maly to honor the wahi pana (sacred places) of Lānaʻi. It is shared with the keiki of Lānaʻi and was featured on Kuana Torres Kahele's album, Music for the Hawaiian Islands (Lānaʻikaʻula, Lānaʻi), Vol. 5

Track #7: He Pua Au Na Ke Kalo

Composed by: Kepā Maly

O Hāloa naka lau kapalili ka mua A kupu mai—ke kalo lau loa, eia au	There was first Hāloa of the quivering leaf Kalo of the long-stalk grew, here I am
Hānau hou mai ka muli o Hāloa A puka mai—ke kanaka, eia au	Next, the younger Hāloa was born Humankind came forth, here I am
O ke kalo, huluhulu me ka iho kalo Ka ʻohā—ke kumu ʻohana, eia au	The kalo, the root, the corm, The offshoot is the source of family, here I am
He hāhā, he piko, he muʻo, He lau naka—i ka makani, eia au	A stalk, a leaf indentation, a sprout A leaf nodding in the breeze, here I am
Eia au he pua—o ke kalo Mai ka huli mua o Hāloa, eia au	Here I am a descendant of the kalo From the first planting of Hāloa, here I am
He kalo kanu o Maunalei aloha E ola au—i ke kalo, eia au	A kalo planted in beloved Maunalei I live through the kalo, here I am

Background

This mele was composed as a way of helping connect Lānaʻi youth to the cultural significance of kalo in the Hawaiian family, and share facets of the traditions and names of the kalo parts. It reminds us that in Hawaiian belief, everyone on Lānaʻi is connected to the kalo, ʻāina and wai of Maunalei. An audio recording of the mele may be heard at: https://youtu.be/HFgt1QBxSZg

Track #8: Oli Mahalo

Composed by: Kehau Smith and Malia Nobriga

‘U hola ‘ia ka maka loa la	To spread forth, open up the finest quality mat
Pū‘ai ke aloha la	Exchange/share as potluck or aloha
Kūka‘i ‘ia ka Hāloa la	Exchange as greetings (between man and wife and descendants)
Pā wehi mai nā lehua	To adorn with the lehua flower
Mai ka ho‘oku‘i a ka hālāwai la	From East to West; sunrise to sunset, we are discoverers, navigators, take care of our ‘āina
Mahalo, e nā akua	We thank our creators
Mahalo, e nā kūpuna la ea	We thank our ancestors
Mahalo, me ke aloha la	We thank you with love
Mahalo, me ke aloha la	We thank you with love

Background

This oli was composed as a greeting of thanks for hospitality, love, generosity and knowledge that is given to us. It also gives thanks to the beauty of the islands and our people. Hāloa is ever-lasting breath. The kalo plant is considered our ancestor that is cherished and preserved. Makaloa is the finest mat woven. It is considered higher quality than lau hala. The message is that it is important for us to practice being “thankful” every day.

APPENDIX 2.
ALOHA ʻĀINA ʻO LĀNAʻI FIELD SITE PREPARATIONS

The Lānaʻi Culture & Heritage Center, Lānaʻi High and Elementary School and Pūlama Lānaʻi are working in partnership with other organizations to offer field site experiences for Lānaʻi students. These field site experiences are an integral part of the units in this guide. Details about the field site investigations are provided in the final lesson of each unit. The information in this Appendix is provided to help teachers in preparing for the field trips.

To set up a classroom visit/learning experience or to make arrangements for a field school trip, please call the Lānaʻi Culture & Heritage Center 808.565.7177 or email info@lanaichc.org.

Huakaʻi Learning Experience — Waiaʻōpae Loko

Ku i ka welo.
Fits into the family behavior.
Whether good or bad, one's behavior is judged by the family he belongs to.
(Pukui, 1983; ʻŌlelo Noʻeau No. 1879)

Field Site Partner: Pūlama Lānaʻi Culture & Historic Preservation Department and Lānaʻi Culture & Heritage Center

Mālama Our Fishpond

- Remind students that Waiaʻōpae Loko is a special place. It is important that they understand that they are visitors to the area.

- Students should try to mālama (care for) and hōʻihi (respect) this wahi (place) by throwing garbage in designated garbage bags and by treating all kumu with respect.

- Volunteer kumu will be facilitating each hui (group). Please remind students to give their full attention so each student can receive the full benefit of this outdoor experience.

- Go over the agenda before the field trip.

- Optional: Your students may wish to share a song, an oli (chant) or a dance that they have learned over the course of the year. The volunteer staff encourages school groups to share this special gift.

E hume i ka malo, e hoʻokala i ka ihe.
Gird the loincloth, sharpen the spear.
A call to prepare for the project at hand.
(Pukui, 1983; ʻŌlelo Noʻeau No. 299)

Nā Ukana
What to bring:

Teacher Ukana (Supplies)

- transportation
- the day's agenda
- first aid kit
- trash bag
- hat
- sunscreen
- lunch and water in backpack
- rain jacket
- cellular phone (optional)
- mosquito repellant
- liquid soap
- paper towels

Student Ukana

- backpack
- water in small unbreakable container
- lunch with as little disposable packaging as possible
- tabis (preferably the sock type that clings to ankles and calves) OR athletic shoes and socks that can get dirty and wet
- shorts and t-shirt that can get dirty and wet
- hat
- sunscreen
- rain jacket
- extra change of clothes - in case of rain
- plastic bag for damp or dirty clothes
- mosquito repellant
- Note: the same list of ukana will apply to visits to loʻi sites.

APPENDIX 3.
GRADE 4: UNIT MAP AND STANDARDS AND OUTLINE FOR LESSONS 1 - 5

Enduring Understandings: In early Hawaiian history, the people, land, ocean, and heavens were connected. Cultural traditions, through practice and example, ensured the continuation of healthy ecosystems. While much has changed over time, this connection remains important for Hawaiians and those who choose to make Hawai‘i home. **Essential Question**: How do Hawaiian practices nurture a healthy relationship to the ‘āina, and how can we give back to the ‘āina today? **Project:** Explore lo‘i kalo (taro terraces) and loko i‘a (fishponds) in an ahupua‘a and discover key geographic characteristics, mo‘olelo (legends), and the skills, values and practices of early Hawaiians. **Values Emphasized:** Laulima (Cooperating) Mālama (Caring)	**Critical Skills and Concepts**: to grow in our understanding of aloha ‘āina, lōkahi, and ho‘oma‘ama‘a. **Student Products**: Learning Logs with drawings, writings, maps, cordage, and observations; models, mural, newspaper and presentations that address the unit’s essential question **Culminating Activity:** Write a “newspaper” with four articles that summarize learning and answer the unit’s essential question. Complete a service project to demonstrate aloha ‘āina. Collaborate with others to create a large-scale mural or map of key features in the ahupua‘a. Individually create a model, diorama, mural, or map that demonstrates understanding of the ahupua‘a geography and life in old Hawai‘i.

Grade 4: Lesson 1 – Our Ahupua‘a How were people, land, and ocean connected in old Hawai‘i? (4 - 5 class periods)			
Common Core State Standards (CCSS) **C3 Social Studies Framework** **Next Generation Science Standards (NGSS)**	**Nā Honua Maoli Ola (NHMO)** **Nā Hopena A‘o (HĀ) General Learner Outcome (GLO)**	**Key Concepts**	**Assessment: performance task and audience, evidence**
Language Arts **Reading Informational Text** **Key Ideas and Details** **4.RI.2.** Determine the main idea of a text and explain how it is supported by key details; summarize the text (Explain the problem in a story and show how it is resolved.) **4.RI.3** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why based on specific information in the text. **Writing - Production and Distribution of Writing** **4.W.4** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Write in a variety of grade appropriate formats for a variety of purposes and audiences).	**NHMO** **‘Ike Mauli Lāhui** **Cultural Identity Pathway** **4.** Apply the cultural and traditional knowledge of the past to the present. **8**. Engage in activities independently or collaboratively with community members to perpetuate traditional ways of knowing, learning, teaching, and leading to sustain cultural knowledge and resources within the learning community. **HĀ Strengthened Sense of Hawai‘i** **c**. Learn the names, stories, special characteristics and the	Ahupua‘a are traditional Hawaiian land units typically extending from mountain summits to the outer edges of reefs. In old Hawai‘i, food and other supplies were shared between people of the uplands and people of the sea (kō kula uka, kō kula kai). Mo‘olelo (stories) teach us about place, Hawaiian society, and the value of qualities such as kuleana and laulima in our ahupua‘a.	Construct an enlarged map of their ahupua‘a and label important geographic characteristics and Hawaiian place names. D2.Geo.1.3-5. Explain the patterns and relationships among geographic features depicted on their maps. D2.Geo.2.3-5. Read ‘Ai‘ai’s Visit to Lāna‘i and write a response about the story. 4.RI.2, 4.RI3, 4.W.4 Illustrate the story on an enlarged map of the ahupua‘a. Research and read another article that documents a visit to Lana’i OR do an oral

Social Studies **Geographic Representations** **D2.Geo.1.3-5.** Construct maps and other graphic representations of both familiar and unfamiliar places. **D2.Geo.2.3-5.** Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics. **D2.Geo.3.3-5.** Use maps of different scales to describe the locations of cultural and environmental characteristics. (Collect, organize, and analyze data to interpret and construct geographic representations.)	importance of places in Hawai‘i. **d**. Learn and apply Hawaiian traditional world view and knowledge in contemporary settings **e**. Share the histories, stories, cultures and languages of Hawai‘i **GLO** **GLO 2:** Cooperate with and help and encourage others in group situations. **GLO 5:** Communicate effectively and clearly through speaking, using appropriate forms, conventions, and styles to convey ideas and information.		history interview of a relative’s / friend’s recent visit to Lana’i.

Grade 4: Lesson 2 – The Case of the Strongest Cord Why was cordage valuable in old Hawai‘i, and what properties make cordage strong and flexible? (7 – 8 class periods)			
Common Core State Standards (CCSS) **C3 Social Studies Framework** **Next Generation Science Standards (NGSS)**	**Nā Honua Maoli Ola (NHMO)** **Nā Hopena A‘o (HĀ) General Learner Outcome (GLO)**	**Key Concepts**	**Assessment: performance task and audience, evidence**
Social Studies **Economics** **Exchange and Markets** **D2.Eco.3.3-5.** Identify examples of the variety of resources (human capital, physical capital, and natural resources) that are used to produce goods and services. (Explain the history of Hawai‘i’s early economy.) **Math** Explain the need to use standard units for measuring **4.MD.1** • Know relative sizes of measurement units within one system of units (km, m, cm, kg, g, lb, oz.) • Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.	**NHMO** **‘Ike Mauli Lāhui Cultural Identity Pathway** **8**. Engage in activities independently or collaboratively with community members to perpetuate traditional ways of knowing, learning, teaching, and leading to sustain cultural knowledge and resources within the learning community. **4**. Apply the cultural and traditional knowledge of the past to the present. **HĀ Strengthened Sense of Hawai‘i** **d**. Learn and apply Hawaiian traditional world	Hawaiians depended on plants and other natural resources in the ahupua‘a for living and survival. Strong cordage was made by twisting plant fibers together, and specific plants were used for their strength, stretch and “no-slip” qualities.	“Manufacture” cordage by twisting and/or braiding natural fibers such as niu, hau, ‘uki‘uki, olonā. 3-5-ETS-1-1 Form hypotheses and design and carry out experiments to test the strength and flexibility of the different kinds of cordage…that you’ve “manufactured” 3-5-ETS-1-1 Explain how standard units of measuring were important when testing the strength and flexibility of different cordage. 3-5-ETS-1-1, 3-5-ETS-1-2, 4.MD.1 Describe a typical day in the economic life of a Hawaiian in the ahupua‘a system, including a reflection on the value of cordage in old

• Record measurement equivalents in a two-column table. (Know that 1 ft. is 12 times as long as 1 in.; express the length of a 4 ft snake as 48 in.) **Science** **3-5-ETS-1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. (Describe a testable hypothesis and an experimental procedure.)	view and knowledge in contemporary settings **e**. Share the histories, stories, cultures and languages of Hawai'i **f.** Give joyfully without expectation of reward **g**. Share the responsibility for collective work **GLO** **GLO 2:** Cooperate with and help and encourage others in group situations. **GLO 5:** Communicate effectively and clearly through speaking, using appropriate forms, conventions, and styles to convey ideas and information.		Hawai'i**.** D2.Eco.3.3-5, 4.W.2, 4.W.2b. Compare strength, flexibility of different types of cordage Persuasive writing: Persuade your audience to use cordage from a particular plant because of its strength, flexibility, and versatility. Give reasons for your choice using data gathered from the cordage you "manufactured" and the experiments you carried out. Include this writing in your newspaper. Explain how standard units of measuring were important when testing the strength and flexibility of different cordage. 3-5-ETS-1-1, 3-5-ETS-1-2, 4.MD.1 Suggestion: Test more than one standard unit of measuring Identify the standard units of measuring being tested

Grade 4: Lesson 3 – Engineering Ingenuity How did Hawaiians engineer shoreline fishponds to grow fish, while maintaining water quality and preventing siltation? (1 - 2 class periods)			
Common Core State Standards (CCSS) **C3 Social Studies Framework** **Next Generation Science Standards (NGSS)**	**Nā Honua Maoli Ola (NHMO)** **Nā Hopena Aʻo (HĀ) General Learner Outcome (GLO)**	**Key Concepts**	**Assessment: performance task and audience, evidence**
Language Arts **Writing** **Production and Distribution of Writing** **4.W.4.** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Write in a variety of grade-appropriate formats for a variety of purposes and audiences.) **Social Studies** **Geographic Representations** **D2.Geo.1.3-5.** Construct maps and other graphic representations of both familiar and unfamiliar places. **D2.Geo.2.3-5.** Use maps, satellite images, photographs, and other representations to explain	**NHMO** **ʻIke Mauli Lāhui Cultural Identity Pathway** **HĀ Strengthened Sense of Hawaiʻi** **c**. Learn the names, stories, special characteristics and the importance of places in Hawaiʻi **d**. Learn and apply Hawaiian traditional world view and knowledge in contemporary settings **e**. Share the histories, stories, cultures and languages of Hawaiʻi **HĀ Strengthened Sense of Aloha**	Hawaiians constructed ʻauwai kai (channels) in the walls of shoreline fishponds to create currents that circulated water and attracted fish with each tidal change. Mākāhā (sluice grates) in the ʻauwai kai allowed small fish to enter the pond but trapped the fish when they grew large. The circulation of water in the pond aerates the pond with oxygen and flushes out excess sediments and nutrients that can accumulate to unhealthy levels.	Sketch a loko kuapā, and diagram how the flow of water through the mākāhā at both rising and falling tides affects water quality and pond life**.** 3-5-ETS-1-1**,** D2.Geo.1.3-5, D2.Geo.2.3-5**,** D2.Geo.3.3-5, D2.Geo5.3-5 Describe observations and inferences after working with a fishpond model. 3-5-ETS1-2, D2.His.14.3-5 Write a one-paragraph display label with a clear topic sentence describing the technology of Hawaiian fishponds. 4.W.4, D2.Geo. 8.3-5

relationships between the locations of places and regions and their environmental characteristics **D2.Geo.3.3-5.** Use maps of different scales to describe the locations of cultural and environmental characteristics (Collect, organize and analyze data to interpret and construct geographic representations). **History** **Causation and Argumentation** **D2.His.14.3-5**. Explain probable causes and effects of events and developments. (Analyze the consequences of human modification of the physical environment in Hawai‘i using geographic representations - including lo‘i kalo and loko i‘a). **Geography** **Human-Environment Interaction** **D2.Geo.5.3-5.** Explain how the cultural and environmental characteristics of places change over time.	**d**. Communicate effectively to diverse audiences **GLO** **GLO 2:** Cooperate with and help and encourage others in group situations. **GLO 5:** Communicate effectively and clearly through speaking, using appropriate forms, conventions, and styles to convey ideas and information.		

Human Population: Spatial Patterns and Movements **D2.Geo.8.3-5**. Explain how human settlements and movements relate to the locations and use of various natural resources **Science:** (Next Generation Science Standards) **3-5-ETS-1-1**. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2**. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. (Differentiate between an observation and an inference.)			

Grade 4: Lesson 4 – Mauka-Makai Connection How did the Hawaiian system of irrigating loʻi allow people to use water wisely in their ahupuaʻa? (3 - 4 class periods)			
Common Core State Standards (CCSS) **C3 Social Studies Framework** **Next Generation Science Standards (NGSS)**	**Nā Honua Maoli Ola (NHMO)** **Nā Hopena Aʻo (HĀ)** **General Learner Outcome (GLO)**	**Key Concepts**	**Assessment: performance task and audience, evidence**
Language Arts **Reading Informational Text** **Key Ideas and Details** **4.RI.2.** Determine the main idea of a text and explain how it is supported by key details; summarize the text (Explain the problem in a story and show how it is resolved.) **4.RI.3** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why based on specific information in the text. **Social Studies** **History** **Causation and Argumentation** **D2.His.14.3-5.** Explain probable causes and effects of events and developments.	**NHMO** **ʻIke Mauli Lāhui** **Cultural Identity Pathway** **HĀ Strengthened Sense of Hawaiʻi** **c**. Learn the names, stories, special characteristics and the importance of places in Hawaiʻi **d**. Learn and apply Hawaiian traditional world view and knowledge in contemporary settings **e**. Share the histories, stories, cultures and languages of Hawaiʻi **HĀ Strengthened Sense of Aloha**	The traditional Hawaiian system of irrigating loʻi made intensive cultivation of kalo possible and ensured that water was distributed fairly and used wisely in the ahupuaʻa. Models provide a geographic representation to help us analyze how people used and cared for water resources. Understanding moʻolelo, mele, traditional practices, and values helps perpetuate Hawaiian culture.	Create a model that shows how water was distributed in ahupuaʻa of old Hawaiʻi. 3-5-ETS-1-1 Identify the major problem or primary conflict in a moʻolelo and describe how the problem or conflict is worked out. 4.RI.2, 4.RI.3 Compare the effects of land and water use in the ahupuaʻa and how similar practices are carried out today. Assess the positive and negative consequences of such uses on the environment and makes connections to current environmental practices. 3-5-ETS1-2, 3-5-ETS1-3, D2.His.14.3-5

(Analyze the consequences of human modification of the physical environment in Hawai‘i using geographic representations - including lo‘i kalo and loko i‘a). **Science** **3-5-ETS1-2**. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3**. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. (Differentiate between an observation and an inference.)	**d**. Communicate effectively to diverse audiences **g**. Share the responsibility for collective work **GLO** **GLO 2:** Cooperate with and help and encourage others in group situations. **GLO 5:** Communicate effectively and clearly through speaking, using appropriate forms, conventions, and styles to convey ideas and information.		

Grade 4: Lesson 5 – Giving Back to the ʻĀina How do Hawaiian practices nurture a healthy relationship to the ʻāina, and how can we give back to the ʻāina today? (4 – 6 class periods plus 2 field trips)			
Common Core State Standards (CCSS) **Social Studies Framework** **Next Generation Science Standards (NGSS)**	**Nā Honua Maoli Ola (NHMO)** **Nā Hopena Aʻo (HĀ) General Learner Outcome (GLO)**	**Key Concepts**	**Assessment: performance task and audience, evidence**
Language Arts **Speaking & Listening** **Presentation of Knowledge and Ideas** **4.SL.4** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. (Give short, informal presentations to inform or persuade.) **Writing** **Text Types and Purposes** **4.W.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. **4.W.2b.** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. (Use appropriate facts and interesting details that develop the intended meaning and anticipate the needs of the audience.)	**NHMO** **ʻIke Mauli Lāhui Cultural Identity Pathway** **HĀ Strengthened Sense of Hawaiʻi** **d**. Learn and apply Hawaiian traditional world view and knowledge in contemporary settings **e**. Share the histories, stories, cultures and languages of Hawaiʻi **HĀ Strengthened Sense of Aloha** **d**. Communicate effectively to diverse audiences	Traditional Hawaiian cultural practices reflect a close relationship to the ʻāina. Models provide a geographic representation to help us analyze how people used and cared for resources within their ahupuaʻa.	Work cooperatively to create a mural that: Illustrates and describes in writing how the use of technology influenced people, land and the economy in the ahupuaʻa system of old Hawaiʻi**.** 3-5-ETS-1-1, 3-5-ETS-1-2, 3-5-ETS-1-3 Describes a typical day in the economic life of a Hawaiian in the ahupuaʻa system. D2.His.14.3-5. Present the mural to classmates. 4.SL.4 Individually create a model, diorama, mural or map that demonstrates their

Social Studies **Geographic Representations** **D2.Geo.1.3-5.** Construct maps and other graphic representations of both familiar and unfamiliar places. **D2.Geo.2.3-5.** Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics **D2.Geo.3.3-5.** Use maps of different scales to describe the locations of cultural and environmental characteristics (Collect, organize and analyze data to interpret and construct geographic representations). **Determining Helpful Sources** **D1.5.3-5.** Determine the kinds of sources that will be helpful in answering compelling and supporting questions, taking into consideration the different opinions people have about how to answer the questions. **History** **Causation and Argumentation** **D2.His.14.3-5.** Explain probable causes and effects of events and developments. (Analyze the consequences of human modification of the physical environment in Hawai‘i using geographic representations - including lo‘i kalo and loko i‘a).	**g**. Share the responsibility for collective work **GLO** **GLO 2:** Cooperate with and help and encourage others in group situations. **GLO 5:** Communicate effectively and clearly through speaking, using appropriate forms, conventions, and styles to convey ideas and information.		understanding of the geography of the ahupua‘a and life in old Hawai‘i. D2.Geo.1.3-5, D2.Geo.2.3-5, D2.Geo.3.3-5 Individually complete a “newspaper” that includes six articles, addresses the unit essential question, and reflects on how people can care for the ‘āina today. 4.W.2, 4.W.2b.

Evaluating Sources & Using Evidence **D3.3.3-5**. Identify evidence that draws information from multiple sources in response to compelling questions. **D4.2.3-5.** Construct explanations using reasoning, correct sequence, examples, and details with relevant information and data. Collect, organize, and analyze data to interpret and construct geographic representations. **Science** **3-5-ETS-1-1**. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2**. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3**. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. (Describe how the use of technology has influenced the economy, demographic and environment of Hawai‘i.)			

APPENDIX 4.
GRADE 4: RUBRIC FOR INDIVIDUAL CULMINATING PAPER OR PROJECT

Name:_____ Date:_____
Total Points: _____

How do Hawaiian practices nurture a healthy relationship to the ʻāina, and how can we give back to the ʻāīna today?

Standards/Benchmarks	**Kūlia** **Exceeds Standard:** **___ Points**	**Mākaukau** **Meets Standard:** **___ Points**	**ʻAno Mākaukau** **Approaching Standard:** **___ Points**	**Mākaukau ʻOle** **Below Standard:** **___ Points**
Language Arts: Writing Rhetoric and NHMO 14-10 Did you include appropriate facts about Hawaiian practices in the ahupuaʻa and interesting details and reflections to answer the essential question? Points: _____	I included a number of facts and interesting details that answer the essential question. I wrote a detailed, thoughtful reflection about giving back to the ʻāina today.	I answered the essential question with appropriate facts and interesting details about Hawaiian practices. I included thoughtful reflections about giving back to the ʻāina today.	I tried to answer the essential question, but my facts were not well connected to the question. I also could have given more thought to my reflection and used better details.	I did not include enough facts, interesting details or thoughtful reflections to answer the question.
Language Arts: Writing Rhetoric Are your newspaper articles organized with an introductory paragraph and a conclusion that summarizes your main points? Points: _____	My articles are very well organized. They move the reader smoothly from beginning to end. They have excellent introductions and conclusions that summarize my main points.	My writing is organized. My introductory paragraphs describe what I am going to address. My conclusions summarize the main points.	My writing is not organized. My introductions do not clearly state what I am going to address and/or my conclusions do not summarize my main points.	My writing is not organized at all. My introductions do not state what I am going to address. My conclusions do not summarize my main points.
Science: Did your feature article describe how Hawaiian practices and their technology affected people and their ahupuaʻa? Points: _____	I clearly described, with details, how Hawaiian practices and technology affected both people and their ahupuaʻa.	I described how Hawaiian practices and technology affected both people and their ahupuaʻa.	I described some Hawaiian practices and technology. However, I did not clearly describe how these affected people or their ahupuaʻa.	I described some Hawaiian practices and technology. However, I did not describe how these affected people or their ahupuaʻa.

