E ʻIKE HOU IĀ LĀNAʻI 2020

To know Lānaʻi once again

A Place-Based Cultural Literacy Program

I ka lōkahi ko kākou ola ai

Our wellbeing is in unity

Lānaʻi Culture and Heritage Center

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Aloha kākou!

E ʻIke Hou iā Lānaʻi Place-based Cultural Literacy Program began in 2012, and through generous support of many community partners, it has run every summer since then. Through the years, our participants have been a part of many firsts--the first mele aloha for Lānaʻi composed by students, the first archeological map of Hiʻi created since 1921, the first pōhaku to be stacked at Waiaʻōpae in hundreds of years, and now, the first virtual version of our program. We celebrate all of these firsts with the knowledge that our work is in honor of Lānaʻi ancestors who set the foundation for us to thrive.

The resilience of Lānaʻi people has been evident many times in our history. Native Hawaiians cared for this ʻāina for centuries, ensuring a prosperous future for generations to come. Plantation immigrants worked the land with the hope of creating better lives for their families. With the rise of tourism and an influx of visitors to our quiet island in the 1990s, Lānaʻi people remained steadfast to maintaining a close-knit community in which we can depend on one another.

This year has presented unprecedented challenges not just on our island, but globally. The COVID-19 pandemic along with movements for social justice have impacted all facets of life here and everywhere in the world. Through all of these changes, we have also witnessed the power of solidarity and courage.

The past few months have, in many ways, forced a time of deep reflection upon us. To reflect, we hope, is to learn from both the mistakes and successes of the past. And from this reflection, perhaps we may build a better future for our children and theirs. This idea has always been at the heart of ʻE Ike Hou iā Lānaʻi--to know Lānaʻi once again. We believe that to know Lānaʻi, we must endeavor to understand the depth of its living history. We must use the past to inform our future actions. We must learn the stories that endure through our ʻāina and its people. We hope you will join us on this journey, E ʻIke Hou iā Lānaʻi 2020!

Me ka haʻahaʻa,

Caitlin Kaopuiki
Jana Kaopuiki
Shelly Kaleialoha Preza
Ikaika Ramones

Acknowledgements

We would like to mahalo everyone who made this program possible. Even though we could not gather together this year, we appreciate your commitment to ensuring a bright future for our ʻāina aloha and our keiki.

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Background

Our E ʻIke Hou program is focused on place-based education--learning on location at different storied sites on Lānaʻi. With our virtual program, we invite students to hear the stories and knowledge we would have shared at these places had we all been together. In order to maintain some of the "feel" of our original program, we have carefully designed "modules" for each significant site we visit. Working our way mauka to makai (mountain to the sea), we begin in the uplands of Hiʻi, move to the kula (plains) lands of Keahiakawelo/Kānepuʻu, down to the valley of Maunalei, and finally end at the ancient loko iʻa (fishpond) of Waiaʻōpae.

How to Use:

Each module has these main components:

- Main Module Video
- Mo‘olelo Video
- Video Response Worksheet
- Reading
- Reading Response Worksheet
- Activity
- Optional ‘Ōlelo Hawai‘i Activity

Since we are opening the program beyond middle and high school, we have designated specific “levels” for readings and worksheets. The three levels are meant to act as suggestions for age-level comprehension, but if students feel they are equipped for more challenging work, they may level up.

- Level 1 - Lower Elementary (requires parent/adult guidance)
- Level 2 - Upper Elementary/Middle School
- Level 3 - High School

The levels are color-coded within each section. Every participant watches the same videos, and Levels 2 and 3 complete the video response worksheet. From there, each of the readings and reading response worksheets are specific to the three levels. They include bolded words that indicate key concepts and important terms to expand their vocabularies. Each activity is the same for all levels except for the Hi‘i module, where more information is provided.

At the end of every module is an optional ‘Ōlelo Hawai‘i section from the *Hō‘ike Aku, Hō‘ike Mai* puke kamali‘i developed by Jonah Kahanuola Solatorio. This is a great way for families or participants to learn and practice some basic language skills.

All content is available on the Lāna‘i Culture and Heritage Center website (www.lanaichc.org). Even though we can’t all be together, we would love to see your progress throughout these modules. Please share your photos with us on social media: Facebook - tag Lāna‘i Culture & Heritage Center & Instagram: tag @lanaichc with the hashtag #eikehou2020!

Please contact Shelly at shelly@lanaichc.org with any questions.

Oli/Mele

From ancient times and still today, oli (chants) and mele (songs) continue to be a method through which we celebrate our love of land and culture. They help us to remember important wahi pana (storied places) as well as inoa kaulana (famous names) of our home.

In a typical E ʻIke Hou Iā Lānaʻi program, we would offer oli at each new site we visit to introduce ourselves to ʻāina and begin to build pilina (relationship). Oli and mele also help us to situate ourselves in a pono (righteous) mindset to ensure our work is good.

To carry on this important practice of aloha ʻāina, we share with you some of our collection of oli and mele of Lānaʻi.

HANOHANO LĀNAʻI

Lānaʻi is Distinguished

Hanohano Lānaʻi i ke kaunaʻoa,
Lānaʻi is distinguished by the kaunaʻoa

Kohu kapa ʻahuʻula, kau poʻohiwi
Which rests like a feather cape upon its shoulders

E ola Lānaʻi a Kaululāʻau,
Let there be life for Lānaʻi of Kaululāʻau,

Hea aku mākou, e ō mai ʻoe!
We call to you, now you respond!

Traditional

MAIKAʻI LĀNAʻI

Lānaʻi is Perfect

Maikaʻi Lānaʻi i ka mālie
Lānaʻi is perfect in the calm

Ka ʻāina i aloha nui ia e nā kūpuna
The land is greatly loved by the ancestors

Mai ka piko o Lānaʻi Hale
From the summit of Lānaʻi Hale

Me Haʻalelepaʻakai
And Haʻalelepaʻakai

A i ke one ʻōlinolino o Huelopoʻeo
To the glistening sands of Hulopoʻe

Kū mai o Puʻu Pehe i ka ʻehu kai
Puʻu Pehe may be seen rising above the ocean spray

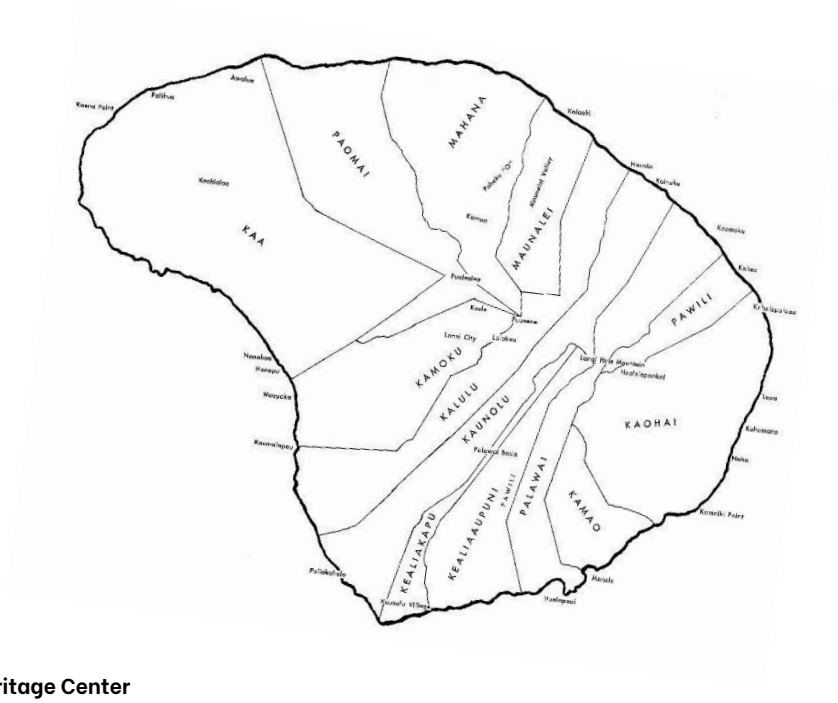
Maikaʻi Mānele i ka wai kaohi ipu	And Mānele is good for there is fresh water that may be caught in the gourd
ʻOhuʻohu Kapihaʻā i ka pua o ka maʻomaʻo	Kapihaʻā is adorned with the yellow blossoms of the maʻo
Ō mai ʻoe i kou inoa o Lānaʻi i ka malie	Answer to your name Lānaʻi there in the calm
E ola!	Let there be life!

Na Kepā Maly

The Ahupuaʻa System

Ahupuaʻa are traditional Hawaiian systems of land division on which residents lived sustainably. Varying in size and shape, ahupuaʻa generally encompassed every resource native tenants needed to live. These resources could include moisture-laden mountain regions, flat kula lands for agriculture, and abundant coastal areas. This system was extremely sustainable because it allowed for proper management of natural resources, which allowed generations of native Hawaiians to thrive.

Across the pae ʻāina, ahupuaʻa were a part of a complex and innovative system of land and resource management. On the island of Lānaʻi, there are thirteen ahupuaʻa. While ahupuaʻa on other islands typically run from the mountain down to the sea, Lānaʻi is unique because there are three ahupuaʻa that go from the ocean, over the mountain-top, to the sea at the opposite side. These ahupuaʻa are: Kalulu, Kaunolū, and Pālāwai. Pāwili also crosses the top of the mountain but does not meet the ocean on the other side. In our program this year, we will visit the ahupuaʻa of Kalulu (Hiʻi), Kaʻā (Keahiakawelo, Kānepuʻu), Maunalei, and Pālāwai (Waiaʻōpae).



Hua ʻŌlelo Hawaiʻi (Hawaiian Words)

- Lānaʻi - day of conquest or victory
- lanai - porch
- ʻōlelo - language
- moʻolelo - story, history
- mauka - uplands
- makai - towards the sea
- kahuna - native Hawaiian spiritual figure
- heiau - traditional Hawaiian spiritual place/structure
- loko iʻa - fishpond
- kalo - taro
- loʻi kalo - irrigated taro patch
- ahupuaʻa - traditional Hawaiian land division

HI‘I

Videos | Readings | Activities | ‘Ōlelo Hawai‘i

Hiʻi Videos

All: Watch the Hiʻi module video **&** the Haʻalelepaʻakai moʻolelo video at www.lanaichc.org

Levels 2 & 3: Answer the following questions

1. What does the name Hiʻi mean? Why is this area called Hiʻi?

2. How do native and invasive species affect our groundwater aquifer differently?

3. Name two of the 4 categories of plants mentioned in the video.

4. What native plant reappeared naturally after the crew came in and cleared invasives from the Hiʻi area?

Hiʻi

We all need plants to live. They **provide** us with food, clothing, **shelter**, and much more. At the bottom of Lānaʻihale, there is a place called Hiʻi that is home to many special plants.

Some of the plants were here hundreds of years ago, even before any people arrived to Hawaiʻi. We call these kinds of plants, "**natives**." We need to protect the native plants from other plants that are taking over and killing the native plants. Those plants are called "**invasive**." Invasive plants do not belong on Lānaʻi. They grow quickly and use up the water and space needed by the native plants.

provide - to give something that is needed
shelter - something that covers or protects
natives - plants that originally grew in that area
invasive - a plant that does not belong in the area and usually causes damage to the place

You can help take care of Hiʻi and places like it by weeding out invasive plants and planting and watering native plants.

Watershed

A **watershed** is an area of land that catches and collects water. A healthy forest of plants is important for our watershed. Plants help catch some of the rain water and let it soak into the ground. The rain water will pass through rocks underground which help clean the water. This is the clean water we drink. The more plants we have to catch the rain water, the better we can build up our freshwater supply. Without fresh water, nothing can live.

watershed - an area of land where all the water collects in the same place

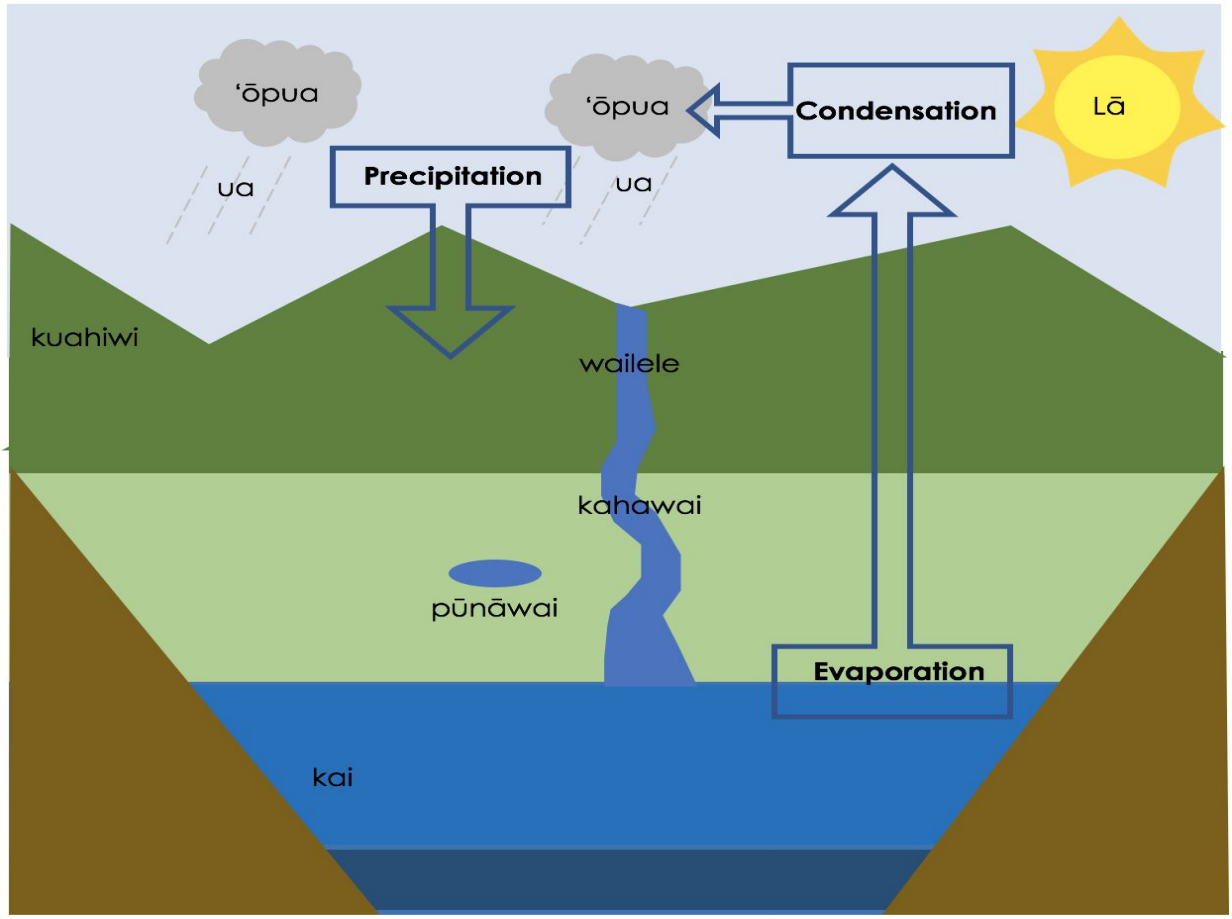
Native ʻōhiʻa lehua blossoms at Hiʻi

Water Cycle

Our fresh water supply **relies** on a healthy water cycle. This may surprise you, but the water cycle begins with the sun! The sun heats up the surface water (the ocean and streams) and invisible water **molecules** rise up into the air. This is called **evaporation**. When enough water collects in the sky, clouds are formed.

relies - trusts or depends on
molecules - the tiniest form of something
evaporation - when the sun heats up the water and water changes from liquid to gas or water vapor

This is called **condensation**. Once the clouds become too heavy to float in the air, rain water droplets fall to the ground. This is called **precipitation**.



condensation - when water vapor turns into a liquid
precipitation - water particles that fall from the sky (rain, snow, hail)

Reading Questions - Level 1

1. What do we call plants that existed in Hawaiʻi before any people arrived?

2. What is the name for an area of land that catches and collects water?

3. Explain one step in the water cycle.

4. Describe one way you use fresh water every day.

Hiʻi

Hiʻi is a special place on Lānaʻi. It is near the base of Lānaʻi Hale, near Lānaʻi City. At Hiʻi, there are many different plants growing. Plants need three things in order to grow: water, sunlight, and space. Some of the plants at Hiʻi were planted recently and some, like the ti leaf plant, were planted long ago. The ti plant was and continues to be an important plant in Hawaiian culture. Places like Hiʻi are important because we can visit and learn about how Hawaiians lived long ago. You can help take care of Hiʻi by participating in planting, watering, and weeding native plants there.

