Ua ku i kāhi haiki:

Voices of Konohiki and Educators on Obstacles & Successes in Cultivating Traditional Hawaiian Resource Management on Moloka‘i & O‘ahu

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ABSTRACT

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Melissa Kaʻiulani Pico

As Hawaiʻi works to address various environmental problems—including deteriorating coral reefs, pollution of fresh water sources, and the extinction of endemic flora and fauna—*Kanaka Maoli*, or Native Hawaiians, are looking to expand and develop existing traditional practice methods that proved successful for over 1,700 years. Utilizing an interdisciplinary analysis including Hawaiian ethnography, and indigenous knowledge and traditional ecological knowledge theory, this thesis looks to gain a deeper understanding of the role of traditional management in mitigating and restoring Hawaiʻi's ecosystems from the perspective of traditional experts. Through semi-directive ethnographic interviewing, *konohiki* and educators on Molokaʻi and Oʻahu spoke about their traditional work, and challenges in practicing traditional Hawaiian ways as caretakers for specific sites and/or educators teaching traditional knowledge in formal and informal settings. The interviews were analyzed using a qualitative coding analysis to identify common themes and topics. While traditional management practices, and Hawaiian culture were the most frequently discussed themes (each contributing 26% of the interview focus), education, community involvement, long-term ecological planning, development and economy, and lack of institutional support were also prevalent themes to come out of the interviews. Ultimately, a lack of understanding and inclusion of the cultural origins of Hawaiian management has led to an imbalance, or lack, of traditional practice in conventional resource systems. This imbalance is a major hindrance to the ability of traditional practitioners to successfully do traditional work while combatting development and economic priorities, and a lack of institutional support.

This thesis would not exist without the insight, knowledge, and kokua
of konohiki and educators who took time to share and teach me about the work they do. I am
forever grateful to these Hawaiian experts and look forward to continuing my learning
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Mahalo to my thesis reader, Martha Henderson, and my peers who helped me along the way
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Glossary

Sources: Pukui 1986; Beamer 2009; 'Aha Ki'ole 2008; Berkes 2012

'Aha ali'i: council of chiefs

'Aha ki'ole: people's council. "An aho is a single strand of material, and many aho are woven together to form one strong chord. Each aho represents a specialist: for example, a lawai`a (fisherman), a mahi`ai (farmer), a *konohiki* (caretaker of the land). It is this type of binding that is called `aha. The second part of the term, ki'ole, refers to the schools of fish hatchlings that used to darken the waters on Molokai's southern shores. The ki'ole became a symbol for the island's dense population." (Kumu Ka`imikaua from *'Aha Ki'ole* Council 2008).

Ahu: altar or pile

Ahupua'a: literally means pig altar; name of the ancient land division system extending from *mauka* to *makai* and incorporating all resource units within each *Ahupua'a*.

***'Āina*:** land, earth

Ali'i: chief, chiefess, officer, ruler

Ali'i nui: high ranking chief

'Auwai: ditch or canal

Cartesian Dualism: from the French philosopher and scientist Rene Descartes, is a concept that perpetuates the notion of "…an external environment or nature separate from human society, a dichotomy of mind versus matter… and humans versus the environment" (Berkes 2012, p154). An example of this is the preservation of wilderness areas, the idea that there can be areas "untouched" by the human environment, whereas in many indigenous communities, the "wilderness" or natural environment is considered part of their home (Berkes 2012).

***Emi*:** falling, diminishing; refers to waning or diminishing moon phases

***Haole*:** white person, foreigner

***He'e*:** octopus

***Honu*:** sea turtle

***Ho'oilo*:** wet or rainy season

Ho'onui**:** to enlarge; refers to waxing or enlarging moon phases

***Huli*:** the stalk and tip of the *kalo* root; the *huli* is used in replanting *kalo*

'Ili: literally means stranded; a land division for a isolated piece of land given to an ohana to ensure access to each resource unit.

***IK*:** indigenous knowledge

Ka Pae 'Āina: The Hawaiian Islands, including the northwest islands. This phrase is used when referring to the islands prior to Kamehameha's unification. Taken from Beamer (2009).

***Kahuna*:** priest, sorcerer, expert in a specific profession

***Kalo*:** taro plant; grown in both *lo'i* fields and in dry beds as well; the root is boiled and pounded into *poi* which was a main staple food for Ancient Hawaiian, the leaves are used in cooking to wrap around food during the cooking process. The stalk of the *kalo* would then be replanted to allow more *kalo* to grow. In mythology, the *kalo* plant is believed to be the older sibling of humans, because of this, the *kalo* plant is more than just a plant or food source, but something to be respected, revered and taken care of.

***Kanaka Maoli*:** native or indigenous person

Kapu: taboo, prohibition; forbidden; holy; no trespassing

***Ka'u*:** dry season

Koa: tree species, acacia *Koa* species, endemic to Hawai'i, has many traditional uses including canoe making, which have been threatened by over harvesting and grazing lands.

Konohiki: Hawaiian caretaker, or land manager over *Ahupua'a*, in ancient times appointed by chief

Kuauna: *Lo'i* field embankment walls

Kuleana: responsibility, privilege, right, concern, interest. Many Hawaiians see the community they and their ancestors inhabit as part of their *kuleana* to take care of and give back to.

***Kumuhonua* Genealogy**: means literally earth source genealogy; refers to the ability of Hawaiian chiefs to trace their lineage back to the brothers Ulu and Nanaulu who were thought to be the descendants of the first man created by the gods.

***Limu*:** seaweed

Lo'i: irrigated terrace or pond field

Loko: a pond, pool, lake, or other enclosed body of water.

Māhele: literally means divide, portion, section. The great divide of 1848 in which western missionaries converted Hawaiian economy from subsistence (where land was mostly communal) to a plantation or market economy (where land was privatized). One third of

the land went to the ruling chiefs, one third to white missionaries, and one third to the commoners

Maka'āinana: commoner, populace

Makahā: stationary sluice gate utilized in fishponds

Makahiki: ancient festival beginning in middle of October and last about four months, offering gifts to akua of Lono.

Makai: towards the ocean or seaward

Mālama 'āina: to care of, tend, protect, or maintain the land or earth

Malo**:** traditional Hawaiian breachcloth worn by men.

Mana: supernatural or divine power believed to be passed down through one's ancestral line (descendants inherit the *mana* of their ancestors).

Mauka: towards the uplands or mountain

Mō'ī: an *ali'i* who consolidated rule over an entire island or more, seen as higher in rank than rest of *ali'i* council.

Moku: land division term meaning district

Mo'olelo**:** history, story, legend

Niu**:** coconut

'Ohana: family or family unit, extended family

'Oiwi: literally means "of the bones", native, genealogical ties to the Hawaiian islands, specifically meaning ethnic aboriginal Hawaiian descent

Olona**:** *olona* plant, native to Hawai'i, its fiber was used for cord and rope and highly valued for its strength

Pa'a mai'a**:** banana sheath

Palena: boundaries that regulated access to resources between differing *Ahupua'a*. Beamer (2009) uses this term to mean "place boundary".

Piko**:** literally navel or umbilical cord, figuratively the plaited thatch above a door frame cut as a dedication of a new house

Poepoe**:** full, refers to full moon phase for the purposes of this thesis

Pōhaku: rock, stone, mineral

Poi: food made from *kalo* root, main staple for Hawaiian people

Pono: goodness, uprightness, morality, correct or proper procedure, excellence, well being, prosperity, welfare, benefit, behalf, equity, righteous, right, just, virtuous, fair, accurate, beneficial, should, ought.

TEK**:** traditional Ecological Knowledge

Ua ku i kāhi haiki**:** standing in a narrow place or a precarious position

Terms for Traditional Hawaiian Resource Management Used:

- ***Aha Moku System***: term used by *'Aha Ki'ole* Advisory Council and Council report
- ***'Oiwi Management***: term used by Beamer (2009) to mean native management
- ***Ahupua'a-based Management***: emphasizing the organization of Ancient Hawaiian resource management as seen in *Ahupua'a* land units
- ***Culture-based Management***: speaking to the imbeddedness of culture in traditional resource management
- ***Land Tenure System***: referring to the *Ahupua'a* system in which land, for the most part, was given in tenure to *ali'i* and maka'ainana to *mālama*, but a *Mō'ī* retained ownership over the land

Chapter 1: Introduction

…**230** years after Western contact,
109 years after annexation,
49 years after statehood…
30 years of Western style natural resource management,

we find the Hawaiian environment and ecosystems in precipitous decline…

- *'Aha Ki'ole Advisory Committee, 2009*

Today, the State of Hawai'i finds itself in a precarious position. In the last 200 years since western contact, Hawai'i's environment has drastically changed, affecting its natural resources and its people. "The over-development of the coastline, alteration of fresh water streams, destruction of life-giving watersheds, decimation of the coral reefs, and the decline of endemic marine and terrestrial species" has left Hawai'i to decide whether this path of decline will continue or if a balance can be achieved to effectively address, not only the environmental, but the cultural, social, and economic concerns surrounding resource management as well (Hawai'i State Legislature, 2012). For Native Hawaiians, or *Kanaka Maoli*, the goal is to perpetuate and expand the use of traditional Hawaiian knowledge and natural resource management practices that have upheld the Hawaiian people for over 1,700 years before western contact ('Aha Ki'ole 2009).