Social Studies: Geography Environment and Society Did your project show how people changed the environment and how those changes affected the ʻāina? Points: _____	My project clearly and creatively shows what I've learned about our ahupuaʻa. It accurately shows how people changed the environment and the effects of those changes in early Hawaiʻi.	My project accurately shows how people changed the environment and the effects of those changes in early Hawaiʻi.	My project only shows how people changed the environment. It doesn't accurately show the effects of those changes in early Hawaiʻi.	My project had many errors. I did not show what I have learned about how people changed the environment in early Hawaiʻi.

APPENDIX 5.
GRADE 4: RUBRIC FOR GROUP CULMINATING PAPER OR PROJECT

Team Members:_____ Date:_____
Total Points: _____

Grade 4: Rubric for Group Culminating Paper or Project How do Hawaiian practices nurture a healthy relationship to the ʻāina, and how can we give back to the ʻāina today?				
Standards/Benchmarks	**Kūlia** **Exceeds Standard:** **___ Points**	**Mākaukau** **Meets Standard:** **___ Points**	**ʻAno Mākaukau** **Approaching Standard:** **___ Points**	**Mākaukau ʻOle** **Below Standard:** **___ Points**
Social Studies: Geography Environment and Society Did your group collect, organize, and analyze data to interpret and construct a geographic representation of our ahupuaʻa that includes all features listed in your assignment? Points: _____	Your group project showed that you collected, organized, and analyzed much information to construct and present a creative and accurate geographic representation of our ahupuaʻa.	Your group project showed that you collected, organized, and analyzed information to construct and present an accurate geographic representation of our ahupuaʻa.	Your group project showed that you collected information and included some of the required features, but your project and/or your presentation needed more detail about our ahupuaʻa.	Your group project needed more work to include the required features and to show that you collected, organized, and analyzed information about our ahupuaʻa.
GLO Community Contributor Did your team members cooperate with, encourage, and help each other? Points: _____	You supported each other's ideas and encouraged each other. Your cooperation and teamwork was excellent. Maikaʻi.	You supported each other's ideas and encouraged each other. You worked well together as a team.	You sometimes listened to each other's ideas and encouraged each other. But you can do better.	You did not work well together. You did not listen to each other's ideas or encourage one another.

GLO Effective Communicator and Language Arts – Speaking & Listening Did your team communicate effectively and clearly using appropriate facts and relevant, descriptive details to support your main idea and did your team speak clearly at an understandable pace? Points: _____	Your team communicated effectively and clearly using appropriate facts and relevant, descriptive details to support your topic. Your team spoke clearly at an understandable pace.	Your team communicated effectively and clearly using facts and details to support your topic. Your team spoke clearly and was understandable.	Your team's presentation showed that you used facts and details to support your topic. However, your oral presentation needed more clarity to be fully understood.	Your team's presentation was not effectively and clearly presented. Your presentation was not clearly understood.
Science: Nature of Science Did your mural labels describe how Hawaiian practices affected the people and their ahupua'a? Points: _____	Your mural labels had excellent details to clearly describe how different Hawaiian practices affected the people and their ahupua'a.	Your mural labels clearly stated how Hawaiian practices affected the people and their ahupua'a.	Your mural labels began to describe how different Hawaiian practices affected the people and their ahupua'a but more detail is needed.	Your mural labels did not describe how Hawaiian practices affected the people or their ahupua'a.

APPENDIX 6.
GRADE 4: STUDENT DVD REFLECTION

Name_____ Date_____

The vision of Project Aloha ʻĀina is that everyone in Hawaiʻi lives by the values of aloha ʻāina and that communities work together to achieve their vision of a healthy environment for all in harmony with the land and the sea.

After watching the Aloha ʻĀina DVD, take a moment to reflect on your vision of aloha ʻāina. Describe why you think aloha ʻāina is important.

The ʻōlelo noʻeau that Liko and Kepa learn in the program is

He aliʻi ka ʻāina;
He kauwā ke kanaka.
The land is chief.
People are its servants.
(Pukui, 1983; ʻŌlelo Noʻeau No 531)

What does this ʻōlelo noʻeau mean to you?

Choose one of the values that were emphasized in the video.

Lōkahi

Kōkua

Laulima

Mālama

Write a paragraph giving an example of how you live by this value.

APPENDIX 7.
GRADE 4: ALOHA ʻĀINA PRE-/POST-TEST DOCUMENTS

Name_____ Date_____

1. A testable hypothesis is:

A. A wild guess about what I am studying.
B. A prediction based on my feelings.
C. An educated guess that the class agreed upon.
D. A prediction that will guide an experiment.

2. An experimental procedure is:

A. A set of directions you follow to test a hypothesis.
B. A set of steps you follow from a cookbook.
C. A set of directions you follow to build a model.
D. A set of steps you follow to test a conclusion.

3. Keoni wants to know more about cordage. He knows that modern cordage is often made from nylon fibers. He learned that cordage in old Hawaiʻi was made from strong natural plant fibers. He decided to compare their strength by experimenting with the "breakage" points of nylon vs. natural fibers. Which of the following hypotheses would best support his investigation?

A. If the cordage is made from plant fibers then it is stronger than nylon fibers because natural fibers are more common.
B. If the cordage is made of nylon then it would win the experiment because nylon fibers are stronger than plant fibers.
C. Cordage made of coconut husk was used to build houses in old Hawaiʻi.
D. Ships once used cordage made from hau because it is very strong.

4. Kāhea needed to grow ti leaf plants for her hula competition. She was wondering how she could grow big healthy ti leaves quickly. Kāhea knew that plants needed sunlight, water, and nutrients to grow. Which of the following hypotheses would best support her investigations?

A. If I grew the ti leaf plants in the dark, then the ti leaf plant would grow faster because the sun will not dry up the plants.
B. If I grew the ti leaf plants in hot water, then the ti leaf plants would grow faster because the plants will be able to absorb hot water faster than cold water.
C. If I gave the ti leaf plants fertilizer, then the ti leaf plants would grow faster because the plants will have nutrients to grow.
D. If I gave the ti leaf plants salt, then the ti leaf plants would grow faster because the ti leaf plants like to grow in very salty conditions.

5. An observation is:

A. What you tell your friend that your mom said.
B. What you see, hear, taste or smell in the environment.
C. An educated guess about what might happen in an experiment.
D. A conclusion based on data.

6. An inference is:

A. An explanation based on evidence.
B. Not a direct observation.
C. May or may not be true.
D. All of the above.

7. Caleb and his team were trying to build a model of the irrigation system in old Hawai‘i. They used sand for their model and the sand kept washing away in their model. They had a difficult time creating a model that showed how stream water was used to irrigate lo‘i kalo. Which of the following statements is the best inference to make?

A. Sand is not the best material for building a model of the old Hawaiian irrigation system.
B. If there were more sand, then it would be easier for a stream to form in our model.
C. It is not possible to build a model of the old Hawaiian irrigation system.
D. Streams will not form when there is too much rain.

8. Which statement below is an observation?

A. The fishes in the pond are ready to be harvested.
B. The fishes in the pond are hungry.
C. The fishes in the pond are sleeping because they are not moving.
D. The fishes in the pond are silver in color.

9. Which statement is an inference?

A. The lo‘i kalo has dry mud in it.
B. All the taro in the lo‘i kalo are taller because of the rain.
C. The lo‘i kalo has 6 taro plants in it.
D. There are five birds and three dragonflies in the lo‘i kalo.

10. John saw many birds dipping their heads in the shallow area of the fishpond. He knew that many small fish were in the fishpond. Which of the following statements is the best inference to make?

A. The birds like to sit in the shallow area of the fishpond.
B. The birds were finding food to eat in the fishpond.
C. The birds were digging holes to hide their eggs in the water.
D. The birds didn't have anything else to do.

11. Which of the following is NOT an example of how farming has affected Hawai‘i's people and environment?

A. Farming influenced where people lived in old Hawai‘i.
B. Farming provided many important products in old Hawai‘i.
C. Farming determined how many boys would be born in one year in old Hawai‘i.
D. Farming fish in fishponds provided a valuable source of food in old Hawai‘i.

12. Which of the following is an example of how fishponds affected Hawai‘i's people and environment?

A. Fishponds gave people safe places to swim near the shore.
B. Fishponds provided a steady supply of fish for the ali‘i (chiefs) and safe places for small fish to grow.
C. Fishponds affected people and the environment by changing the tides to be higher and lower.
D. Fishponds affected people and the environment by increasing the salt water in the ocean.

In early Hawai‘i, the people had to get all the resources they needed to survive. Some of the people were farmers and they grew kalo, breadfruit, and other foods. Other people were fishermen and they gathered fish, octopus, and other seafood. People traded with each other for things they did not have such as ropes, wood to build canoes, pili grass for building homes, food to eat, and water to drink. Nothing was wasted and the people took good care of each other.

13. In early Hawai‘i, if a farmer needed fish to eat, how will he get the fish?

A. Go to the market and buy the fish for his family to eat.
B. Get a bamboo and make a fishing pole to catch the fish for his family to eat.
C. Go to the ali‘i fishpond at night and steal the fish his family needs to eat.
D. Go to a fisherman and trade the kalo he grew for the fish that the fisherman caught.

14. The lo‘i kalo and loko i‘a are examples of how the Hawaiians in the past kept:

A. A balance between the natural resources and the needs of the people.
B. An endless supply of food by controlling the movement of the sun.
C. Making inventions to serve the land and water as a gift for the gods.
D. A journal of the sun, moon, and tide changes to control the land and water.

15. Unlike the practices of old Hawai‘i, people today often affect the environment:

A. Permanently so that some changes can be reversed.
B. Permanently so that some changes cannot be reversed.
C. Temporarily so any changes are positive to all the people.
D. Temporarily so any changes are negative to all the people.

Pua wanted to see different kinds of birds. She visited three places and counted the birds she saw. The first place was at Kaumālapaʻu Boat Harbor. Then she visited Dole Park in the heart of Lānaʻi City. Her last visit was to the sand dunes at Hulopoʻe, where she saw Hawaiian wedge-tailed shearwater birds called ʻuaʻu kani. The harbor was visited by lots of people with cars, and barges bringing in supplies. Dole Park was visited by more people and a few dogs but was quieter than at the harbor. Only a few people walked along the trail adjoining the sand dune at Hulopoʻe. There were no loose dogs, and Pua did not have any people or dogs there. Pua made a table and graphed her data.

	Harbor	Dole Park	Sand Dune
Mynah Birds	11	7	0
Doves	8	9	0
ʻUaʻu kani	0	0	5
Kōlea	6	8	0

16. According to the graph, which of the following is a true statement?

A. The most birds Pua observed were mynah birds.
B. The most common birds at all sites were the ʻuaʻu kani.
C. The most birds were found at the country park.
D. Dole Park had the most ʻuaʻu kani.

17. According to the graph and the data from Pua's visits, what would be a good inference to make from her observations?

A. Doves are not afraid of people and dogs.
B. Doves are not adapted to live in most places.
C. Doves and ʻuaʻu kani don't like to fly high into the mountains.
D. ʻUaʻu kani and doves like the easy life of the city.

18. What is another word for conflict?

A. Description
B. Character
C. Solution
D. Problem

19. In a story, what does it mean when a conflict is resolved?

A. The characters disappear.
B. The conflict happens again.
C. The story's problem is worked out.
D. The story's character has a problem.

20. In old Hawai‘i, what is an example of how the ahupua‘a system resolved conflicts?

A. The konohiki (land managers) kept order.
B. Trading of goods made sharing not an important thing to do.
C. Families were able to move up in ranking by working hard.
D. Families prepared for the annual harvest festival called the Makahiki.

21. What is the problem that was solved by the formation of the lo‘i?

A. Supply and fair use of the land in the ahupua‘a.
B. Supply and fair use of the food in the ahupua‘a.
C. Supply and fair use of the water in the ahupua‘a.
D. Supply and fair use of the labor in the ahupua‘a.

22. Using parts of bodies to measure things was common in ancient Hawai‘i. If you wanted the most cordage, who would you want to do the measuring?

A. A tall person.
B. A young child.
C. The shortest person.
D. The average person in the village.

23. Standard units for measurement are____.

A. Needed to have the same results in measuring all the time.
B. Needed only when measuring things in science.
C Useful only in ancient Hawaiian times.
D. Useful now because of the metric system.

Some fourth-grade students wanted to conduct a project to care for the land. They thought about what they had learned about Hawaiian values and traditions. They decided to cooperate on a project that would help protect the fishpond.

24. Which action is an example laulima (cooperation) and mālama (caring) for the fishpond?

A. Students work together to catch fish in the fishpond.
B. Students work together to rebuild the fishpond wall.
C. Students work together to plant mangrove in the pond.
D. Students work on their own to harvest limu from the pond.

25. Which action shows how we can apply what we've learned from the past to our fishponds today?

A. Students work together to make a mākāhā that traps large fish in the pond.
B. Students show younger students how to make dyes from plants.
C. Students show younger students how to make cordage.
D. Students work alone to catch the fish in the fishpond.

GRADE 4 – TEACHERS ANSWER SHEET

NGSS: 3-5-ETS1-2. Describe a testable hypothesis and an experimental procedure.
1. D
2. A
3. B
4. C

NGSS: 3-5-ETS1-2. Differentiate between an observation and an inference.
5. B
6. D
7. A
8. D
9. B
10. B

NGSS: 3-5-1-1, 3-5-ETS-1-2, 3-5-ETS-1-3. Describe how use of technology has influenced the economy, demography, and environment of Hawai‘i.
11. C
12. B

C3SS: D2.Eco.3.3-5. Explain the history of Hawai‘i's early economy
13. D

C3SS: D2.His.14.3-5. Analyze the consequences of human modification of the physical environment in Hawai‘i using geographic representation (including lo‘i kalo and loko i‘a).
14. A
15. B

C3SS: D2.Geo.1.3-5, D2.Geo.2.3-5, D2.Geo.3.3-5 Collect, organize, and analyze data to interpret and construct geographic representations.
16. A
17. A

CCSS ELA: 4.RI.2., 4.RI.3. Explain the problem or conflict in a story and how it is resolved.
18. D
19. C
20. A
21. C

CCSS Math: 4.MD.1. Explain the need to use standard units for measuring
22. A
23. A

Nā Honua Mauli Ola (NHMO) 14-10 Preserve, protect, and sustain a healthy environment.
NHMO: 8-4 Apply the cultural and traditional knowledge of the past to the present.
24. B
25. A

GRADE 4: ALOHA ʻĀINA PRE-/POST-TEST ASSESSMENT

Name_____ Date_____

Pre _____ Post _____

Answer Sheet

Use pencil to completely darken the appropriate circle for each question.

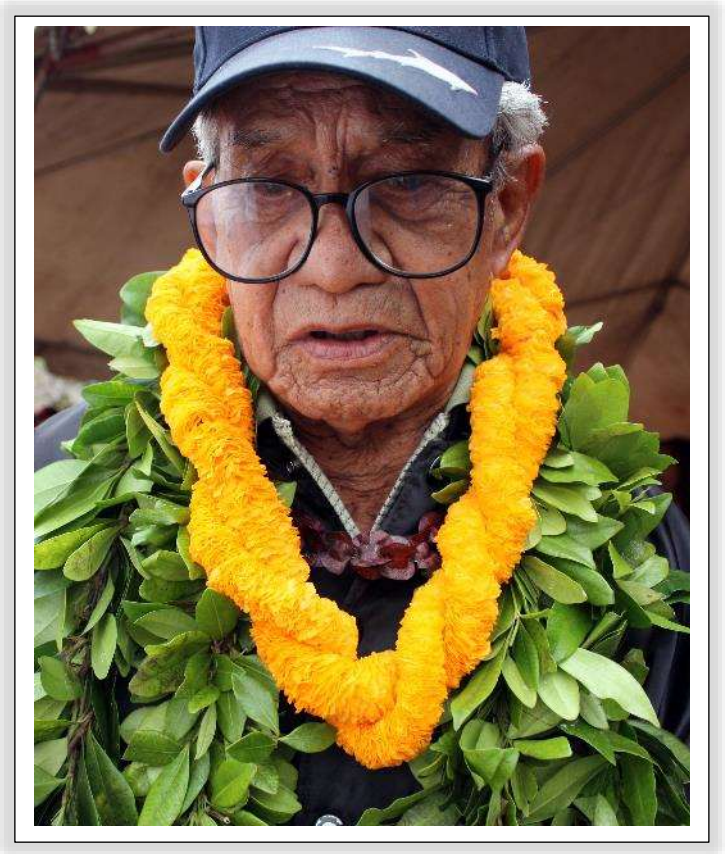
1.	A	B	C	D	13.	A	B	C	D
2.	A	B	C	D	14.	A	B	C	D
3.	A	B	C	D	15.	A	B	C	D
4.	A	B	C	D	16.	A	B	C	D
5.	A	B	C	D	17.	A	B	C	D
6.	A	B	C	D	18.	A	B	C	D
7.	A	B	C	D	19.	A	B	C	D
8.	A	B	C	D	20.	A	B	C	D
9.	A	B	C	D	21.	A	B	C	D
10.	A	B	C	D	22.	A	B	C	D
11.	A	B	C	D	23.	A	B	C	D
12.	A	B	C	D	24.	A	B	C	D

APPENDIX 8.
PERFORMANCE TASK CREATOR TEMPLATE

Main Benchmarks:	**Real-World Problem / Challenge:**	**Real-World Role:**	**What do students need to know or be able to do in order to accomplish this**?
Assess Depth of Knowledge.	(A problem that the community or world is currently facing that requires skills and content embedded in the benchmarks to solve.)	(Something that students might actually be or do.)	
	Real World Product:	**Real-World Audience:**	
	(A product that is similar to what would be found in the real-world, eg. Ennvironmental impact statement, essay, public service announcement, a worksheet.)	(Ideally beyond the walls of the school, and audience that is authentically a part of the challenge.)	
Transfer Skills:	**Real-World Process**:		
(How will benchmarks be used in real life?)	(The process mirrors what would take place in the real world.)		
	Real-World Scenario: (Put it together and set up a scenario that is engaging for students.)		

APPENDIX 9.
LEO O NĀ KŪPUNA MAI LĀNAʻI MAI (LĀNAʻI ORAL HISTORY INTERVIEWS)

Solomon Kaopuiki (SK)
Lānaʻi Culture & Heritage Center Oral History Program
Excerpts of Kōʻele to Kāheʻa Field Interview
December 31, 2005 – with Kepā Maly (KM)



Kupuna Solomon Kaopuiki was born at Kaʻa in 1919. Throughout his life, he worked to foster respect for the land and stewardship of resources. During the interview he describes conservation, protection of native plants, impacts of introduced grazing animals and the resulting sedimentation. He also shared recollections of moʻolelo (traditions), cultural-historical features—including the loko iʻa (fishponds of the Keōmoku region)—and practices of his family. Kupuna observed that new comer's habits of taking everything when they went fishing changed the fisheries. He also stressed the importance of stewardship and caring for the land. Until the time of his passing he engaged in working the land and teaching younger generations about the values his kūpuna shared with him. For years, Kaopuiki was recognized as the man with knowledge about Lānaʻi and many people from Hawaiʻi and beyond sought him out whenever they wanted knowledge about Lānaʻi.

Various family members accompanied us during the interview; participants included:

Sandra Kanipaʻe-Ropa (SR; driving) was driving and Suilan Kanipaʻe (SKa; passenger); Noelani Kwon-Watanabe, Keʻala and Keoki Santos (KK), Onaona Maly (OM), Marlene Alvey (MA), and other ʻohana members.

Driving down Keōmoku Road through Mahana and down to coastal region of Maunalei:

SK: …The olopua [*Osmanthus sandwichensis*] was the most predominant tree, and easier to grow. They can grow without water. That's why, I've got a plan, I would like to start

some olopua some place down here. Start them.

And I get this plant by the white stone, Kalaehī too. I'm going to put over there a sign, "If you have extra water and you're going back… Leave that, don't throw it away, give it to these native plants."

KM: Yes. It's a way to help bring back, to restore some of the natural, the native landscape.

SK: Yes. I had plans for all over here. Also, to put the hibiscus. I had them growing over here. You know, that hibiscus is right down there.

KM: Yes, the one you take care of. The ma'o hau hele [*Hibiscus brackenridgei*] I remember that one on the side of the road, you would always stop and take care of it.

SK: Yes.

SR: How come this one and the one that we saw up at the preserve is different?

SK: This is the one that crawls, the one over there…

SR: Goes straight up?

KM: The reason too, is partly because it's more protected over there.

SK: You can slow down right here.

KM: This one is more…

SK: You can see them [pointing out the ma'o hau hele blossoms].

KM: Beautiful!

SR: They used to be all over here.

KM: Look at how beautiful! But see the grass, everything, all in here.

SK: I get couple over here, the one top side I get.

KM: You take care of these?

SK: I took care of them, they all doing well.

KM: Yes. More in there, beautiful!

SR: Was two years ago, this whole area was all blooming.

SKa: All in here.

KM: Must have been beautiful!

SK: We used to come down and hoe hana, clean, make it outstanding. But the deer also noticed that.

KM: Oh! And look, there's some nehe [*Bidens*] right there.

SK: Right, and naio [*Myoporum sandwicense*].

KM: Naio, yes.

SK: And then I used to trace where this thing came from. I find big, big kind trees down here. But they all make [died]. They went all the way down [chuckling].

KM: All the way down to near the shore?

SK: Near to the down side. The last one, everybody see my pathway, they know already… So, I going try to keep on it.

KM: Yes.

SK: Had one right here by the corner but I don't think… with all the rain it didn't come back.

KM: You began taking care of these plants in the 1930s?

SK: Yes. And had plenty wiliwili, I see they coming back now.

KM: Yes, beautiful! That's the bad thing about the goats, mouflon and everything, they just eat everything up.

SK: Yes.

KM: They kill it all.

SK: The deer grind, the hibiscus, hoo—I look, wow!

KM: Like candy.

SK: I bring chicken wire; I cover on top.

KM: Cover it up.

SK: Bring it back. Then I go up I make the trail, I block up all the plants with stones, they no can get at it.

KM: Yes.

SK: They start going a different place.

KM: Good.

SK: I make sure I come down at 5 o'clock in the evening because everybody goes home, then they no see what I doing.

KM: Where you going, yes. It's just like you no like people see your fishing grounds [chuckling].

SK: Right [chuckles].

KM: You go different time.

SK: Had down here, was pretty much right in here. But I don't know, I haven't gone back to look, but had some plants here. When I bought my two boys [chuckling], they tell, "Daddy, where we going?" "We're going to go water the last one down there." And before days, when the guys who go drive cattle before, they see that, they made sure they add stones on the side so the cow no come.

KM: How nice. Even the old cowboys would help you watch that.

SK: Yes, right.