Invasive/Native

We need plants to live. Plants can be sorted into two categories: **invasive** and **native.** Invasive plants do not belong here on Lānaʻi. We have many invasive plants on Lānaʻi. Invasive plants take up space and use up water. They are usually not good for the environment.

invasive - a plant that does not belong in the area and usually causes damage to the place
native - a plant that originally grew in that area

There are some plants that are good for Lānaʻi. Native plants belong on Lānaʻi and are good for the environment. Some of these plants existed on Lanai long before humans arrived. Native plants help the environment by capturing rainwater and **moisture** in the air. Some of this moisture remains in the soil and some **percolate** deep into the ground.

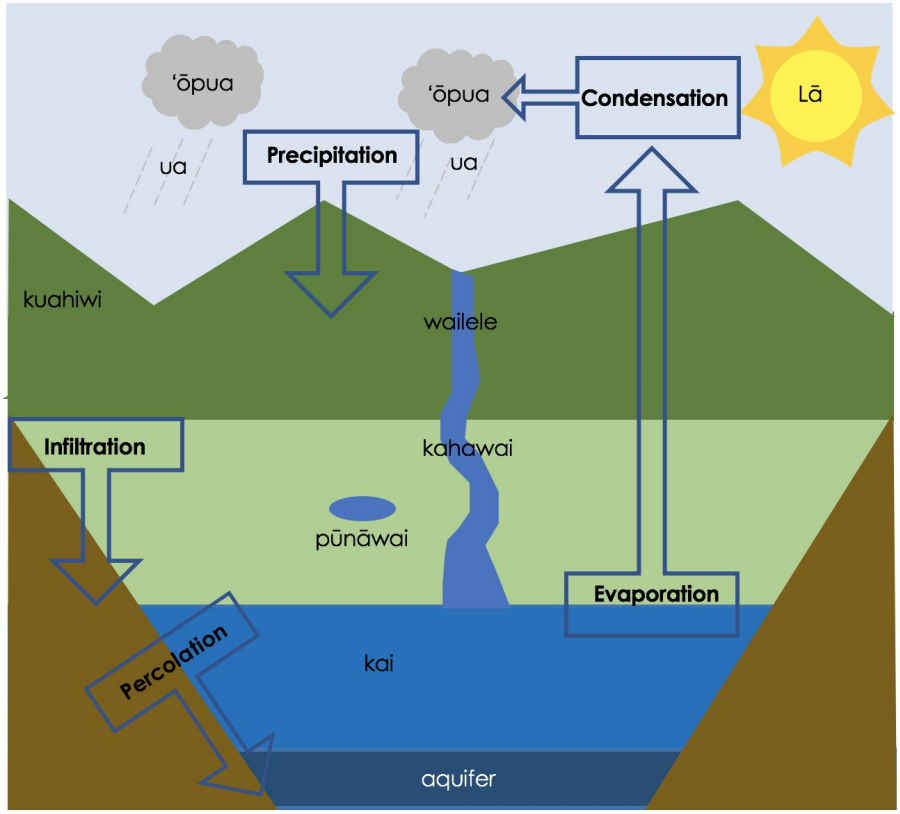
Native ʻōhiʻa lehua mamo blossoms at Hiʻi

Water Cycle

Did you ever wonder where rain comes from or where it goes after falling from the sky? The diagram on the next page explains how the water cycle works in our **watershed**. Surprisingly, the water cycle begins with the sun. Heat energy changes water in liquid form into a gas, or water **vapor**. This process is called **evaporation**. Water vapor builds in the air and become tiny liquid droplets forming clouds. This is **condensation**.

moisture - small amounts of water in the air
percolate - liquid passes through a filter
watershed - an area of land where all the water collects in the same place
vapor - a substance in the form of gas
evaporation - when the sun heats up the water and water changes from liquid to gas or water vapor
condensation - when water vapor turns into a liquid

As more droplets **condense**, the clouds become too heavy and water falls from the clouds in different forms, such as rain or snow. We know this as **precipitation.** Rain water flows down the watershed in streams. Some of the water is caught by plants and **absorbed** into the soil. This is called **infiltration**. **Percolation** then **occurs** as water passes slowly through a collection of rocks called the **aquifer**. The aquifer **filters** out dirty **particles** and what's left is clean water.



condense - to become more compact
precipitation - water particles that fall from the sky (rain, snow, hail)
absorbed - took in; soaked into
infiltration - precipitation or water soaks into the soil
percolation - the passing of liquid through a filter
occurs - happens
aquifer - a collection of underground rocks that allows water to pass through slowly
filters - removes dirt and other contamination
particles - tiny bits

Reading Questions - Level 2

1. What are some things that plants need to grow?

2. Name two categories that plants can be sorted into.

3. What is an aquifer and how does it work?

4. What does the phrase “the rain follows the forest” mean?

Ke Kuahiwi o Lānaʻi

When traveling in the upper regions, or the **wao akua**, of Lānaʻi, you may observe the lush **foliage** and note an increase in moisture that can be rare in other places on the island. Despite the appearance of a healthy landscape, Lānaʻi's mountain areas have experienced drastic changes over the past two centuries. These changes, such as the introduction of **ungulates**, have had many **deleterious** impacts to our island environment.

Looking out toward Lānaʻi City from atop Lānaʻihale

What is a Watershed?

Contrary to what it may sound like, a watershed is not an actual building or structure. According to the National Oceanic and Atmospheric Administration (NOAA), a watershed is defined as "a land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean." Watersheds exist around the world and are important for the health and **prosperity** of all people. On Lānaʻi, our watershed comprises most of the island, with Lānaʻi Hale at its **apex**. From the mountain to the sea, all parts of our island are connected, channeling rainfall from the upper forest down to the ocean.

What is an Aquifer?

Additionally, rainfall **percolates** down through the ground into our aquifer, which is an underground system that captures groundwater. If you have ever wondered where the water we use every day in our sinks, showers, and garden hoses comes from, since we don't currently have flowing streams or large lakes, here is the answer: it comes from our aquifer. Deep below the surface, the aquifer catches and holds water that takes years to **permeate** through layers of soil and rock.

The Healthy Path of Water

In the wao akua/kuahiwi regions of the island, which includes Lānaʻihale and Hiʻi, moisture collects from rainfall, mist, and fog. In a healthy, native ecosystem, the plants that capture this water include trees like koa and ʻōhiʻa lehua and smaller ground covers like uluhe and ʻukiʻuki. These native plant species utilize the water they collect and then allow it to percolate down to eventually reach the aquifer far below. In addition to this, native plants aid in naturally **mitigating** erosion by holding soil in place with healthy root systems.

Uluhe ferns and ʻōhiʻa lehua grow atop Lānaʻihale

In a healthy watershed system, some water will also feed into natural rivers and streams, which bring important nutrients from the uplands down into lower land regions and eventually into the ocean. Over thousands of years, the natural path of water erodes the landscape, creating valleys and rivers. This natural erosion occurs over long spans of time and should not be mistaken for severe erosion that is often caused by disruptions to native ecosystems.

The Watershed in Traditional Times

Prior to western contact, native forests **flourished**. Plant species found in the upper regions were **diverse**--hundreds of different types of plants contributed to creating a **robust** ecosystem. These healthy habitats meant native birds and insects thrived too. On Lānaʻi, our healthy mountain ecosystem contributed to an island landscape that allowed at least 6,000 native Hawaiians to sustain themselves for centuries. On the kula lands, agriculture flourished, with oral history records indicating that ʻuala (sweet potato), a staple for Lānaʻi residents, was known to grow as large as a 5-gallon bucket. A healthy watershed also meant that the Maunalei stream flowed **perennially**, or all year round. Because the native forest also allowed most water to percolate down to our aquifer, our island's coastal ecosystems benefited from a healthy dosage of mountain nutrients brought down by streams but did not suffer from severe runoff.

The Watershed Today

Lānaʻi has experienced many disruptions to its healthy, native landscape in recent centuries. From ranching, to pineapple, to game hunting--all of these activities were foreign to a place that had evolved without the threats these industries posed. After western contact, ranchers introduced cattle, goats, and sheep to the island, and by the mid 1800s, severe changes to the landscape were underway. As introduced ungulates ate away at the native vegetation, the land grew **arid**, with barren tracts of land and lack of water-bearing clouds passing through the mountains.

Lānaʻi pineapple fields in the 1970s
Photo courtesy of Lānaʻi Culture and Heritage Center

The introduction of pineapple farming to the island also had detrimental effects on the landscape. Vast areas of land were cleared of vegetation to make room for rows of pineapple. Cultural resources were likely lost during this time. In fact, pineapple fields reached almost all the way up to Hiʻi Heiau. If the heiau had been just a few hundred yards below, it would have been demolished by tractors clearing the area for planting.

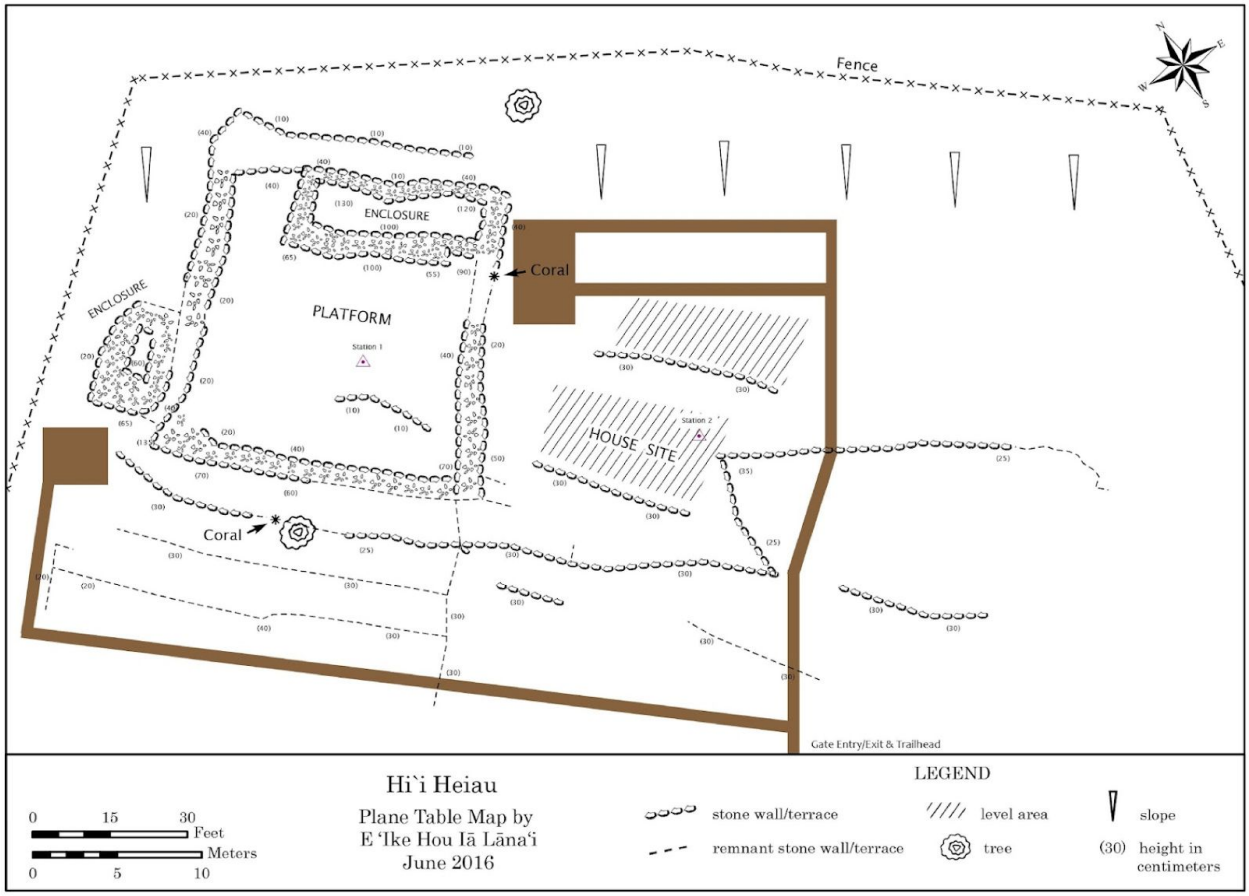
During this time, foreigners also introduced a small herd of twelve axis deer to Lānaʻi. Released onto the land, they multiplied **exponentially**, and like the introduced sheep and goats, they wreaked havoc on our landscape, munching on native plants and loosening dirt that led to serious runoff of sediment into the ocean. The loss of native vegetation also gave way for invasive plant species to take over the landscape.