Traditional Hawaiian resource management is derived from Ancient Hawaiian management systems that featured a land division system by which division was based on resource units including the divisions of mokupuni, *moku*, and *ahupua'a*. *Ahupua'a* are, ideally but not always,

pie-shaped land divisions running from *mauka* (uplands) to *makai* (seaward). This complex system, disassembled by missionaries during the *Māhele* in the latter half of the 19th century, was designed with the goal of providing each *'ohana* living in the *ahupua'a* with resources from the various ecological zones, including upland forest resources, midland agricultural areas, and marine resources from coastal fishponds and fishing.

Traditional Hawaiian practitioners[1] and experts have been making a concerted effort in the past 30 or 40 years, since the second Hawaiian Renaissance, to rehabilitate Hawai'i's resources and environment through the inclusion of traditional management systems. These systems utilize collaborative decision-making processes that would become a standard practice for making decisions about Hawaiian lands and resources. But, as with their *'Āina*, traditional practitioners too find themselves "*ua ku i kāhi haiki*". The work that they undertake leaves them straddling two "worlds" or ways of existence, the conventional western systems and the traditional ways, the priorities of a profit driven economy and those of an environmentally sustainable economy, and the uncultured and the cultured.

The traditional Hawaiian management system lasted for over 1000 years, supported near the same number of people that live in Hawai'i today, and was environmentally sustainable ('Aha Ki'ole 2009). This research looks to communicate a deeper understanding of the role of traditional management in today's society. What can we learn from traditional Hawaiian practices to guide mitigation and restoration in the face of 230 years of colonial destruction? How can traditional knowledge inform resource management and managers in general?

[1] This term is used throughout this thesis to mean people whose work revolves around traditional Hawaiian knowledge, including traditional land practitioners, or konohiki, and traditional educators.

Specifically, this research will explore what traditional practitioners see as important factors to successfully implementing traditional management systems, as well as, some of the barriers they encounter in doing traditional work. These questions are explored through the voices and insights of a handful of traditional land managers, *konohiki*, and traditional educators.

Initially, the framework for the analysis of traditional management's role in today's society will be explained, providing information about indigenous knowledge theory and traditional ecological knowledge theory. Chapter Three imparts a necessary and brief primer on aspects of ancient Hawaiian society and traditional Hawaiian resource management relevant for this thesis—by no means extensive, but rather an introduction to the origins of Hawaiian society, culture, history, and resources. Chapter Four lays out the methods, results, and an interpretation of the lessons and big picture ideas gained from the insights and knowledge of the traditional experts interviewed for this thesis. Chapter Five continues this big picture track and provides a summation of what the reader should leave understanding and questioning.

In conclusion, this research does not reveal or co-opt traditional knowledge, or present the author as an expert of traditional knowledge. In Hawaiian culture, experts possess a lifetime of experience, and generations of knowledge. The goal is to present the insights and opinions of a handful of traditional experts on Moloka'i and O'ahu, and provide the reader with what was learned from these experts and the thesis process—an interpretation, utilizing an interdisciplinary perspective, of how this knowledge can inform future resource management work. An interdisciplinary approach allows this research to draw on theory, knowledge, and implications from multiple fields to provide a holistic interpretation, something that traditional management

does inherently. The interdisciplinary approach for this research draws from Hawaiian ethnography, ethnoecology, natural resource management theory, and utilizes segments of environmental education theory, and political ecology to answer the research questions posited above.

Chapter 2: Theoretical Framework

Ua lehulehu a manomano ka ʻikena a ka Hawaiʻi.
Great and numerous is the knowledge of the Hawaiians.

- Hawaiian Proverb

Indigenous Knowledge & Traditional Ecological Knowledge Paradigms

In determining the appropriate lens in which to make sense of and analyze traditional Hawaiian resource management, it was necessary to utilize a framework that spoke to the source and creator of the management system itself, the Hawaiian people. Indigenous knowledge (*IK*) theory addresses the "local knowledge held by indigenous people or local knowledge unique to a given culture or society" (Berkes 2012, p. 9). Traditional ecological knowledge theory (*TEK*), a subet of IK, is particularly crucial to understanding and analyzing traditional Hawaiian resource management because it addresses how indigenous or native cultures have imbedded environmental or ecological values into their cultural identity. By definition *TEK* looks at the "cumulative body knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes 2012, p. 7).

Central to this framework is the understanding that along with the dispossession of native and indigenous groups from their land, water, and resources, comes the marginalization of their knowledge. This marginalization exists through both epistemological barriers—that is, what constitutes the best and truest knowledge; and systemic or institutional barriers relating to

economic and political influences determining what kind of knowledge is imbued with value (Ross 2011; Berkes 2012). The most relevant of these barriers to Hawaiian traditional resource management will be discussed in detail including the lack of validation of *IK* and *TEK* in western resource management science, differences in how traditional knowledge is presented, and how boundaries are conceptualized in traditional cultures. Additionally, systemic barriers about the "othering" of indigenous practitioners, issues of racial and cultural inferiority, and the power dynamics that exist between the state and indigenous communities will also be discussed.

Validation in the Western Reductionist Paradigm

Often because of *TEK*'s inclusion of moral, ethical, spiritual, and cultural context, its status as a legitimate, and culturally and scientifically relevant body of knowledge is called into question by western reductionist science paradigms which form the basis for natural resource management in the western world. Berkes (2012) comments:

> Indigenous knowledge systems are characterized by embeddedness of knowledge in the local cultural milieu; boundedness of local knowledge in space and time; the importance of community; lack of separation between nature and culture, and between subject and object; commitment or attachment to the local environment as a unique and irreplaceable place; and a noninstrumental approach to nature. (11)

This is in contrast to Western reductionist scientific theory, which by definition requires "value-neutral descriptions of objective events in nature, with the assumption that scientists themselves are detached from the world and operate in a value-free environment" (Berkes 2012, p. 264). This is perhaps the most important distinction between western and indigenous societies in general—the influence of *Cartesian Dualism*. Unlike in indigenous societies, *Cartesian Dualism* is the basis for how western societies conceptualize the natural world, pitting mind against matter, humans against environment, commodifying nature, and separating environments (human

and natural) that have no actual separation in the real world. Indeed, Ross (2011) even goes so far to claim that it is this *Cartesian Dualism* that is the root of our current day environmental problems. The best example of this is western resource management's standard of "wilderness" preservation. Gomez-Pompa & Kaus as quoted in Ross (2011) explain:

> The concept of wilderness as the untouched or untamed land is mostly an urban perception, the view of people who are far removed from the natural environment they depend on for raw resource… Indigenous groups in the tropics, for example, do not consider the tropical forest environment to be wild, it is their home. (236)

Indeed, many of the areas that we often think of as wilderness, including many national parks, are actually the original homelands of various indigenous peoples. And, even as the conversation begins shifting toward conservation over preservation, the western ideal of conservation differs from the indigenous practices of conservation (Ross 2011; Berkes 2012).

The reality of this unsolvable conflict is that western reductionist science, and traditional ecological knowledge are two different paradigms, with two different goals. The former often offers knowledge about the world in the form of generalizations and principles devoid of context, space, and time; while the latter centers on a holistic approach, in which the human and natural environments are one and the same—with most indigenous communities living in areas western society would call "wild". Western science is only one way, rather than the *only* way to acquire knowledge and understand the world.

Yet, western reduction science dominates natural resource management and ecology, saying more about western society's "mission to extract rather than conserve" our environment (Berkes 2012, p265). For example, most ecologists believe that ecosystems are in a state of continuous change, invalidating a equilibrium-centered management strategy; however, ideas such as

maximum sustained yield (MSY) and its counterparts, which were created from the equilibrium centered paradigm, are still in use today in fisheries, wildlife, and forestry (Berkes 2012).

Sharing Traditional Knowledge

The lack of validation of *TEK* in western resource management leads to expectation or requirement for traditional practitioners to translate their knowledge into terms understandable by western reductionist science. Ross (2011) argues that "knowledge that is held in song and story, or maps that are encoded in art or seasonal calendars, lose important details and become muddled… [which] quickly lead to essentialization and appropriation… and totally disempowers local knowledge holders… " (101). Furthermore, Ross (2011) observes the power imbalance between western resource managers and traditional practitioners, saying, "It would be interesting to watch the howl of resistance that would arise if scientists and bureaucrats were required to recast their own knowledge in indigenous ways" (101).