KM: When you were young in Maunalei in the valley here, was anyone still growing taro in the loʻi?

SK: Yes.

KM: Yes.

SK: We were staying down there by our land, where we walk up. You can see… but there wasn't very much water at that time.

KM: Right.

SK: If you look, the land, you move your feet, you stay in the next guys one.

KM: Loʻi?

SK: Loʻi, yes [chuckles].

KM: Yes. Because it's so narrow on the pali yeah?

SK: Yes, on the pali. So, I asked my father, "How come?" One day you will water on the right side, you water your plants, the next day you direct the water to the other side.

KM: To the left side?

SK: Yes, the other side people gets it.

KM: Amazing! They shared, māhele ka wai [traditional system of sharing water on the land]?

SK: Right. That's the only way.

KM: Yes.

SK: Bum-by hukihuki.

KM: ʻAe.

SK: So that hibiscus, the one I was telling you about, was way down here. This is it.

KM: Oh, there's the maʻomaʻo [*Gossypium tomentosum*], the Hawaiian cotton in here too.

SK: Yes. The other one was down here right down here. That bugga… The place where it was growing, I looked at the soil, there's nothing in it. So, we bring my… you know when you mow your lawn, all that grass?

KM: Yes, the mulch.

SK: The mulch, we dig around and hey, that bugga went.

KM: That's right. And that's what your kūpuna did they called that kīpulu, when they mulch it up like that.

SK: Right, right.

KM: So, it would capture the kēhau [morning dew] like that.

SK: Yes. That's why they asked, "How my parents grew their watermelon over here?" We let that water that came from the mountain go outside our property, they bring all this lepo come down, that's all top soil.

KM: Yes, that's good soil.

SK: So, we go get that and put inside, so when our watermelon came, oh! [gestures large melons]

KM: It grew good?

SK: Yes.

KM: Does anyone still have ʻāina in Maunalei Valley or is it all lost now?

SK: No, all lost.

Group: [at Maunalei and end of pavement – begin dirt road]

SK: You know when you look up here every time that cloud, when we go to Maui and we come back and we glance up here, that Maunalei, the mist and fog.

KM: ‘Ae, it adorns the mountain.

SK: Every time it shows that.

KM: Beautiful!

SK: I thought, only story, and yet when we go, it’s clear. When the clouds…you can see the left side is the big area and then it comes like this [gesturing].

KM: It thins out coming towards this side [towards north west].

SK: It’s the curiosity, I thought this is all bull. But when we come to work at our farm, every time we get to the Kalaehī, I look up there, there it is. So, when I heard from Tūtū, that’s true.

KM: Yes, Mauna-lei.

SK: It goes with that. So certain things, it’s not hearsay, you know.

KM: That’s right, that was how your kūpuna passed things down.

SK: The connection in that thing. Wow!

KM: Now, Kalaehī?

SK: Everybody always tells me, “How come Kalaehī?” I told them, “I don’t know. You know too is, you run and hī!” [chuckles]

KM: ‘Ae, a ‘oia. Now this is kind of a famous place?

SK: It is, yes. This area here, from here till all the way till where we came down the end of the paved road.

KM: Yes.

SK: That is just like a fishing ground for the ‘ama‘ama, mullet, that is their area. When you go by the other side you see all the small pua [fingerlings] all swimming.

KM: Yes.

SK: That’s where this place it was out of bounds for the old people to go surround net. You see everybody catching tako [octopus] outside. They respect that thing. But when some of these plantation laborers came in… [pauses]

KM: They no respect?

SK: They take everything.

KM: You know the interesting thing Kalaehī has water coming out on the reef, right?

SK: Yes, still yet.

KM: That’s why the pua are all there, the ‘ama‘ama, the āholehole [*Kuhlia sandvicensis*] like that. Because of the fresh water.

SK: Yes, the fresh water.

KM: So, it’s like the nursery ground?

SK: Right, right. That area, that’s what it is!

KM: So, your kūpuna wouldn’t just go humbug over there?

SK: No.

KM: They would get he‘e or what?

SK: Yes.

KM: Leave the pua?

SK: Leave the pua. You walk by the shore, that’s when you look first, everybody sees all the pua. Hey, it’s on top the water, “How the hell?” They tell, “Leave ‘em alone.” Of course, they like throw, I tell, “Hey, you cannot throw!”

KM: Waiho mālie.

SK: Yes, that’s what’s feeding all this whole area.

KM: That’s right because that nursery, if you let those babies mature, then they go out.

SK: Right.

KM: Did you folks get ‘ōpae [shrimp] over there too?

SK: ‘Ōpae. And we bought one 4-inch pipe and let ‘em go… ho, loaded inside! You take one small net; you know the kind [gestures scoop net with two sticks]. You paipai [slap the water] over here, you go over there and it’s full.

KM: You just lay the pipe in the water by there and the ‘ōpae go inside?

SK: Yes.

KM: Amazing!

SK: That’s why when everybody catch that, we go back to the farm. We cook ‘em and then everybody eat ‘ōpae.

KM: How big are these ‘ōpae?

SK: They were about like this [gesturing size].

KM: Two to three-inch kind.

SK: Yes.

KM: Clear? This was, do you remember ‘ōpae – the rest of the name?

SK: I forgot the name.

KM: ‘Ōpae lolo?

SK: That’s not the big kind shrimp.

KM: Yes, the native ones.

SK: Ho, ‘ono when you eat that! I don’t know what was. I know that ‘ōpae had a special name. ‘Ono! Everybody tell me, everybody that sees us do that, they were starting to bring nets over here. I told them, “Hey, if you guys come every week, you guys do this, we’re not going get anything.”

KM: Yes, that’s right.

SK: Not going get anything. All the word spread around, and they were honest enough to mālama.

KM: ‘Ae.

SK: They left it. People came and they looked, plenty shrimp.

KM: When you take care, it can grow.

SK: Yes.

KM: You know, I spoke with Uncle Apelahama Kauila.

SK: Yes.

KM: Did you hear at Kalaehī, is there a hole in the stone, one puka?

SK: Yes. When we come back, that is the maka of that… [thinking]

KM: Pahulu?

SK: Yes.

KM: Ka-maka-o-Pahulu?

SK: Pahulu, right.

KM: A ʻoia. You heard that moʻolelo too?

SK: Yes. I went go look.

KM: When Kaululāʻau finally killed Pahulu.

SK: Right.

KM: Lele ka maka?

SK: Yes, right.

KM: And puka in there?

SK: Puka inside.

KM: A ʻoia. Okay, that's what Uncle Apelahama had said also.

SK: Right. I went to look, and I found it.

KM: Wonderful!

SK: I asked my tūtū, "Ai hea ka maka o Pahulu?" My tūtū showed me.

KM: Maikaʻi. Wonderful!

SK: Sandra, make sure when we come back that we stop at the white stone. We got to go look. Kamakaopahulu, and we have to look at the water.

KM: Did you ever see that?

SR: Not the puka.

KM: That's very important because it's a part of that wonderful story. I went years ago and found it too, and it was quite amazing!

SK: This side right where the people walk up.

KM: ʻAe. Very important!

SK: We had some nice… I forgot the name of that white flower [thinking] it's been such a long time, I forgot. That one is still growing.

KM: The native maiapilo [*Capparis sandwichiana*] with the green-silverish leaf?

SK: Yes, right.

KM: Maiapilo?

SK: I think so, yes. Still yet, still growing up there right on the tip and back further.

KM: That's right.

SK: And underneath there get the water.

KM: A ʻoia. What was nice too about Kalaehī before, the ʻakiʻaki [*Sporobolus virginicus*] grass, the native beach grass.

SK: Right.

KM: The kaunaʻoa [*Cuscuta sandwichiana*] grew beautifully there too, you could just lift it off.

SK: Yes, you can just lift the thing up.

KM: Not hihia like the pōhuehue [*Ipomoea pes-caprae*].

SK: No, when you lift up, you no get all that grass.

KM: Yes, that's right, it was beautiful!

SK: Yes. That long kind, just like the grass was different.

KM: Yes, it was a native ʻakiʻaki.

SK: When we had all that stuff going down there, guys think who I am telling them what to do. I told them, "We got to preserve this kind of stuff."

KM: A ʻoia.

SK: I said, "You folks take, somebody come see, they take." Nalowale [lost].

KM: Nalowale. When you no mālama [care for it].

SK: Yes. Aʻole loʻa [not going get].

KM: ʻAe, pololei [yes, right]!

Group: [passing lower Hauola]

SK: And the Kauila family used to be over there. Before, over here was the place, when ua, nobody could cross.

KM: For real! The kahawai?

SK: Yes.

KM: Wow!

SK: Us, we go makai, because the water over here, it goes to the other side. It's not soft. Today I look, no. But this is one kahawai. All the people who used to stay down here, when they see that kind, they diverted the water to someplace else.

KM: That's right.

SK: To prevent it coming on the road.

KM: Yes.

SK: That's why I told them, "You folks send this thing like that, you got to go down look where to send it out. This kind lepo, I think this is going to stay, it's not going. When you get this solid kind of lepo…"

KM: That's right.

KM: Wow, this kiawe is so thick now.

SK: Yes. And you know before, the ranch guys used to come, they take care. But then we started to do it because we were using the road, and we liked the sun to catch the road and make it dry. You can go. But if all the kiawe trees grow over, the sun no can reach.

KM: Yes.

SK: All of this kiawe like this, was no more. It was way back away from the shore.

KM: Yes. So, you folks would trim it back?

SK: Yes. Everybody scattered, I said, "No, we take one side, go for a mile."

KM: Yes.

SK: That way they look back, they tell, "Ho, we make fast." "Yes, that's the best way to do it. If you stagger, we can maybe only go two hundred yards." And when we cut, we cut, we pile it up, but we cut, cut so it's small. Then when you light 'em so that we don't burn the whole forest.

KM: That's right, don't burn everything down.

SK: We can control it.

KM: Yes.

SK: I told them, "That's the only way to keep the door open."

Group: [arrives at Kaʻa]

SK: That's where I grew up.

KM: Yes. You hānau at Kaʻa?

SK: Kaʻa. Then we moved down to Keōmoku.

KM: Did I understand that the house that you folks lived in at Keōmoku was the house that Aunty Venus Gay them lived in before?

SK: Right. That's right when Aunty Venus…and you going see the hibiscus that was planted way back and the fence and I going continue… That's why I talked to my brother Sammy, I told him, "We go rebuild the fence, put it back originally, how it was before."

KM: Wonderful! Before the Gay's came in that house was part of the Maunalei Plantation house?

SK: Right. And you know they had an office down there, if you go to Pioneer Hotel when you get in the wharf. You going see that, just like where everybody is having breakfast.

KM: Yes.

SK: That portion of that was taken from Lānaʻi and huki.

KM: The lumber, they took over?

SK: They hemohemo everything by sections and huki and they put it up there.

KM: Wow! Over there.

SK: Yes.

KM: That was sometime around 1901, I think.

SK: When you go over there you can see. You look in the back, the original is wide, but in the front facing the wharf, kind of a small structure.

KM: Maunalei Sugar was dying out already, and they were doing the pipi too by that time, plenty.

SK: Yes. This corner over here is the lot.

KM: I see the sign up there.

SK: Yes.

SK: No can go inside bumby you get flat tire.

KM: The kiawe is so thick. You folks had your house down here too?

SK: Yes. The house burned, we burned it down.

KM: Oh. When was that?

SK: [thinking] One day me and my brother came, and we looked everything was gone. I tell…this coconut tree, I planted, it came from the ocean, I put it inside.

I planted this coconut tree down the beach over here everything is growing. When we go down Keōmoku, we are going to look at the original fence that our grandparents made. I'm going to continue to do that and I'm going to bring it back to original.

SK: Way back, one morning we came out, we looked was rough out there. There was a canoe in the breakers, get about five Filipino guys. They came from Lāhaina, were fishing, the wind came up so fast they couldn't go back. They paddled over there and wrecked. We took care of them. Not one of them lost their life. The five guys, after they finished, nobody could find them. Those days no more communication like now, and yet they were alive. When my uncle, took them back on the boat, they took 'em Lāhaina, everybody tell, "You guys make!" [see *Nupepa Kuokoa* article of March 26, 1925]

Group: [chuckling]

[Discussing siltation all across the coastal property] …But as usual all the mountain, the rocks were taken away and all that dirt, is all beginning to come here. Come looking for the well. Where is the well? It's buried.

KK: Brackish water?

KM: So, you folks dug that well?

SK: Yes.

KK: Tūtū said they used to drink brackish water.

SK: I grew up in this area. When we grow up, eight years old, we got to go dive, get water… We had one goat we caught, it was tame, and we put one bell on it. It would go up the mountain, then we look at it, it's bringing home about fifteen to twenty goats… [chuckling]

Group: [laughing]

SK: We extended the fence, fixed the fence, take 'um all.

SK: And that goat was never taught to bring others back. But she had to come back, and

she had the bell. So, every time we hear ‘um…

KK: Aunty Rebecca and Aunty Lei were born down at Kahalepalaoa, and then grandpa was born here. This was an aunt’s property?

SR: Yes. I think this was connected with the Butlers. They got married to another family relative. Uncle knows…

Group: [walks out to beach fronting Ka‘a]

SK: …We’d take piula, roofing iron, flat that thing and [gestures shaping into a canoe-like form]. When the tide rises up, you get a good ride. But you have to catch a wave like this that does not break. The back side is low, but you get a good ride all the way in.

But when it’s rough, you cannot go out.

KM: Yes. You folks would get he‘e [octopus] like that?

SK: Yes. All over there [pointing out to the ‘āpapa fronting the wave break]. That’s all he‘e. Right between here and the fish pond, is where the ‘ama‘ama are.

KM: So, this pile of stones here, is the ruins of the old fish pond?

SK: Yes, Ka‘a loko. And when the tide is low, you go right where this boat is and by brother Sammy goes and throw for fish. Every time he goes, we have to get everybody out there, scaling the fish [chuckles].

KM: Because so much?

SK: Yes, one throw, he gets over fifty. And then he goes—we’re struggling to clean the fish—he goes and catches some more [chuckling].

KM: When you were young was this fish pond better defined, was the wall better?

SK: Yes, it was really good. And it is so evident that the fish pond contributed a lot to maintaining the species.

KM: Yes, absolutely that’s why the kūpuna were so smart. Just like how you take care of the land, cultivate it, well to make these fish species like that.

SK: Yes.

KM: Uncle, your mo‘opuna Ke‘ala was just saying, you were talking about before when they would bring the poi from Lāhaina. Did you bury it in the cool sand or something?

SK: What we did was in areas like this, where we would clean the area where the sun is not on it, we dig a square. We have a galvanized type of metal. We set this in there and we get a cover. That’s where we would keep some ice in it.

KM: You would bring the block ice from Lāhaina, put it inside the sand pit?

SK: Right. Because we got that container in there and the poi lasts.

KM: Anything you keep cool?

SK: Yes, right.

KM: It was sort of a natural ice box.

SK: It was about five feet long and about three feet wide. Every one… That’s why you figured, what the heck, how come it’s not further in. But the ground is cooler here.

KM: Damp and moist.

SK: Right.

KM: That's right.

KK: Grandpa, how big was the bag of poi you guys used to get from Lāhaina?

SK: Very sizeable. Every week we got to go, yes.

KK: Like how many pounds?

SK: I don't know. Can you imagine, for when we don't have…if this kind of wind like this, this is terrific for sailing. We got to sail all the way to ʻOlowalu and then come back to Lāhaina.

KM: Tack back?

SK: Tack back and back inside. When we come back, we go all the way back to Māla Wharf, going home, riding on the surf [chuckles].

KM: Too good!

SK: My Uncle Noa was asked to race this yacht, they started in Lāhaina. All the Lāhaina guys thinking, "How the hell my uncle and his father headed for Māla." They went to Māla and this yacht, you don't fool around where in hell they can go. But these guys from Māla they opened the sail, opened wide. They went on the surf, they reached inside, anchor, go up, the guys still yet coming.

KM: Amazing! They knew just where to go. From Māla they could angle and come straight to Lānaʻi.

SK: Yes, you riding the surf coming in.

KM: Wow!

Group: [in vehicles, continues drive towards Keōmoku]

KM: Mahalo for sharing this moʻolelo about your ʻāina hānau.

SK: Yes, maikaʻi! Maikaʻi!

KM: You said that in front of here had that loko iʻa, the fish pond.

SK: Right.

KM: You folks would go out fishing? Did you ever take care of the walls still yet?

SK: Yes.

KM: You did. You folks would still go sort of?

SK: We walked around, and we looked, and you can see the small kind fish. We put all the stones back, and next time we go, oh plenty!

KM: Yes, yes.

SK: But before that, no more. They no can hide when the other big fish come, but when we get all the small—hāʻule all that stones. That's why I told them, you see, you guys walk around. Not only walk around, you can look for heʻe but you come to this place you see the kind stone, put back.

KM: Yes. You folks just like the loko iʻa…

SK: Yes.

KM: …did you folks make umu or imu some places for go fishing?

SK: Yes.

KM: A fish house just like?

SK: Yes.

KM: You would build a stone mound?

SK: But you know after a while we discarded that, because somebody else was taking them.

KM: Oh. Someone else intruded on your fisheries?

SK: Yes, so we broke it up. We stopped taking the stones.

KM: Sad yeah. In the old days people didn't go mahaʻoi like that.

SK: You know these people don't share. They not like us, from here.

KM: It's the malihini.

SK: The malihini.

KM: Because in the old days when you go lawaiʻa, you would māhele iʻa [share the fish]?

SK: Yes, right.

KM: You would always share.

SK: You know these old people stay home they never go, but when get plenty fish we go to the house, "Hey, here."

KM: Hāʻawi aloha.

SK: Oh, "Mahalo!"

KM: Especially the kūpuna like that, they no can go out.

SK: Yes…

KM: Eia mākou.

SK: Ka hale pule.

KM: Hale pule, ʻae. Kēia hale pule, o Ka Lanakila o ka Malamalama Hoʻomana Naʻauao?

SK: ʻAe. And all makai here, the waʻa and the hale. Hale la, hale maʻō. [All here was good, there were canoes and house all around, here and there.]

KM: ʻAe. Nui nā hale?

SK: Yes…

Group: [gets out at church]

MA: Uncle, we had two churches down here. Lānaʻi Hale which was my Tūtū Man's church.

SK: That one was down there [indicating further east].

KM: Lānaʻi Hale church was on the makai side of the alanui?

SK: Right on the high-water mark area and up a little ways. You go Lāhaina, we used the Church as a marker to come home.

KM: Amazing!

SK: Right. All I got to do is look at the steeple, okay. If you see the steeple and the church, then you know that the water is not rough. When you don't see it, you see only portion, no come home.

SK: You go up to Kāʻanapali, you catch that surf you hoe [paddle], and go like heck.

But like I was telling Kepā, the office, bumby we go back over there. The company that was here…

MA: Maunalei?

SK: Yes. If you look at the Pioneer Hotel, the structure facing the ocean is smaller. That portion was over here, and it's broken up into sections and towed back to Lāhaina and set up.

KM: Portions of the Maunalei Plantation office?

SK: Yes.

KM: And you said was it by where they eat now?

SK: Where they eat outside.

Group: [photo on Ka Lanakila Church steps]

KM: Now across the road to that side, there's the bread oven.

SK: Yes. The Portuguese oven.

KM: Was it really Portuguese?

SK: I don't know [chuckling].

KM: There were no Portuguese families living down here right?

SK: None.

KM: No, it was the Hawaiians and later some of the haole and Japanese families.

KM: That's right! [walking] Oh yes, I see the oven.

SK: You can imagine we surrounding that thing and cooking and everybody saying, "Hey, hey, hey. Come, come."

SK: Yes.

KM: That's Japanese.

SK: Japanese, yes.

KM: The Japanese went cut and make this. You look at that stone, had other cut stone in there.

SK: Funny thing you know, when we heated up this thing, the fire was so strong that we put, anything you put in for cook, it's no good.

KM: Too hot?

SK: Too hot. We had to take off the whole thing out…

KM: Mahalo! Now, I saw the boat one time. How far are we?

SK: The boat, right here.

KM: Right down here, right?

SK: Yes. Miki‘oi, way at the other side. Manuki‘iwai.

KM: Manuki‘iwai.

MA: The Manuki‘iwai is over here too?

SK: Yes.

MA: I’ve never seen the Manuki‘iwai.

KM: Uncle, you look at this stone. You see how it’s cut like that.

KM: Good, we’re going to go down…

Group: [walking through kiawe towards shore]

SK: The island grew! [commenting on how far it is out to the shore now]

OM: [chuckles] “The island grew!”

SK: The water was…

OM: The water used to be way up here?

SK: No, was way up there [indicating further inland]. The Manuki‘iwai all palahē, I think.

Group: [walking along shore]

KM: …So the fish pond [Kahōkeo] is there, and the Lāna‘i Hale Church was?

SK: Right by that point.

KM; So, in front of the fish pond?

SK: Above it. You see the pipe?

KM: I see the pipe.

SK: The iron.

KM: Yes. Is that the channel that you folks would go out?

SK: Yes. The break going out, when you go you stay on the left of the inside.

KM: Yes.

SK: And then you go out and when you come back you come back the same way.

KM: This is the place where they would count the waves like that, when they were getting ready to go out with the boats.

SK: Right in here. You see only the white breaks there?

KM: Yes.

SK: There is a…the reef was not that far out. The waves come right here.

MA: So, all the run-off, uncle.

KM: Yes, all the lepo.

MA: Yes. No more limu kohu?

SK: Limu kohu get, but this area here, me and my wife, we don't want people to come look this side because it's a small area. The other places get limu kohu, but it takes three days to clean. So, we take our scissors to pick…

MA: Uncle so what, is there līpoa now?

SK: Yes, loaded with līpoa. The best limu kohu is by white stone, the channel, they are this high [indicates six inches].

KM: Wow, long!

SK/KM: [Inaudible – discussing collection of limu ʻeleʻele, manauea and wāwaeʻiole along the Keōmoku shore line]

KM: So, these were limu that you folks could go gather when you were young?

SK: Right.

KM: Was there as much lepo before?

SK: No.

KM: So not like now?

SK: No.

KM: So, I guess that's had an effect on the limu?

MA: You folks told me before that my Tūtū papa man would ask the cowboys to go clean the gulches, to minimize the run-off.

SK: Yes. That's the thing, they'd clean all the lepo that was left on the bottom of the gulch. These were the kind of lepo that the erosion from on top, not from the gully itself. It was on top, and when this water from the kahawai comes down, it ends up in the ocean.

KM: Sure, but if they clean that, get rid of that… And actually, that was good top soil?

SK: Right.

KM: Actually, you could plant with that?

SK: Sure. That's what I used to dig my watermelon row, and use whatever compost the kiawe trees presented. You notice that all that lepo has all kiawe trees in them. That's the best one. We go up and get that, we plant our watermelon. Hey, that thing takes off.

KM: You said your watermelons is the thirty pounds kind?

SK: Average about… but as I said you get a branch like that [gestures sticking branch-twigs in ground to direct the spread of the watermelon vines]. You get over there, over here, plenty branches, cut off here.

KM: You trim some?

SK: Yes, you take off and you get only on this one branch, maybe five. Then they come about twenty-five to thirty pounds.

KM: Amazing!

SK: The other guys they just… the wind blows everything ends up, just like only from here to there, pile up. You see two, three big ones, but all by the side, small kind. Whereas me and my scientific way, ho, when I come back. I go Honolulu I come back, "Where the heck is my watermelons?" I tell, "Who the hell took the watermelons?" The store guys came down, they sold them.

Group: [walking back along beach toward kiawe thicket – looking for boat]

SK: When they pulled the boat in, on shore, one guy made a wench, and we pulled the boat in with that.