Fast forward 100 years to the present day. Years of environmental degradation due to deer, mouflon, and humans have made our landscape unhealthy. While there are some native plants that have survived in our upland regions, the majority of the greenery you see surrounding Hiʻi consists of invasive plant species.

Invasive species are those that are not naturally found in a region and take over, often spreading over large areas and creating a **monoculture**. Healthy ecosystems usually require a diversity of plant species to function properly, and because invasive plants often cause the opposite, they are actually degrading the land, which ultimately **depletes** the resources we need to survive here on Lānaʻi. While native plants capture water, utilize some, and then allow it to percolate down to the aquifer, invasive plants are often greedy, using lots of water for themselves. Invasive strawberry guava, or waiawī, also create root systems that are so dense that water they don't use often is forced to runoff, bringing dangerous amounts of sediment from the mountain to the ocean. Over time, this process ends up smothering our coral reefs.

Invasive eucalyptus and manuka plants grow atop Lānaʻihale

Hiʻi Agricultural Heiau



Plane Table Map of Hiʻi Heiau

On the benchlands of Lānaʻi lies Hiʻi. When looking up towards Lānaʻi Hale from Pālāwai, the incline plateaus before resuming once again. In modern times, residents call those areas the "benches" and typically refer to the places as "first bench, second bench, third bench, and fourth bench". These are their proper names in relation to their commonly used names:

- Hiʻi (first bench)
- Waiapaʻa (second bench)
- Kaluanui (third bench)
- Waiakeakua (fourth bench)

Hiʻi means "to cradle" or "to lift," which could be a reference to the way the mist often settles on the area, carried on the benchlands. At Hiʻi, there is a structure made of dry-stacked stone, which we interpret to be a heiau for agriculture. Though the heiau likely had a specific name in traditional times, that name has unfortunately been lost through the years as the Hawaiian population declined and during the **suppression** of Hawaiian language in the early 1900s.

If you had tried to visit Hiʻi in the early 2010s, you may not have been able to locate it. Covered by dense invasive brush, the area was only cleared in 2015, when the Pūlama Lānaʻi Culture & Historic Preservation Department worked to restore health to the site, which has been ongoing. Removal of invasive strawberry guava, eucalyptus, and albizia and installation of a predator-proof fence resulted in healthier conditions for native plants to return. Now, Hiʻi is a place to learn not only about our watershed but also to view a diversity of native plants that would have once made up a healthy mauka ecosystem.

Endemic Halapēpē grows in Hiʻi.
This subspecies exists only on Lānaʻi.

Hahai ka ua i ka ulu lāʻau

The **sagacity** of Lānaʻi kūpuna (ancestors) is evident in ʻōlelo noʻeau, or wise sayings. To learn ʻōlelo noʻeau is to begin to understand the intelligence and innovation of those who came before us. The above ʻōlelo noʻeau translates to: "the rain follows the forest." Based on the reading above, what knowledge can you **glean** from this phrase?

Level 3 Reading Vocabulary

apex (n)– the tip; summit

arid (adj)– extremely dry

deleterious (adj) – harmful

depletes (v)- decreases seriously; uses up

diverse (adj)– various kinds

exponentially (adv)- rising or expanding at a steady and usually rapid rate

flourished (v)– thrived; to be at the height of excellence

foliage (n)– leaves of a plant

glean (v)- gather; learn

mitigating (v)– making less severe; lessening

monoculture (n)- only one type of crop/plant is grown in an area

percolates (v)– (of a liquid) to filter through; passes through a porous substance

perennially (adv)- year-round

permeate (v) - pass through completely

prosperity (n) – successful and thriving condition

robust (adj)– strong and healthy

sagacity (n)- great intelligence, discernment, judgment

suppression (n)- elimination; abolishment

ungulates (n) – hoofed mammals

wao akua (n)– realm or domain belonging to the akua or gods

Reading Questions - Level 3

1. In your own words, describe what a watershed is.

2. What are the positive effects of native plants on our groundwater aquifer?

3. Name an example of an introduced industry and discuss the related negative effects on Lānaʻi's natural landscape.

4. What knowledge can you glean from the phrase "the rain follows the forest?"

Hiʻi Water Percolation Activity

Hahai ka ua i ka ulu lāʻau

The rain follows the forest

PURPOSE:

Our reading taught us about native and invasive plants, the water cycle, and what a watershed is, but you might still have questions about where rain goes after it falls. This activity will help you understand how a watershed works and how runoff affects our water quality.

MATERIALS:

- 2 pieces of large chart paper
- Squeeze bottle
- Water
- 4 water-based markers (different colors)

PROCEDURES:

Part 1

1. Crumple up one large piece of paper, then smooth it back out (should still be a little crumpled)
2. Find the high points of your paper with the finger. Color along the ridges with one of your markers.
3. Use your squeeze bottle to create a rainstorm over your land.
4. Observe what happens after every misting. What happens to the color? Where does it go?
5. Look for a major "stream." Using your finger, trace the stream all the way back to where it starts at the top of the ridge.
   All of the inside, downward-sloping area is your watershed!
6. Take or draw a picture of your watershed in the box on the next page.

Part 2

1. On your second sheet of paper (uncrumpled), use your other 3 colors to draw some ways we use land on Lānaʻi. Examples: houses, farms, streets, stores, native forests, non-native forests, etc.
2. Follow Part 1 Steps #1 - 4
3. What happened in your second experiment? Where were the colors in the end?
4. Take or draw a picture of the second experiment on the next page.

*Adapted from The Ferguson Foundation's "Crumpled Paper Watershed" Activity

Experiment #1

Experiment #2

Hiʻi Water Percolation Activity

Hahai ka ua i ka ulu lāʻau

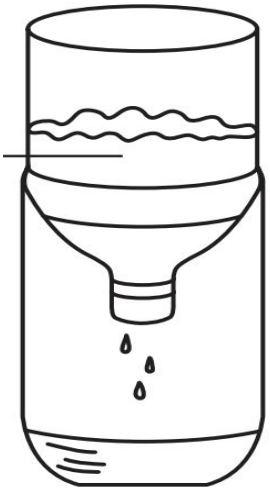
The rain follows the forest

PURPOSE:

The previous reading and ʻōlelo noʻeau above illustrate the importance of a forest to our groundwater aquifer, but does what's in the forest matter? This activity will explore the effects of forest composition on different aspects of our aquifer such as amount of water collected, speed of percolation, and purity of filtration.

MATERIALS:

- 2-liter bottle cut in half
- Coffee filters
- Dry soil samples
- Water
- Stopwatch
- Ruler
- Sharpie/Marker
- Comparison Graph (see attached)



PROCEDURES:

<u>Part 1</u>

1. Collect 1 cup of soil either from your backyard or surrounding areas.
2. Cut the empty bottle in half and remove the cap.
3. Flip the top half of the bottle so it nestles into the bottom and place a coffee filter into the resulting funnel (see picture above).
4. Add one of your soil samples into the filter and cover the sample with another filter (filter → soil → filter).
5. Start your timer at the same time you pour 1 cup of water into the funnel.
6. Keep time until most of the water has gone through the soil sample.
7. Add the data to the *Comparison Graph* activity sheet.
8. With your marker, mark the outside of the bottle at the water line.
9. Measure the height of the water from the bottom of the bottle and record in inches on the activity sheet.

<u>Part 2</u>

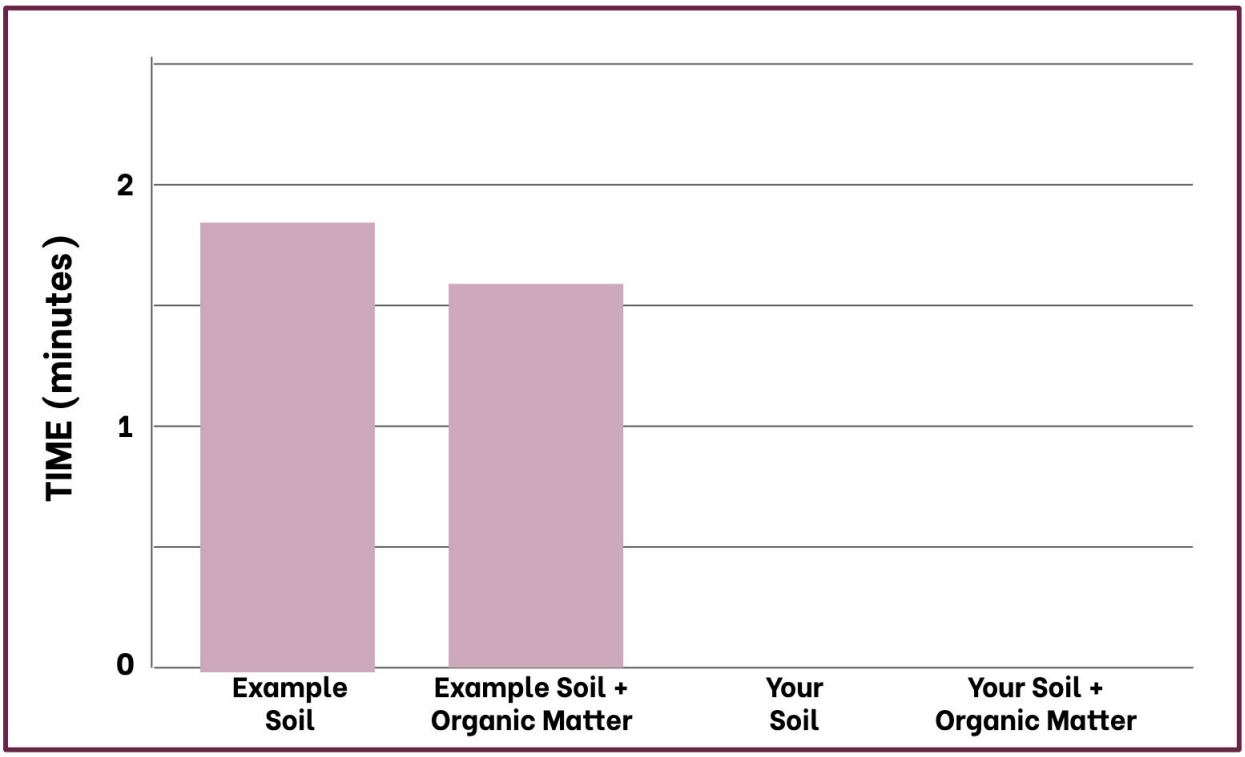
1. Add organic matter (compost) to your soil sample
2. Follow Part 1 Steps #5 - #9

<u>Part 3</u>

After you are done with your experiment, don't throw away your soil! Use the bottle as a planter for the seeds provided to you!

*Adapted from National Agriculture in the Classroom's "Soil Texture and Water Percolation" Activity

COMPARISON GRAPH



SAMPLE	AMOUNT OF WATER COLLECTED (inches)
Example Soil	1.5 inches
Example Soil + Organic Matter	1.625 inches
Your Soil	
Your Soil + Organic Matter	

HOʻOLAUNA (INTRODUCTION)

Fill in the spaces with your hoʻolauna information and then practice introducing yourself.
Then, draw a self portrait in the box below.

E hoʻolauna iā ʻoe iho

Aloha mai kākou e nā pua o Hawaiʻi!
(Greetings to all the children of Hawai'i!)

ʻO _____ koʻu inoa piha
(My full name is _____)

No _____ mai au
(I am from _____)

Noho au ma _____
(I currently live in _____)

Mahalo nui loa!
(Thank you very much!)

#EHOOPILIMAI

INOA (NAME)

Practice saying the different types of names in Hawaiian! Then, fill in your inoa in the spaces.

E ha‘i mai i kou inoa

INOA MUA	FIRST NAME	_____
INOA WAENA	MIDDLE NAME	_____
INOA HAWAI‘I	HAWAIIAN NAME	_____
INOA HOPE	LAST NAME	_____
INOA KAPAKAPA	NICKNAME	_____
INOA PIHA	FULL NAME	_____

‘O wai kou inoa Hawai‘i?

What is your Hawaiian name?

‘O _____ ko‘u inoa Hawai‘i

My name means _____

I was named by _____

#EHOOPILIMAI

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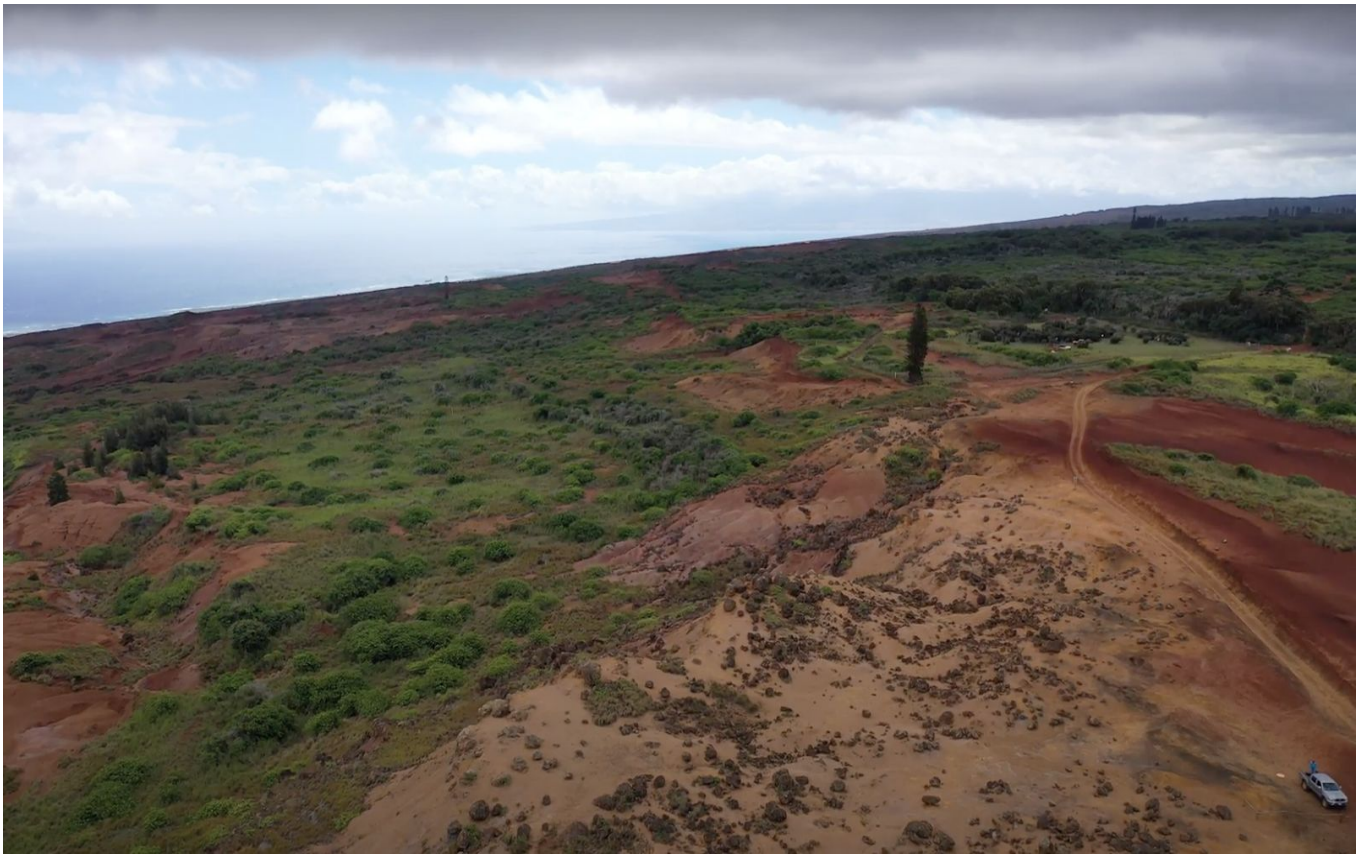
KA‘Ā