Place vs Space Boundaries

Western cartographic constructions of the world can seem arbitrary to indigenous societies who conceptualize land and space in many forms beyond physical geography. Casey in Ross (2011) argues that "place" differs from "space", in that place is imbued with culturally and socially defined phenomenon—it is defined by local knowledge. Many indigenous communities determine boundaries based on the context of a place, the history of it, or perhaps what the space holds (ie: a specific plant type of rock formation), using songs, stories, and memories, to mark, name or label the location. Western resource managers can find it challenging to understand the importance of specific "places" to indigenous communities because there is no conventional

cartographic landmark. In Hawai‘i in 1994, for example, native Hawaiian communities became outraged when the construction of a new highway in O'ahu threatened dozens of heiau or sacred sites. Many of these sites were not properly surveyed by the department of transportation survey team due to the remoteness of location and because many sites are not recorded or documented on paper, but rather closely held local knowledge. Additionally, many sites that were surveyed were deemed not important enough to keep, with western leaders and agencies not understanding the cultural and historical importance of these sites. The highway was built, despite heavy pleas and protests from native Hawaiian groups, and "…destroyed dozens of cultural sites in both Halawa and Kaneohe and forever compromised those that were saved" (Omandam 1997, pg 2).

The Othering of Indigenous Experts

In the Western worldview, resources are managed by government bureaucracies comprised of various "experts" of various specializations compartmentalized into specific ecosystems or habitats. Traditional practitioners, on the other hand, are experts in the area or place they inhabit, not specific pieces, parts, or habitats, but how it interacts or exists as a whole (Berkes 2012; Ross 2011). Ross (2011) explains that, "in the west, an 'expert' is one who acquires data via the establishment of replicable experiments, interpreted through the application of verifiable laws of nature, and leading to independent recognition and accreditation of knowledge…" (100). However, in many indigenous communities, Ross (2011) argues, knowledge is communal, and can be traced through kinship systems, where accreditation "is based on one's kinship and heritage" (100). Not only is it all encompassing and holistic, but practitioners have the advantage of long term observational data having been passed to them from elders in the community.

Perceived Racial & Cultural Inferiority

The western worldview of indigenous peoples involved in natural resource management has often centered on a dichotomous and unrealistic stereotype. They are either classified as the elder, ecologically "noble savage" who is intrinsically connected to nature; or more primitive and inferior, whose practices are inherently destructive to the environment because of agriculture or hunting practices that are no longer acceptable because of western overuse of resources (termed "intruding weasel") (Berkes 2012; Ross 2011). A prime example of this dichotomy can be seen in Hawaiian communities that practice subsistence living. These communities rely on hunting and fishing to supplement their family's food supply, yet these priorities can conflict with western management goals, like the eradication of the invasive wild pig. Because of their disagreement over the management of wild pigs these communities are often categorized as supporting destructive practices, along the lines of the "intruding weasel" stereotype. A shallow understanding on the part of western practitioners ignores the valid needs of Hawaiian communities, and perpetuates a racial stereotype on an entire population. Characterizing indigenous or native communities as either the noble savage or intruding weasel not only bundles millions of people as believing or acting in a singular fashion, but also boxes millions of people into only two very narrow ways of being.

State power

One of the largest institutional barriers is the ultimate power that state and federal governments have over much of the management practices, laws, and policies that affect the resources of indigenous groups—even on sovereign tribal lands. The power dynamics between traditional practitioners and western managers is very uneven, with the latter having the power to simply

say “no” with no reasoning required. Similarly, in state and federal decision-making, traditional managers have at most an advisory roll with no real authority. The most typical or common form of inclusion is to include a single indigenous or native person (perhaps not even a traditional practitioner) in meetings or commissions, in order to boast of including the “indigenous perspective” in decision-making (Ross 2011). Additionally, Ross (2011) points out that, “…to achieve… genuine collaboration… between State and Indigenous people residing within State’s boundaries, these issues of power need to be explicit and transparent in the negotiation process…” (111). Without this truth telling, it would be difficult to create a collaborative relationship in which all parties carried equal weight. However, transparency does not necessarily lead to action, and could be used instead as a tool to appease traditional experts. Either way, decades and centuries of state power strong-arming and overruling traditional experts have not discouraged the work and fighting spirit of indigenous or native communities.

Chapter 3: An Origin Mo'olelo

Nānā I ke kumu.
Look to the source.

- Hawaiian Proverb

Source: Kamehameha Schools 1994.

Hawaii Then & Now

In the ways of our ancestors

The traditional Hawaiian resource management system that exists today is based in historical traditions. How this ancient system came into being is critical to understanding how land, resources, and culture are connected in the contemporary world. Eighty-four generations before Kamehameha I became the uniter of the Hawaiian Islands and established the Hawaiian Kingdom, two brothers, Ulu and Nanaulu, sons of Ki‘i and Hinakaula, traveled to *Ka Pae ‘Āina* and thus began who would later be known as the Hawaiian people. Fifteen generations after Ulu and Nanaulu, Heleipawa created the *ali’i* system of governance on Maui (Beamer 2008). Eighteen generations after Heleipawa, Haho, son of Paumakua of Maui, created the *‘aha ali’i* council. It was the *‘aha ali’i* that established a pedigree type of system through which all *ali’i* had to trace their genealogy from Ulu and Nanaulu (descendants of *kumuhonua*, the first man to be created from the gods) to gain entry into the council. Since Hawaiians believe that the *mana* (power, spirit, authority) of your ancestors is passed through the family line, the closer to Ulu and Nanaulu meant greater *mana* for an *ali’i* chief.

Finally, sometime between Haho (the 66th generation in *kumuhonua* genealogy) and Kalaunuiohua (the 85th generation) the concept of *Mō‘ī* (supreme chief) evolved into being. While it is hard to know when and to whom this title was first applied, Kalau is referred to as *Mō‘ī* in several historical accounts, the term could have been applied as early as Pili (73rd generation) (Beamer 2008). An attempt at unifying *Ka Pae ‘Āina*, as both Pili and Kalau attempted, has been theorized as the qualifier for achieving the *Mō‘ī* title (Beamer 2008). In the

time of *ʻaha aliʻi* council authority, *aliʻi* could not rise or fall below their genealogically determined rank no matter how much land they lost or their political achievements. The shift to *Mōʻī* leadership structure, where *Mōʻī* gained power over other *aliʻi* through being chosen by the council and by way of certain political successes like conquering land, equated the end of genealogical determinism. And, while a *Mōʻī* was not necessarily the highest ranking chief in the *ʻaha aliʻi*, no chief could rise to such a high position without the aid or support of at least some of the *ʻaha aliʻi* council. Beamer (2008) observes, "It is as if the *ʻaha aliʻi* which began as a means to legitimize *aliʻi* from *makaʻāinana*, over time, developed into a structure which also created a pool of chiefs, of whom could be recognized as legitimate rulers should they rise to power" (71).

The evolution from the *ʻaha aliʻi* council to *Mōʻī* leadership meant a significant difference in governing structures—from a semi-independent group of chiefs who did what best suited them for their territory to a centralized figure of authority. It was this shift in governing structure that is theorized by Beamer (2008) to have been the "catalyst for the implementation of precise *palena* [boundaries] over the land in *ahupuaʻa*s" (77). Without the leadership from a central governing authority like the *Mōʻī*, the *ahupuaʻa* or *ʻoiwi* land division system may not have existed due to the lack of organized rule inherent from one *aliʻi*'s territory to another (Beamer 2008).

Ancient Hawaiian Land Division System

It was during the *Mōʻī* period of leadership that *palena* for *ahupuaʻa* were created on many of the islands, although some of these boundaries may have been based on undocumented

preexisting *palena* prior to reorganization by *Mōʻī*. This period, in which *Ka Pae ʻĀina*'s population was at its peak, is often classified as peaceful, productive, bountiful, and prosperous—essentially a golden age for agriculture on many of the islands. The *Mōʻī* most famed for this age of abundance was Māʻilikūkahi, the *Mōʻī* of Oʻahu; however, *Mōʻī* on other islands (Umi on Hawaiʻi, Manōkalanipō on Kauaʻi, and Kākaʻanaleo) made similar advances (Fornander, Kamakau, cited in Beamer 2008).

Ancient land division system of *Mōʻī* like Māʻilikūkahi, Umi, and Manōkalanipō allowed for precise implementation of systems of resource management that would have not been possible without organized and central authority. While *ahupua'a* divisions are the most well-known land division today, they are part of a larger, more complex system set up by *Mōʻī*, and consisting of many different land terms and divisions. Table 3.1 is a list of the handful of land division terms used in this thesis. Islands, called mokupuni, were divided into *moku* or districts, which varied in size and could cut across water to include smaller islands, as is the case with the *moku* of Kahikinui on Maui and the island of Kahoʻolawe. Kalana and ʻokana are terms that were thought to also mean districts, however Beamer (2008) cites a primary source which indicates that on Hawaiʻi Island ʻokana divisions were smaller than *moku*, but larger than *ahupua'a*.

Table 3.1: Ancient Hawaiian Land Division Terms

Term	**Description**
Mokupuni	Island
Moku	Districts of an island, larger than *ahupua'a*
Kalana	Thought to be the same as *moku*
ʻOkana	Thought to be same as *moku*, but Mary Pukui found newspaper that seemed to suggest that ʻokana were smaller than *moku* but larger than *ahupua'a* (Beamer 2008)
Ahupua'a	Smaller than *moku*, larger than *ʻili*. Used in *Makahiki* procession, not comparable to western ecological concept of watersheds.
ʻili kupono	Divisions independent of changes in *Ahupua'a* borders or control (not subjected to kālai*'aina*)
ʻili lele	Non-contiguous pieces of land; distinct sections (usually wetland, mountain, fishery) of lands and fisheries grouped together to form 1 unit
Kālai*'Āina*	Process of land redistribution by *Mōʻī*; when a *Mōʻī* died, all land reverted back to new *Mōʻī* and he would distribute/define *palena* with advice from Kālaimoku (divider of island), an impt advisor in the redistribution process.