KM: Oh, too good. And this was the main channel for you folks to go out with the boat?

SK: Yes. This whole area is all dirty, but before we would go out and put the net inside, when we pull in the net, you look, all fish jumping inside the net. What are we going to do with the fish? We have to go get the horse, we got to take all the way to White Stone [Kalaehī], the people up there, we take the fish. My father tell us, "Okay, go get the horse. You guys got to take the fish; you cannot waste the fish." The other guys go down this way, go give all the people down this side. Ho, you don't eat mullet that kind of time, but that's the way it is, got to share.

KM: Yes. Amazing! That fish pond wall that's there, it went that way towards the east, or it came this way?

SK: It went that way [gesturing towards Kahalepalaoa]. This is a stone pile. You can go down there… like now the tide is pretty high, but I can see it way on the other end.

KM: ʻAe. You folks still took care of those ponds?

SK: This whole area. This is where all the ʻamaʻama, you can see all inside here, they're floating.

KM: Wonderful!

SK: That's why you know if you go out, and you know how hard it is, hard work…

KM: …You know all the lepo has moved out so far that's why. The shoreline is extending further out… So, the Manukiʻiwai, and there's still the engine block.

MA: Yes.

KS: I saw another one gramps, with like a cabin.

MA: Oh, you did, you found another one too.

SK: The Akamai.

KM: That's the Akamai?

KS: Yes. What color was it gramps, white?

SK: White. The Manukiʻiwai. I thought this boat would never fall apart.

MA: What happened to the piece of wood that had Gay-Lāhaina on it?

SK: You know what's happening, people come in here, I saw other stuff on top there, had a number somebody got 'em, you can see the saw cut. I'm sure that's what happened.

KM: Yes. Somebody stole it.

OM: How can we put something over here, so they don't touch any more.

SK: As I said, the ocean was like that some place down here.

KM: Amazing!

SK: We had to bring this way up. It's amazing the boat…

KM: And you're right, you look you can see the stern.

SK: Yes.

KM: This was what, 30 feet, about 30 feet long or so?

SK: Right, right. It was big…

Group: [in vehicles, continues drive towards Kāheʻa]

KM: …There is value in taking care of the ʻāina.

SK: Yes. I want to make sure that the owner knows on this island, there are people who have pride, and maintain it.

KM: Yes…

Uncle, you mentioned, the graves behind the church, that's the gravesites for the old families down here?

SK: Right, yes. I got to clean so they know that somebody is looking after it. I told some of the guys I said, "We got to go do all those kind of things to prove to him that we are able to do it."

KM: Yes. And that it means something to you.

SK: Yes.

KM: Otherwise they figure it doesn't mean anything, if no one takes care, they figure it doesn't matter.

SK: Yes.

KM: Why should they take care. Uncle, you mentioned the Gay Well along here.

SK: Yes, we're supposed to be some place right here, try slow down. Look, look, left side. I think we passed it. We go further, turn around and go back.

KM: …So the Gay well, the families put it in? Charles Gay them built this well?

SK: Right.

KM: Did it have a windmill before?

SK: [thinking] I think they had a pump.

KM: A pump.

SK: Yes.

KM: The well was for their agricultural area, where they were growing alfalfa or something?

SK: Yes, right.

KM: That's what you guys were talking about earlier.

SK: Yes.

KM: That was for feed.

SK: Yes.

KM: For the cattle?

SK: Yes. It didn't turn out good.

KM: Was the water pretty much brackish, wai kai?

SK: Yes. That's what I thought, the brackish water was suitable. Try look on your left side.

SR: There's a road.

KM: There's a little alanui here.

SK: I think this one. Let me go take a look….

KM: We're just trying to see if Mikiʻoi is here. I'll just go with uncle.

SK: …I think somebody got a camping site.

SK/KM: [walk west along shore of Waiaʻōpae, and in kiawe]

SK: This is Waiaʻōpae…

KM: This is Waiaʻōpae loko. Look the puʻu one [sand dune banks].

SK: Yes. This is the kind puʻu one over here, I was telling you, that's really big, the one where that family was. We got to go back this way…see the fish pond.

KM: There's the side wall. You know that heiau you were talking about the other day, the Pōhaku-lī-kanaka, that's near here?

SK: It's right down here, right by the side of the road. See that stone pile, we have to go over there and check out.

KM: So actually, this is the kuapā?

SK: Yes, Waiaʻōpae. This place, Waiaʻōpae, has one channel out here. And you see the three coconut trees down there [pointing eastward, to a location about one-half mile from where we were standing]

KM: Yes.

SK: Well all over there had the manō inside, swimming. You go inside there; you see all

the sharks…

KM: Uncle, when you were talking about out here and the fish pond?

SK: Yes.

KM: This is Waiaʻōpae?

SK: Waiaʻōpae, yes.

KM: You said when you were young, this place was noted, the ʻāpapa out here, for ʻuhu? And also had manō?

SK: Right. Out here.

KM: You would go out lawaiʻa?

SK: When we go, we go inside, we got somebody looking way up there for the fins. They tell us, “They coming.” So, we leave alone the fish, we go back on the papa.

KM: On the papa.

SK: Yes.

Group: [in trucks driving to Kāheʻa]

KM: Now Kāheʻa is where has that heiau you were talking about?

SK: Right.

KM: And the pōhaku where they lī kanaka [strangle men]?

SK: Right.

KM: You said had a puka in the pōhaku or something?

SK: Yes. Had a nice one, but the big kiawe tree over there, hāʻule and broke that puka. Everybody come they tell me—Oh, they show me the other kind, I say, "that's not it." We're going to go right over there, get one opening going to the beach.

KM: Just a little further down.

SK: Get three coconut trees, yes. Park by the three coconut trees…

KM: …In your youth were there still families living in the Kāheʻa section?

SK: Aʻole, no more.

KM: No more, pau already.

SK: Yes. The only people were staying was by the pier.

KM: And the pier was where?

SK: Kahalepalaoa.

KM: Kahalepalaoa already, okay. That had a small village?

SK: Kahalepalaoa was past Kāheʻa.

KM: Ah!

SK: It's amazing! The Hawaiian name is tricky.

KM: Yes. You were saying how important is the pronunciation.

SK: Right, yes.

KM: Otherwise what?

SK: We go to the other side, look. You can see the petroglyph.

KM: So, these are the three coconut trees we saw from Waiaʻōpae?

SK: Yes, and this is where I was telling you about the sharks.

From here all the way to down to the fishpond, don't go. All in here, way up here, always had somebody to watch, and see the fin of the sharks. Had some thirty sharks swimming in a circle, and then some kind of disturbance. And according to what I heard; the turtle is just like hānau here too. And these guys were circling there.

Group: [walks to heiau]

SK: …So the Hawaiian pronunciation has a lot to do with it. Kāheʻa. Now what this heiau had to do with it, this is where they hung guys, you know, in this heiau.

Be very careful when you walk in this area. Make sure you hang on.

KM: When did you first see these petroglyphs?

SK: [thinking] In 1935.

KM: Wow!

SK: I came here with my father to fix the windmill and wandered off by myself.

KM: That's right they had a windmill at Kāheʻa also.

SK: Yes. Was on the top here. We can go on the top after. You see Suki, you folks remember, Suki?

KM: Yes.

SK: She came here, she took these two pictures here. When she developed the picture, she got three. She threw away the picture [chuckling]. I said, “Hey, I don’t know.” That’s like my parents, when they went to Kona by that Hōnaunau. They were by that grass shack, when they took the picture, only my mother and my father sitting down. When the picture was developed get two guys behind them with malo, my mother was ready to throw away. I told, “Mom, don’t do that.” Never in her life had she seen something like that. She insisted that there were only two of them. They were the only two people, yet when the picture came out, there were these two guys in the back. They were well dressed. They had the, what they call that, the thing they carry?

KM: The kāhili?

SK: Kāhili. Even me, I look that hey [chuckling].

KK: Grandpa, what happened to the picture?

SK: I don’t know whatever happened to it.

KM: The heiau is… Partly, you see the big stone wall up here.

SK: Yes. Part of it? We got to go up…you can see the construction was roughly made.

KM: But look how beautiful that stone wall is up there, all this has hāneʻe [collapse].

SK: Hāneʻe that’s why. Yes. The coconut trees area, it’s a flat area. This is the place where… I’m telling him about on the other end, the heiau is flat on the top…

Group: [at petroglyph wall]

KM: These kiʻi are the only ones. [looking at the heiau walls] This was a major construction, this heiau. You look at all the stones and all this and up here was all level off at one

time too but the kiawe has destroyed it all.

SK: Notice there's a lot of small rocks.

KM: ʻAe.

SK: And yet you have the heavy rocks. Oh boy all the trees fell down across.

KM: Yes.

SK: We cannot.

KM: Just come up here maybe, no go any further.

SK: Yes.

KM: We're going to come back down here.

SK: We go the other side. Before we go the other side I better look if get any bees.

KM: This was an amazing place. You see the back wall too, some for enclosure.

SK: You get one wall back there, you know.

KM: Yes.

SK: The wall is high. If you go back there you got to go…you go over there you can see it.

KM: Amazing!

SK: Big! And you look all this pōhaku, wow!

KM: Everyone had hāpai these stones.

SK: Yes. You try to take a look; I can go walk down. You go up look on the side. You got to go way…

KM: Along the side.

SK: That side, it's easier.

KM: Amazing!

KK: To me that's like in comparison to the pyramids…

Group: [returns to trucks and begins drive back to Keōmoku and city]

KM: Uncle, I going nīele you a little more, okay?

SK: Yes.

KM: You mentioned when we were at Kāheʻa and that heiau. You first saw it in 1935 because you and your papa work on the windmill.

SK: Yes.

KM: Was that an old windmill already, and you were fixing it or?

SK: It was an old one. We had to repair the structure, because they had strong wind and the windmill had hāʻule. We had to go back and fix all the blades. That's why I went with him.

KM: Who put the windmill up? Was it for the ranch?

SK: Yes. The ranch.

KM: That water. Was there a place somewhere where they were drawing brackish water

out of, right by there or something?

SK: Yes. Right where [thinking] this side by the three coconut trees.

KM: Yes.

SK: The windmill was right originally where we stopped. It was right on top there.

KM: Okay.

SK: That's why you see that opening there, catch the wind but the kiawe trees weren't that tall before.

KM: Of course.

SK: So, when that windmill, had an aluminum (silver) sort of paint, the whole thing, the structure and everything was painted aluminum.

KM: Oh, silver color?

SK: Yes. We come down Lāhaina Wharf, we look, we can see, we used the church…

KM: Lānaʻi Hale church to mark.

SK: Yes, as a marker. Then we looked on the left side you can see the windmill too, then we know that the waves are small.

KM: And that windmill, the water went into a trough right there or did it pump the water by pipeline somewhere?

SK: No. The water trough was…you know where we went in and parked?

KM: Yes.

SK: Right over this side.

KM: Was for the pipi to have water?

SK: For the pipi.

KM: I see. Interesting how they chose that spot with that old site there.

SK: Yes.

KM: And I guess there were a series of windmills along here.

SK: And then when Maunalei Sugar Company had the train, right where we went walking there's a small little kahawai. They made a bridge like.

KM: Oh. To go across.

SK: Yes.

KM: The Maunalei train ran from…?

SK: Till Keōmoku. Not beyond Keōmoku. Keōmoku they were prepared they had already laid stone wall and stones right alongside like this.

KM: So, they could make a track if they wanted to.

SK: Yes, right.

KM: Did the sugar company ever have any production? Did you hear? I know it was before your time?

SK: No, they did. The original production was so good that they wanted to enlarge because

they got… Any time you take a well down the beach, just like the first three feet of water is pure.

KM: Yes, that's right. They thought they had good water?

SK: Good. That's why the stock, whatever came out, the guys were really fascinated. That thing was good, but when you continuously and continuously…

KM: Suck the water out.

SK: Yes. The water becomes brackish.

KM: Too much salt then the cane would die.

SK: Right, right.

KM: How interesting! They had the same pilikia at Puakō in Kohala on the shore.

SK: Yes.

KM: The first time was good the water, but then come pa'akai.

SK: That's true, I heard about that.

KM: The Hind's.

SK: Yes.

KM: In fact, Ernest Vredenburg's uncle them.

SK: Yes.

KM: Was the one's that did that in Puakō.

SK: Yes. That's why when they decided to make…in fact over here.

KM: What area is this?

SK: This is Hā'ua.

KM: Hā'ua.

SK: They got the resolve, so these people who owned that Maunalei Company decided to get bigger acreage. So Maunalei all on top there before you reach our place, it's all flat land. They wanted to take over one thousand acres and plant sugar, and using the water from the Maunalei.

KM: Maunalei.

SK: Yes.

KM: But the water you said was always kind of small. It wasn't a big flowing river?

SK: No.

KM: If they had taken the water the Hawaiian families would have had no water.

SK: No more, no more. They had good results with the water, so they figured even though you know they pump the water, still get good water, and the production is good enough to warrant for them to invest further, going into sugar.

KM: And then it never, didn't go too far.

SK: Yes.

KM: And the train ran from the Keōmoku…?

SK: Keōmoku to the pier.

KM: To the pier, Kahalepalaoa.

SK: Kahalepalaoa.

KM: The train never really came this side at all, only Keōmoku.

SK: When they made the wall, they made it all the way to Kaʻa or something.

KM: Oh, like you said they were planning for the expansion.

SK: Right, they were planning to use that land for cane on the plans they had made over there…

Marian Kuʻuleialoha "Aunty Lei" Kaopuiki-Kanipaʻe
Lānaʻi Culture & Heritage Center Oral History Program
Excerpts of Interviews with Kepā Maly
October 14, 2005 at Kōʻele with siblings and family members, January 26, 2006 in Pālāwai, and February 16, 2008 visit to Keōmoku and Naha

Marian Kuʻuleialoha "Aunty Lei" Kaopuiki-Kanipaʻe was born November 23, 1915 at Kahalepalaoa. Growing up, Aunty Lei and her family also lived at Kaʻa and Keōmoku Village. Around 1938, she moved up to the Lānaʻi City, starting her own family. During her interviews, Aunty Lei shared rich details of life on Lānaʻi over 100 years ago. She spoke of families, customs, practices, and of the resources from the honua ola (living environment) of land and ocean which sustained the people of the island. She also shared how different practices of newer residents led to diminished fishery resources and how the land itself changed. Mud washing down from the mountain impacted the lowlands and changed the reefs as well. Throughout the interviews one gets a glimpse into the spiritual and familial relationship elder Hawaiians shared with the land of their birth.

Between 2005 to 2016, a number of oral history interviews (both formal and informal with notes taken) with Aunty Lei were conducted. Among those was an outing to the Keōmoku region on February 16, 2008. One of the important statements shared by kupuna was that the "Sand dunes in vicinity of Pōkaʻī were once noted for līpoa and limu kohu." The dunes are high, and when she was young, iwi (both skulls and bones) were often exposed there.

During the interview of October 14, 2005, Aunty Lei (LK) was joined by her elder sister, Rebecca Kaopuiki Richardson (RR), her younger brother Solomon Timothy Kaopuiki (SK), her cousin Irene Kamāhuialani Cockett Perry (IP), and younger family members. Here, the kūpuna speak about Maunalei and the windward region of Lānaʻi, noting that the environment has changed radically in their lifetime.

Maunalei – the source of water and naming the land area:

LK: …So this Maunalei, the name of this Maunalei, this is what Tūtū Papa said. “Maunalei, that’s where kau mai ke akua.” That’s why every time has that…what you call that?

SK: The mist.

LK: The mist and the ‘ohu.

KM: ‘Ae.

LK: Kau mai ka ‘ohu o Maunalei, a mai laila ka wai e hele mai ai.

The mist settles on Maunalei, and from there, the water comes.

KM: ‘Ae. Mai ka ‘ohu mai.

Yes, from the mist.

LK: Yes. That’s why Maunalei — mau nā lei!

KM: Ahh. So always covered with a lei?

LK: Always…

Fishing and marine resources of the Keōmoku – windward coast:

KM: ...Tūtū, you were mentioning about the honu, and that you folks would kaulaʻi like that. A little further down has Kahemanō.

Group: Yes.

KM: Did you folks lawaiʻa manō?

SK: We ate manō.

LK: I never did.

IP: We played with them. The hammerhead sharks, they would come inside, close to the shore, and we would run in the water and we’d chase them.

LK: I never did down there, the mother them.

SK: We would get the ones more this size [gestures].

KM: So, about a foot and a half.

SK: You slice them thin, and then you either pūlehu or kōʻala palai. And fry ‘um, gee!

LK: My mama used to make for us.

IP: You folks ate that, the hammerhead shark?

SK: Yes. And I swim after ‘um, go like hell. [chuckles] When I swim, I win [chuckling]. I eat shark meat, I win.

KM: [chuckling] So you folks, no problem, you eat the shark like that?

IP: No, I never had that.

SK: But you tell me now, I found out that’s our ‘aumakua.

KM: But not all sharks are ‘aumakua, eh?

SK: Right. But still you look, that's shark, so you no like eat ʻum.

IP: I never did.

KM: So, if you folks are going lawaiʻa down Keōmoku section, what kinds of fish did you folks get.

IP: Mullet, pāpio.

SK: Manini.

LK: Uhu, ʻōʻio, kala.

IP: Kala, yeah.

LK: Nenue.

IP: Heʻe.

LK: Oh, yes, heʻe.

IP: We used to get plenty heʻe.

IP: Get, weke.

SK: Everything that was edible.

LK: Yes [chuckling].

IP: I think we had more fish then than now.

SK: Balloon fish [nohu].

IP: We get alamihi.

SK: ʻŌhiki.

IP: ʻŌhiki, kūpeʻe.

LK: Only once in a while we get that, because it doesn't come out every time.

IP: Wana and hāʻukeʻuke, plenty.

SK: But you eat plenty wana, you going run to the toilet.

KM: ʻAe, hī [chuckles].

LK: Not too much hāʻukeʻuke down Keōmoku side, you have to go out more.

IP: We had lots of limu, limu ʻeleʻele.

LK: Oh, the limu, had plenty.

KM: The limu ʻeleʻele, where the fresh water comes out?

Group: Yes.

SK: Yes, the green one.

KM: So limu ʻeleʻele?

RR: Yes.

SK: Līpoa.

LK: Limu līpoa, limu kala, any kind of limu.

KM: Did you folks eat limu kala?

LK: No, not us. Līpoa, yes.

KM: Wāwae-ʻiole?

SK: Wāwae-ʻiole, get plenty.

KM: Manauea?

LK: Manauea, yes.

IP: There were plenty kinds of limu.

LK: And limu kohu.

KM: Limu kohu, out on the papa?

SK: That's the limu of the aliʻi.

IP: But the limu ʻeleʻele is only after the rain, big rain, and the water goes down in the ocean, and there is plenty. But after that, it's pau. But the other kinds had all the time.

Ocean today is different than when they were young – the water is muddy.

KM: Well, an interesting thing, when you look at Keōmoku, where you folks were, today, it's different, isn't it?

LK: Yes. No more those things like that.

IP: No more nothing.

KM: So, what's happened to the land from when you folks were young and living down there, to today? How has it changed?

LK: Plenty.

IP: More trees. It's all covered with trees.

KM: So, more trees.

IP: And not too many sand dunes, it used to have lots of sand dunes.

SK: The sand was bigger.

KM: Bigger. That's what kupuna was saying, before, the kahakai was clear.

SK: Way up.

LK: Close to the village.

KM: Now the mud…?

SK: Yes.

KM: Where did the mud come from?

SK: From the mountain.

LK: From the mountain.

IP: Because of the rain.

KM: And how come, because the animals destroyed the forest or what?

SK: Even in our time, never had forest, too much. Erosion was terrific, no matter where.

IP: Yes.

KM: So, when you folks were young, it never happened like that? The erosion wasn't bad?

SK: It wasn't bad.

KM: So, what happened, why is there erosion now, like since the late 1950s, 1960s, that wasn't there when you folks were young?

SK: Well, these things were not growing, the trees up on the mountain… You go to the mountain, you look up, you see all bare spots, but today…

LK: They had the cows back that time. They had the cattle, and the cattle eat everything. But today, I don't know what happened. And they blocked up all the places where the water used to come down.

IP: The drought had a lot to do with it too, a ten-year drought.

KM: Sure. But you know, before, the kūpuna said, even your folks kūkū Keliʻihananui, one of the quotes, when Lawrence Gay put together the little book.

MS: Yes, I remember.

KM: He talks about Keliʻihananui saying, "before, it was forest, but then goats ate everything…"

LK: Yes, they ate everything.

KM: And then the rain stopped. So, the land began to dry up.

SK: Right, right.

KM: So then with the years of cattle, goats, the deer like that. If they eat everything, what holds the soil down?

LK: Yes.

KM: So now, when you go down. Like let's say when we go down to the church. Were there two churches at Keōmoku?

LK: One church was Ka Lanakila, and the other one was Lānaʻihale, the Gays' church.

SK: Currently, if you go to Keōmoku, the church is right next to the road, and you go way over here, this church was down here, the beach, right over here, the kahakai. This church.

KM: That was the Gay's church?

RR: Yes.

KM: And that is all pau, hiolo ʻia?

SK: Yes.

KM: Let me ask you about the church then. Because now, the church has been partially restored, yeah?

IP: Yes.

KM: What do you folks feel about the church? Is it important that the site be taken care of?

IP: Yes.

KM: Well, I want to ask you a question. The other day, when about all the siltation that's occurred, all the lepo has come from the mountain. And kupuna, you said that even the shore line has extended out, and dirt is filling up there. How can we save that

church lot so that the dirt won't fill into the church?

LK: Let me tell you now. Since the last rain came, the dirt is level with the floor. So, I don't know how they are going to preserve that.

SK: That kind of stuff, my brother Sammy and I figured that we were going to go find a way to divert the water back. And block it over here. Then we are going to shovel all that dirt. We've been doing that all the time. We didn't ask anybody. We did it all. We went back here, we diverted the water, go all the way, almost to where the other church was. Now, I have to go back and still divert it.

KM: Okay, kupuna, I want to ask you a question about that. The problem is, of course, the water has its natural area to flow.

SK: Right.

KM: So, when we start to play around with the stream area, the kahawai…

IP: That's what happened.

KM: I was wondering, and just throwing this out as an idea to you. In order to save the church… And now the lepo is almost up to the floor.

LK: It is already.

KM: So, by-and-by, it'll be buried.

Group: [agrees]

KM: And one other thing, are there ilina… He pā ilina i loko kēlā pā o ka hale pule.

There is a cemetery behind the church lot.

RR: Yes.

LK: Behind.

KM: Okay, so you have to take care of those ilina too, right?

LK It's not too close to the church. About from here to there [pointing to an area by some trees].

KM: So, about 1550 feet plus.

IP: That church was nice for years and years, ever since I can remember it. Big rain and all, but nothing happened. And there is a big kahawai. And our house was here, and the kahawai was right there.

KM: So, on the side.

IP: And all those years, the water went right down to the ocean. Then later, when I came back. I was in Honolulu, and I came home, and I went down. They had blocked the kahawai up there, and they diverted all the water down this side.

KM: So that's why. Can they reopen the kahawai to the natural bed?

LK: It's all covered now.

SK: [gestures various angles] The kahawai comes this way, and comes down here, and comes right by Charles Gay's place. Today, it comes here, and that are became level. So, you have to put a wall here. And if you put a wall here, you will divert this. We don't want it to come down here. From the ocean, because of this dirt coming down, the lepo is maybe about three feet high.

KM: Oh, so it's blocking it up.