Videos | Readings | Activities | ‘Ōlelo Hawai‘i

Ka‘ā Videos

All: Watch the Ka‘ā module video **&** the Keahiakawelo/Kānepu‘u mo‘olelo videos at www.lanaichc.org

Levels 2 & 3: Answer the following questions

1. Name two differences you see between the natural landscape of Keahiakawelo and Kānepu‘u.

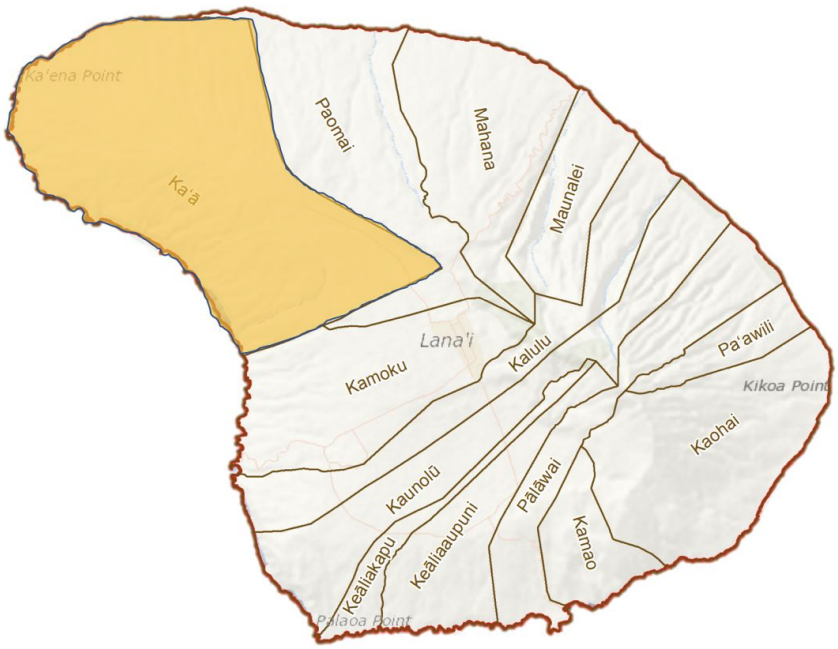
2. What is the name of the moku where Lanikaula was hiding his kūkae?

3. Name one native plant mentioned in this video.

4. What is the name of the young man in the story of Kānepu‘u?

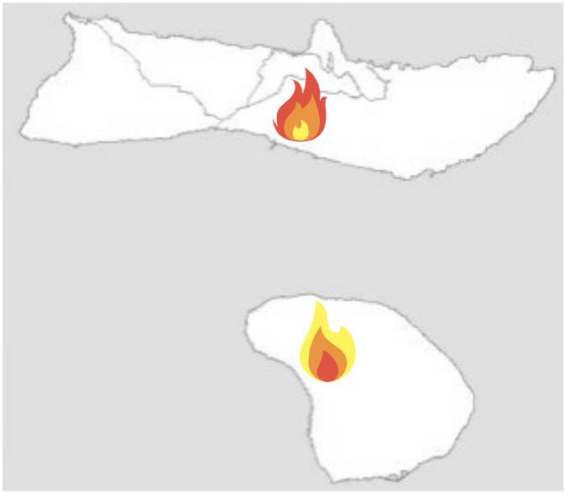
Ka‘ā

Ka‘ā is the largest of all thirteen ahupua‘a on Lāna‘i. Today, the landscape of Ka‘ā is very **barren**. Like many places on the island, deer, mouflon sheep, and goats have eaten away at the native plants that once were **abundant**. The land may look lifeless, but there are so many important stories our kūpuna have passed down about this place. When we tell these stories, we bring life to the land. These stories connect us to our ‘āina and are reminders of our kuleana to care for the land.



barren - land is too poor to produce much or any vegetation; lifeless
abundant - plentiful; having plenty of

Keahiakawelo



Keahiakawelo means “the fire of Kawelo.” Many visitors and even residents call Keahiakawelo by its common nickname, “Garden of the Gods.” This nickname may be **alluring**, but it doesn’t tell you the real story of this place. Long ago, Kawelo, the kahuna of Lāna‘i, noticed that many people on the island were starting to get sick. He realized that Lanikaula, the kahuna of Moloka‘i, was using a fire on his island to send harmful prayers to Lāna‘i. Kawelo paddled to Moloka‘i on a canoe to search for Lanikaula’s personal belongings. He found Lanikaula’s kūkae or **excrement** on Mokuho‘oniki, a small island off Moloka‘i. When he got back to Lāna‘i, Kawelo set a fire in the ahupua‘a of Ka‘ā and burned Lanikaula’s kūkae. Shortly after, Lanikaula died. Kawelo saved the people of Lāna‘i.

alluring - strongly attractive; extremely interesting
excrement - human waste; poop

Kānepu‘u

Kānepu‘u is a dryland forest. Only a small part of the original forest **remains** today. The dryland forest **ecosystem** is home to many native plants and animals who are **endangered**.

Uncle Sol Kaopuiki at his trail dedication (Kānepu'u, 2010)

Luckily for us, there are people like kupuna Solomon Kaopuiki who spent his lifetime protecting these plants. He **identified**, cared for, and protected important native plants. The Kānepu‘u Dryland Forest Trail was **dedicated** to Uncle Sol on March 27, 2010. Today, we must continue Uncle Sol’s work by taking care of these plants. How will you do your part to protect what we have here on Lāna‘i?

remains - is in the same place; is left after a part was lost
ecosystem - a community of living things in an area
endangered - almost gone completely
identified - to find out what something is; to recognize something
dedicated - given in honor

Reading Questions - Level 1

1. Which is the largest ahupua‘a of Lāna‘i?

2. What does the name Keahiakawelo mean?

3. What type of forest is Kānepu‘u?

4. Think about your family. What is your favorite thing to do together?

Keahiakawelo

Behind every name is a story. Just like how names of people are important, names of places are important. Inoa wahi, or place names, give us clues to what these places looked like and what happened here hundreds of years ago.

Keahiakawelo means “the fire of Kawelo.” Kawelo was the kahuna of Lānaʻi. He saved the island and its people from the Lanikaula, the kahuna of Molokaʻi.
After noticing that the people of Lānaʻi were falling ill, Kawelo discovered that it was Lanikaula causing the sickness. Lanikaula was using a large fire on Molokaʻi to send harmful prayers to Lānaʻi. In order to save his people, Kawelo secretly paddled to the island of Molokaʻi to find something of Lanikaula’s personal belongings. Kawelo found Lanikaula’s kūkae, or **excrement**, on Mokuhoʻoniki, a small island off of Molokaʻi. When he returned to Lānaʻi, Kawelo started a fire in Kaʻā and burned the excrement. This action sent a tall pillar of black smoke into the air. A vision of his own death came to Lanikaula right before he died. Kawelo had saved the people of Lānaʻi.

Many visitors and even residents often call Keahiakawelo by its common nickname, “Garden of the Gods.” This nickname tells us

excrement - human waste

nothing about the story of Kawelo. When we stop calling places by their traditional names, we lose the stories that go along with the names. Let’s challenge ourselves to use the true names of these places. E ola ka inoa! Let the names live on!

Kānepu‘u

Kānepu‘u means, “hill of Kāne.” Kāne is sunlight and fresh water, two things necessary for life and growth. Kānepu‘u was once a native dryland forest. However, just like most places on the island, deer, mouflon sheep, and goats destroyed the forest allowing invasive species to grow in their place.

Dryland forests are the most **endangered ecosystem** in Hawai‘i. Only two percent of the forests exist today; however, many of our native plants and animals can be found in this ecosystem. It is extremely important for us to protect these areas.

Ma‘ohauhele (endemic hibiscus) blossom saved from extinction on Lāna‘i by Uncle Sol Kaopuiki.

Kupuna Solomon Kaopuiki spent his lifetime protecting the plant species in this area. He saved several plants from **extinction**,

endangered - at risk of extinction
ecosystem - a community of interacting organisms and the environment
extinction - species no longer exists

including the Ma‘ohauhele, Lāna‘i’s native hibiscus. Other efforts such as putting up a fence to keep animals out and clearing out invasive plants were done to ensure the survival of the dryland forest.

The ahupua‘a of Ka‘ā is the largest of all thirteen ahupua‘a on Lāna‘i. The landscape of Ka‘ā has changed **tremendously** because of **deforestation** and **soil erosion**. Although the land may seem **barren**, there are many wahi pana or important places in the ahupua‘a of Ka‘ā such as: Polihua, Ka‘ena-iki, Keahiakawelo, and Kānepu‘u. We know these places are important because of the stories shared about them by our kūpuna. These stories connect us to these places and are reminders of our kuleana to care for our ‘āina.

Today, new threats such as the “cork vine” have entered the fenced-off area. This vine is spreading rapidly and killing native plants. Taking care of the land is the responsibility of every generation. It doesn’t ever end. How will you do your part to protect what we have here on Lāna‘i?

Invasive cork vine climbs through a native lama forest at Kānepu‘u

tremendously- to a very great extent
deforestation - removal of forest trees
soil erosion - the washing away of dirt by rain or wind
barren - land that is too poor to produce much or any vegetation; lifeless

Reading Questions - Level 2

1. Who were the two main characters in the story of Keahiakawelo?

2. What does the name Kānepu‘u mean?

3. What is one way kūpuna have helped protect native plants in this area?

4. Why do you think it is important for us to use the original place names of Lāna‘i? (i.e. Keahiakawelo vs. “Garden of the Gods”)

Ka‘ā

The ahupua‘a of Ka‘ā is the largest of all thirteen ahupua‘a on Lāna‘i. There are many significant places within Ka‘ā, including Polihua, Ka‘ena-iki, Keahiawelo, and Kānepu‘u. This region looks much different than it used to in traditional times. Years of deforestation and erosion have detrimentally affected the landscape. Despite this, many stories that connect us to place remain, reminders of our kuleana to care for our ‘āina.

When we speak of legacy, we might think of the impact we leave behind in our lives. How we interact with our landscape can directly affect our environment and future generations. Native Hawaiians who stewarded their land left a positive legacy on the landscape, ensuring that healthy resources would be available for generations after them. On the other hand, choices to introduce ungulates and plant species that would take over the landscape left an unhealthy environment that we must now try to **rectify**.

Traditional Place Names

Behind every name is a story. Just like how names of people are important, names of places are important too. Inoa wahi, or place names, give us clues to what these places looked like and what happened here hundreds of years ago. We honor and show respect to our Lāna‘i places by calling them their proper names. Instead of “Garden of the Gods,” which was a name introduced by a visiting foreigner, we should strive to call the area by its rightful name, Keahiawelo. Place names also help us keep stories of place alive, allowing us to pass our unique history down for future generations to learn from.

Kānepu‘u

Directly translated to “the hill of Kāne,” Kānepu‘u is a storied landscape. One mo‘olelo tells of a **famine** that swept through the island and how the deity Kānepa‘ina restored life to the land and its people. The area of Kānepu‘u lies in the upper regions of Ka‘ā and was once covered in native dryland forest. The region, however, did not escape the destruction that

deer, mouflon sheep, and goats caused across the island. Gradually, more and more dryland forest was eaten away, and invasive plant species grew in their place.

Native nā‘ū blossoms at Kānepu‘u

Lāna‘i people recognized the value of this place and in the 1980s, began the **endeavor** to protect what remained of the native forest. They introduced measures, particularly fencing, to keep ungulates out of areas with the highest concentration of native species. Due to their efforts, Kānepu‘u is home to the largest native dryland forest in Hawai‘i.

Stewardship is not a one-time undertaking. Caring for this area was the lifetime work of Lāna‘i kupuna Sol Kaopuiki, who dedicated his time to ensuring the protection of Kānepu‘u. To this day, however, new threats emerge to the native trees. In just the past decade, a new invasive plant species called “cork vine” was spotted in the **exclosure**. Within the span of a few years, the vine has spread **exponentially**, gradually covering and killing native and invasive trees alike.

Keahiakawelo

While Kānepu‘u is an example of a positive legacy people can strive to leave on the landscape in spite of introduced threats, Keahiakawelo shows the result of decades of degradation without positive intervention. Also a significant wahi pana on Lāna‘i, Keahiakawelo was much different than the **arid** landscape we know today. Keahiakawelo (commonly miscalled “Garden of the Gods”) was once covered in the same native dryland that covers the neighboring area of Kānepu‘u.

However, introduced **ungulates** ravaged the landscape, eating through the native forest, leaving bare **tracts** of dirt **susceptible** to erosion. These barren areas suffered severe erosion, with sediment washing down into the ocean through wind and rain. Over time, large boulders once buried under the ground became exposed, creating the strange landscape we see today.

Because Keahiakawelo is not fenced like other areas on Lāna‘i, like Kānepu‘u, the area is still vulnerable to the grazing of ungulates. Unfortunately, many of these invasive animals prefer native plants and do not often munch on the invasive plant species that overtake our landscape. The constant threat of grazing animals makes it extremely difficult for native plants to survive. With a fenced-off **exclosure**, hunters are able to control deer and mouflon populations within the fence, giving a better chance for native plant species to take hold. This is another contributing factor to why Keahiakawelo and Kānepu‘u look so vastly different.