Source: Beamer (2008); Kamehameha Schools (1994)

Each *moku* contained multiple *ahupua'a*, which translates literally to mean pig altar. The *ahupua'a* divisions were significant not only for their organization of resource units within each *ahupua'a* which contributed greatly to the agricultural and fishery feats of the time, but because of their role in the *Makahiki* festival offering hoʻokupu (tribute) to Lono, the pig god (Figure 3.1). The *palena* (boundaries) of each *ahupua'a* were marked with an *ahu* (altar or pile), adorned at the top with a kukui wood carving of a puaʻa (pig or hog). The *konohiki* would collect gifts from the *maka'āinana* of food and goods to be placed at the *ahu* for

Figure 3.1: illustration of Makahiki idol used in Makahiki procession, Source: Curtis 1997.

the *Makahiki* procession during which the gifts were collected by the *Makahiki* god (or rather the human embodiment of the god, the akua *Makahiki*) (Kamakau 1976; Beamer 2008).

Additionally, while the *ahupua'a* division is an important part of the resource management system of the time, it is only one part of the larger system. While it is common to compare the *Ahupua'a* to the contemporary western ecological concept of watershed, this can be wholly inaccurate and culturally inappropriate. Kamanamaikalani Beamer (2008) cautions against comparing the *'oiwi* (native) system to western ecological concepts, arguing:

> Some contemporary usages of the word '*Ahupua'a*' have distorted its meaning by equating *Ahupua'a* to 'watershed'. Taking an *'oiwi* land division and simplifying it by making it synonymous with contemporary scientific concept not only misrepresents the diversity of *Ahupua'a* (many of which are not watersheds) it also creates an effect that de-culturizes *Ahupua'a*. (87)

He goes on to state that, similarly, modern usages of the term nature have often been used to mean empty or uninhabited places when in actuality they have traditionally been and continue to be places "that are known and intimately connected to native people" (87).

Within each *moku* and ahupua**ʻ**a, *ali'i*'s would appoint overseers of specific resources. An *ali'i nui*, who ruled over a specific mokupuni, would appoint a lower chief to rule over each *moku*, an *ali'i* 'ai *moku*. Each of the *moku ali'i* would then appoint a chiefs below them, to rule over each *ahupua'a*, an *ali'i* 'ai *ahupua'a*. This *ali'i*, depending on whether he lived in the *ahupua'a* in which he was given, would either serve as the *konohiki* (caretaker, manager) or appoint a *konohiki* who was responsible for running the daily operations and labor force of the *ahupua'a* (Kamehameha Schools 1994). The *konohiki* would decide where and how a fishpond was sited, or where a *lo'i* field would be built, and beyond the design and construction, he would oversee

the workers who planted, harvested, and maintained these resources (Kamakau 1976; Apple & Kikuchi 1975; Curtis 1997). The *konohiki* would often have assistants, luna, who were experts in different specialties and would oversee their specific resource or area in consultation with the *konohiki*. Luna wai, for example, were responsible for ensuring the right amount of water flow for the *lo'i* fields, and the luna ana‘āina was in charge of the land boundaries within an *ahupua‘a*. Additionally, there was also a luna for farming and for fishing who would oversee the other workers or fishermen (Kamehameha Schools 1994; Pukui 1986).

The Māhele and the End of Land Tenure

The great *Māhele* (divide), which was signed by the *Mō'ī* Kauikeaouli in 1848—although developed and played out from 1845 to 1850, amounted to the end of Ancient Hawaiian resource management as it had been known for over 1000 years. While the traditional Hawaiian system would obviously continue, it would not be the same as it was under the land tenure system that Hawaiians had practiced for generations.

The eventual agreement by Kauikeaouli to the terms of the *Māhele* were most likely due to a combination of advice from *haole* counselors and *kahuna*, the climbing death rate of the native Hawaiian population, and pressure from *haole* businessmen to own land in perpetuity. By the 1840's, many of the Calvinist missionaries had earned places among the *Mō'ī* and *Ali'i* as close advisors and *kahuna* (priests). Those who held the confidence of and gave advise to the *Mō'ī* did not fully understand Hawaiian customs and were looking "to render them industrious, moral, and happy" through capitalism (Kingdom of Hawai'i as quoted in Kame'eleihiwa 1992, p202). Indeed, the *kahuna* and counselors advised the *Mō'ī* to accept and sign the *Māhele*, with his

kahuna insisting that the *Māhele* would "ola hou" (restore the health) to the sharply declining Hawaiian population (Kame'eleihiwa 1992). As *Mō'ī*, Kauikeaouli was responsible for the health and well being of his people, and no doubt felt helpless to stop the many many Hawaiians that were dying of disease and illness (including many *ali'i*).

Crucial to the *Māhele* development and consequences was the Land Commission, established in 1845, and consisting mostly of and being led by *haole* businessmen. The Commission put forth the *Māhele* resolutions, dictated the terms of the *Māhele*, and approved or granted land claims. The most well known Land Commission decision or directive was that the *'Āina* would be divided into equal thirds (or a little less than 1.3 million acres) between the government, the *ali'i* population, and the *maka'āinana*. However, Kame'eleihiwa (1992) documents that in reality the land would end up being divided in six ways, "…between the *Mō'ī*, *Ali'i*, *konohiki*, *maka'āinana*, government, and foreigners, in unequal amounts" (212). She also points that the five year period in which the *Māhele* played out is telling of how Hawaiians viewed its passage, saying "the length of time it took… to convince the *Mō'ī* and *Ali'i Nui*… in Hawaiian society, that sort of delay indicated reluctance to agree" (208).

The *Mō'ī* and *ali'i* were convinced by their *haole* advisors to agree to the change in economic system, particularly by the results of a survey of missionaries conducted by the Minister for Foreign Affairs, RC Wyllie. He concluded that the population decline would stop once they were rid of the "oppressive" *ali'i*, *konohiki*, and land tenure system. Kame'eleihiwa (1992) explains, "…the theory ran… once the *maka'āinana* became industrious, they would give up their bad habits, save money, and become wealthy—and the alarming decline in Hawaiian populations

would be halted. This latter point was perhaps the one that most influenced the *Mō'ī* and *Ali'i Nui*…" (202).

Evidently, what the *haole* advisors failed to mention was that it was their very presence, the influx of foreign diseases like syphilis, tuberculosis, and flu, which was to blame for the steeply declining Hawaiian population. Beyond that, the lack of health care, due to the expense of foreign doctors and the outlawing of traditional Hawaiian medical practices by missionaries, allowed the epidemics of westerners to flourish and spread (Kame'eleihiwa 1992). Lastly, the *Mō'ī* saw the *Māhele* as a way to bring peace between the *haole* businessmen (looking to *own* the land) who without fail clashed with the *Ali'i*, who preferred to lease the land in order to be able to ensure *mālama*, or proper care.

In the long run, the *Māhele* ended up benefiting the *haole* businessmen the most, and left the *maka'āinana* questioning the very purpose of the process (Silva 2006; Kame'eleihiwa 1992). Kame'eleihiwa (1992) explains, "It was a difficult thing for Hawaiians to understand. *'Āina* is something that all Hawaiians need to live. How can it be divided for exclusive use? It is like dividing the air that we all breathe…" (210). In the end, Silva (2006) states that the *Mō'ī* owned more than 1 million acres, the *Ali'i* and *konohiki* owned about 1.5 million, and for the *maka'āinana* it is more unclear how much they actually ended up with because they were allowed to file claims after the *Māhele* deadline at which point they owned about 28,000 acres. Silva goes on to say that, "…what the *Mō'ī* and *ali'i* thought would be the '*pono* hou', or new *pono*… actually put the *maka'āinana* in an even more precarious situation. And, in the end, the new *pono* failed to stop the epidemics and low birthrate…" (43). Still, while many scholars see

the *Māhele* as a tool of *haole* oppressors, effectively dispossessing many native Hawaiian, some argue that it was not all bad. Beamer (2008) puts forth the argument that, "the *Māhele* as a process protected Hawaiian interests through awarding lands 'subject to the rights of native tenants,' and through… codify[ing] traditional *ahupua'a* resources rights into law" (202). He goes on to say that there is much still to be learned about the *Māhele*, more research needs to be done with archival documents and records that have not yet been studied by Hawaiian scholars today. Ultimately, the *Māhele* was engineered to allow *haole* businessmen to profit from Hawaiian land, and appropriate Hawaiian resources, with the *maka'āinana* feeling the exploitation more than anyone else. But, whether there were positive effects to the wholesale dispossession of Hawaiians from their homeland and the beginning of the end of a societal structure that had been around for a thousand or so years deserves more study from Hawaiian historians themselves. Moreover, understanding a modicum of the historical context of the Hawaiian Islands allows for a better comprehension of how Hawaiian natural resource management practices fit in the cultural milieu of ancient Hawai'i and contemporary Hawai'i.