SK: So, it's best if we divert it to the other side. The only thing that I want to work out is, when they go down to fix the road, I want to tell the guy to push away all this dirt from by the church.

KM: Yes.

SK: Divert it away. Then me and some other guys, I'm going to get some volunteers, we're going to fix this area up here. Instead of just pile up rock, we'll pile up rocks and make soft cement and just put it in there, that way it'll lock.

KM: Yes, so it'll look natural outside, but inside will be pa‘a.

SK: Right…

KM: …May I ask, the pā ilina, is that from Ka Lanakila Church? Who is buried there?

SK: The families from there.

LK: All of the families, all the people that were there before.

KM: Do you folks know the names of some?

MS: Some names are on the graves.

KM: Okay, so still visible?

MS: Some.

SK: And I also buried, five guys that they found some place else.

LK: Some bones that they brought back from the mainland.

KM: Oh, the museum remains, that's right.

MS: The iwi that were sent back from Bishop Museum.

SK: Before I put them in the ground, I asked the people there, that "We don't know where this iwi came from."

KM: Yes, just that they were from Lānaʻi?

SK: Yes, from Lānaʻi.

IP: Maybe from Dr. Emory's time.

SK: So, I put them there with the understanding, that after I put them in the ground, if they want to go back to where they came from, just go.

KM: ʻAe.

SK: Where it's located, is very well protected.

KM: Good.

SK: So, the only thing is, make a fence, showing…and up here too, we've got to do the same thing up here. We've got to make a fence, so that the tractor come, no push ʻum.

KM: ʻAe…

January 26, 2006

KM: …As a young girl when you were living makai…

LK: Yes, yes. I used to play on top there.

KM: You played on top there. No one was using it when you were a child?

LK: The old people were. They were using, but at that time when everybody moved and then hardly any people going use the oven. We used that place when we go church, we young yet, we go climb on top. Go play.

KM: When you went to church, hardly any kiawe when you were young?

LK: No more, no more because had all the houses.

KM: Amazing!

LK: Had old houses, and I remember how that houses were. My aunty them the one that was staying over here, they moved down to Keōmoku because the Gay family was planting watermelons, and something else besides the watermelons.

KM: Was that Aunty Nami?

LK: Aunty Nami them. They were staying right next to that stone house. Aunty Maggie's father them, they was living beyond that.

KM: Nakihei.

LK: Nakihei.

KM: Johnny?

LK: John Nakihei. And then had John Nakihei's brother. That's the one that died in the sea… [thinking] Joe Kahaleanu's grandfather.

KM: Yes. ʻOia, nalowale?

LK: They were staying with Kaʻuhane Kukololoua down, and that old man Kini. He was the

minister for Ka Lanakila.

KM: How did he die?

LK: They died inside the ocean because when my father them came back from Lāhaina… They went to Lāhaina for shopping, and came back. Every time when they come back and somebody from Lāhaina comes back because his house is right next to his older brother's one. My aunty was staying there just like close together the homes there. So, this old man's house was staying right here and get one more other house right next to his house. And then my cousin them was staying there. Nami's daughter was married to Pili Kahoʻohalahala.

Sol Kahoʻohalahala them's grandfather. Then had some more other houses but the people all left. After Sol's Kahoʻohalahala's great grandfather, they were living right next to that house, they were close together.

KM: The judge, I think.

LK: Yes.

KM: Judge Kahoʻohalahala.

LK: Then had another house [thinking] these people had left over here… [thinking] Pili Kalua, Kalua was the last name.

KM: Yes, I've seen the name.

LK: I forget already the first names of these people. They was living right next over there. Then had one more other family, that's Aunty Hannah's uncle, living right next. Jacob, I think.

KM: Kauila?

LK: No. [thinking] Not Kauila, Jacob Kaʻuhane, I think.

KM: Kaʻuhane. This is all on the makai side of the alanui?

LK: Makai side of the church. That's all the people was in there.

KM: Wow!

LK: And when everybody moved away, they left, only left the Cockett family there. Aunty Irene them was staying in that house where we were staying later.

KM: Yes.

LK: The Gay family left already. Had nobody staying in the house.

KM: The Cocketts went and then tūtū mā.

LK: Yes. When Cocketts moved up here, he told Tūtū Papa take care the cattle down that place. That's how we moved down there. We were staying up at Kaʻa before that.

KM: I see.

LK: And then when we moved down there, we stayed over there in that house where the Cocketts were. The house next to the other yard was the Gay's house. Nobody was staying there. Until they sold the land, and then Mr. Katterman at the time, he was the assistant foreman, I think, for the Dole plantation.

I don't know what his first name was. He told to my papa, "Better you folks move inside the house, bumby the house come rotten." That's how we went move inside the other

house.

KM: Oh! How interesting!

LK: When we stayed down the other house, people were coming to Keōmoku. Joe Kahaleanu's grandfather and his grandmother were staying at the other house. Down where my aunty them was staying. Poor thing the house was all falling down. Popopo already. But get the ranch people come down and take away all the lumber.

KM: They took them apart. Plenty of them.

LK: Yes.

KM: You know that old oven. Did you hear who was using that oven? Was it Japanese people, Hawaiians?

LK: I don't know.

KM: You didn't hear anything. It was old when you were young already?

LK: I was young.

KM: Did anyone ever cook in it when you were young. Do you remember or never cooked?

LK: My aunty did.

KM: Your Aunty Nami?

LK: Yes. She baked inside there.

KM: Bread?

LK: They baked bread and they baked cake.

KM: How did they cook in it? Do you remember?

LK: With the wood.

KM: They put fire inside?

LK: They put fire underneath first, and heat up the oven inside and on top.

KM: Oh!

LK: Never had broken part like that.

KM: Yes.

LK: It was good and nice.

KM: It looks like how the Japanese stone workers cut the stone.

LK: I think so. Maybe the Japanese did that, I don't know.

KM: Because I know that the Japanese came and worked for Maunalei Plantation.

LK: Yes. The first plantation when they made down there, had plenty new houses that's why had the two houses. The Gay's never make that house.

KM: It was before them?

LK: Was before them.

KM: That's right.

LK: That's why you know these two houses up here, up the ranch.

KM: Yes, yes.

LK: That's the house from down Keōmoku.

KM: Oh, the two houses actually came up. The one that aunty is in now?

LK: Yes. The one inside, the Richardsons, the two houses.

KM: So actually, came from makai up?

LK: Yes.

KM: Oh!

LK: And you know the Pioneer Mill, the Lāhaina one.

KM: Yes, Lāhaina.

LK: That's from Keōmoku.

KM: A part of the lumber or something?

LK: All from the plantation house down there.

KM: Maunalei plantation. Wow!

LK: They took it all to Lāhaina.

KM: Interesting! Must have took it apart and floated it across?

LK: And floated it inside the water and take 'em.

KM: Wow!

LK: The Manuki'iwai was running that time, take letter. How they went take that thing, because they were using Kahalepalaoa.

KM: 'Ae. It was the landing at that time.

LK: Yes, the landing down there. How they do that I don't know.

KM: Interesting! But it was before your time?

LK: Yes, before my time.

KM: You hānau in 1915.

LK: Tūtū Mama them tell us the story. My tūtū, my grandmother…

KM: Who was your grandma?

LK: Her name was Mahinakauloa [Haumea], but they went change when she went join the church, I think. They called her…they took out the Mahinakauloa and they named her Lahapa. Lahapa.

KM: Lahapa.

LK: That's the name they gave her.

KM: Yes. So Mahinakauloa was her old name?

LK: Yes, that's her first name. Why, I don't know.

KM: So interesting! Sometimes they say names get mana.

LK: Yes. Them they believe, "How can you call that Mahinakauloa? God is the one that belongs there, not man." But today you hear plenty people calling that name.

KM: Yes… When you were a child where was the beach? How much further behind you, not too far?

LK: Not too far.

KM: Not like now?

LK: It was close. Now the land has grown out.

KM: Yes.

LK: That's why when I went down there lately with this club, they call Mālama ʻĀina, I went with Jackie them. I went walk down the beach with Laurie, when I looked at the land... [pauses]

KM: You don't recognize it?

LK: I said, "The land went grow out."

KM: Yes. All the dirt from the mountain pushed…

LK: Pushed the land out.

KM: Where the fish pond was, where the āpapa?

LK: The papa.

KM: Changing.

LK: That's why when I looked at that, and when I looked from where we was, I look the land, turned like that [gestures curving outward].

KM: Yes.

LK: That's the difference. Before, the land when you look, the land was inside [gestures curving inward].

KM: Yes.

LK: Never moved out.

KM: ʻAe.

LK: Before to us it was wide open and you look at kuapā, we call that kuapā…

KM: ʻAe, kuapā, ka loko iʻa.

LK: The loko iʻa. Was from the land from up the shoreline and wide. And when I went looked at that the kuapā stay far away out. I mean the rocks. You can see the rocks.

KM: Yes, the rocks.

LK: The land went cover up part of that.

KM: And now it's close?

LK: Close.

KM: When you were young, were people still using iʻa from the kuapā?

LK: [thinking] No.

KM: No one was taking care of it then?

LK: No. But the land never go out that much.

KM: That's right.

LK: Because nobody was down there at that time. To me, I figure we was taking care that place. We go church and we take care the Lord. The Lord knows that people are staying there, so he not destroying the land.

KM: How interesting! Pau, haʻalele ka poʻe?

LK: But when we all moved up here, Tūtū Mama and Tūtū Papa, the last ones, they went move up too. Nobody stayed down there to take care the place. Then you see the land, just like nobody cared for the land.

KM: Loli ka ʻāina.

LK: This is how you can see. [thinking] I don't know.

KM: Yes. We lose all of these old things. But you think, "Mahalo ke Akua!" I ka noho ʻana o ka poʻe kamaʻāina, ua mālama lākou i ka ʻāina. Aʻole lilo like me kēia lā?

LK: Yes. To tell you that thing happened, Tūtū Mama was the first one, she saw these things. She only… when you think in spiritual things. Tūtū Mama was sitting down behind, we had one small porch behind facing to the beach. I think was my brother Johnny, I think. She was outside there sitting down, she was feeding with her breast, I was down there with them. I was the last down there with them until Aunty Eva was born. When she was feeding this baby, she heard music up in the air. Hard to explain that kind to people. She tell me, "Oh, the nice, beautiful how that music was playing." On the kiawe trees it passes through.

KM: ʻAe.

LK: She tell me, "Oh, how nice!" At that time, we was still going to the church and keep the word of God with us. She was the first went hear that. Then after when nobody left, then when us, we moved to the big house, the Gay house. And then it was showed to me.

KM: Ō, ua lohe ʻoe?

LK: When that thing went happen to me, I think “this is what Tūtū Mama went hear.” So nice the music…

KM: Beautiful?

LK: You no can explain to people how nice. Up in the air. And you know Tūtū Mama tell me, “That’s huakaʻi, that’s the angels flying, going up in the air.”

KM: Beautiful!

LK: I mentioned that when we were in the church, I no forget. It’s hard to explain to people. That’s what you see at the time. Maybe the Lord knew we were leaving the place and nobody going take care after that. He showed these things, but we don’t know.

KM: I guess it would be good if there’s a way to try and take care of the land a little bit.

LK: Yes.

KM: Got to take care of these stories like this, it’s important. When you were young you would go holoholo, fishing a little bit?

LK: Oh, yes!

KM: Right, makai.

LK: The whole beach, we can walk with my mama. We had to go fishing because nobody going get fish for us.

KM: ʻAe.

LK: The boys were all grown up and they are the fishermen for us.

KM: Yes.

LK: So, who going out fishing? We had to go, me and my aunty, Tala, the younger ones. The younger boys they know how to fish already. They are the ones that go out catch the fish and come home.

KM: Right from makai of your house you could just go out?

LK: Yes, from right outside, we go.

KM: What kinds of fish you ʻohi?

LK: Either the moi or sometimes we go for the kind shall kind fish.

KM: ʻAe.

LK: Either the moi, not so small, but at least you can fry up.

KM: Moiliʻi kind?

LK: Yes. Moiliʻi and nehu. They call that the nehu.

KM: Nehu.

LK: We used to catch that. We get them by the tub. Because when you surround on top the kind mosquito net, you going catch you think only little, but you catch so much.

KM: And what, you kaulaʻi that?

LK: We kaulaʻi that, after we clean all the nehu and salt them little bit. Then we kaulaʻi that on top the peʻa, they call that.

KM: Yes, canvas, peʻa.

LK: Canvas. They would put down on the boat sometimes, we leave ʻem on top Manukiʻiwai, big boat.

KM: Yes.

LK: Lay them on top there, kaulaʻi. Sometimes we go down there and hulihuli every time, you got to sit down there and watch.

KM: ʻAe. And no more flies before?

LK: Get flies, but makani, usually only half day and then you take home.

KM: Amazing!

LK: Yes.

KM: Your paʻakai. Were you folks making paʻakai?

LK: No.

KM: You kūʻai?

LK: Kūʻai that from Lāhaina, they go buy the bag. Even the poi, kūʻai all, this came from Maui, from Lāhaina, they come home with the poi.

KM: You folks didn't have to make paʻakai then?

LK: No.

KM: Before the kūpuna used to make.

LK: My tūtū them they used to do that.

KM: ʻAe.

LK: Down [thinking] that place down where they call that the Federation Camp, now.

KM: Oh, Kaiolohia?

LK: Kaiolohia. That's where my tūtū them used to go down there and Kalaehī, make the salt water.

KM: ʻAe.

LK: They dry, and that's where they go get the paʻakai.

KM: Interesting. The go make paʻakai down the other side?

LK: My tūtū them.

KM: Oh. ʻOno that paʻakai?

LK: I know that's the kind from the sea but now, no good.

KM: No.

LK: They kāpulu the ocean.

KM: Yes! No good.

LK: No good.

KM: Interesting.

LK: But now they getting water from underground.

KM: ‘Ae.

LK: They make the water from underground. You see how akamai the man. [chuckles]

Also, when they used to go fishing down that way, Kalaehī to Kai‘olohia, they never used to take food with them. It was like saying you don’t need the fish. The spirits would come and chase the fish away. So, they would catch fish, and give some back.

That’s how it was, they don’t take food with them, or else they don’t catch fish.

KM: Yes, like the story of Pahulu, when they eat the weke, the call out to Pahulu, “E Pahulu, eia kāu wahi” “Here is your portion.” Mahalo nui. Aloha.

LK: Yes.

KM: So, you folks, did you grow any ‘uala or anything around your home at all when you were young?

LK: Not down.

KM: Not Keōmoku?

LK: Keōmoku, up where we was living, up where the windmill was.

KM: Yes.

LK: That’s where we planted that time never get plenty kiawe.

KM: Yes. It must have been so nice before.

LK: Yes, never have much kiawe.

KM: Were there pipi running around when you were young?

LK: Oh, yes [chuckles].

KM: Had plenty pipi.

LK: Had plenty pipi, when we go school…

KM: You no scared of the pipi?

LK: We scared! Because when we look at the pipi, we scared because red and we…

KM/LK: [chuckling]

KM: Did you ever get chased by the pipi?

LK: No, we never did.

KM: Good, good!

LK: The pipi no chase but we scared! You never can tell what they going do. Every time the older ones, they especially tell us, “Hey, watch get the bull over there, you watch if the bull going horn [gestures, shaking]. That’s when he going chase you!” And that’s why we come scared. If they no tell us that, we no get scared.

KM: Did you folks have stone walls or was it fences mostly around your houses?

LK: No. No more fence.

KM: The pipi could just come out by the house and everything?

LK: Yes.

KM: Junk then!

LK: Only front place they get the fence. Where the Gay house was, had fence.

KM: Fence around it, yes. They had planted plants around.

LK: Had the kind fence, the stick kind. The other house when we was, no more. Only the front and the side get, but they no come inside.

KM: What was Tūtū Papa's job when you were young?

LK: [thinking] Fisherman.

KM: Fisherman. Did he take care of the pipi or the water, windmills or anything?

LK: After that when the Cocketts left.

KM: Oh.

LK: They was working only part-time.

KM: I see.

LK: They was helping the Cocketts part-time.

KM: I guess Robert Cockett was making some of the windmills or working on the windmills.

LK: Yes. After that he was taking care of that.

KM: Then Tūtū Papa took care.

LK: Tūtū Papa was the one took care of that. Got to go down to where ever all the windmills stay.

KM: Yes.

LK: He had to take care of that. When he goes, get only me and Aunty Rebecca, we, only the girls' home. The younger boys they don't know what to do yet. So Tūtū Papa tell us what to do, and then we go handle the pump.

KM: Yes. You actually had to go help?

LK: We had to help with that before, put in the oil to keep 'em running when no more wind. The pump had to work. If the pump no work, the windmill not going spin.

KM: Yes.

LK: That thing, the water comes up with the pump.

KM: Yes. And how was that water wai kai or was it pretty much fresh?

LK: Brackish.

KM: Brackish, wai kai.

LK: Brackish water.

KM: The pump was run by the windmill?

LK: No, the windmill goes by itself, but when no more wind you had to use the pump.

KM: Did it have an engine?

LK: Yes. One small, little engine for pump the water up. Get the water goes in the tank.

KM: I see.

LK: The water goes in the tank, and sometimes the water is empty in the tank. You have

to keep the water filled otherwise it cracks, the tank because it was empty.

KM: It was all wooden tank?

LK: All wooden tanks.

KM: How many were there? Do you remember about?

LK: The windmill…

KM: The windmill tank like that, how many about?

LK: Gee. Had plenty!

KM: All along the kahakai? Up on the mauka side of the road?

LK: Yes. Mauka side of the road.

KM: Different areas along the shore. Maunalei.

LK: Hauola had one and Maunalei, I don't know where's Maunalei's one. I don't know if Maunalei. Hauola I know had one, down Keōmoku and down Kāheʻa. Namilimili's place, Kahalepalaoa, where that Club Lānaʻi is.

KM: Yes.

LK: Related to the Kahaleanu family. Kukololoua, Kaʻuhane, that's the name. Related to them, that's their land. Had one over there and had one down, I don't know if Kahemanō had one and down… [thinking] Where's that last place. Naha.

KM: Naha.

LK: Down Naha.

KM: Maybe five or six maybe, about.

LK: I think so. Naha, Kahemanō and then Kāheʻa, Keōmoku and Hauola.

KM: Hauola.

LK: Maunalei, I don't know. Or the other name, that place we go the Federation.

KM: Yes, Kaiolohia side.

LK: Kaiolohia.

KM: Did they ever tap into Kahōkūnui pond there? Do you remember Kahōkūnui?

LK: I wonder if that's the place had over there? I don't know, I don't remember… I only hear that, before Kauila's property.

KM: Yes, the stone building.

LK: Yes. Right over there. You know by the kahawai, you come up from Maunalei side?

KM: ʻAe.

LK: Right inside there, that wall is up. That's what I hear from Kauila them before.

KM: ʻAe…

LK: When you think about that, this is what my tūtū used to tell me. You know "When they were raising their children, they had that kind huakaʻi." You know certain people for certain place.

KM: ʻAe.

LK: They no click with the other side, they call that kind, huakaʻi, you got to watch.

KM: ʻAe, huakaʻi pō.

LK: Huakaʻi pō. They fighting against one another. This family, this side may be good. This side they get one leader that you got to obey to this kind leader that's no good. The one that you get family that stays inside with these no-good people, if you been some place, one of the family going tell the leader that's his family so no do harm.

KM: That's right, so you hear them "ālia!"

LK: No bother them. That's what my tūtū used to tell us. What they got to do, they got to move away from the place. They no can stay there.

KM: Yes.

LK: Because they going fight each other. The one's who get children, they got to move away. That's why when my tūtū them at the first beginning they was staying up Kainehe. Kainehe away from Nāhoko I think they call that place now.

KM: Nāhoko, yes.

LK: Then comes Kainehe. Kainehe that's where they get big hill, every time you see that sand hill, now get plenty. That's where my tūtū them lived. When they moved over there got to move down to certain place and they go back again to Kahalepalaoa. They take all their children far away.

KM: Yes. They no like pilikia.

LK: Let these people fight with each other. That's what she told us the story of their life time.

KM: Yes.

LK: How they raised their children. You think about that, they fighting for what…they like their land? I don't know.

KM: Oh, no good when the ʻuhane got to fight one another.

LK: Yes. That's how that moʻolelo was from Tūtū Mama them.

KM: Mahalo nui.

LK: That's all my moʻolelo I can think of.

KM: Mahalo. It's so beautiful! Thank you so much! Mahalo nui! So nice.

LK: Nice today, I thought was going to get ua.

KM: Yes.

[begin drive back to city]

LK: When you look, minamina the land.

KM: ʻAe.

LK: From pineapple.

KM: Imagine back in Tūtū Keliʻihananui's time when Tūtū Mama was a young girl was only pipi and they eat everything. The land has been really abused at times.

LK: They used to get goats before. That's the one eats all the vegetation.

KM: Yes, that's right.

LK: And she used to tell get the passion fruit, the purple one.

KM: Lemiwai kind.

LK: Yes. They call that lemiwai, used to get the purple kind, that's what they used to eat. When they went bring the yellow one, nalowale.

KM: ʻAe. Imagine though living out here and walking the distances like they did or ride horse.

LK: Yes.

KM: Even to go down to Kaunolū to go fishing or something. Lōʻihi!

LK: Yes…

Kupuna Venus Leinaʻala Gay-Holt (VH)
Lānaʻi Culture & Heritage Center Oral History Program
January 28, 2006 – with Kepā Maly (KM)

Kupuna Venus Leinaʻala Gay Holt (Aunty Venus) was born at Keōmoku, Lānaʻi on September 30, 1905, three years after her parents, Charles and Luika Kala Gay, purchased the island of Lānaʻi. In the excerpts of the interview below, Aunty Venus shares some of her early memories of Lānaʻi, life at Keōmoku, and the families of Lānaʻi who worked with her father.

KM: Thank you so much for being willing to talk story again. We're going to talk about your growing up on Lānaʻi.

VH: Yes.

KM: Real quickly, kupuna, your full name and date of birth.

VH: My first name is Venus, Leinaʻala Gay-Holt.

KM: Okay.

VH: September 30th, 1905.

KM: ʻAe. And where were you born?

VH: Keōmoku, Lānaʻi [chuckling].

KM: Yes, that's amazing! You were showing me a picture of your Keōmoku house.

VH: The Keōmoku house, is the one right here [pointing to photograph].

KM: Yes. That's the house you were born in.

VH: That's the house I was born…

KM: Hmm. So, your father was ranching?

VH: Yes.

KM: Was he ranching mostly down by Keōmoku at that time?

VH: No, always up above. The ranch was all up there.

KM: All up?

VH: Yes. What he had down at Keōmoku was a piggery.

KM: Oh!

VH: We raised pigs; we had some people living down there.

KM: Yes.

VH: That was quite a settlement, there were a lot of Hawaiian homes down there at Keōmoku. So those people worked for us. They took care of the piggery, and we planted a lot of alfalfa and things like that. Food for the animals.

KM: Yes.

VH: So that was quite a settlement at Keōmoku. Not only the people that worked for us, but the old times residents.

KM: Yes.

VH: They all lived down there. Very few of those people that lived up Kō‘ele and Lālākoa were the old-time residents, most of them were from Keōmoku.

KM: Oh, I see. Families like Makahanaloa?

VH: The Makahanaloas were from down there. The Kaopuikis.

KM: Kaopuiki.

VH: Kane, and [thinking] the Enokas.

KM: ‘Ae. Apiki?

VH: Yes.

KM: Kauila?

VH: Kauila.

KM: ‘Ae.