Lāna‘i students work to leave Kānepu‘u better than they found it
by clearing invasive cork vine. Photo courtesy of the Lāna‘i Culture & Heritage Center

Level 3 Reading Vocabulary

arid (adj)- dry; having little to no rain

deity (n)- a god or a goddess

endeavor (n) - attempt to achieve a goal

exclosure (n)- an area from which unwanted animals are excluded

exponentially (adj)- rapidly increasing

famine (n)- extreme shortage of food

rectify (v)- fix

susceptible (adj)- prone; capable of

tracts (n)- an indefinitely large area

ungulates (n)- hoofed mammals

Reading Questions - Level 3

1. What are some contributing factors that detrimentally affected Ka‘ā ahupua‘a?

2. What is particularly special about the forest at Kānepu‘u?

3. What are some similar themes between the stories of Keahiakawelo and Kānepu‘u?

4. Why do you think it is important for us to use the original place names of Lāna‘i? (i.e. Keahiakawelo vs. “Garden of the Gods”)

Keahiakawelo & Kānepu‘u Legacy Activity

E kolo ‘ana nō ka ēwe i ka ‘iewe
Descendants of the same ancestors crawl together.
Said of those of similar lineages who seek each other out.

PURPOSE:

In thinking about both the current landscape of Keahiakawelo and the community stewardship efforts at Kānepu‘u, Ka‘ā ahupua‘a offers visible examples of how past actions influence our present realities. This activity will explore the concept of a legacy, highlight the legacies from which we benefit, and challenge you to think about what your legacy might be in the future.

PART 1: WHAT IS A LEGACY?

- Write your definition of the word legacy below (in your own words).
- In the chart, give two examples of people you feel have left important legacies and their impact (can be anyone)

Legacy is _____

_____.

Name	**How/Why** (Evidence of their legacy)	**Where** (Important places to their legacy)
Example: Kamehameha I	Unified the Hawaiian archipelago into one kingdom	Kohala, Hawai‘i Island, Ko Hawai‘i Pae ‘Aina
1.		
2.		

PART 2: LĀNA‘I’S LEGACY

- Brainstorm names of people who have had important legacies on Lāna‘i.
- List 5 specific examples of how they have positively contributed to our community
- Write a note to this person thanking them for these things on the card provided using the template below
- Return your card to the Lāna‘i Culture and Heritage Center

Dear _____,

My name is _____ and I am in the _____ grade. We’ve been talking about the importance of leaving a legacy and I wanted to thank you for your legacy for Lāna‘i. Thank you for...

Sincerely,

Your Name

PART 3: YOUR LEGACY

- Think about who you are right now. What do you like? Who is important in your life? How would you currently describe yourself?
- Now, think about yourself in the future. What do you hope to accomplish? What kind of legacy do you want to leave?
- In the box below, choose **5 words** that you would like to describe your future legacy.

‘OHANA (FAMILY)

Fill in the spaces with your ‘ohana information and then practice introducing your family.
Then, draw a picture of your family in the space below.

E ho‘olauna i kou ‘ohana

‘O _____ ka inoa o ko‘u makuakāne
(My father’s name is _____)

‘O _____ ka inoa o ko‘u makuahine
(My mother’s name is _____)

‘O _____ ka inoa o ko‘u (kaikuahine)
(My (sister’s) name is _____)

Kaikua‘ana - Older sibling of same gender

Kaikuahine - Sister of a boy

Kaikaina - Younger sibling of same gender

Kaikunāne - Brother of a girl

Note: Replace “kaikuahine” from the example with any of the sibling terms listed above

#EHOOPILIMAI

KŪPUNA (ANCESTORS)

Fill in the spaces with your kūpuna information and then practice saying your mo‘okū‘auhau.

E ho‘olauna i kou mau kūpuna

KO‘U MAKUAKĀNE (My father‘s side)

‘O _____ **ke kāne** (Paternal Grandfather‘s Name)

‘O _____ **ka wahine** (Paternal Grandmother‘s Name)

Ua noho pū lāua ma _____ (They lived in _____)

A hānau ‘ia ‘o _____, **he kāne** (Born was “Father‘s name”, a man)

KO‘U MAKUAHINE (My mother‘s side)

‘O _____ **ke kāne** (Maternal Grandfather‘s Name)

‘O _____ **ka wahine** (Maternal Grandmother‘s Name)

Ua noho pū lāua ma _____ (They lived in _____)

A hānau ‘ia ‘o _____, **he wahine** (Born was “Mother‘s name”, a woman)

KO‘U ‘OHANA (My immediate family)

‘O _____ **ke kāne** (“Father‘s Name” is the man)

‘O _____ **ka wahine** (“Mother‘s Name” is the woman)

Ua noho pū lāua ma _____ (They lived in _____)

A hānau ‘ia au, ‘o _____, **ko‘u inoa** (I was born, _____ is my name)

#EHOOPILIMAI

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MAUNALEI

Videos | Readings | Activity | ʻŌlelo Hawaiʻi

Maunalei Videos

All: Watch the Maunalei module video **&** the Hāloa moʻolelo video at www.lanaichc.org

Levels 2 & 3: Answer the following questions

1. How many Hawaiians do we estimate lived in Maunalei before?

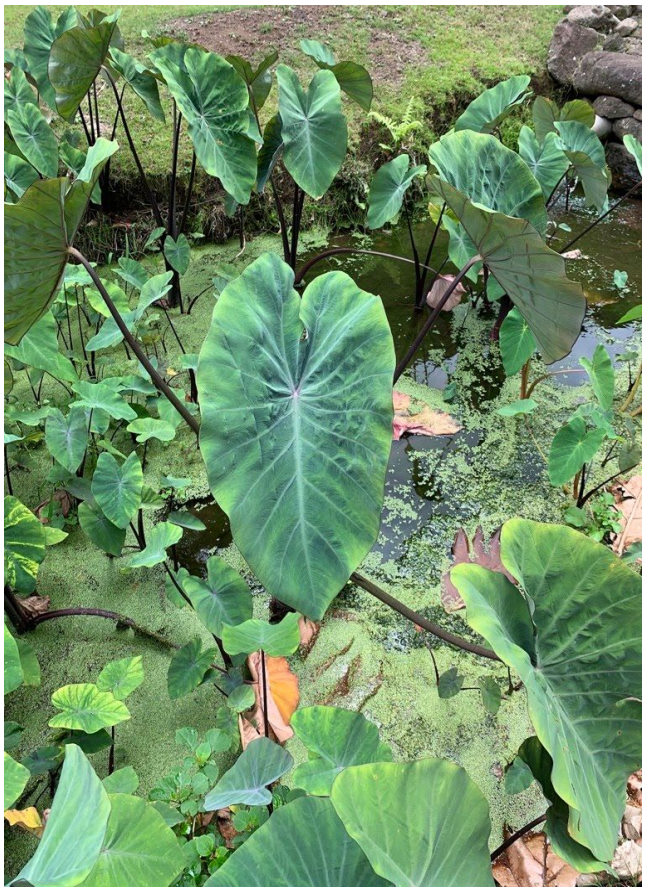
2. What invasive animal caused rock slides in Maunalei?

3. What familial relationship do we think Hawaiians had to kalo?

4. What should you do at places like Maunalei before leaving?

Maunalei

Maunalei means “Lei Mountain.” Sometimes clouds can be seen forming what looks like a lei at the top of the mountain. Maunalei is the smallest ahupuaʻa on the island. Maunalei didn’t have to be a large ahupuaʻa because people had everything they needed to live on this small piece of ʻāina. It was full of life!

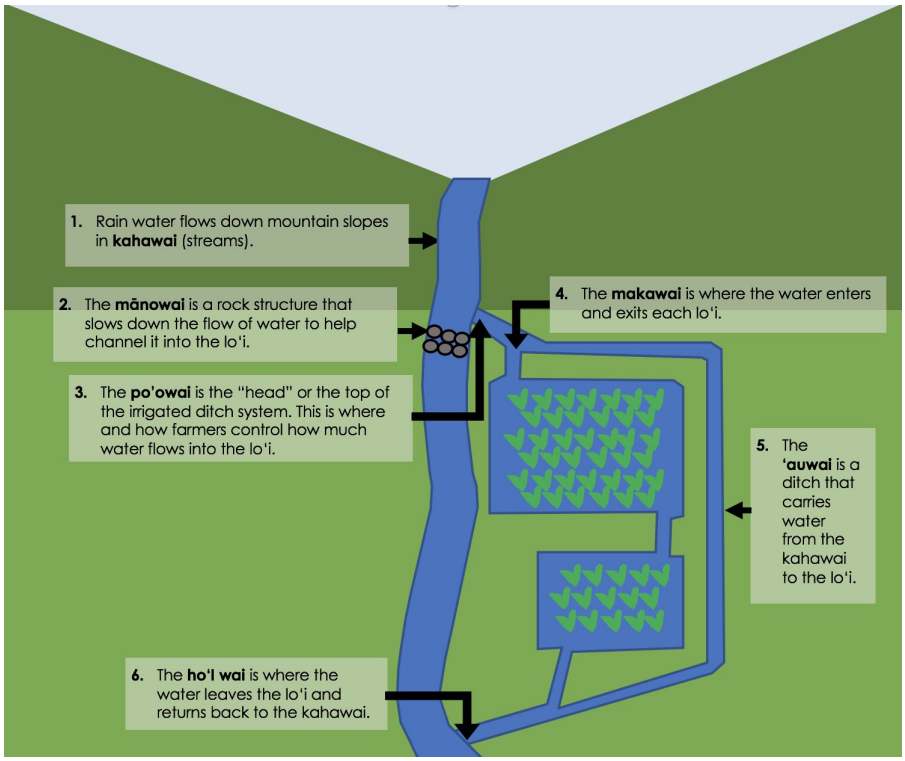


Kalo growing in loʻi at Maunalei

The life of the valley comes from Lānaʻi’s only stream that flows year-round. The Hawaiian word for fresh water is “wai.” The word “waiwai” can mean **wealth**, **abundance**, or rich. Hawaiians believed that if you had water, you were rich!

wealth - having a lot
abundance - a large amount; plenty

Loʻi Kalo



With an abundance of water, Maunalei is the only place on the island where people farmed loʻi kalo. The loʻi system allowed water from the stream to flow through the loʻi and exit back into the stream where the water would then flow down into the ocean. Farmers all had a **responsibility** to keep the water clean and not stop the flow. If anyone **disrupted** the flow of the water, it would **affect** everyone and everything in the ahupuaʻa.

responsibility - duty; something you are expected to do
disrupted - disturbed; held up
affect - to cause a change in

Maunalei Today

After goats were brought to the island, they **destroyed** the valley. They ate the native plants and climbed the sides of the valley, which caused huge rockslides. It became too dangerous to farm and live in the valley.

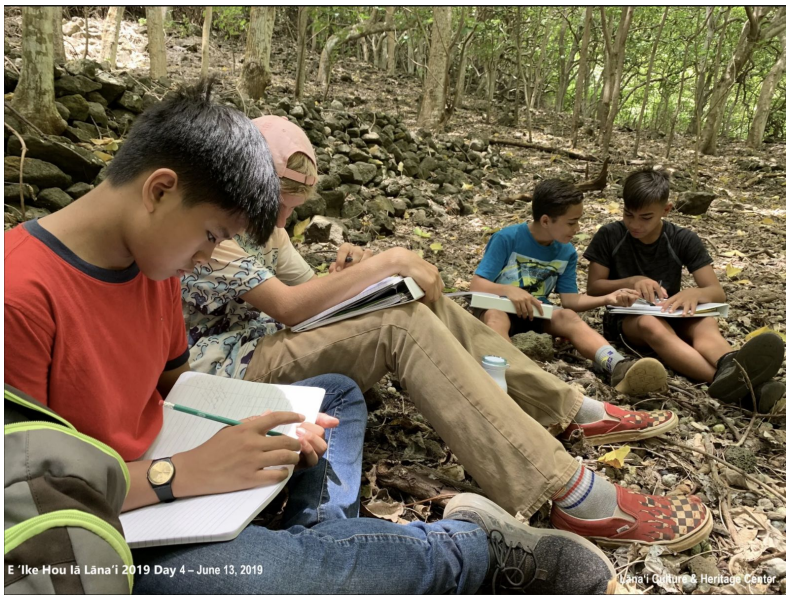
Students studying the dry, dusty road into Maunalei where there was once more water

Over two million gallons of water in Maunalei stream used to flow into the ocean every day. Today the flow is only a small **trickle** in **comparison**. Water was pumped out of the valley to be used for the ranch and plantations. The water supply was not being **replenished** because of the loss of native plants.

destroyed - put an end to; ruin
trickle - a thin, slow stream
comparison - to point out as similar
replenished - resupply; refill

Today, people are trying to bring life back to Maunalei by planting native food plants and getting rid of **invasive** plants. They are also trying to rebuild loʻi kalo.

Education is one of the biggest ways we can help our ʻāina. When school groups come to visit Maunalei, the hope is that it will **inspire** the next **generation** to take care of this place.



Students journaling under the kukui trees at Maunalei

inspire - to motivate; to encourage
generation - a group of people born around the same time

Reading Questions - Level 1

1. What does the name Maunalei mean?

2. What did Maunalei have more than any other place on Lānaʻi?

3. What happened to the water in Maunalei?

4. What does living a full life and being rich look like to you?

Maunalei

Maunalei can be translated to mean “Lei Mountain” or “Mountain Garland.” At times, clouds can be seen settling at the top of the mountain forming what looks like a lei. Another moʻolelo is that when Pele visited Lānaʻi, she stopped at Maunalei to make a lei ʻieʻie.

Maunalei is the smallest ahupuaʻa on the island. Its size **reflects** its **abundance**; because the valley was once full of **resources**, the boundaries of the ahupuaʻa were very small. You didn’t have to go far to get what you need.