Traditional Hawaiian Natural Resource Management

Hawaiian Principles & Guiding Philosophy

In 2007, the ‘Aha Ki’ole Advisory Committee was created by Act 212 of the Hawai’i Legislature, with the purpose of integrating the traditional cultural natural resource management system into the existing government regulatory policy (‘Aha Ki’ole 2009). The Committee published a report in 2009 detailing guiding principles and goals of traditional management, as well as a management structure that was decentralized. This system, called Aha Moku, utilizes the traditional land divisions detailed in the previous section and, rather than regulated through top-down policies and departments, relies on a collaborative community decision-making process.

Traditional resource management is essentially a form of adaptive management. The practitioners hold site-specific knowledge passed down generations or from master to apprentice, focusing on environmental and ecological activity in the area, as well as resource specific knowledge. This knowledge and history of a site allows practitioners to identify ecological principles and patterns, as well as cycles of scarcity and abundance (‘Aha Ki’ole 2009). Because contemporary management—relying on a central authority—is often removed from the direct site that is being cared for, the ‘Aha Ki’ole (2009) argue that it “…is not an effective means of conserving and managing a natural resource. Management decision need to be made in a timely and adaptive manner to specific environmental, ecological, economic, social and political stimuli” (13). Furthermore, the ‘Aha Ki’ole point out that natural resource management, “as a

whole is often in crisis mode… and decisions are sometimes being made in the courtroom…" (14).

Native Hawaiian resource practitioners, on the other hand, have the ability and flexibility to practice ecosystem-based conservation in the form of adaptive management. Looking at management policies and strategies in a constant "test phase" light, wherein practitioners can learn from what works and what does not, and tweak the latter based on what they learn. In this sense, practitioners are constantly learning and building off of their knowledge, improving their understanding for the better, and reaching an increasingly better result with each change or tweaking. Although, Poepoe, Bartram, & Friedlander quoted in 'Aha Ki'ole (2009) are quick to clarify that adaptive management, "…requires common sense but is not a license to just try anything" (14).

Because nature is not static, adaptive management also allows practitioners to change strategies when ecological cycles warrant it. In this sense, for Native Hawaiian resource practitioners, the 'Aha Ki'ole (2009) point out that, "…science is a system for adapting in a constantly changing environment. Subsistence practices involve a form of science that is at once a creative process (learning how to adapt to nature), a culturally defined expression (perpetuating traditional practices) and a problem-solving strategy (obtaining food)" (14). Additionally, because of traditional management's focus on subsistence use—meaning long term consumptive use, or sustainable use—conservation principles are naturally built in, with practitioners utilizing and teaching ethics like "take only what you need", and "fish only in your area" or "ask permission if not in your area".

Some of the key concepts or best practices that make traditional management so different from contemporary management, documented by the ‘Aha Ki’ole (2012), are crucial to the management decision-making and techniques that practitioners employ:

1. Utilize an adaptive management regulatory system
2. Codes of conduct, that are about community accountability and informal social control rather than regulatory, as a process to support the regulatory system
3. Community consultation to provide management accountability that benefits the people
4. Education to support culture-based natural resource management, and
5. Establish eligibility criteria for people to participate in resource management

An example of “code of conduct” as an informal community accountability process comes from Uncle Mac and Hui Mālama O Mo’omomi at Mo’omomi Bay on Moloka’i who drafted a fishing code of conduct seen in Figure 3.2.

1. Let the *keiki* and *kupuna* fish the easily accessible shores. Able-bodied adults can walk to more distant grounds.
2. The ocean is your icebox. Take only the fish you need to eat fresh in the next few days. Don’t be greedy and fill up the freezer.
3. Don’t waste. Use fish that come up dead or dying.
4. Learn the habits of fish. You will know when to catch them and when to leave them alone to reproduce. This way each fisher acts voluntarily as an individual “marine protected area.”
5. Each fisher is his own/her own enforcement officer.
6. Whenever possible, share your catch with family, friends and the elderly so they can eat healthy, local seafood.
7. Respect the ocean and its resources as you would your own family.
8. You don’t have to blow up or poison the reef to catch fish. Use legal gear.
9. Don’t catch fish that are very large (because they are the most important for reproduction) or very small (before they reach reproductive size).
10. Be *Pono*. When you are making a big catch, think about your children and grandchildren. They will need fish too.

Figure 3.2: Mo’omomi Bay Fishing Code of Conduct. Source: ‘Aha Ki’ole 2009.

A frequent feature of an informal code of conduct are Hawaiian cultural values and conservation principles like the *kapu*, *mālama ʻāina*, *pono*, and *kuleana*. *Kapu* are restrictions put on resources, mainly marine resources to allow the species to reproduce and spawn without being fished or harvested. The *kapu*, which will be discussed further in the following section, is an essential part of ensuring *long term* sustainable use of resources in subsistence economies. *Mālama ʻāina*, literally meaning to care for the land, even in actions that only indirectly affect the environment, *mālama ʻāina* teaches that the land and its resources must be cared for in a way that will ensure that the resource exists more many generations to come. While a small word, being "*pono*" with the land and resources is anything but small. It speaks to living in balance with the natural world, working in conjunction with the natural cycles of one's ecosystem and it's resources to ensure that future generations have access to the same resources. *Kuleana* is in reference to a person's responsibility and interest in taking care of the resources and land that one uses or calls home. Ultimately, all these concepts are about a holistic understanding of and relationship with the world where human and natural environments are not separated, but are one and the same. Additionally, they all address the larger purpose of sustainability, and the belief that honoring the generations that came before you involves leaving plenty for your children and the generations that will come after you.

Hawaiian Natural Resources and Management Strategies

The following section is a brief discussion of some of the major resources and management strategies or approaches used by Ancient Hawaiians and their current day descendants. Additionally, because traditional Hawaiian resource management relies on site-specific management strategies based on local knowledge, the practices discussed do not apply to every

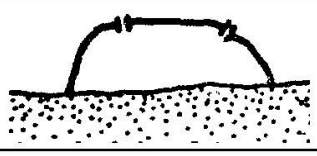
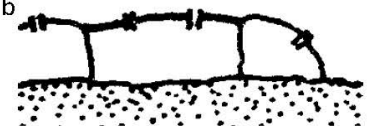
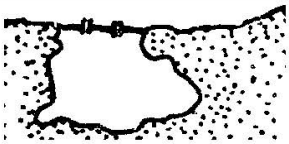
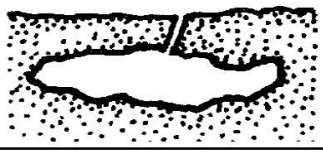
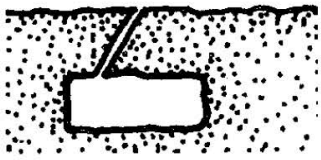
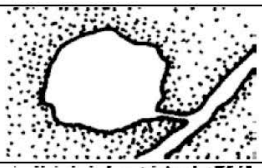
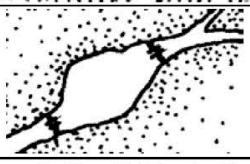
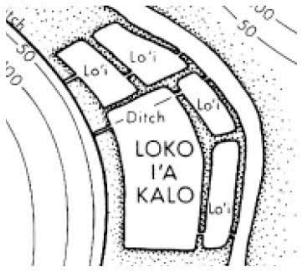
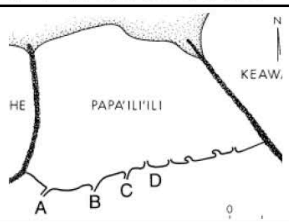
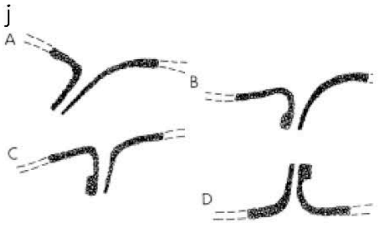
island or ecosystem, but is a combination of strategies discussed in archival documents and Hawaiian historical accounts.

Loko I'a & Aquaculture

There are five main types of *loko* i'a or fishponds, with each type containing various sub-types of variations of the main *loko* design based on the needs of the specific site in which the *loko* was built. Table 3.2 describes each *loko* design and examples of the possible variations that are commonly seen. As most *loko* were of royal ownership, a *konohiki* would manage the entire operation, from siting to harvesting, and delegate specific tasks to *maka'āinana* (i.e. maintenance of the *makahā*) or to the luna wai (i.e. monitoring water levels in a *loko* i'a *kalo*).

The kuapā or seawall of a fishpond are built using the Hawaiian style of mortarless masonry in which utilizing large pieces of rock and coral (which acts as a natural kind of cement) to form the exterior parts of the wall with rock and coral of the same size or smaller former the interior of the wall. The style of building left air pockets and small spaces, which allowed to wall to be permeable against tidal forces, as well as allowing circulation of the tidal waters. The permeability in conjunction with the angle of the wall sides (as illustrated in Figure 3.3)–with the base was wider than the top and both sides of the wall tilted toward one another—give kuapā a better ability to stand up wave and tidal energy than a purely vertical wall (Apple & Kikuchi 1975).