VH: Kauila was over by… He always lived down there. But he also… All these people that worked for us also had homes—the ranch provided them with homes up in Kō‘ele.

KM: Kō‘ele, oh.

VH: So, their families always lived, stayed back down there at Keōmoku, because the public school… Right next to our house was the public school.

KM: Yes, I see.

VH: So, the children all went to that school. Only the men folks that worked, the cowboys that were needed to go up to Kōʻele, moved. The rest of the family just stayed down there.

And we always had a boat, Mikiʻoi, right down in Keōmoku there. That boat, the man that ran the boat, the launch, often went to Lāhaina. Not only to buy whatever they wanted, poi and things like that, but also to take the mail.

KM: Ah, yes!

VH: We had to have the government sponsor that boat to take the mail every Wednesday and Saturday to Lāhaina.

KM: Oh!

VH: So that boat also belonged to the folks [Chas. Gay]. The ranch did have one, but they had a small boat. But ours ran, because we always depended on food from Lāhaina.

KM: Yes, yes.

VH: We had to have poi [chuckling].

KM: Yes [chuckling].

VH: We couldn't grow poi on Lānaʻi. We'd have great big barrels of poi [gestures a barrel being about three feet in height].

KM: Oh, yes, big!

VH: To last for a week or so [chuckles]. They weren't in bags they were in barrels.

KM: Amazing! Tūtū, you have a photograph of Kahalepalaoa Landing…right over there [pointing to photo of Kahalepalaoa Landing].

VH: Yes, right over there, Kahalepalaoa.

KM: Is that the landing you folks would use? Did you use Kahalepalaoa Landing when you were young?

VH: For the boat?

KM: Yes. Did the boat use it?

VH: We very seldom used that; we used our own.

KM: Oh, right at Keōmoku?

VH: Right outside of our place, there's a channel out there.

KM: Yes.

VH: The folks always had…the Hawaiians always had that channel.

KM: I see. Who was the kapena, who was the captain for the boat usually?

VH: Keoni Nakihei was one of them, and [thinking] Noa Kaopuiki, and Daniel Kaopuiki.

KM: Yes.

VH: [thinking] Those men were always available.

KM: Yes. It must have been something for the boats running between Lānaʻi and Lāhaina.

VH: Yes. Twice a week. We had to get our poi from over there [chuckling], and flour.

KM: Yes. Now you said that your church, Lānaʻi Hale…?

VH: Yes.

KM: Why was it named Lānaʻi Hale Church?

VH: After the mountain, that mountain. The highest mountain is Lānaʻi Hale.

KM: Yes. And so, they named the church for the mountain?

VH: For the mountain. And the church was founded by my father.

KM: Yes, yes.

VH: And it was he who named that church Lānaʻi Hale. They used to have… It was sponsored by a mission here.

KM: Yes.

VH: The mission is still yet; I've forgotten what they call themselves.

KM: Hawaiian Evangelical Association?

LK: Yes…

Irene Kamāhuialani Cockett-Perry (Aunty Irene) and Momi Perry-Suzuki
Lāna‘i Culture & Heritage Center Oral History Program
Excerpt of Interview on October 14, 2005 – with Kepā Maly (KM)
Kō‘ele to Naha Field Interview
February 17, 2006 – with Kepā Maly

Irene Kamāhuialani (IP) was born on April 15, 1917 at Keōmoku village. Her mother’s family was of Lāna‘i and her father from Maui. During the interviews, she shared some of her recollections of things she had learned from her elders and those things which she personally experienced.

Tūtū’s father, Robert Cockett, relocated the family to Kō‘ele in 1928, where he was serving as an assistant to George Munro. As a result of her life-long experiences and her love for Lāna‘i, she was asked to create a poem in a mele (chant form) for Kō‘ele and Lāna‘i, which expressed the love of place that elder native families possess for Lāna‘i. Excerpts from the October 14, 2005 interview with lines of the mele are included below.

Aunty Irene’s memory of the windward landscape from her childhood informs us of how much it has changed in one individual’s lifetime. The beaches along the windward shore were fairly clean, natural kahawai (stream beds) were open so when there was heavy rain, run-off followed geographic routes (kahawai) rather than spreading across the land covering everything. The old families fished and gathered resources in the ways of their ancestors, while newcomers with the plantation tended to over harvest, so species were reduced or disappeared.

Later in June 2015, Kupuna visited with haumāna who started the restoration project at Waia‘ōpae Loko. Notably during her conversation with the group, she observed that when she was a child, the beach along the pond region had been clean, now it’s all mud. She asked the haumāna, “Where did all the sand go?” In follow up discussions with the haumāna, we shared with them that their “normal” landscape was not the “normal” of Lāna‘i’s elder Hawaiian families. At a number of times during the interview of February 12, 2006, Kupuna and her daughter both advocated for programs that would help restore the land to its earlier health, and care for cultural places.

October 14, 2005

KM: …One of the things that you did, you wrote a short mele for Kōʻele?

IP: Yes, for the hotel. When the hotel was built.

KM: What inspired you to write that little mele?

IP: Well, we were invited to go and help with painting and decorate. The fellow who came to decorate the hotel, he was an artist, and he said anybody who wanted to go up and help with the painting of the hotel, should come. And we got paid. So, I went up and painted with him. We were talking and got to be good friends. Then he asked me one day, if I could write something for the hotel? And I said, "Gee, I don't know. Like what?" He said, "Like Kōʻele and the ocean, and something like that." So, I said, "I'll try." So, I came up with that mele.

I waena o ka Pakipika, aia o Hawaiʻi.	In the middle of the Pacific, behold Hawaiʻi.
I waena o Hawaiʻi, aia o Lānaʻi.	In the middle of Hawaiʻi, behold Lānaʻi.
Aia i ka mole o Lānaʻi, o Kōʻele.	There at the center of Lānaʻi, is Kōʻele.
E hoʻokipa mai i Kōʻele!	Be welcome at Kōʻele!

February 17, 2006 – Driving past Mahana pasture lands, heading makai.

KM: …We've just passed Mahana, you remember place names?

IP: Yes. The names, but I don't know which areas.

KM: Did you ever hear any stories about places when you were coming mauka. They would say, "such and such occurred here or?"

IP: Yes. Up around there. They have the big rocks. You look down in the valley, there's huge rocks. Because never had all these trees like this. No more, it was all nice and you could see right through. Like people standing there… What do they call it, Pōhaku-ō.

KM: ʻAe. You heard about Pōhaku-ō?

IP: Yes. And they used to talk about it, we would get scared [chuckles]. When we were able to come up on horseback, my father had a nice big horse, a beautiful horse. He let me ride it. I had to take it and put it by the fence, climb up on the fence and get on the horse because I was too small to get on. It was a nice horse. We would come up sometimes with the family, my brothers and sisters. We would go to the stores at Kōʻele, get what we need. And lalau, yeah, play around. And then they would tell, "Got to go home, late." Get on our horse and come down, by the time we get to that area…

KM: By Pōhaku-ō?

IP: Yes. It's kind of dusk. Everybody kick their horse, get going, running [chuckles]. The horses going. Me, the small one on the horse [chuckling]. And then when we pass there, then we take our time.

KM: How come you were afraid of the Pōhaku-ō area?

IP: Because they say, when you come over, when you come there with foods. They hear this call.

KM: ʻAe, ō!

IP: Ō! Maybe it's the wind, yeah.

KM: Could be. But you know, mamua, they believe nui ka ʻuhane [plenty spirits].

IP: Yes.

KM: Nui ka poʻe [plenty people].

MS: It around this area right here.

IP: This is like, see that rock over there?

KM: Yes, the one standing up.

IP: Used to be up like this. Had plenty. All over. It was really nice and shaped like people standing.

KM: Yes, how interesting!

IP: They said they call, they ō, yeah.

KM: ʻAe. There's a place where they say that Pōhaku-ā is, and also a place called Kamoa.

IP: Yes. I heard that name, Kamoa.

KM: The rooster, the chicken one.

IP: Yes.

KM: Sometimes they hear the ʻō o ka moa, too.

IP: Yes, I heard of the name Kamoa, I think it's still further up.

KM: Mauka, ʻae.

IP: Yes. Oh boy, it was everybody for themselves [chuckles]. I hold the pummel and let the horse run! I don't even… [chuckles] It was really fun! Then after we pass there, then we trot down.

KM: Yes.

IP: Look at all of that.

KM: ʻAe.

IP: I think it's around this area, used to have lots.

MS: Yes. I remember back when we used to come through this area, they used to tell us about riding the horse and to hang on to the horse.

KM: Through this section here. Okay.

IP: Yes. They were nice and high you know, had plenty.

KM: Upright.

IP: I guess the erosion.

KM: Yes.

IP: It's blown down, and there's only a few more. That's what they used to say, that they call, and the horse wouldn't go, you know.

KM: Really! Amazing!

IP: Yes. The horse would stop.

KM: Wow! Mana then.

IP: You would kick your horse, get going, go! Then it would go.

KM: How amazing!

IP: We didn't believe it. But one time my dad came, he said that this horse stopped. The horse wouldn't go. He kept going [indicates spurring the horse on], and it wouldn't go. He had some food stuff and he threw it out.

KM: Oh, he left the ukana behind, then?

IP: Some of it. He took out some, just threw it out. And then he… That's why we believed it.

KM: ʻAe.

IP: But when the people were saying it, we didn't believe, it was just a story. But when my dad told us that, that's why we got really scared [chuckling].

KM: ʻAe. [chuckling]

IP: Lots of people said that so… Maybe some Hawaiians were buried around there.

KM: Could be.

IP: Could be.

KM: And you know, like how you see these pōhaku standing up like this. That's all the way across to Keahiakawelo too.

IP: Yes. Used to be lots. So, I guess as time goes, the wind, it just breaks down.

It is beautiful! We used to come on horseback, and I don't know the trail. But it didn't seem too long of a ride. Maybe in about an hour, I think.

KM: Wow! Amazing! Was it fairly straight coming mauka when you rode, or was it still narrow and curvy?

IP: [thinking] The road we had it wasn't this curvy, it was shorter.

KM: It was more straight going up?

IP: Yes.

KM: Interesting…

IP: You know when you have a trail. It was a nice trail. It was fun!

KM: Look at the wiliwili trees. Beautiful! Do you remember these?

IP: Had wiliwili.

MS: Were there more wiliwili trees over here, mama?

IP: Used to have plenty in the valley.

KM: I know, you see the naio, the big ʻaʻaliʻi, the wiliwili. Do you remember the native hibiscus, the yellow one? The maʻohauhele?

IP: Yes. I've seen that hibiscus, but I didn't know, I thought it was one, like the ones we had. Until they said it was the Hawaiian kind, the native.

MS: The wiliwili trees, were they tall?

IP: Yes, big wiliwili trees. It would grow mostly in the gulch.

KM: Yes.

IP: They were huge.

KM: So, the land, there were scattered trees. Not all like mauka, with all the brush, just those Christmas berries and everything? No more like that?

IP: No more. I think it was nicer then.

[Continue drive to makai road]

KM: Tūtū, as we're riding along here now, if we come to a place that you think of, or you remember somebody was living there or where something occurred. Try and share with us, just so that we can remember.

IP: The only place I know Kalaehī. [thinking] Yes, Kalaehī, I always thought that was a special place.

KM: Yes, yes.

IP: When we were kids because we would see the white stones, that was so… [pauses]

KM: Beautiful! So, you always felt, even as a youth, it was a special place.

IP: Yes. And it was nicer than now, it was a beautiful area.

KM: All of this kiawe here, wasn't like this when you were young?

IP: No.

KM: It was open country mostly?

IP: Yes. We could see up the mountain.

KM: Wow!

IP: And the ocean.

KM: Yes. And the ocean was closer I guess than it is now, the shoreline.

IP: Yes. Now, it looks ugly, it's all kiawe trees and all these old branches.

KM: Yes. I see the old fence line scattered still along some of here. There was a fence back there. Was the road fenced most of the way, or not? Do you remember?

IP: No, not.

KM: Didn't need. I was just thinking some of that from the cattle days.

IP: Yes. When the cattle was in, they had fence. Was nice, no more all these kiawe. Makai side was all clear, you can just see Maui all the way. This, up here, was all nice, you can see the white rocks.

KM: ʻAe. This is Kalaehī?

IP: Kalaehī, yes.

IP: Watch out, we don't get stuck. Some place in here is that Pahulu eye.

KM: ʻAe, Kamakaopahulu.

IP: Yes. It's by the point over there. You come up, a bush like this. Maybe over there we should go look.

KM: Okay. We go look then. You remember hearing the story about that.

IP: Yes. But then when we came to look, my brother, my brother showed us.

IP: I saw Sol Kaopuiki last night and he said get all kiawe under, the kiawe.

KM: We go easy, easy. Tūtū, do you recognize this?

IP: That's uhaloa.

KM: ʻAe, uhaloa.

IP: Yes.

KM: When you were young, did mama?

IP: That's a medicine.

KM: Yes. The root, you would gather?

IP: Yes.

KM: You were still using the uhaloa?

IP: Yes. We would take and scrape a little bit and then chew it.

KM: Yes.

IP: My oldest brother used to use that all the time for his cold. You know when you catch cold?

KM: ʻAe.

IP: Then you take that. We did it too, and chewed it. My brother Lloyd liked it.

IP: I was telling Sol, and he said it was maybe under the bushes. Like this one, it's hard to tell now, with the kiawe.

KM: Because everything has changed, yes?

IP: Yes. It's like the point is over here. You know at one time it wasn't covered like this; it was all open.

KM: ʻAe.

IP: [walking along Kalaehī towards shore] Was just some place right like up here.

KM: ʻAe. Kupuna, you did hear a little bit about the story about Pahulu and Kaululāʻau like that?

IP: Yes.

KM: And this puka that we're looking for, was, where his eye…?

IP: For his eye.

KM: …flew, yeah?

IP: Yes.

KM: So interesting.

IP: Yes. And my brother Lloyd knew where it was. He showed me where. Something like up to the top…

MS: I saw the puka too.

IP: Maybe that tree. Maybe that tree grew over there and covered it.

MS: Somehow as you come up the hill, it would be on the right.

IP: It would be right about here.

MS: That's how I kind of vaguely remember it being on the right. Not very far.

KM: Not too far down then?

IP/MS: No.

KM: And you see, as you look mauka to the Maunalei area and what. You can imagine, when they tell the story about how when Kaululāʻau killed Pahulu, and the rock hit him, his eye flew out, landing at Kalaehī.

IP: [chuckles]

KM: Flew out to here.

IP: To here. I think it was a puka, about that big [gestures size of hole].

KM: Sure, yes. About three, four inches in diameter.

IP: It's big and then it's like back here some place.

KM: Hmm. Pretty too, the ʻilima, you see the little ʻilima blossoms.

IP: Here's one puka [chuckles].

KM: ʻAe. But I think that's the wrong one.

IP: Wrong one.

KM: Yes. Because this one was on a flat, yeah.

IP: Yes. It was little more flat.

KM: Yes.

IP: I would like to stop and look at it.

KM: Yes.

IP: I was working in Honolulu, when I came home in the ʻ60s, I came down here, everything was changed.

KM: Yes. You know that's one of the things too, tūtū, when we were talking about this. Even just that little puka, yeah. Kamakaopahulu, it's an important place…

IP: Yes.

KM: …in the stories, in the history.

IP: Yes.

KM: What we don't want is we don't want someone to come and bulldoze. "Oh, we going clean all of this," and then they destroy it.

IP: Yes.

KM: Is that right? Should take care of it, right?

IP: Right, right! And even these kiawe when they were growing, they should have cleaned it, kept it nice. It's a beautiful shape this stone going up there.

KM: Yes. And there's a way to take care of this kiawe without ripping everything up. You spot, treat poison, because there's also some beautiful native plants in here.

IP: Yes.

IP: Is it that kind morning glory or something.

KM: Yes. The pōhuehue.

IP: Pōhuehue.

KM: And do you see the big green plant over there?

IP/MS: Yes.

KM: That's a native plant called maiapilo or puapilo.

MS: Oh, yes. I wanted to ask you about that.

KM: Yes. In the morning it has the beautiful flowers, white spider lily like. Do you remember that?

IP: No.

KM: Okay. Maybe we'll see some makai, because that plant was an important medicine. When you said, pōhuehue and the morning glory like that. They used this medicinally, the maiapilo or puapilo for broken bones and sprains. Just like the kōwali.

IP: Yes.

KM: I was curious if you remembered seeing that though.

IP: Maybe get a plant.

KM: Yes. There was another one a little further makai. I'm just going to look… The maiapilo is an endemic, a native Hawaiian relative of the caper.

IP: Oh! … The road is nice you can go drive up, easy to take care.

KM: Like you said earlier, maybe, who knows maybe we can get the high school involved. Do a little sort of a project to restore and to try and relocate Kamakaopahulu.

IP: Yes.

KM: And to keep it so that we'll never lose it.

IP/MS: Yes.

KM: Before, did have all this kiawe?

IP: When I was growing up never had nothing.

KM: Was all open?

IP: Was all open and the rocks were nice.

KM: Yes.

IP: Get nice formations.

KM: Yes.

IP: You could see the whole area as you come up this hill, and you go down the other side. All nice and white stones, very beautiful. The puka was just like on a nice place like that. Was kind of almost…

KM: On a flat level.

IP: Yes.

KM: Yes, I hope we can find Kamakaopahulu again.

IP: Maybe next time we'll have Sol, come. Maybe we can clean the place.

KM: Yes. Like we said, we should try and get the students involved some.

IP: When I came back and the road was nice, I'd come down and try to see where the Pahulu eye, but I couldn't find it. I remember my brother showed me, some place like this, a nice area. And then the little one was up there.

KM: Yes.

IP: There was a puka.

KM: Yes.

IP: And then the next time I came there was one morning glory growing out of it.

KM: Oh, really. Oh!

IP: And then the last time I saw it, when I came back to look, I couldn't find it. Oh boy!

…Then they were talking about building here. I said, "No, you better not because that's a sacred spot."

KM: Yes.

IP: "And if you do, your house will tumble." [chuckling]

[continuing drive towards Keōmoku]

KM: Speaking of taking care, what is your manaʻo about kūpuna burials. Should people go mahaʻoi or should they leave it alone?

IP: They should leave them alone.

KM: Okay.

IP: I don't think they should take them to the Bishop Museum or somewhere.

KM: That's right. Okay.

IP: They should leave them alone.

KM: Okay. When something is exposed because of pilikia, they bulldozed or maybe by natural erosion.

IP: Yes, erosion.

KM: Sometimes, even like you said, makai here. Was all pu'uone, clean sand dunes, before?

IP: Yes. And they said that they get some bones.

KM: Yes, sometimes they get. So, if it's exposed, it's important to put it back.

IP: Put back. If it's not in a safe place, I think they should rebury them someplace else.

KM: Relocate so that it will be safe.

IP: Relocate. Yes, right.

KM: The idea though, is, that it be taken care of?

IP: Yes.

KM: Okay.

IP: That's the way, I think it should be.

KM: Good, good. Yes.

KM: Tūtū, one more question about this. And e kala mai, nīele ana wau iā 'oe, but, it's important. Okay.

IP: Yes, nīele [chuckles].

KM: Before you do this work, you pule mua?

IP: I think people should.

KM: Pono e pule mua?

IP: Right, yes.

KM: You explain how come.

MS: Tūtū Lady always used to tell us kids, "Leave alone, but pule."

KM: 'Ae. Pule.

MS: She said, "That's old time, way back, pule, but you leave it alone."

KM: If it's to help to make sure that it doesn't just get messed up.

IP: Cover it, yes.

MS: Yes. It should be reburied. Where it's safe.

KM: Pule mua…

IP: Yes.

KM: …You know, when we were talking about Pahulu, and just like the idea about old sayings. Do you remember that your kūpuna, your papa and mama them perhaps, said certain fish? You've got to be careful when you eat certain parts of the fish. Like out here, because of Pahulu or anything? Like the weke?

IP: Yes. Only they said not to eat the weke, because [chuckles], you get night dreams.

KM: ʻAe, nightmare kind?

IP: Nightmares, yes. That's all I heard about the fish.

KM: ʻAe. You could eat the weke but not the poʻo. Is that right?

IP: Something like that.

KM: Okay. It was so interesting when Tūtū Apelahama Kauila.

IP: Yes.

KM: Was talking to me about that, years and years ago. The old saying was, "E Pahulu, eia kāu wahi!" Pahulu, here's your portion.

IP: Yes.

KM: Because they said, they wouldn't eat the poʻo like that. You folks didn't eat the poʻo?

IP: No. Well, I never [chuckling].

KM: You never. No need nightmare [chuckling]… They say, "Don't eat that, you going get nightmare, dreams."

KM: Yes. Interesting.

IP: I was thinking, I can eat ʻem, that's one fish, I eat it. I never get.

KM: You never went chance ʻem. [chuckles]

IP: No. [chuckling]

[Discusses fishing, changes in the environment — sand is different — and loss of near shore resources.]

IP: …My brother used to get up every morning and go out. You know where the waves break?

KM: Yes.

IP: Get reef.

KM: ʻAe.

IP: He used to go out. There's a place like a little outlet. He used to get ʻōpae, sometimes lobsters, and heʻe.

KM: Yes, and had fresh water coming out in places.

IP: Just beyond here.

MS: There's pretty clean sand somewhere over here. Remember when we went swimming with Uncle George. It was an all sandy bottom; it was clean sand.

IP: We used to walk from Keōmoku where we were living. Walked all the way up here when we were kids. Kaopuiki's used to have watermelon patches here. The family

used to get together, when it needed weeding, and pegged the watermelon vine.

KM: What would you do when you pegged it. Make the vines run?

IP: Yes. So, they grow good and not all jumbled from the wind.

KM: Yes.

IP: When they get hua they all tangled. So, we would make sticks to hold them.

KM: That must have been something. And your story about the watermelons, ‘ono.

IP: We had fun. Once, myself and my friend, Sol’s cousin. We’re going to look at watermelons about that big [gestures]

KM: About six inches in diameter.

IP: We don’t know that. We go and we look around, nobody watching. We were supposed to be weeding. We go and we see this watermelon. We take ‘em and cut ‘em open, no good. We stuck ‘em on the wood pile.

KM: ‘Auwē!

IP: So, nobody… But we got caught! [chuckling]… Back at Kalaehī, you see the water going down and the fresh water running.

KM: Yes. You know where that water comes down like that? Do you remember, is it from Maunalei?

IP: Yes, Maunalei, that’s what they said.

KM: From underground?

IP: Underground.

KM: Do you remember limu ‘ele‘ele out here?

IP: Yes.

KM: You folks would go gather limu?

IP: That’s my favorite.

KM: ‘O ia?

IP: And then down where we were staying, it liked muddy water, yeah.

KM: Yes, it has like fresh water mixed.

IP: Yes. When we were down there, living at Keōmoku, the kahawai was right by our house. The big rain comes, and all that water goes down in the ocean. After that, all the limu ‘ele‘ele comes. I used to go get, and bring home. I like that. And then, no more.

KM: Yes.

IP: No more now, no more nothing limu over here. All gone. We blame it on the plantation employees. When they came, they picked it all up, they picked everything. And they throw the rocks out instead of leave ‘um.

KM: That’s right! Tūtū that’s important, when you folks would gather limu, you would just ‘ohi?

IP: Yes.

KM: Pinch and gather, and you would leave the root system in the ocean. That's important.

IP: Yes.

KM: Otherwise if you bring the rocks up and then you clean. Pau, make!

IP: No more. No more in the ocean. I like limu ʻeleʻele.

KM: ʻAe.