Native ʻulu tree grows at Maunalei

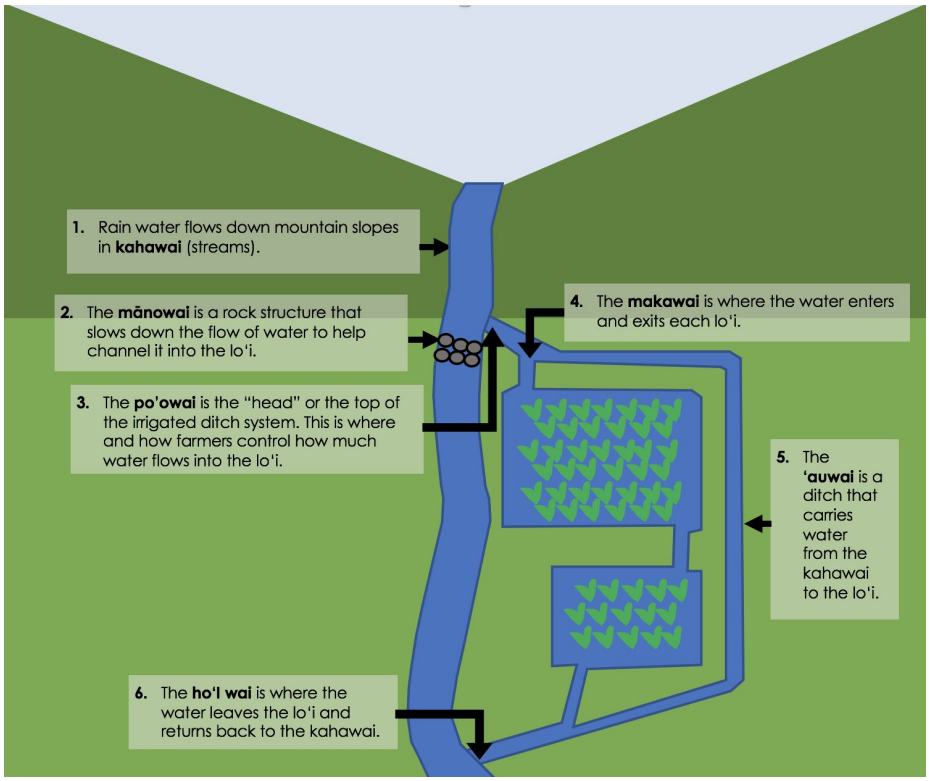
Larger ahupuaʻa have **expansive** boundaries because resources were less available in the area. The abundance of Maunalei is **attributed** to the island’s only stream that flows year round. The Hawaiian word for fresh water is “wai”. The word for **wealth** and abundance is “waiwai.”

reflects - shows
abundance - a large amount; plenty
resources - natural materials that provide food and other needs for people
expansive - covering a large space
attributed - to view as a result of
wealth - having a lot

Hawaiians understood the connection between water and wealth. If you had water, you were **considered** rich.

Loʻi Kalo

At one point in time enough food was **cultivated** in the valley to feed a thousand people living there! Native Hawaiians developed **sustainable** farming systems that allowed water to flow through their loʻi kalo (taro patches) and return to the stream, eventually flowing down into the ocean. This practice **assured** that the entire ahupuaʻa system remained **intact**. Farmers who were upstream had a responsibility to keep the water clean for the farmers downstream. If anyone **disrupted** the cycle of water, everyone would be affected.



considered - to think of in a certain way
cultivated - farmed
sustainable - protects natural resources
intact - not broken or damaged
disrupted - disturbed; held up

Maunalei Today

When goats were introduced to the island in the 1830s, they destroyed the valley. They ate away at the native landscape and scaled the valley walls causing **fatal** rockslides. Soon it became too dangerous to farm and live in the valley.

The water sources were affected by the loss of vegetation as well. The stream that had once produced over 2 ½ million gallons a day barely flowed 150,000 to 200,000 gallons. In addition, the water in Maunalei was pumped out of the valley for **commercial** use (ranching and pineapple).

Today, people are trying to bring life back to Maunalei by planting native food plants and **eradicating** invasive plants. They are also working to **restore** loʻi kalo. The valley is **inaccessible** to the public, however, school and community groups are sometimes able to visit. Education is one of the best ways we can help our ʻāina. When people come to visit these places, they build a connection, which hopefully inspires them to take care of these places.

Students learn about traditional agricultural systems at Maunalei

fatal- causing death
commercial - having to do with the buying and selling of goods or services
eradicating - removing
restore - bring back to original state
inaccessible - hard or impossible to get to

Reading Questions - Level 2

1. What makes up the "lei" referred to in the name Maunalei?

2. What natural resource is found in Maunalei more than other places on Lānaʻi? Why is that important?

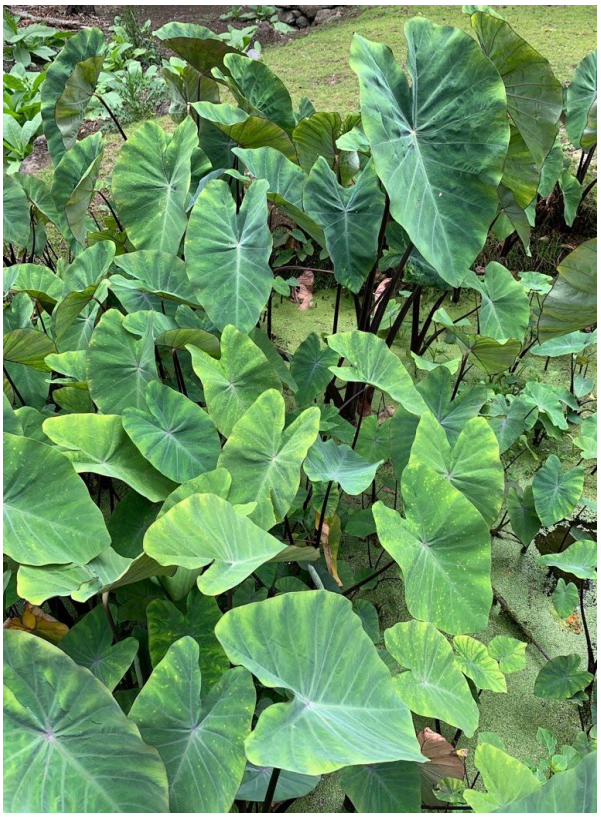
3. Name one of two detrimental changes to Maunalei that caused people to move away.

4. Describe your ideal vision of Maunalei in the future. What does it look like? What happens there? How do we interact with it?

Ka Hana o Ka Mahi‘ai

Native Hawaiians lived all across Lāna‘i, gathering resources from the uplands to the sea. An important facet of life included **cultivating** food for their communities. In order to produce enough food to sustain 6,000 people who once lived on Lāna‘i, Hawaiians developed efficient systems of agriculture that worked in harmony with the living environment. For growing food, the most significant factor to consider was access to fresh water.

Maunalei



Kalo growing in lo‘i at Maunalei

The smallest ahupua‘a on Lāna‘i, Maunalei was known for its abundance. The only **perennial** stream on the island existed in Maunalei valley. In Hawaiian culture, the word for fresh water is “wai,” and native Hawaiians understood the value of water to all life. The Hawaiian word for wealth, in fact, is “waiwai.” Unlike modern society that tends to value money, Hawaiians understood that true prosperity comes from the availability of freshwater.

Due to steady supply of water, Maunalei provided ideal conditions to cultivate food crops. We estimate that Maunalei Valley sustained 1,000 native Hawaiians in traditional times. Using innovative agricultural systems, they were able to produce enough food to ensure the health and well-being of all who lived there.

Lo‘i Kalo

Lo‘i kalo were irrigated taro patches that routed water from nearby streams and rivers to feed crops and then returned to the original water source, bringing nutrients back into the water and eventually down to feed coastal ecosystems. The process of directing some water to flow through lo‘i and then return to the stream also made sure that mahi‘ai (farmers) further downstream would have access to the water resources they

needed for their loʻi. This unique system worked with the existing natural features rather than disrupting them, ensuring they would be protected for future generations.

Kalo, or taro, was a **staple** crop in the Hawaiian diet. It could be grown in dryland māla (cultivated field or garden) as long as there was plenty of fresh water available. In Maunalei, kalo were grown in wetland fields because of the constant supply of water. Hawaiians created small diversions of water from the main stream called ʻauwai, which flowed from one loʻi kalo to another using gravity to direct its path. In Maunalei, rock walls of ancient terraced loʻi kalo are still visible--a reminder of the abundance of food the valley used to provide for our island's people.

Traditional loʻi terraces in Maunalei valley

Major Changes

Once a thriving agricultural region on Lānaʻi, Maunalei today has also experienced the detrimental effects of introduced ungulates and new economical industries. In particular, when goats were introduced in the 1830s, they wreaked havoc on the valley and the lives of its residents. Able to climb along the steep valley walls, the goats created dangerous rockslides that threatened lives and damaged loʻi kalo. By the 1870s, rockslides reportedly killed native tenants, and water resources began to dry out as a result of deforestation in the upper regions of the watershed.

Freshwater running through ʻauwai at Maunalei

Along with the decline of our healthy landscape came the serious decline of the native population. After western contact, foreigners flooded the islands and brought with them diseases to which native Hawaiians had no immunity. This led to the **decimation** of around 90% of the Hawaiian population in just over a century. Foreigners also had much different worldviews, and many came to Hawaii viewing land as a resource to be **exploited** for profit.

There is a Hawaiian saying that goes "He aliʻi ka ʻāina, he kauā ke kanaka." The land is chief, the people are its servant. This shows that Hawaiians viewed ʻāina as something that should be **revered** and treated with the same respect as royalty. They understood that it is our responsibility to care for the ʻāina as stewards. With this perspective in mind, it is easy to understand how Hawaiians worked the land and utilized responsible conservation practices so that generations of people after them would have access to healthy resources. For them, land was not a **commodity**--it was the source of life and connected present generations with past and future.

This worldview was in **stark** contrast with the ideals foreigners brought with them to Hawaii, including the idea of "private property." The Māhele of 1848 instituted a foreign system of land privatization, which allowed **parcels** of land to be "owned" by an individual. This was an entirely unfamiliar concept to native Hawaiians, who had cared for their ancestral homelands for centuries. While the Māhele initially was intended to protect Hawaiian land rights, it actually resulted in the opposite--the **dispossession** of native people from their land. The small land parcels that were **retained** by native families are known as "kuleana."

Here on Lānaʻi, the privatization of ʻāina eventually led to the consolidation of the majority of the island under one owner. In the mid-1800s, a Mormon missionary named Walter Murray Gibson leased major land areas on Lānaʻi using church money. The goal of the Church of the Latter Day Saints was to establish a colony on Lānaʻi, which ultimately failed after it was revealed that Gibson had purchased most of the land on Lānaʻi in his own name, but using church funding. Since that time, Lānaʻi has been under the ownership of a majority landowner, with few kuleana still in the hands of Hawaiian families.

Pipes run up the cliffs of Maunalei, diverting water for other industries

The rise of private property also made way for foreign economic industries to take root. Ranching occurred on Lānaʻi for nearly a century, with operations closing in 1951. The ranching industry, which comprised large herds of cattle and sheep, also contributed to the deforestation occurring on the island during that time. In 1922, James Dole purchased the majority of Lānaʻi and **catalyzed** the pineapple plantation industry, which would last for 70 years.

How did these changes affect Maunalei? Regarding land rights, there were a number of kuleana parcels in Maunalei, but due to the destruction of goats, many native tenants traded their properties in the valley for areas in the Keomoku region along the coast, which is why there was a Hawaiian community there in the early 1900s. The introduced industries of ranching and pineapple also negatively impacted Maunalei because they **diverted** water out of the valley to a reservoir at Kō‘ele. Due to these factors, Maunalei stream unfortunately does not flow anymore.

Maunalei Today

Despite the degradation Maunalei has experienced, there are still signs of hope for its future. Large kukui groves tower over remnants of ancient lo‘i, and a small ‘auwai feeds water from a pump down through new lo‘i kalo that we have been working to establish. The threat of invasive plant and animal species remains, but continued stewardship of this area will hopefully return health to this once-abundant valley in future years. Since all parts of the island are connected, restoring health to the upper regions of the watershed will also positively impact Maunalei’s landscape. Until water flows once again in Maunalei, we can honor this place by telling its story and actively working to be good stewards of this ‘āina aloha.

E ‘Ike Hou Iā Lāna‘i 2019 students at Maunalei

Level 3 Reading Vocabulary

catalyzed (v)- caused or initiated

commodity (n)– something that can be bought and sold

cultivating (v)- farming

decimation (n)– destroy a large number of

dispossession (n)- oust; put a person out of possession

diverted (v)- turned from its initial path; deflect

exploited (v)– used for personal or financial gain

parcels (n)- portions

perennial (adj)– all year long

retained (v)- kept

revered (v)– to have great respect for

staple (adj)– regularly consumed

stark (adj)- extreme

Reading Questions - Level 3

1. Explain the relationship between wai and waiwai.

2. Give 2 reasons why loʻi kalo are example models for sustainable agriculture.

3. Discuss the difference between a Hawaiian mindset of land stewardship and the privatization of property ownership around the Māhele.

4. What does it mean to be a good steward of ʻāina?

Maunalei Lei Hana Noʻeau Activity

E lei kau, e lei hoʻoilo i ke aloha
Love is worn like a lei through the summers and the winters

PURPOSE:
The related reading and videos describe how Maunalei historically provided a *lei* of abundance around our Lānaʻi community. In the same way that productive agricultural systems nurture and care for us, this activity will challenge you to create your own lei of abundance in appreciation for those who care for you.

PART 1: LEI MEMORY

- Think about a time when you received a lei
- In the box below, describe the situation, who gave you the lei, and how you felt in that moment.
- Then, choose **5** words that best describe the practice of making, giving, and or receiving lei

CHALLENGE:
Create a lei of abundance to gift in appreciation of someone who cares for and nurtures you. You may choose to create an actual lei using natural materials from your yard, an artistic representation of a lei, or weave together words in the form of a poem, short story, or song. Like the kūpuna of Maunalei, be resourceful and use whatever you have available to you.

PLAN

- Sketch a draft of your lei in the box below
- Create a list of materials you need to make it
- List the steps you will take to complete the activity

SUBMIT

- Take a picture of you presenting your lei to someone you appreciate and submit it to the Lānaʻi Culture and Heritage Center (in-person or tag on social media using #eikehou2020)

ONE HĀNAU (BIRTHPLACE)

Learn more about your one hānau. Then, draw a picture of your home in the space below.