Table 3.2: Ancient Hawaiian Loko (Fishpond)

	Loko Description	Loko Illustration
1	**Loko Kuapā**: The most common type of loko, they were owned by the ali'i and not accessed by the maka'āinana. The main characteristic of this loko is the seawall or kuapā constructed of living coral (which acts as natural cement as it grows), or stone and having at least one makahā. Typically, the wall was built extending out from the shoreline (*as seen in graphic a*); however, there are six other sub types of loko kuapā which feature distinct characteristics such as a loko kuapā built in between two other preexisting kuapā (*graphic b*), or a kuapā built at the mouth of a natural bay (*graphic c*).	a  b  c 
2	**Loko Pu'uone**: Also called loko haku'one, these ponds were also owned by the ali'i and maka'āinana were forbidden from harvesting from them. "An isolated shore fishpond usually formed by the development of a barrier beach building a single, elongated sand ridge parallel to the coast and containing one or more ditches and sluice grates" (Apple & Kikuchi 1975). There are three sub types of these loko, these could be formed naturally by various rock types including sand (seen in graphic d) and lava rock, or by manmade excavation (*graphic e*).	d  e 
3	**Loko Wai**: An inland freshwater fishpond, most of which have at least one makahā, also ali'i owned. Usually either a natural lake or swamp where ditches are naturally existing or many times created to connect body of water to a river, stream, or the sea (*graphic f*). There are at least four different sub-types, including a loko wai created or located in a volcanic crater, a loko wai with a dirt and stone embankment wall separating it from a river or stream with makahā at both ends (*graphic g*).	f  g 
4	**Loko i'a kalo**: Also called loko lo'i kalo, were integrated fishponds, utilizing an existing taro plot or lo'i plot. These types of fishponds were managed by maka'āinana and ali'i, with fish being grown in the same waters in which the agricultural crop, kalo or taro, was growing (*graphic h*). *For more on lo'i agriculture, see proceeding subsection "Lo'i & Irrigated Agriculture".*	h 
5	**Loko 'Ume'iki**: A fishtrap loko, featuring numerous stone flanked lanes (not makahā) which directed fish into netting areas in sync with the tidal ebb and flow. These loko were managed by ali'i and maka'āinana alike. Graphic i shows an illustration of a loko 'ume'iki in between two loko kuapā which exists on Moloka'i. Graphic j shows an up close, detailed view of the lane structure. Lanes A, B, C are outlet canals utilized to capture fish during falling or ebb tides; whereas, lane D is an inlet canal designed to capture fish during rising or flow tides. The enlarged wall sections of B, C, and D, are for fishermen to stand on to net fish.	i  j 

Source: Apple & Kikuchi 1975; Costa-Pierce 1987.

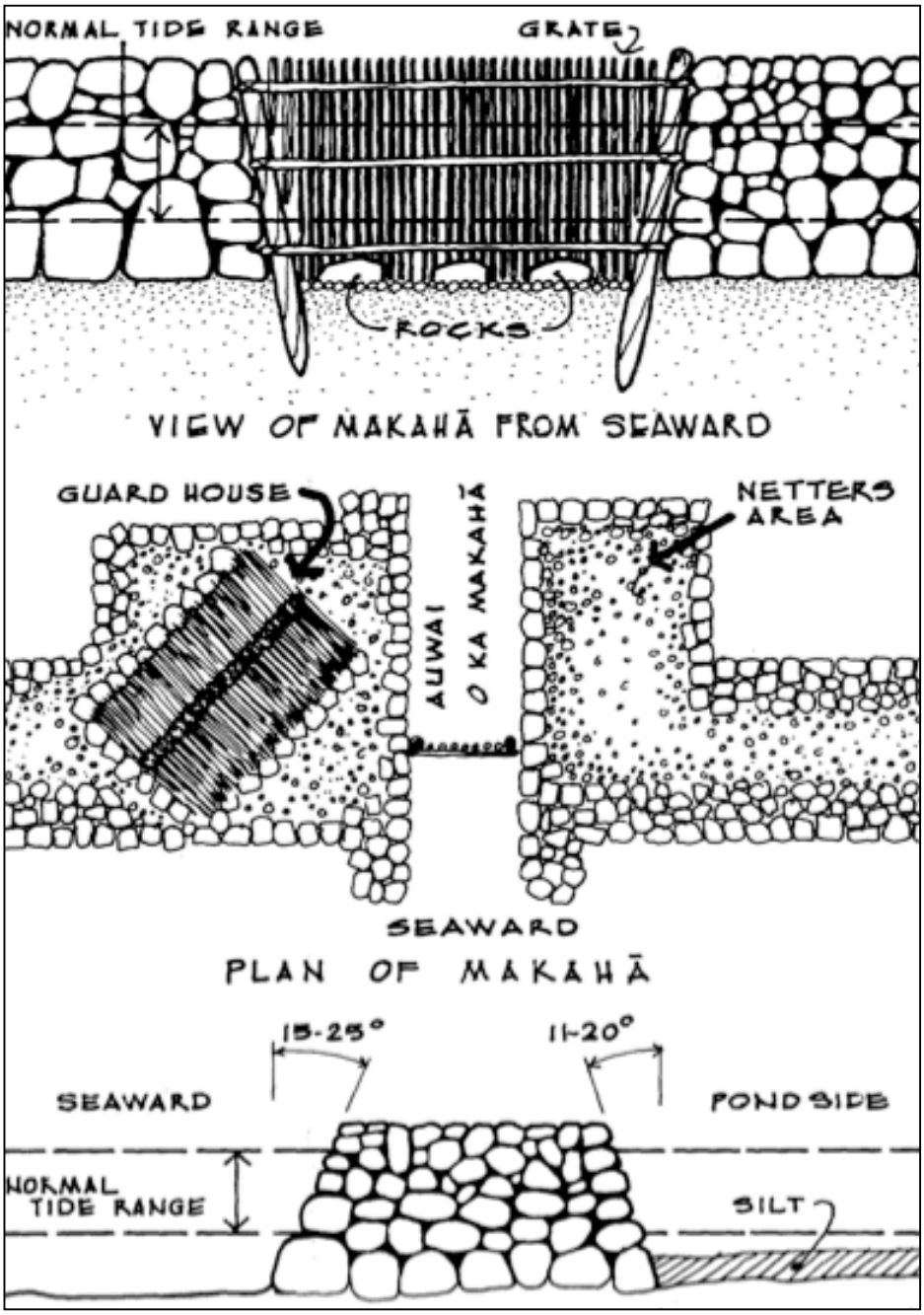


Figure 3.3: Kuapā and Makahā Detail, Source: Apple & Kukuchi 1975.

The implementation of the *makahā* by prehistoric Hawaiians (which have only been found in one other place in Oceania, and are a distinctive feature of Hawaiian aquaculture) allowed Hawaiians to graduate from fish traps to enclosed seawater ponds (Apple & Kikuchi 1975; Costa-Pierce 1987). This stationary sluice gate (although most *makahā* used today in Hawai'i have been

modified or built to be movable) was used on most types of *loko* i'a. However, not every type was built with a sluice gate, meaning that there are variations or specific sites where the *konohiki* would determine that a *makahā* was not needed such as a *loko* wai that was enclosed or cut off from any river or water source. In most *loko*, the *makahā* served to create an estuary type of environment, allowing fresh and seawater to mix in shallow depths with enough sun exposure to attain productivity comparable to an estuary. This productivity naturally attracted a variety of marine life including various fish species, shellfish (including opihi or limpets, and crab), *honu* (turtle), and *limu* (seaweed).

Beyond the natural "stocking" that took place in fishponds, artificial stocking could also take place with netters catching fry for the *loko* to ensure that a desired number of a certain species would be present. However, even in catching fry for *loko*, the *kapu* of any species would be honored and left alone. Additionally, maintaining the *loko* is a constant job. In ancient Hawaii, women were more often the "cleaning crew" for *loko* than the men, which involved clearing silt deposits that accumulate from tidal flows using bamboo rakes, clearing any algae from the pond bottom, as well as clearing excess *limu* growth to allow for new growth. The *maka'āinana* men undertook repair of the kuapā itself, when rock or coral was either damaged or fallen (Apple & Kikuchi 1975). Apple & Kikuchi (1975) also described a few ponds in Moloka'i that were sited so that tidal flows flushed out mud and silt through the *makahā*. In order to facilitate the tidal cleaning, during high tide a weighted bamboo rake towed behind a small canoe would stir up sediments so that the tide could more easily carry them out through the *makahā*.

Once the fish had matured and were ready for harvest, netting was the most common method (Apple & Kikuchi 1975). As nets were considered sacred for Hawaiians, imbued with *mana* that was protected through proper care, usage, and storage of the net, it was forbidden for women or children to step over or even go near a net. Long nets, requiring multiple men, would either be swept around the *loko* i'a or set up inside of it, and fish would be driven into the net through by slapping the surface of the water with hands or sticks to scare the fish into fleeing toward the net. Smaller scoop nets, which could be used by one man alone, would be most commonly used at the *makahā*. In either case, Apple and Kikuchi (1975) noted that high tide and nighttime or early morning harvesting resulted in higher yields than daytime nettings.