IP: I haven't had it for years. No more. I used to tell Sol, "Get limu ʻeleʻele down Keōmoku?" He said, "No more, Irene. All gone!" And he told me that after big rain…

See, when it rains and then the car comes get all that muddy water. And then they come with the bull dozer and they scrape ʻem off.

KM: ʻAe, yes.

IP: And instead of just scraping they should just run over it.

KM: Yes. So, it's not all bumpy like this.

IP: They scrape, and they put it on the side right here. When you put it on the side and the water comes no more place to run out.

KM: Yes. That's right.

IP: It gets all lana [floating and spread out] , this water.

KM: Yes.

MS: Remember how the road used to be all the way.

IP: Yes.

KM: Up and down, up and down.

MS: Yes.

IP: We used to have nice sand dunes.

KM: Yes. Was it all white sand pretty much?

IP: It was kind of light grayish.

KM: Grayish. But now like this you see all lepo.

IP: It's all dirt. Before we used to jump on ʻem. We'd get up, climbing up, we used to come down, you cannot get up because it keeps coming down. Like at Keōmoku, where we used to live. Across the street, I think it was Apiki who had a little shack in the back. Right by his house there's a big sand dune. We used to climb up on the house and then jump in the sand dune. But now, you don't see any sand dunes, it's all brown. It's all dirt. And the road, like I said, never had all this kiawe, we can see all the way.

KM: Yes. Right to makai.

IP: Yes. Really sad! So much kiawe, thick.

KM: Thick.

IP: We used to have ʻalamihi… [thinking], no.

KM: ʻAlamihi and ʻaʻama.

IP: That small one. The small ones under the rocks. You throw the rocks and they come.

KM: Yes.

IP: Get lots of that.

KM: Good fun.

IP: You have to go down and catch and take them home.

KM: ‘Ae.

IP: And have them for lunch. Fun!

KM: ‘Ai maka, just eat raw? Little pa‘akai?

IP: Yes.

KM: Did you folks have inamona when you were young? Did you use kukui?

IP: Yes, my mother had.

KM: I wonder where it came from. If she brought it over from Lāhaina or…?

IP: From Lāhaina.

KM: There were some old kukui on the island, but far away.

IP: Up Maunalei. Get plenty kukui in the valley.

KM: That’s right.

IP: Get plenty kukui up there. We have now by our church.

KM: Yes. How about lauhala down here? Did you folks weave at all? Did mama weave or anything?

IP: Yes! That was one of our chores. Like Sol and Lei, we used to get together when the leaves were ready to harvest.

KM: ʻAe.

IP: We used to go pick them and put them in big bundles and stack them up.

KM: Yes.

IP: When the tūtū's or mama wanted to work, they have the lauhala ready. We would have to help them take the thorns out [chuckles].

KM: Yes. So where was the lauhala growing?

IP: Down at the Gay's place.

KM: Oh. At the Gay's place. Okay.

IP: Yes.

KM: Was it a couple of big trees or something?

IP: Yes. They had, I think there were three trees, good lauhala. But then the fire, they had the fire when the house burned down. The trees all got burned too.

[Arrive in area of Keōmoku Village.]

IP: Right, this lot [indicating just southwest of where we were standing], and between, there's a big kahawai [stream bed]. Used to be a big kahawai. I would say from here to there, the width [about 25 feet]. When like in December, a big storm comes rushing down. One time the water came, and [gestures] about that much more it would have come in our house.

KM: One more inch only. Amazing!

IP: It would have come in the house.

KM: So, between this house, the old Gay's house and your house, had a kahawai?

IP: Yes.

KM: How about on the side of the school. Was there another kahawai?

IP: No.

KM: No kahawai, that side. Okay.

IP: No, just that big one. The church never got flooded. All these years that we were living here I never, never seen any flood. When I came back from Honolulu, I came down, the place was all… I asked Sol what happened, he said they had diverted the kahawai.

KM: Yes.

IP: It went that way, so it flooded all by the church and never came down here.

KM: Tūtū, the kahawai, the weather, everything was different.

IP: Yes.

KM: They diverted it. On the makai side, if we have the school house, was there any one living on the other side of the school house?

IP: No.

KM: No more house.

IP: The school was the last one.

KM: It was school house, teacher's cottage?

IP: Yes.

KM: The windmill was in front?

IP: [thinking] It was next to the Gay's property.

KM: Okay. Next to this property?

IP: Yes.

KM: Then it was the Gay property, and kahawai?

IP: Yes.

KM: Your house, which was a company house.

IP: It's a company house, yes. [chuckling]

KM: On the Lōpā side was there someone living?

IP: Yes. [thinking] There were about eight homes, I think.

KM: Oh. Further going down?

IP: Yes. Going right down.

KM: That comes over to the place to where the stone oven is too. Right?

IP: Yes.

KM: Was there just the one stone oven that you remember?

IP: Just one that I know of.

KM: Do you remember who was living around the stone oven when you were a child?

IP: There was… [thinking] the Kahaleanus.

KM: Kahaleanu.

IP: I think they were the last, Kahaleanu. And then there was Maggie, Elaine's mother, I think.

KM: Keoni Nakihei mā?

IP: Nakihei, I think. And…

KM: Where was Nishimura?

IP: Nishimura was same, next to there.

KM: Do you remember Moke Kane?

IP: Yes.

KM: Were they over there too?

IP: Moke Kane, isn't that with Akuila? Kane is Akuila's father?

KM: Oh, I see.

IP: Akuila used to live up here, just next to the church.

KM: On the same side of the church or makai?

IP: The same side.

KM: Which side. Were they this side or the other side?

IP: This side.

KM: This side of the church. The Gay house side of the church.

IP: This side, Gay house, then our house. And across like I was saying, our watermelon patch was across here.

KM: Across the road.

IP: We had a watermelon patch.

KM: In between here and the church.

IP: Apiki, Tūtū Mahoe's father I think was Apiki.

KM: ʻAe.

IP: He had that little shack with the sand dune next to him.

KM: Oh. It was on the mauka side of the alahele.

IP: Mauka side. And then the Akuila house and the church.

KM: I see. Okay.

IP: And then across and further down [towards Waiaʻōpae] was the Gay church.

KM: That's right, Lāna'i Hale.

IP: Yes. Nice church.

KM: On the makai side?

IP: Makai side.

KM: Makai side of the road. Past where the stone oven and everything.

IP: Yes.

KM: So, you said on the mauka side of the alahele. From your house, watermelon patch?

IP: Yes.

KM: Tūtū Apiki.

IP: Yes.

KM: Moke Kane.

IP: Yes.

KM: The church?

IP: Church.

KM: Okay. Good, good. I'm going to bring you a map. We're going to try and make a map.

IP: Had one windmill up there too.

KM: Oh. There was a windmill there too. And all of these windmills, your papa had been brought over… That was his job, he had them built up. Right?

IP: Yes.

KM: He designed or whatever.

IP: Yes.

KM: How many windmills were there? Do you remember?

IP: [thinking] I don't know.

KM: Do you remember naming?

IP: I know only this one over here and I don't know the name other than just, windmill. [chuckles] This one and that one up there.

KM: But there were more down, right?

IP: There were more. I don't know if he built all of them. But I know he did this one here and up there.

KM: Now papa, was actually working for Charles Gay, right?

IP: I don't know. The company, I think.

KM: Oh.

IP: I think the company.

KM: Okay. You think Lanai Company? If I recall what Aunty Venus them was saying, your papa originally, and I think the mills were put in with the Gays. They were still here. Papa came… When did you hānau?

IP: In 1917.

KM: In '17, and papa was here already working. The Gays came in 1902. I don't think papa came before 1902.

IP: No, I don't think so. That I don't know, but Venus should know.

KM: Some, yes.

IP: Get from her cause she knows all. I remember when we were… Over there had the Japanese Nishimura and had another Japanese named Murata, I think.

[Murata as called by the Hawaiians was actually Tamura – who originally came to work on the Maunalei Sugar Company plantation, as did the elder Nishimura]

IP: He was the "Honey Man."

KM: Yes.

IP: And then Helen Onuma. You talk to Helen, that's the dad.

KM: That's right… So, the hala trees were also in this lot here?

IP: Yes. They had hala trees over here. And this property went down to the beach area.

KM: Now of course, the ocean is couple hundred feet beyond.

IP: Yes.

KM: It's amazing! We walked through here you go; you go and go and go. Where the boats are, was the shore before.

IP: Yes.

KM: The boats were pulled up on the shore.

IP: That's why I said that, "Mikioi" used to be on the sand dunes all covered when I saw it. We used to run on it. Get 'em out and jump off, play master, run and jump off.

KM: That must have been a good fun game, master.

IP: Oh, yes! And we had to come over here and gather lauhala. I think it was about four bushes, they were good ones.

Now, the kahawai was right… No more even sign of it.

KM: Here it is right here then. I guess…

IP: This is the kahawai.

KM: This is the kahawai?

IP: Okay.

KM: Yes. This would be the kahawai.

IP: Right here.

KM: Okay.

IP: This is the Gays right here.

KM: Yes. The Gays and then the kahawai.

IP: The kahawai, then we would be about here, our house.

KM: The watermelon were just mauka here then?

IP: Yes. Across the road and up.

KM: Tūtū, you were saying that you folks would make sticks across like that?

IP: Yes. Where the vines grow.

KM: Where the vines grow, and you would cross?

IP: And then you put your cross sticks.

KM: An X to keep the vine?

IP: From tangling.

KM: Tangling around.

IP: The wind blows it and the hua gets all knocked off if the wind blew it. We would go and peg them all and it doesn't… We had a fence over there at the kahawai, and we had a fence over there, on the mauka side of the road, I think. We had big watermelons!

KM: Hmm. So, you folks left makai here about '28?

IP: I think about '28.

KM: Sometime after that is when Daniel Kaopuiki mā moved into this house?

IP: Yes. They stayed down later. We moved up and they stayed down.

KM: Okay.

KM: And was it from here that you would go visit Tūtū mā, Keli'ihananui them?

IP: Yes. When we go to Naha trail side, yeah. We go to see tūtū, now and then, my mother had to go up to check on tūtū, to see how they're doing or take some food. I'd go with

her; I'd ride in the back of her horse. On the way we'd go by Naha, if the ocean was mālia and the tide low, kai maloʻo. Then she would go with the horse in the water. She would spot heʻe.

KM: ʻAe.

IP: She has a little spear with her, and she would poke ʻem. With the gunny sack bag, she carries, she puts it down in the water, put the heʻe in there and the heʻe would loosen from the spear.

KM: Amazing!

IP: And me I'm like scared. I'm sitting in the back of her and I'm scared because of the big heʻe!

KM: Amazing!

IP: And all that going around her. She puts the bag down in the water and the spear in it and the heʻe loosens up.

KM: Right from the horse?

IP: Yes.

KM: Amazing!

IP: Just on the horse.

KM: You ride out go on the āpapa.

IP: Yes. She just keeps on going till maybe she get two or three, enough for her to take, and then we go up.

KM: This is you folks riding horse from Naha side going, the trail goes mauka?

IP: They have the trail up here, going up.

KM: ʻAe.

IP: And we'd go up. I cannot figure out where we came out when we got up there. Because we didn't go all the way on Lānaʻi Hale.

KM: No. I'll show you on the old map that I left for you. You'll see… You folks would ride that trail.

IP: Yes.

KM: Come out part of the way of the mountain by Waiakeakua.

IP: We'd come up, and then we'd come down into Tūtū's place.

KM: Cut down into Pālāwai.

IP: Pālāwai, yes. Every time we'd go to do that.

KM: This is Kāheʻa.

IP: Yes.

KM: So, you folks would be going to check on Tūtū. What Tūtū was this?

IP: Keliʻihananui.

[looking at Register Map No. 1393]

KM: So, this shows you the route that you took. Even on this 1878 map. You see one more time. This is what I was mentioning to you. See all the coconut trees here.

MS: Yes.

KM: Here's Lōpā, Wahapuʻu, Halepalaoa, Waiaʻōpae. A little series of fish ponds. And they say here at Kahemanō there's a heiau. See all the clusters of houses here. So, when you were talking about where your grandmother them. Too, when you mentioned down this side, you wonder. There's one, two, three, four, five, six, at least six houses on this map in 1878, when they surveyed this. And the big coconut grove, and then here's the lone coconut tree.

So Waia'ōpae, the heiau, and one of the other windmills that your father built and then later on Daniel Kaopuiki was taking care of when they were down, because you folks had moved mauka.

IP: Yes.

KM: Then the heiau over there.

MS: That was the heiau for sacrifice?

IP: Yes. That's down below.

KM: Kāheʻa.

IP: They said, it was spooky. [chuckling]

MS: Which rock is it that tūtū's name is on, was that by the heiau also?

IP: Yes. I that's the one down there.

MS: It's flat on one side, it's facing this way on, mauka of the road and it says Cockett. I have a picture of it.

IP: These tamarind trees are really tall. It's so quiet. Nice to be here, nobody bothers you, you just enjoy.

KM: So that must have been some experience riding with your mama while she's going, heʻe fishing and just going up.

IP: Yes.

KM: She would take the heʻe up to your tūtū them?

IP: To tūtū them, yes.

KM: How wonderful!

IP: Yes. That was something.

MS: She said where Lāna'i City was, it was plains, grass.

KM: Yes.

MS: It was just rolling hills, I would imagine like in the central part of America I guess, the plains.

IP: There's where Elaine folks are [Lōpā].

KM: That's Elaine mā, Aunty Elaine them, okay.

MS: And my tūtū had this old shotgun. She used to go hunt for birds.

KM: Really!

MS: She was quite a woman. Horseback and with her gun.

IP: Yes. And she'd go with the shotgun and we used to go look doves. The kids go ahead, and we see plenty in one place. She would come, bang and all the doves fall.

KM: Amazing!

IP: Sometimes, we need to get something different for dinner.

KM: Yes. How did your mama prepare the doves?

IP: [chuckling] Doves were small. She would just clean them up and roasts 'um over charcoal.

KM: Roast 'em over charcoal, just like how they would make kōlea before.

IP: Yes.

KM: Did you ever eat kōlea?

IP: No, I never did.

IP: We had to get plenty doves. There's five of us in the family so we got to get at least two each. [chuckling] We would look and go where get lots of doves nesting and we take 'em. She said, "Get only enough for us to eat. Take that, and that's enough."

KM: I think that was the way they were with everything.

IP/MS: Yes.

KM: Just take what you needed, yeah?

IP/MS: Yes.

KM: And leave the rest for another day.

IP: And then we used to go hukilau.

KM: Where?

IP: Down Keōmoku side.

KM: So, you folks would go hukilau?

IP: Yes. We were kids, we had the Kahaleanu family, or whoever is down that side, we'd go out.

KM: Really!

IP: They would go and put the big net inside. We'd go and shoo.

KM: Paipai?

IP: Yes. We had fun, that was one day for us. The kids jumping up and down, and then we'd come out. They would leave it for little while and they would go and pull it in.

KM: 'Ae. And you huki?

IP: They pull 'em in and come up the shore and all the fish in the net, and we kids…

KM: What kinds of fish, do you remember?

IP: Yes. They used to get sometimes mullet. I don't know red fish. I don't remember the names.

KM: Yes.

IP: Some big ones like that [gestures size].

KM: The kind eight-inch, ten-inch kind.

IP: Yes.

KM: Tūtū, you folks would go hukilau at Keōmoku? The different ʻohana would all come together?

IP: Yes.

KM: Do you remember, was there someone that was sort of the supervisor, the overseer of the fishery. Who would call them, "We go hukilau."

IP: No. Just the kids, just go get the kids, and then the parents come down. If they want or not, the kids come, and we all go. Then we divide and the kids take the fish.

KM: Yes. They māhele the fish like that and share?

IP: Yes. We always…they were always sharing the fish.

MS: So, the kids, they understood at that time that you were helping out to gather food?

IP: Yes.

KM: How interesting.

IP: And then you get the honu.

KM: ʻAe. The honu?

IP: Yes. We used to have plenty honu, you know.

KM: You lawaiʻa honu? ʻOno?

IP: The men would get ʻem. They bring them home and then they [thinking] kālua.

KM: Kālua the honu.

IP: Kālua the honu. They kālua and when they take, they clean ʻum, salt ʻum, and dry it. There was all kinds, manini, mullet, pāpio. All kinds of fish.

KM: Amazing, yeah?

IP: Yes.

KM: And like you said, even the ʻōpae, paʻakai, and everything you needed.

IP: Yes. That's why, if the boat couldn't go to Maui to get food, we always had the crabs, and what.

KM: Yes. Did you folks eat sweet potatoes down here too, Keōmoku, or mostly poi?

IP: [thinking] Mostly poi, I think. We got poi from Maui.

KM: Yes. And so interesting like you were saying, mauka, that on Friday's papa would ring the bell, and everybody would come get their poi and what.

IP: I remember those days, the bell would ring, and everybody would come in with their bowls and what. And they mix the poi, they get one scoop like that [gestures, throwing the poi into the smaller containers], plop in the bowl! [chuckling] You would hold your bowl there, and the man would chuck it in. Three scoops and you're pau.

KM: Too good, yeah.

MS: It really amazed me how well Gay family treated their workers. When Joe Kahaleanu passed away, his funeral was at our church. And we received a letter from… I forget who that man was, a representative of the Gay family. And he came and represented the Gay family during the funeral. He went back and wrote a letter, how the Gays were appreciative how the funeral service was conducted. And they felt obligated, because he was the last one to help the family. And they wanted to make sure that he had a nice funeral.

IP: Yes…

[Nearing Naha] …Gee, I don't remember this kahawai.

MS: There were plenty. Okay, we're getting to the end.

KM: It's too bad this kiawe has gone so wild.

IP: Yes, especially here.

MS: That was the wrong plant to be planted here in Hawai'i.

KM: Yes… Did you folks used to pick up kiawe seeds when you were a child?

IP: Yes.

KM: What did you do with the kiawe beans?

IP: They sent 'um to Maui, Lāhaina, I think. I keep thinking, "How much did our parents get for that?" For a bag? Because we used to pick a lot.

MS: I remember seeing bags and bags piled in the store room at Kahalepalaoa .

KM: The store room down here?

MS: Yes.

IP: And we used to eat them too.

KM: Sweet, yeah?

IP: Yes. And there's some from the trees, when they fall, you open, them, it's just like honey. So, we used to pick that up. And when we were kids, we would make a fire outside, get a can and cook the beans, and we would sit and eat them.

[At Naha end of road]

IP: Oh, it looks different.

MS: It really does. Is that part of the fishpond?

KM: Yes, that's one of the fishpond walls.

[head back towards Kahalepalaoa – talking about the old church]

IP: That's Kahalepalaoa.

MS: And the walls of that church were really thick.

KM: Did you see the one at Kihamāniania?

MS: Yes, it was similar to that.

KM: That's all the same period that they were building those stone meeting houses, school house-church. They were multi-purpose.

IP: That was before my time.

KM: Oh yes. Let's keep our eyes open for the trail mauka.

MS: Yes.

IP: I missed all the good old ones.

KM: But you have so much wonderful history to share…

MS: I know the trail is close to here, but not on the very end. On the map, it seems like it comes down to Naha.

IP: Yes, that's where my mother would come, and go on the trail.

KM: ʻAe, go mauka.

IP: Yes. But when we go to Maui, and I'm looking, I say, "How did we get to tūtū's place? We never went on all this pali and that."

MS: From her picture, she had broad shoulders, big. And the palaoa necklace…

[stop near intersection of beach road and ʻAwehi trail]

MS: The water trough is right up here, yeah. We came down with Keola and we were looking at the water trough, with all the rocks.

IP: Yes.

MS: And they said that tūtū's place was right over here.

IP: We can't find the paper, but we own the place.

MS: I think it was her tūtū's, tūtū.

MS: Look they shoved all this rubble over here, so they've covered the wall.

KM: Yes. That's why there's pilikia. When we were talking yesterday, and with the kūpuna group, we have to tell them not just keep coming and widening the road, right?

IP/MS: Yes.

KM: Because when they widen, there are things that they are going to destroy. So, we need to set up a system so that there is monitoring. Otherwise, we are going to lose these places, like the heiau at Kāheʻa, because it's right on the edge of the road now.

MS: Yes. And see, we lost this already too. The rocks were right where the road comes, right in here. You could see the stone wall and the white lime rock.

KM: So right makai of the ʻAwehi Trail.

MS: Is this lime stone?

KM: Yes, part of the coral. It was probably part of the wall. And the trough you were talking about, it is how far up?

MS: Right here. We can go take a look.

KM: Okay. [walk over to the water trough, photo KPAS-3197.]

KM: Oh, I see it, beautiful. And there's still water inside.

MS: Yes.

KM: Was there a windmill here?

IP: I don't know.

KM: Nice though, and the pipi could walk in to drink water.

MS: Yes.

KM: And they lined the whole thing with stone.

MS: Look at how nice that stone is.

KM: Yes. When you look at the way they set this stone, there was a lot of pride in their work.

MS: Yes.

KM: So in regards to caring for a site like this, and older sites, might it be an idea to try and clear away some of the kiawe to try and protect it?

MS: That was going to be my question, how can we kind of preserve locations like this? That would be a very good outing for the Hui. Bring the families and everybody, so they can come and help, and that way they learn.

KM: Yes, kōkua. And that way, they get attached back to the places.

MS: That would be really nice.

[continue drive towards Keōmoku]

KM: Maybe this old water trough was from your papa's time?

IP: Yes.

KM: Mahalo, thank you for stopping there.

MS: Yes…

KM: …So Joe Kahaleanu mā owned this ʻāina, then they sold to Club Lānaʻi?

MS: No. They sold it to someone else.

KM: Starr, right? Was it Starr?

MS: I think so.

KM: Yes. The guy named Starr.

IP: I think so, yes.

KM: And then the Kahalepalaoa Landing was?

IP: The landing was down there. It's just below there…

MS: The wharf is just around here right?

IP: Further over. Get to Annabelle's place and a little further. Not too far away from where Annabelle's place is.

KM: Tūtū, the pier still standing when you were young?

IP: Yes. We used to go and play over there.

KM: Yes.

IP: We'd go up and swim over there too.

KM: Was it a cement pier or wood, do you remember or?

IP: I think it was wood.

KM: Yes.

IP: I think it was wood with a little cover up.

KM: Had a cover at the end or all the way along?

IP Yes. A little distance and where the boats dock.

KM: Now we're at Ohumukini's place.

IP: Yes. Around here, I think.

IP: Over here got lauhala trees too.

KM: Yes. Did you folks gather this lauhala too? The family down here did or?

IP: The family did, I think.

KM: Ohumukini, you said.

IP: Ohumukini…

[approaching Kāheʻa]

IP: Over here is where that rock is. I think the old windmill used to be, right over here some place.

KM: Okay!

IP: I think that's where get Tūtū Man's name.

MS: On an area where there's a large rock, high like six or seven feet or…

IP: It's in the back, go slow, it's some place around here. It wasn't so far away from Annabelle's place.

KM: Oh. And look at all these big milo trees in here. Nice.

IP: Yes. It was in here some place, that rock with the name on it.

KM: Had Cockett?

IP: Yes.

KM: Okay. Just a little bit Keōmoku side of Annabelle, Ohumukini's place too.

IP: Yes. That rock was there…

KM: How interesting. Wow it's amazing!

IP: Tall coconut tree.

KM: Yes. Oh, this is it here, this is Kāheʻa.

IP: This is Kāhe'a.