E aʻo mai e pili ana i kou one hānau

ʻO _____ **kuʻu one hānau**
(My birthplace is _____)

ʻO _____ **ka ua**
(The rain is _____)

ʻO _____ **ka makani**
(The wind is _____)

ʻO _____ **ke kuahiwi**
(The mountain is _____)

#EHOOPILIMAI

WAIA‘ŌPAE

Videos | Readings | Activity | ‘Ōlelo Hawai‘i

Waiaʻōpae Videos

All: Watch the Waiaʻōpae module video **&** the moʻolelo video of Tūtū Lei Kaopuiki-Kanipae at www.lanaichc.org

Moʻolelo Video Times:

0:00 - 1:28	**Intro to Tūtū Lei**
5:55 - 10:08	**Fishing practices**
21:09 - 22:49	**ʻŌlelo Hawaiʻi & English**

Levels 2 & 3: Answer the following questions

1. What does the name Waiaʻōpae mean?

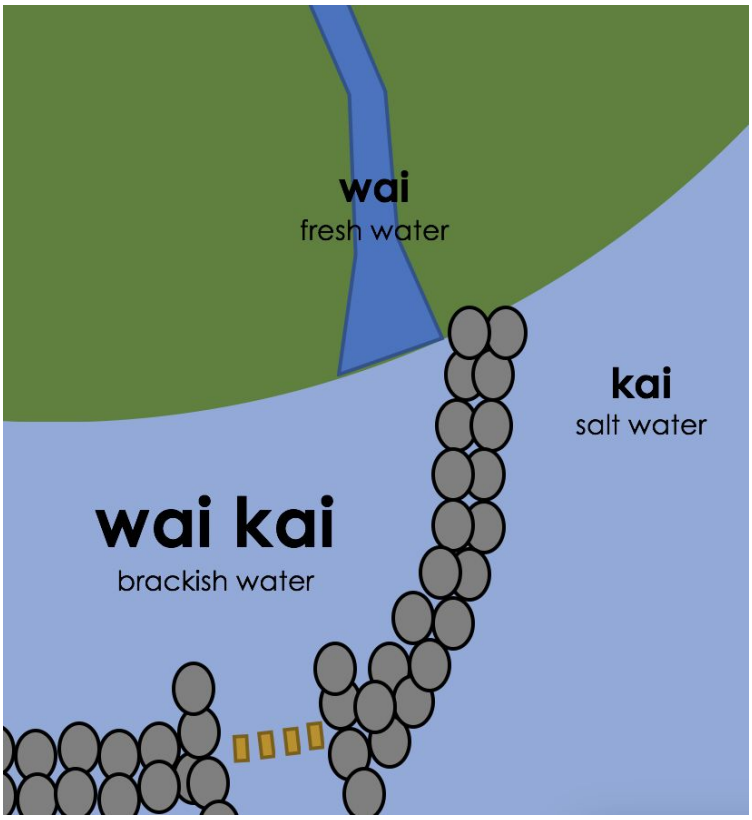
2. Name one type of stone used in building the kuapā and its purpose.

3. What is one cause of the silt on the shore and an effect it has on the loko iʻa?

4. What do you think the benefit of restoring Waiaʻōpae can have on our Lānaʻi community?

What is a Loko I‘a?

A loko i‘a is a fishpond. Loko i‘a were built by native Hawaiians hundreds of years ago. When the weather was bad, fishermen could not go out into the deep ocean to catch fish. Hawaiians built loko i‘a so that they could get fish safely near the shore.

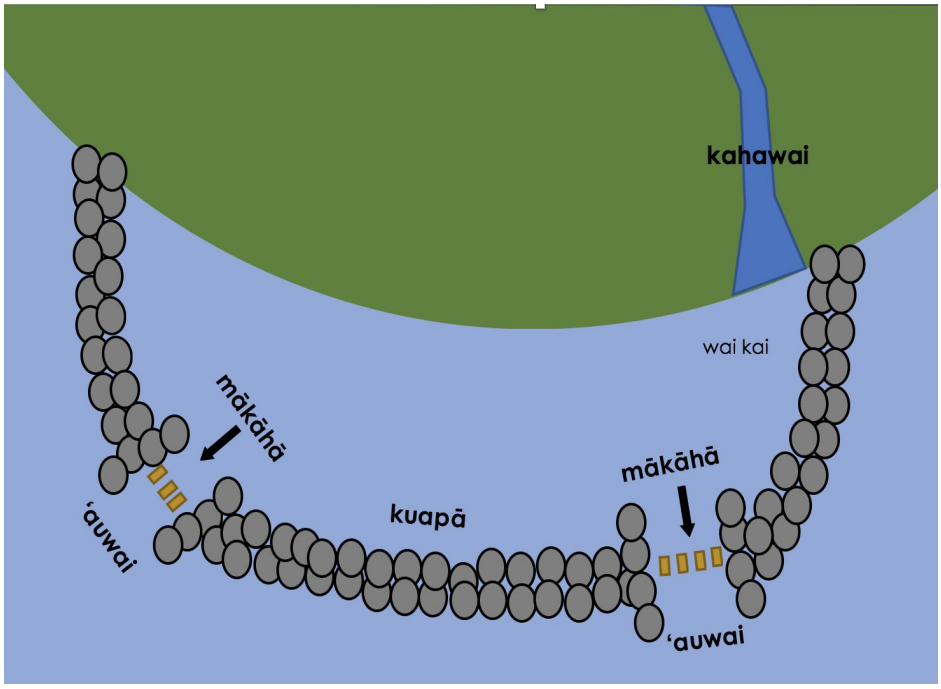


Loko i‘a are full of life. They are built near a stream, so the water in the pond is a mix of freshwater and saltwater. This mixture is called **brackish** water or wai kai. Wai kai has lots of **nutrients** to help things grow.

brackish - a mixture of fresh water and salt water; also known as wai kai
nutrients - vitamins and minerals that help things grow

Waia‘ōpae

We used to have five loko i‘a on Lāna‘i. Over time, people were unable to care for them, so sadly they do not work. Today, people are working hard to rebuild one of the loko i‘a called Waia‘ōpae.



Waia‘ōpae is a loko i‘a kuapā. It used to have long rock walls called kuapā and gates called mākāhā. The mākāhā let small baby fish into the loko i‘a. The little fish eat limu in the pond and grow nice and big. When they try to swim out of the loko i‘a, they are too big to fit in the spaces of the mākāhā. Now the fishermen can catch them!

Soil Erosion

One of the biggest problems at Waia‘ōpae is **soil erosion**. The deer and mouflon sheep eat away at all the plants on land. Without plants, there is nothing to help keep the dirt in place. When it rains, all the dirt washes down into the loko i‘a. The blanket of dirt makes it hard for things to live in the pond.

Photo Courtesy of Lāna‘i Culture and Heritage Center Website

A Healthy Loko I‘a

It takes a lot of work to care for a loko i‘a, but healthy loko i‘a can feed thousands of people. When you take care of the land, it will take care of you. It would be amazing to see Waia‘ōpae rebuilt and able to feed all of Lāna‘i again!

soil erosion – the washing away of dirt by rain or wind

Reading Questions - Level 1

1. What is brackish water?

2. How many loko i‘a did we used to have on Lāna‘i?

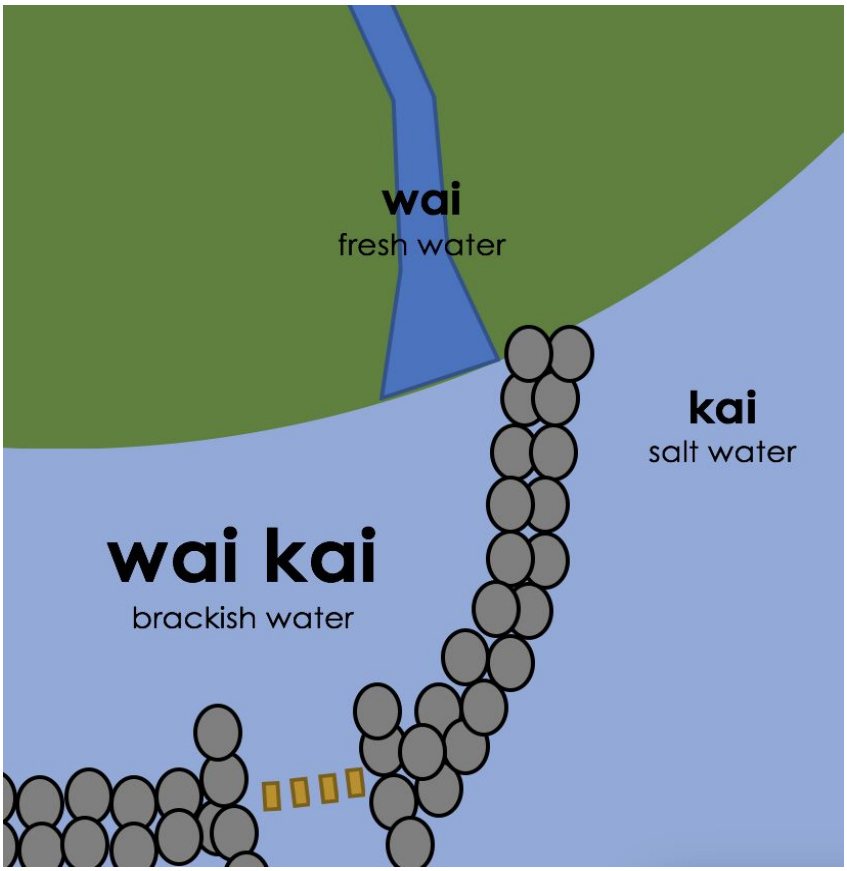
3. What is the name of the fishpond’s rock wall?

4. Caring for a loko i‘a is hard work. Describe a time when you worked hard. What made you keep going even though it wasn’t easy?

Loko I‘a

Sometimes fishermen were unable to go out into the ocean to fish because of bad weather and rough ocean waves. Loko i‘a, or fishponds, were created so people could farm fish near the shore and sometimes even further upland. These loko i‘a could provide food for thousands of people when other ways of fishing were not possible.

Most loko i‘a were built near the ocean. Hawaiians knew the benefits of having a mixture of freshwater in saltwater in the pond. This mixture of water is called **brackish** water, or wai kai. Wai kai is full of nutrients and helps make the loko i‘a a healthy **habitat** for limu, fish, shrimp, and other living things.

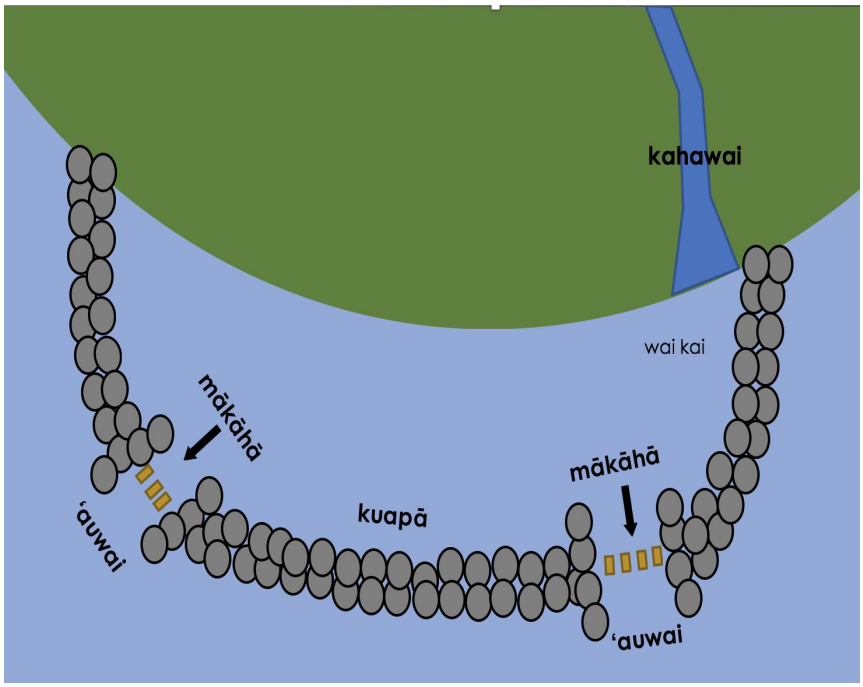


brackish - a mixture of fresh water and salt water; also known as wai kai
habitat - the home of a living thing that provides all that it needs to live

Loko I‘a Kuapā

The most common type of loko i‘a is the loko i‘a kuapā. A loko i‘a kuapā is made of kuapā (rock walls) and mākāhā (**sluice gates**).

Kuapā are built with different sizes of stones and coral stacked carefully on top of each other. The stones are stacked without anything holding them together! Some of the kuapā that remain today are over 800 years old! Can you believe that they are still standing?



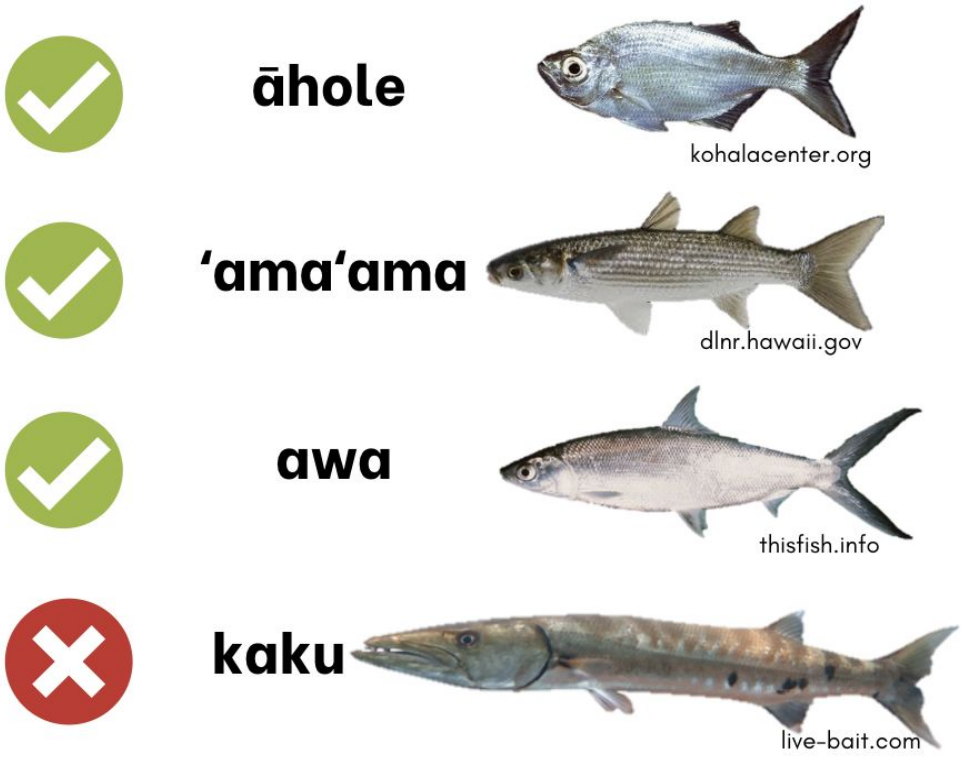
Mākāhā are created by tying pieces of wood together. They are then placed at different openings in the kuapā. The spaces between the wooden pieces of the mākāhā allow little fish to swim into the loko i‘a. There is so much food in the loko i‘a that the fish quickly grow too big to swim back through the spaces and are now trapped in the pond. What an incredible invention!

sluice gate - a sliding gate for controlling the flow of water; it allows small fish to enter the loko i‘a and keeps larger fish trapped in the pond; also known as mākāhā

Life in the Loko I‘a

The loko i‘a is full of life! Tiny **organisms** called **plankton** can be found floating in the wai kai, and are one of the main food sources for little fishes. Limu is also a main food source for the fish. Some types of limu are even harvested as food for people.