Fishing & Marine Resources

The most well known and widely used fisheries/marine management policy in traditional Hawaiian practice is the *kapu* (taboo, restriction). *Kapu* were instituted during the spawning season of a fish species, which restricted fishermen from catching the fish and allowed the species to reproduce and repopulate. Used as a conservation tool, *kapu* are still used by Hawaiians today, however not legally enforceable as they were in ancient Hawai'i where violators were punished by death. Friedlander, Poepoe, et al (2000) explain that, "harvest management was not based on a specific amount of fish but on identifying the specific times and places that fishing could occur so it would not disrupt basic processes and habitats of important food resources…" (1).

Beyond the sacred *kapu*, Hawaiian low impact fishing techniques and equipment also lent itself to conserving the marine ecosystem and marine resources themselves. Fishermen would use spears, hook and line, nets, and torches for shallow night fishing (Figure 3.4, 3.5). Beyond the

common fish species—including ahi (tuna), āhole, ulua (jack fish), ʻama (mullet), awa (milkfish), aku (small tuna called bonito), and various other fish species, *he'e* (octopus), *honu* (turtle), and eel were also specially harvested marine resources (Kamakau 1976). And, as with anything in the Hawaiian culture, prayers and offerings before, during, and after fishing to the fishing akua or gods was the *pono* way to fish. And, while men held domain over the deep waters and fishponds, women harvested closer to home, using baskets and their hands to collect shellfish, *limu*, and smaller shore or river fish.

Figure 3.4: Illustration of night fishing with torch and spear, Source: Curtis 1997.

Along with offerings and prayers, it was expected that during any fishing expedition no talking would be heard. In fact, it was not usual to speak about one's intention to go fishing, partially for spiritual reasons and partially to be better able to observe subtle details of the environment. Indeed, speaking about going fishing, talking the day of one's fishing expedition, or even wives of fishermen speaking about their husband's activities was forbidden.

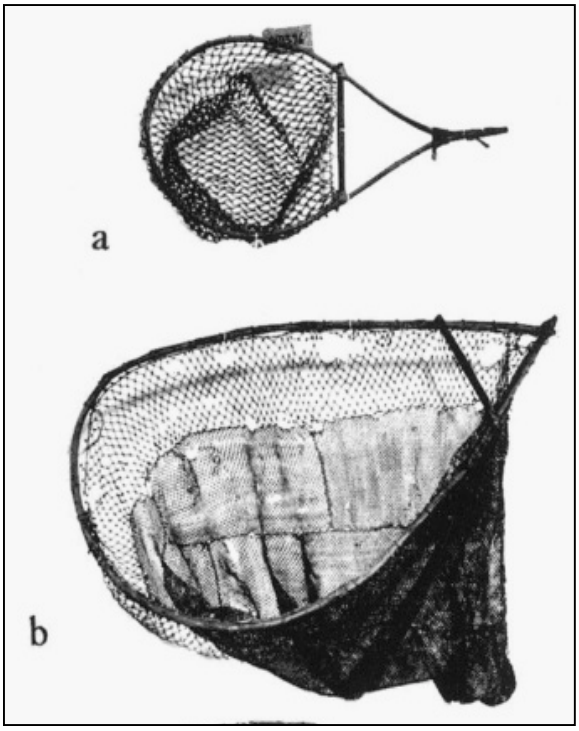


Figure 3.5: Traditional Hawaiian Fishing Nets, Source: Hiroa 1957.

In Hawai'i today, a community fishery management model has been utilized by several communities, most notably the Ho'olehua Hawaiian Homestead on Moloka'i, to practice and perpetuate traditional Hawaiian management. This system relies on community support, resource monitoring, conservation ethic, and local management knowledge to inform and practice traditional Hawaiian management. Poepoe et al (2003) writes:

> The good Hawaiian fisherman is always watching the ocean, monitoring it for cues that signal what can be fished, where and when, in a manner compatible with local resource 'rhythms' and to adapt fishing to changing environmental conditions. Key indicators include tidal cycles, waves and currents, day length, ocean temperature, habitat stability, sand movement, rainfall, wind velocity, and direction. (331)

Hawaiians, ancient and today, have utilized the moon calendar as the basis to which the *kapu* system was informed, drawing on three moon phases (ho'onui, *poepoe*, *emi*) and two general seasons (*ka'u* and *ho'oilo*) to guide fishing activities and restrictions for the major fish species in subsistence living (Poepoe 2003).

Lo'i & Irrigated Agriculture

While Ancient Hawaiians utilized both dry and wet agriculture, this section will focus on *lo'i* pond agriculture. *Lo'i* are irrigated terraces commonly used to grow taro or *kalo* (pictured in Figure 3.6). In Hawaiian mythology, the *kalo* plant was created through the death of Haloanaka, a child of the akua who formed the Hawaiian Islands (Wakea and Papa). It was from Haloanaka that the first *kalo*

Figure 3.6: Hawaiian kalo. Source: Cho et al 2007

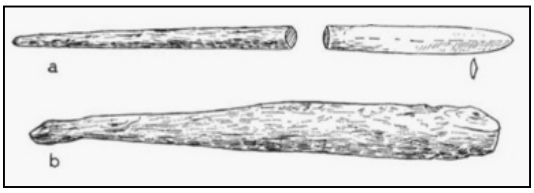


Figure 3.7: Traditional ‘ō‘ō or digging stick, Source: Hiroa 1957.

Figure 3.8: The kalo root to be made into poi (on the left), and the huli (on the right) used for replanting. Source: Cho et al 2007

plant grew and it was then the responsibility of Haloa, the younger sibling of Haloanaka and from who all Hawaiians are believed to descend from, to respect and care for his elder brother (*kalo*) and in return receive sustenance and nourishment (Cho et al 2007).

To create a new *lo’i* field, the land had to be flooded for several days to soak and soften the soil. Then, the *kuauna*, the embankments forming the sides of the *lo’i* pond, were built up by piling dirt from what would be the pond bottom. Large rocks, and weeds cleared from the site were stamped into the embankment and foundation, and then both were treaded—an event that combined work and celebration for ancient Hawaiians. Samuel Kamakau (1976) writes:

> It was a great day for the men, women, and children, and no chief or chiefess held himself too tabu to tread in the patch. Every man, woman, and child bedecked himself with greenery, and worked with all his might—trampling here and there, stirring the mud with his feet, dancing, rejoicing, shouting, panting, and making sport. This treading was done so that the water would not sink into the soil, and to allow the taro to grow. The taro was not planned until the next day, when the mud had settled to the bottom. (34)

Mounds, into which the *kalo* would be planted, were created in evenly spaced rows and tall enough so that the top crested the water level (Kalokuokamaile 1922). A digging stick, or ‘ō‘ō, (pictured in Figure 3.7) was used to make a hole in the top of the mound into which the *kalo* stalk, called *huli* (pictured in Figure 3.8), (the base of which was the top of the *kalo* corm or root)

was planted. Around the embankment of the *lo'i* ponds were planted banana plants, sugar cane, and ti (Kamakau 1976). And, when the *huli* had grown to have two or three leaves this was a signifier that the *kalo* would grow successfully—as long as the planter performed all the right prayers and work. These first leaves were cooked and eaten and a prayer said to give thanks to the gods and ask that there be enough food for the planters family and livestock (Kamakau 1976; Kane*ali'i* 1863). Appeals and prayers to the gods were made through the cultivation process and harvesting process to show thanks and respect for the *kalo* which, when cooked and pounded into *poi* (seen in Figure 3.9), was a main food source for Hawaiians.

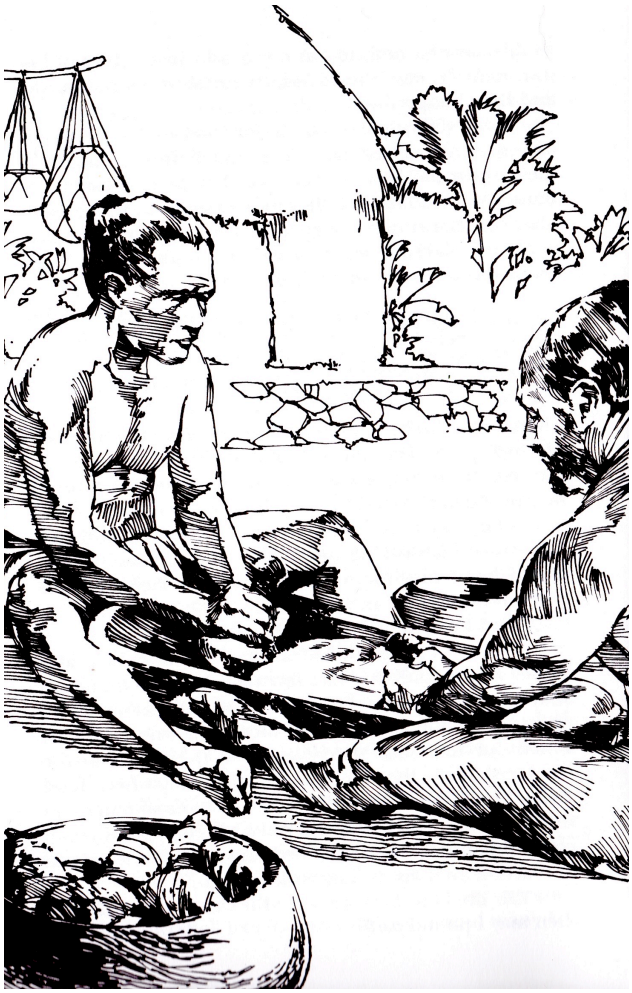


Figure 3.9: Illustration of traditional pounding process to make poi, Source: Curtis 1997