KM: And there's petroglyphs on there too… [starts to drizzle – we head back to city]

Solomon Kaopuiki & Sam “Uncle Koa” Shin
Lānaʻi Culture & Heritage Center Oral History Program
Drive over the Southeastern slopes of Lānaʻi Hale and along the Windward Coast of Lānaʻi
July 19, 2006 – with Kepā Maly (KM)

On a drive through Pālāwai Basin, to the Naha Trail Overlook, up Lānaʻi Hale, down ʻAwehi Road, and along the old Keōmoku Beach Road back to Lānaʻi City, Kūpuna Solomon T. Kaopuiki and Sam Koanui Shin (Uncle Koa) shared some of their recollections from earlier years on Lānaʻi. Excerpts from the interview share glimpses into changes on the watershed and coastal region of Lānaʻi. Interestingly, both uncles discuss the use of fencing to control grazing animals and point out historic locations of some of the fence lines.

Background on Kupuna Solomon Kaopuiki (SK) is found in the earlier interview cited above. Kupuna Sam Koanui Shin (SS) was born on March 8, 1925 at Kōʻele. His mother was a Hawaiian and his father a Korean. His father worked for George Munro at the Kōʻele ranch headquarters. Kupuna’s Hawaiian name was given to him by an Aunt Piʻikula Apiki, who was married to a Hawaiian man named Koanui Piʻimoku, who worked as a cowboy for the ranch. Uncle Koa went on to become a cowboy himself and worked for the ranch until it closed in 1951, when he transferred to the Dole plantation as a truck driver. As a cowboy, Uncle traveled across Lānaʻi driving cattle in the paddocks that encircled the mountain lands. A part of their regular duties were driving cattle up from the windward pasture of Maunalei and the Keōmoku region – passing either via the old Naha Trail and Waiakeakua, or along the road up from Maunalei to Kōʻele. Along the way he heard stories of place, saw various features, and also fished and raised his own family from the land.

Driving along Waiakeakua Flats towards the Naha overlook intersection with Munro Trail.

SK: You remember Sammy. You remember that flowers on the side, what you call that? Koʻoloaʻula [*Abutilon menziesii*]. Before we had all the different, Hawaiian name for the plants. Today I no see nothing.

SS: You know the one I really looking for?

KM: Had plenty before, not so much now.

SS: By the rubbish pile down there, used to get plenty. But they not growing.

KM: I see pūkiawe [*Styphelia* sp.] scattered around in here.

SK: Yes, right.

KM: And then Munro brought in that mānuka [*Leptospermum scoparium*] and that Australian tea that looks a little bit like it, but this is...

SK: That's right. And they survived but the others…

SS: Stay close to the road?

SK: You know, we call that Australian, New Zealand something.

KM: Tea. New Zealand tea, right?

SK: Yes, we call it that. That thing was just loaded on the side. Wow, today I don't see 'em boy.

KM: More high, a little higher. Although there was one, uncle, when you took us to Waiakeakua, to the pump, I saw one on the side of the fence.

SK: Right there, yes.

KM: Interesting, because the native pūkiawe looks a little bit like that too.

SK: Right, yes. Then when I studied the mānuka, when I tell the guys that's mānuka, "Nah, no more that kind Hawaiian name plant." But that's not the Hawaiian name.

KM: No, that's New Zealand.

SK: New Zealand.

KM: You know when you folks came up here when you were young driving pipi. Was more open not covered with the eucalyptus and stuff like this or?

SS: No.

KM: Was open?

SS: Trees were smaller.

KM: I know like the guava.

SK: Yes. The guava was not like this.

SS: This guava not supposed to be here that time.

KM: No.

SS: I don't know who went start it, but I knew was going be wild.

KM: Really sad… [continue driving]

We going turn down Awehi now. Was this the old trail you folks used except it's been cleaned up or was it a different one?

SS: This was man-made they started it. I don't know what year they made the road. Before only horse trail.

KM: Was the horse trail before or was it elsewhere?

SS: No more alanui that time, was Naha Trail.

SK: This one, never had, but the Lanaʻi Hale one, had…

KM: From Lānaʻi Hale road. Look at the guava thick now?

SK: Thick look, plenty.

SS: This one you wait, five years more, more worse.

KM: I know. Well, uncles, may I ask you a question? Do you remember Pat Conant who was here in the 80s?

SK: Yes, right.

KM: He e-mailed me yesterday. This guy works with forestry things like this.

SK: Yes, I know, the bugga was terrific.

KM: He e-mailed me yesterday because the clidemia that's come up here now, they call it Coster's curse, clidemia, it's a terrible invasive species. The federal people and the state went through a whole testing process and there's a moth that only eats clidemia that they've introduced on the other islands already. He e-mailed me yesterday to say, because clidemia is on L ʻi now, he was wondering if they should try and make an arrangement to bring that little moth over here to come and kill the clidemia. Otherwise the clidemia, you know it grows so thick, no native plants will seed underneath it.

SK: It's not going to knock out our nāʻū [*Gardenia brighamii*]?

KM: No. He said it is very host specific.

SK: I see, okay.

KM: That's what they were wondering. And maybe because it's getting a foothold on Lānaʻi Hale now, if they should work on that.

SK: But we don't know how it looks like. Where?

KM: I'll show you, it's more wet area. If you folks like, we can come, next time we go holo over the mountain.

SK: Okay.

KM: Today we're going to go makai.

SK: Right. We come with axe and the kind, kill ʻum.

KM: You know it's so thick! We can pull up little bit, but you know, that's why they said and because it's just getting it's foothold on Lānaʻi now they said this was the perfect time for this biological control.

SK: Shoot ʻum with…

KM: I know, spray like that?

SK: Yes.

KM: But you see, then if it carries over in the breeze to your native, no good then.

SS: Then you got to learn how, if there's little seedlings on top there, you got to pick ʻem up and burn ʻem.

KM: Yes.

SK: We got to catch ʻem before it starts.

SS: Because if you just going leave it like that and there we go again, adding more.

KM: Hihia. Like you said, hihia, all thick, piled up again.

SK: Son of a gun. [driving down upper ʻAwehi Trail]

SS: This road still good.

KM: A little bit down here there's an interesting stone formation. I wanted to ask your manaʻo, if you recognize this, just a little further down. You folks would walk the pipi up here?

SS: Yes.

KM: Amazing!

SS: But the other side though. You know where the gate?

KM: Yes.

SS: The gate that side.

KM: That you puka through?

SS: Up there.

KM: Okay.

SS: But that gate is only for… Actually, the other road, you know the one stay coming up?

KM: Yes, Naha.

SS: For go down, on the left.

KM: Yes.

SK: That's a lower platform that's why easy, over here, wow!

KM: Yes, steep…

SK: Sammy, you never come down here long time, hey, look nice yes? Son of a gun… otherwise…

SS: Me, I walk inside this kind place, I get lot of curiosity…

KM: ʻAe… This is going to be a little bit of a long ride. I figured good when we get down towards Puʻu Nēnē, is that right, Puʻu Nēnē side like that. Beautiful!

SK: Yes.

KM: The big gulch on this side, the big valley. What is that?

SK: [thinking] Waiaʻōpae.

KM: Ahh. Hauola is where? Further?

SK: Way past Keōmoku, about three miles.

KM: Towards Maunalei?

SK: Maunalei. Hauola, you think hey, Hauola, get something ola you know.

KM: Dew of life because of the water, the moisture of the dew.

SK: And that place used to get water, the well was over there. My father made the well. I climbed on the windmill, gee, when I look the windmill pump, wow.

SS: Gee many years we've been using the windmill to pump water up to the cattle.

SK: Yes.

KM: How many windmills were there along the coast from say?

SK: From Maunalei?

KM: Yes.

SK: Get one down by the beach, that bugga was knocked down, pau. And Hauola, Keōmoku by Kāheʻa, Kahalepalaoa.

SS: And the last one is Naha.

SK: Naha.

KM: Naha. Now you know at the bottom of this road has that beautiful watering hole where they made the stone and everything, the pathway down. Beautiful, yes?

SK: Right.

KM: Did that have a windmill there or no, it was natural?

SK: It was natural.

KM: Natural.

SK: They had one down by Naha right by the fence.

KM: Yes.

SK: Yes. [thinking]

KM: You can still see the trough. There's a trough out there, yes.

SS: But no more that water hole stuff, the one they used to dig.

SK: Yes.

SS: That was a good idea, brackish water so not too bad.

KM: Yes.

SS: I know clean up, I did twice, cleaning up that place. Everybody, all the community, whoever like go. But before because the pipi, they cleaned up and took some years before that thing was covered.

KM: Come nahelehele. That's right, because the pipi and stuff kept things down.

SK: Yes.

KM: Then you removed them from the land.

SK: Ulu.

KM: ʻAe, everything ulu.

SS: That lantana bush was the biggest trouble maker on the island.

KM: Ahh.

SK: Yes.

KM: See that's the idea like with this plant they call clidemia or Coster's curse. They brought in a little moth to kill of some of the growth of the…

SK: Oh, okay, now it begins to register.

KM: …the lantana, yes, the same kind of idea.

SK: Right, okay, I read about it.

KM: The same idea.

SK: And they thought that that would help that by bringing in that.

KM: Yes. And in fact, some, it's not as wild you know.

SK: Right. Okay, okay, now I know. You know they gave it a good study; they were looking if it will affect…

KM: Anything?

SK: Yes.

KM: Look at how beautiful this valley is.

SS: I went walk inside there. That over there too, come down, cross over go this place.

KM: Wow!

SK: What's that kahawai name Sammy?

SS: This one?

SK: Yes.

SS: Gee, I don't know, I got to look the map.

SK: That's the one by… ʻAwehi.

SS: That's the one goes down? Right to Mock Chew's place.

KM: That's right, this comes just out, not far from Lōpā…

[pulling car over on road, refolding map]

KM: Here's Puʻu Nēnē, and Kīkoa… It comes out, and Puʻu Nēnē is on the side of the gulch, right?

SK: Yes.

KM: There's Lōpā, and this big hill is Mauna-o-ʻUmi, the puʻu.

SK: Mauna-o-ʻUmi.

KM: Upper Kalama, then Mauna-o-ʻUmi is the one right below here?

SK: Right, right.

KM: Okay. That's Mauna-o-ʻUmi. Here's Wailoa, Lōpā is right up here.

SK: Yes.

KM: Now you see, Mauna-o-ʻUmi. That's the puʻu down here?

SK: Yes, right.

KM: And this is already to the other side. Waiakeakua, here's Kalama coming down.

SK: Yes.

KM: It comes to ʻAwehi Gulch.

SK: Oh, okay.

SS: Right.

KM: Yes. It's ʻAwehi gulch.

SK: Okay. Pololoi, yes.

KM: This is Awehi gulch, kahawai. [continuing drive towards coast]

KM: If we look makai now, that puʻu, that's Mauna-o-ʻUmi.

SK: Mauna-o-ʻUmi, yes.

KM: The puʻu. And has some interesting stones on the makai side of it.

SK: Yes, right, I saw that. One day this guy was way down there…

SS: Past the puʻu then?

KM: ʻAe.

SK: You see by that trees on that side?

KM: Yes.

SK: This guy came hunt and I was down, and I was walking out, and I saw this guy coming down. What happened was he went down in the middle of the gulch and go rest, he lie down. Hey, when I came up, I saw him down there, I shot one deer and I was carrying ʻem across. I figure I better go look; hey he stay in the sun. He lying down, the bugga was out cold. I go on top I wait and then Johnny Maile came, I tell him, hey the guy, the Japanese guy, you gotta carry the bugga out.

KM: Auwē!

SK: He get canvas, we made the kind…

KM: Stretcher kind?

SK: Yes, stretcher. We made the kind, me and him carry the bugga out.

KM: Oh, you're kidding!

SK: After we carry him out, his boys was coming. Put him in the hospital. High diabetes…

[pointing toward west] …Sammy you look on top there by Puʻu Nānā, you see where the washout, never used to be like that, eh?

SS: Where?

SK: On the flat there, way up by the trees, the bare spot.

SS: Had that already.

SK: Had before?

SS: Yes, had… Over that high hill that's where Puʻu Nēnē stay, across?

KM: ʻAe… There's a fence post right there.

SK: Hiki nō.

KM: …I get a little bit of the fence post inside there.

SK: That's right. Before can see all around.

KM: Could see it all.

SK: Yes.

KM: There's the fence post.

SS: You know up Kahalepalaoa, that fence line those guys made, goes up Puʻu Nēnē flat.

SK: Hmm.

SS: You remember that one?

SK: Yes.

SS: That used to run eight or ten feet. The deer he just jump, right over.

KM: Really!

SS: Like nothing.

KM: Amazing!… This ʻAwehi Road, they made this way after the war?

SK: Yes, way after [1950s]. When they made the road, instead of taking an engineer, they take an old-timer. When I saw where he want the thing. I tell them how the hell, the cost factor of these rocks. They don't think of cost factor; all they think about is… You can find other means of avoiding these kinds of things.

KM: This is the worse area of this road.

SS: That's a bad area over here.

KM: We're doing pretty good.

See right here. We should stop right here; this is that well or the water hole.

SS: Yes, I think over here used to be a water hole.

KM: Yes. It's a big beautiful hole here. Nice rock work. [walking around]

SS: That's the one.

KM: …Yes, this is the one. [walking around] You know you look at how beautiful the workmanship on this is.

SS: Good job.

KM: Yes.

SS: I think not too long ago, somebody came and cleaned.

KM: A couple months ago had some bad kiawe inside. We pulled and threw it out over there.

SS: Alright.

KM: Is there a name for this water hole or did they just call it ʻAwehi?

SS: I called this one ʻAwehi water hole. ʻAwehi because it's close to the name.

KM: ʻAe.

SS: Never did get name for this. I asked about, "What's the Hawaiian name for this?" Nobody know.

KM: When you were young this was used already?

SS: That was I think after the war [World War I]. Somebody came down here, when they started to make the windmills. I don't know somehow; they went dig one down Naha too. I forget where…

KM: I know some of the windmills went in early.

SS: Early.

KM: The 19-teens like that, old man Robert Cockett, came from… Uncle Sol, this water hole we're just looking at, beautiful. You see how, looks like a kiawe log.

SS: Kiawe log, yes.

KM: They used that to block the stone. Is this paved so the pipi wouldn't get all muddy and slip inside?

SS: Right. We had calves fall inside but they can come out.

KM: Yes, not to deep.

SS: I think five feet, I think was.

KM: This is quite a beautiful workmanship they put on this?

SK: Right. Those guys did a dam good job.

KM: This is cowboys? The cowboys?

SK: Cowboys put ʻem in line.

KM: Had a water hole here probably before? This must have been brackish water?

SK: Yes. Brackish water, right.

SS: I hear stories about that. Had water here that's why they dug here.

SK: But you see the brackish water that these guys dug down there, the first foot and a half is good water, drinkable.

KM: ‘Ae.

SK: But if you continuously and continuously use, the salt going rise. Keomoku one, we didn’t even use that water till palahē.

SK: Yes.

SS: Get pa‘akai but we make tea and coffee, like that, it’s alright.

KM: May I ask you guys, if you think, would it be, since it’s such a beautiful thing and like you said the kiawe and up on the top side, so it’s like they lock the stones in. The kiawe block on the bottom, the kiawe block on the top, so the stone no come loose.

SK: Right.

SK: Some stone went move.

KM: Yes, but you can see…

SK: They put that thing to prevent supposing a big rain or the ocean water come out, it will be able to stand against all that.

KM: Would it be appropriate to, with like Hui Malama to come and clean off some of the kiawe of this little bit so it doesn’t get destroyed? Would that be a good community kind of thing? You know, to talk story?

SK: It’s been going on before. This is… I think I came here three times to clean.

KM: Down here?

SK: Yes. We can do it but, because there’s no cattle. I don’t know whether it’s worth it, you know what I mean. But to make it as a display of what was here, I say, yes.

KM: Yes. That’s a nice thing.

SS: This is a nice thing, and the Naha one too.

KM: You know and like the water is all green now. If the kiawe over-story wasn’t all falling, that’s why all the nitrogen and everything is green.

SK: If we can get one pump. We can just pump ‘um out. Then the water come out.

KM: Yes.

SS: Before was nice when the cattle used to use it.

KM: Yes.

SK: Every time we come, I look, wow.

SS: You don’t see this kind.

SK: And the cattle they go inside too.

KM: Yes, I don’t know.

SK: Those kinds of things we got to think about. Some of these things, the Hui Mālama group got to come, take care.

KM: Yes.

SK: Then somebody know that we’re taking care of it.

SK: I heard the old man [D.H. Murdock], somebody was saying that he wanted to clean this place, but I don’t know. Now with the road bad as it is, he’s not coming down. He

wants to go back and come from using the regular road to come Keōmoku. But according to the office guys, he likes down here, it's not too windy and the trees you could cut and establish something.

SS: But Sol, I think he's looking for a place where he can build a beautiful harbor.

SK: I think so too you know. Actually, I think that's what it is.

SS: That's where the fishermen go and camp.

KM: Inside around here. When you folks were young, was there any one living out this side?

SS/SK: No.

KM: Nobody. But you know has old house sites and things along the way?

SK: Right.

KM: Before, long ago, before, kūpuna lived here.

SK: Yes.

SS: Long ago, yes.

SK: My parents relatives were here way back. Great-great grandparents.

KM: Yes.

SK: You look at this place all level.

KM: Yes. But you know the big thing for Lāna'i is water.

SK/SS: 'Ae.

SK: That's the thing see.

KM: You don't want to suck too much out because they take too much out of the inside.

SK: Right.

KM: By and by everything will go…

SK: They got to grow up like us, know how to survive on the brackish water.

KM: The wai kai.

SK: Yes.

SS: I wonder if nature got something to do. I would say down by the ocean; I don't know how water can be way down there, but I see get lot of fresh water along the shore.

KM: Yes.

SS: They might seep into the ground and come up to our side. [chuckling]

SK: You know if you go down to Maunalei and down by Shipwreck when it's low tide, you can see all this water oozing out.

KM: Yes. [driving toward Naha from 'Awehi Trail]

SK: You come down here by Naha I see…

SS: Naha get?

SK: I seen that couple of places, the bugga coming out and pretty strong. Stronger than

what I see the other places. But then those guys, you know, Sammy before they went up there, they made one well, but the thing…they no pump over there already. And you know that water the one that's usually by the pier side, Mānele, and come out.

SS: Yes.

SK: That's from the mountain.

KM: Yes, the fresh water at Mānele.

SS: Mānele, yes.

SK: Probably…

SS: Now I think only small amount coming out of there.

SK: Probably that whatever is in there, probably that's the one that's going down to the ocean.

KM: Yes. So, when they take more out, the shoreline is less?

SK: Yes. We going get drought.

KM: Yes…

KM: There's the trough.

SS/SK: Yes.

KM: Was there a windmill at this trough?

SS: They had one.

SK: They had one.

SS: They had one over here, otherwise no more the trough.

SK: Was some place, not too far away.

KM: So, this is Naha.

SK: Naha.

KM: Had a fish pond out here?

SK: Yes, right.

KM: Kupuna, some of this shoreline must have eroded away?

SK: Yes.

KM: The trail went along the shore and then cut mauka…

SK: Right.

KM: Not far from this gulch by Naha, right?

SK: Right, yes.

KM: And this gulch I think the name is Pōhakuloa on the old map.

SK: Right.

KM: And you said that some of your kūpuna kanu [buried] at this place too?

SK: Right.

KM: That's very important to preserve, to protect, right?

SK: Right. You can see it right away.

[walking along shore towards Naha Trail – makai section]

KM: This looks like something of a trail running along the shoreline here, maybe we should see a cut-up?

SK: This goes to the other side.

KM: Other side, yes. But the main trail cut mauka?

SK: Yes.

KM: And it's paved?

SK: Over here get some place, maybe that one comes around. I go look, long time I never go.

KM: Okay. Shall I follow you or shall I walk around a little bit?

SK: You see if anything goes up that way.

KM: Okay.

SK: There's kind of a big stone on top and the other one makes a marker.

KM: ʻAe. Maʻaneʻi, right here kūpuna, it starts right down here [indicating the set stone from paved trail].

SK: I don't know who put these stones here.

KM: This is the ancient trail of your kūpuna?

SK: Yes, right.

KM: When they would go between Naha up to Pālāwai like that.

SK: Yes, they go up to Pālāwai and even over to Kōʻele.

KM: ʻAe.

SK: Nice day.

KM: Beautiful, we've been blessed.

SK: Nice day. When you look the stones, you think, "how the hell they when lay ʻum."

KM: Beautiful!

SK: You see I never come up this side for a long time. That's why I am interested in seeing most of the stuff up on this side. Nobody ever scouted this area. All we did is come here go up meet somebody and catch a ride, go.

KM: And was it your Tūtū Lahapa or someone told you that has the ilina?

SK: Yes. Right beyond that point.

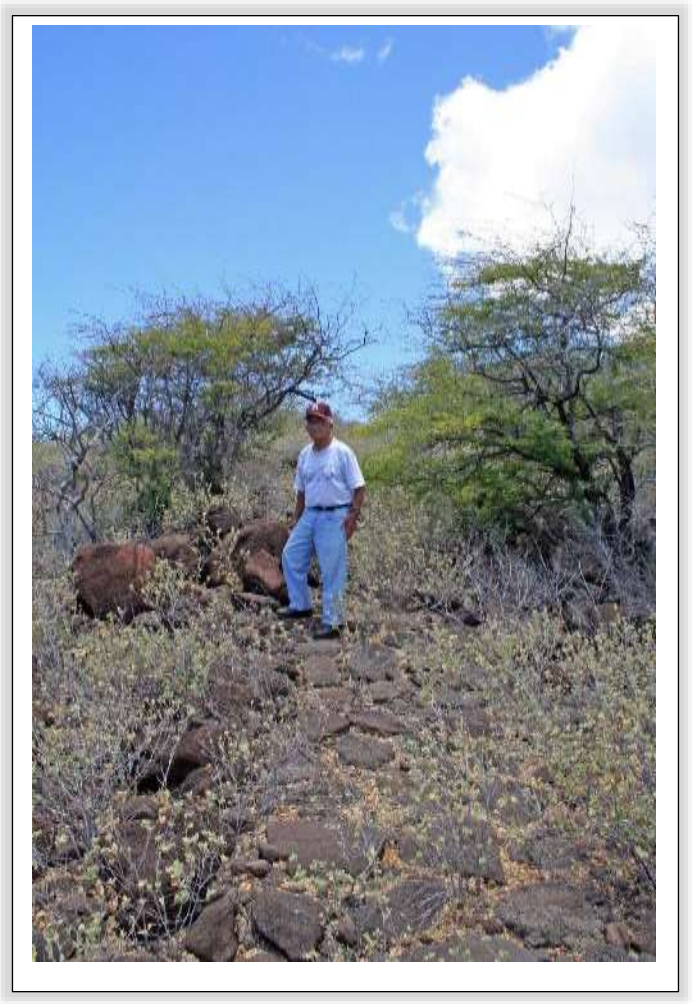
KM: ʻAe.

SK: But you no see but if you look on top, you can see just like some area. I never did go so I… One time I would like to come here and walk this area and at the same time go the other side.

KM: ʻAe.

SK: For us maybe we missed something behind here because if they did something over here, so down this area I'm sure there may be others.

KM: Yes, just like…



SK: Just like one wall.

KM: Yes. It is beautiful you know… [walking back to truck and begin drive towards Keōmoku]

SK: …Before you no see deer tracks like this. Where everybody walk, now… You know it's too bad that nobody in the early days, nobody knows anything, and all that stuff is lost.

KM: Nalowale.

SK: We coming in between.

KM: Yes, that's right. But at least you know…

SK: We capture what we can, and we match them with the original story.

KM: Yes.

SK: That's good enough to know that there's some connection.

KM: Yes.

SK: The boys that used to come with me was Japanese boys, they bring all the kind to cut. Those guys worked hard but they like know the history too…