The best kind of fish to have in the loko i‘a are āhole, ‘ama‘ama, and awa. These fishes are **herbivores** and will only eat the limu in the pond. Sometimes **predator** fishes that are **carnivores** like kākū will get into the pond, and need to be caught before they eat the other fish!



organisms - living things
plankton - organisms that float in the wai kai; main food source for fish
herbivores - an animal that only eats plants to live
predator - an animal that hunts and eats other animals to live
carnivore - an animal that mostly eats meat to live

Reading Questions - Level 2

1. What benefit does brackish water provide to the fishpond?

2. What types of fish species do we want to have in a loko iʻa?

3. What is one of the biggest problems that Waiaʻōpae faces today?

4. Imagine that you are the kiaʻi loko (guardian) of Waiaʻōpae. Create a schedule of tasks that you would potentially need to do in a day.

Ke Kai Ola

“‘Āina” can be translated as “land,” but it also means “that which feeds and sustains.” With this interpretation, our living ocean environment can also be considered ‘āina, as the kai (ocean) provides important food resources for our people. Native Hawaiians were ocean experts and understood how to provide food for their community and protect those resources for future generations to sustain themselves.

Loko I‘a

Loko i‘a is the general word for fishpond. **Feats** of engineering and **ingenuity**, traditional loko i‘a were often built using dry-stacking techniques and required the collaboration of hundreds, if not thousands, of people. There were many different styles of loko i‘a as well, including loko kuapā, loko ‘ume‘ike, loko pu‘uone, loko wai, and loko i‘a kalo. The first two utilized stone walls along a shoreline to create an enclosed fishpond, while the **latter** three used land areas to create these enclosures.

All of these loko i‘a were sustainable methods of **procuring** important seafood resources. While native Hawaiians were **adept** fisherpeople from the shallows to the deep sea, fishponds created food resources that were easily accessible in times when other fishing methods were not possible, such as during bad weather.

Waia‘ōpae

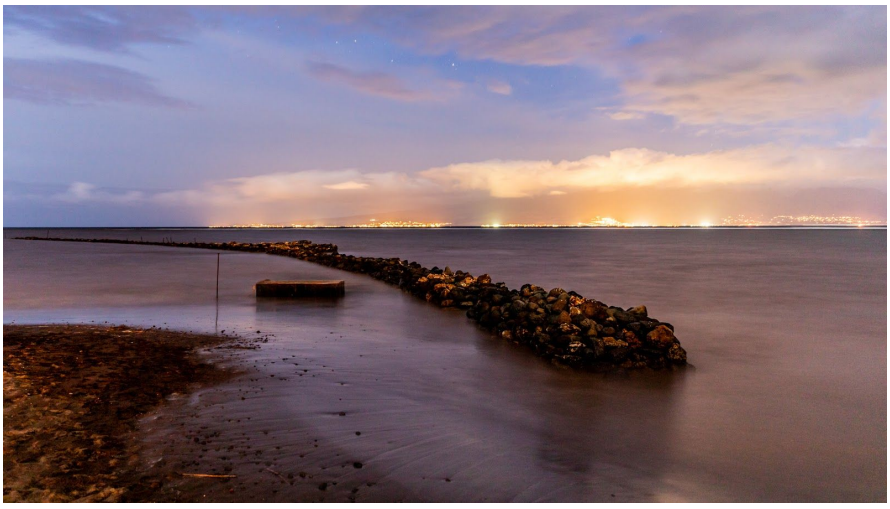


Photo Courtesy of Bryan Berkowitz/Lāna‘i Culture & Heritage Center

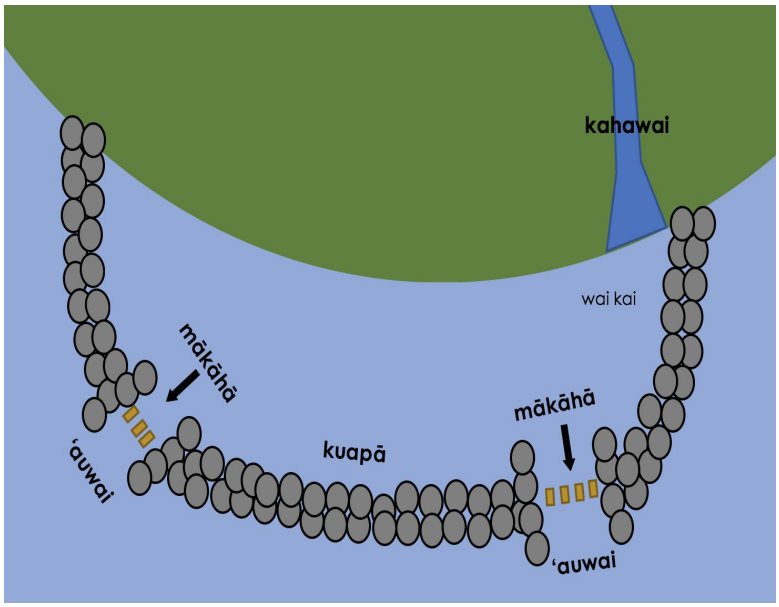
Along the eastern shores of Lāna‘i lies the ancient loko i‘a, or fishpond, called Waia‘ōpae. Translated, its name means freshwater shrimp spring. Waia‘ōpae is one of five loko i‘a on Lāna‘i that once sustained thousands of native people, providing an important food resource--fish, limu, and shrimp. The other fishponds are called Naha, Lopā, Ka‘a, and Kahōkeo. They all exist on the Keomoku coast, the only suitably shallow region on the island for fishponds to be built. In traditional times, people built and cared for the loko

i'a, but as the native population declined due to introduced diseases, so too did the fishponds fall into **disrepair**.

How It Works

There are many factors that influence a loko i'a and its ability to function properly. Some of these include: wave action, currents, water salinity, and **adjacent** shoreline. In a loko kuapā, there are three main structures that work with the surrounding environment to create a healthy fishpond ecosystem for fish to thrive.

The kuapā, or wall, needs to be built **meticulously**, taking into account constant wave action that can threaten the stability of the wall. Stones are stacked in layers, each rock relying on the strength of the stones surrounding it. There are five categories of stones on a kuapā, each serving an important role in the wall's overall structure. The base layer is composed of niho (directly translated as "teeth"), which are typically large, heavy stones that create a firm foundation. "Face" stones are called alo, which make up most of the vertical face of the kuapā. Since they are dry stacked, meaning there is no mortar holding the stones together like glue, each rock must be placed carefully and are often set on at least two stones below it for maximum support. Unu are stones that act as "wedges" for alo stones that need extra stability. Pani hakahaka, translated literally to "closing the gaps," are stones that fill in the center of the wall. The top layer is made up of pāpale, or "hat," which are typically flat stones that cover the upper layer of the kuapā. Each of these stones serve a different purpose on a kuapā but are equally important in ensuring its durability.



'Auwai are the open channels that allow water to flow in and out of loko i'a. Constant circulation of water is critical for a healthy fishpond ecosystem. Without a consistent flow of water, the water in the pond would **stagnate**, creating a poor environment for fish to grow.

Mākāhā are sluice gates that create a barrier within ‘auwai to control the movement of fish. When fish are babies, their small bodies are able to fit through the slats of the mākāhā, seeking shelter in the fishpond, which protects them from strong waves and currents. The fishpond also guards young fish from predatory species, which native tenants could easily remove from the pond if one slipped in. As the baby fish grow, they get too big to escape back through the slats, effectively trapping them in an accessible area for people to gather them as needed.

Waia‘ōpae Today

Waia‘ōpae is unfortunately far from the once-thriving loko i‘a it used to be. The degradation outlined in previous modules of the uplands severely affected our island’s coastal regions too. As goats, sheep, and deer eat away at the native vegetation, they create large **tracts** of dry soil susceptible to erosion. After it rains, this sediment makes its way down to the shore in large quantities, which is why the water at Keomoku looks so muddy after a storm.

Additionally, invasive kiawe (mesquite) trees completely took over the coastal regions, spreading and creating a dense, thorny forest in which native plants struggle to survive. After they fall, the kiawe’s small leaves **deteriorate**, eventually breaking down to form silt, a fine powder that **exacerbates** the over-sedimentation issue occurring in the water.

Prior to invasive plants and animals degrading the landscape, our coastal regions thrived--fish were abundant and the shorelines were still white sand. Over the years, severe buildup of sedimentation has covered our near-shore coral reefs, which require clean seawater and sunlight to survive.

Photo Courtesy of Lāna‘i Culture & Heritage Center

Restoration Efforts

In its prime, Waia‘ōpae was a 9-acre fishpond with a full wall length of around 2,000 feet. Though the original wall has fallen apart, when viewed from satellite imagery, the outline of the kuapā is still clearly visible. In 2015, physical restoration of Waia‘ōpae began. Using original stones, volunteers and crew use dry-stacking techniques to restore

the wall, and in 2020, we have rebuilt about 25% of the kuapā.

We know that what occurs in the mountains affects our coastlines and oceans. Therefore, rebuilding the wall is not enough to restore health to the loko i‘a. Other critical components are upland and shoreline restoration activities. In the uplands, though goats were **eradicated** in the 1970s, there are still large herds of invasive Axis deer and mouflon creating bare areas of land susceptible to erosion. By reintroducing native plants to areas that have been cleared of vegetation, this will hopefully begin to **mitigate** some of the runoff that would otherwise end up in the ocean.

Along the shore, removing the invasive kiawe that dominates the landscape is a major activity. By planting native coastal plants such as milo, kou, and pōhuehue, hopefully the shoreline will return to the healthy, diverse ecosystem it once was. The restoration of Waia‘ōpae is a multi-generational project. Centuries ago, many hands came together to build and care for this loko i‘a, and today, we must work together as a community if we would like to see Waia‘ōpae thrive once again.

Photo Courtesy of Lāna‘i Culture & Heritage Center

Level 3 Reading Vocabulary

adept (adj)- very skilled or proficient at something

adjacent (adj) - next to or adjoining something

deteriorate (v)- become progressively worse

disrepair (n)- poor condition of a structure due to neglect

exacerbates (v)- make a problem worse

feats (n)- an achievement that requires great skill

ingenuity (n)- the quality of being clever, original, inventive

latter (n)- situated nearer to the end of something than the beginning

meticulously (adv)- in a way that shows great attention to detail; thoroughly

mitigate (v)- make less severe

procuring (v)- obtaining something, especially with care or effort

stagnate (v)- cease to flow or move (of water or air)

tracts (n)- an indefinitely large area

Reading Questions - Level 3

1. Name the two types of fishponds that utilized stone walls to create an enclosed fishpond.

2. What is an ‘auwai and why is it important to a healthy fishpond ecosystem?

3. Describe the function of the mākāhā or sluice gates.

4. Describe your vision of what Waia‘ōpae will look like for future generations. What steps will you take to ensure that this is possible?

Waia‘ōpae Fishpond Modeling Activity

‘O nā loko i‘a, ‘o ia kekahi mau mea e ho‘ohiluhilu o ka ‘āina

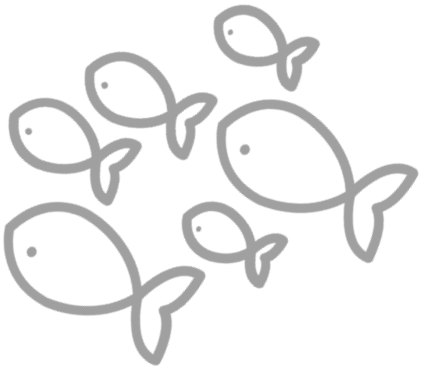
Fishponds are among the things that beautify the land -S.M. Kamakau

PURPOSE:

It is clear through our reading that fishponds, while beautiful and simple in theory, are complex in function. This activity will guide you through hands-on construction of a small-scale *loko i‘a* to model its different physical features and how they interact with one another.

MATERIALS:

- 1 small aluminum pan
- 1 block modeling clay or dough
- Toothpicks or popsicle sticks
- Raffia/string
- 2 cups clear water
- 2 cups colored water (food coloring)
- Squeeze bottle
- Two colors of food coloring
- 15 small leaves (to represent big fish)
- Oregano or other spice (to represent small fish)



CHALLENGE:

Design and build a *kuapā* with an *‘auwai kai* and a *mākāhā*.

PROCEDURES:

1. Using the modeling clay, build the *kuapā* of your *loko i‘a* in the foil pan, leaving a gap for your *mākāhā*.
2. Build a *mākāhā* using the toothpicks and raffia/string.
3. Once your *kuapā* and *mākāhā* are built, add two cups of clear water to your pan.
4. After the water level is equal on both the inside and outside of the model, add one color of food coloring to the inside of the pond.
5. Using your squeeze bottle, slowly raise the water levels on the outside of the pond by adding your second colored water to the outside. What happens to the stagnant water in the pond?
6. Add small leaves and oregano to the pond and create a current to move the “fish” toward the *‘auwai kai*. What happens to the fish and the color of the water?

*Adapted from The Pacific American Foundation’s *Aloha ‘Āina ‘O Lāna‘i* “Engineering Ingenuity” Activity

Draw or take a picture of your experiment below:

- Label each part of the *loko i‘a* and explain its function

Write a paragraph answering the following:

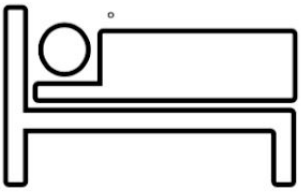
- What is the function of the mākāhā based on your experiment? (Think about the movement of the leaves)
- What is the function of the ‘auwai kai based on your experiment? (Think about the movement of the water)
- Why are tidal fluctuations important to a fishpond?
- How is your model different from our real situation at Waia‘ōpae?
- What do you think are the biggest challenges to making Waia‘ōpae fully functional again?

E MĀLAMA (TO TAKE CARE)

Let’s clean! Go ho‘oma‘ema‘e (clean) different parts of your house and have your parents sign when each area is completed.

E mālama a ho‘oma‘ema‘e i kou hale

UA HO‘OMA‘EMA‘E AU I KO‘U



LUMI MOE

(I cleaned my bedroom)

PŪLIMA: _____

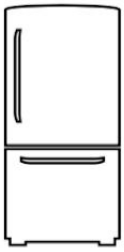
UA HO‘OMA‘EMA‘E AU I KA

LUMI ‘AU‘AU

(I cleaned the bathoom)

PŪLIMA: _____

UA HO‘OMA‘EMA‘E AU I KA



LUMI KUKE

(I cleaned the kitchen)

PŪLIMA: _____

UA HO‘OMA‘EMA‘E AU I KA

PĀ HALE

(I cleaned the yard)

PŪLIMA: _____

#EHOOPILIMAI