Upland Resources

From the uplands of their *ahupua'a* Ancient Hawaiians utilized forest resources for everything from cord for nets, to shelter and clothing. *Koa* acacia, or *Koa*, was the main tree used by Ancient Hawaiians to make canoes for *ali'i*, where the canoe would be carved out of a single

Figure 3.10: Illustration of traditional Koa harvesting for canoe building, Source: Curtis 1997

trunk. The tree would be cut down in the uplands (Figure 3.10), after the various prerequisite offers and prayers to the gods, and would be craved in the uplands, and only brought down to the shore once the canoe was ready for it's maiden voyage (Kamakau 1976; Curtis 1997). As *haole* businessmen and missionaries began to transform the Hawaiian forests into plantations for cattle grazing and monocultures in the 1800's, vast amounts of upland forests, including old growth *Koa* trees were cut down and cleared. In the last 10 to 20 years there has been a concerted effort, especially on the big island, to restore and replant native forests including *Koa* in order to perpetuate Hawaiian cultural practices and traditions and pass them on to future generations.

Olona fiber was an extremely valued item for Ancient Hawaiians as it was the best cord for use in all things fishing. The fiber was used to make the best fishing nets and fishing line, as well as rope and other items. The fiber was extremely strong, but extremely laborious to harvest or scrape from the *olona* plant bark, and required a trained and skilled hand to do it. For this reason it held much value in Hawaiian society, and the people of Moloka'i and Maui were known for their skill in scraping *olona* (Kamakau 1976).

Other plant fiber was also used for cordage or rope, although not as strong as the *olona*, *niu* or coconut fiber, and various sedges or grasses were also used, especially in the building of shelters (see Figure 3.11). Shelters themselves in Ancient Hawaii were thatched structures built using tall pili grass (and sometimes large rocks for the walls) gathered from the uplands or midland agricultural areas (see Figure 3.12). House building was a communal process, supervised by elders, and filled with the necessary offerings, prayers, and thanks to the gods, and with every person contributing whether it was by gathering and piling the pili grass, helping in setting the posts of the house, or in plaiting or braiding the pili for the walls and thatched roof. The final blessing ceremony was done as part of a celebratory feast for the couple's house in which the *piko*, or the plaiting tail that ended in the frame of the doorway was cut by the couple (Kamakau 1976; Curtis 1997).

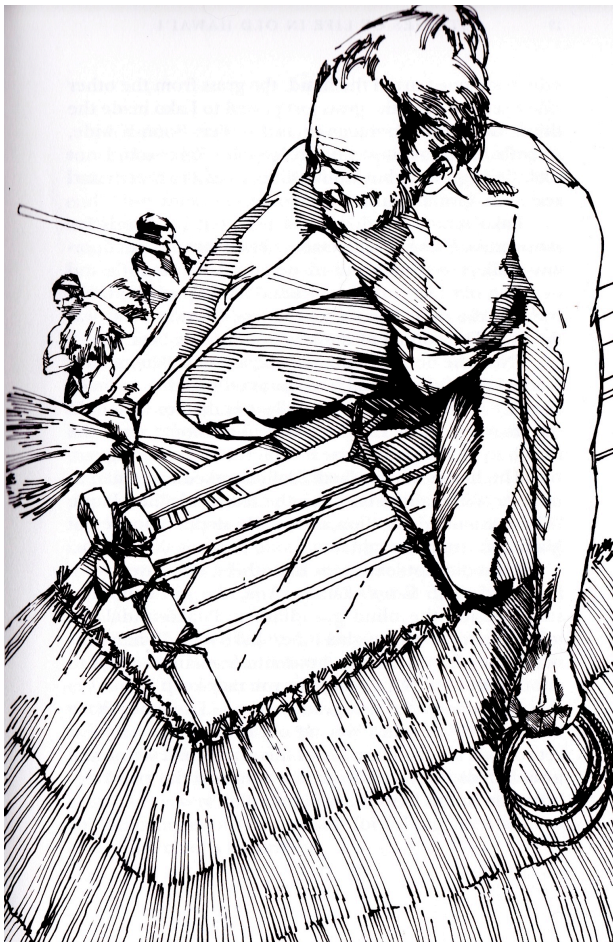


Figure 3.11: Illustration of traditional house building technique. Source: Curtis 1997

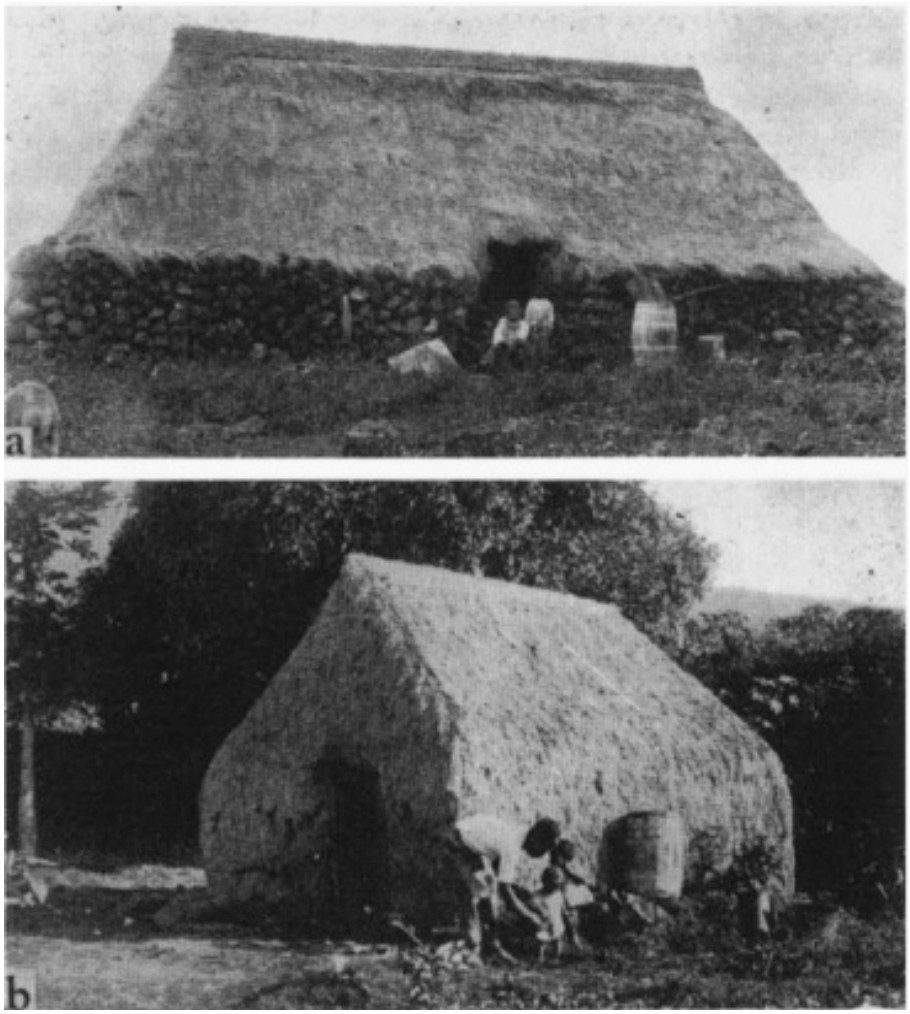


Figure 3.12: Traditional Hawaiian shelter using pili grasses, Source: Hiroa 1957.

Clothing, bedding, and mats were made using kapa or tapa barkcloth gathered from upland wauke or paper mulberry trees (Kamakau 1976). Traditional malos (breechcloth) for men, dresses and skirts for women, rain or cold weather capes for both sexes, as well as blankets, pillows, bedding mats, and eating mats were made from kapa cloth. Women held domain over the harvesting, beating, dying or printing and plaiting of the kapa, with each step in the process preceded by offerings, thanks, and prayers to the forest and kapa gods (Kamakau 1976). The same is true for the harvesting of any plant or tree from the upland forest, and in fact, an offering was given before one even entered into the forest and it was customary to speak as little as

possible while in the forests (Curtis 1998). The kapa beating left the barkcloth thin and soft (depending on how long it was beaten for and the skill of the maker), and the addition of printing and dying, something done for a special occasion or for *ali'i,* added an artistic and eye-catching element to the kapa clothing, bedding, and mats (see Figure 3.13). *Pa'a mai'a* or banana sheath fibers, and ti leaf was also used for clothing, especially capes, and mats or bedding (Kamakau 1976).

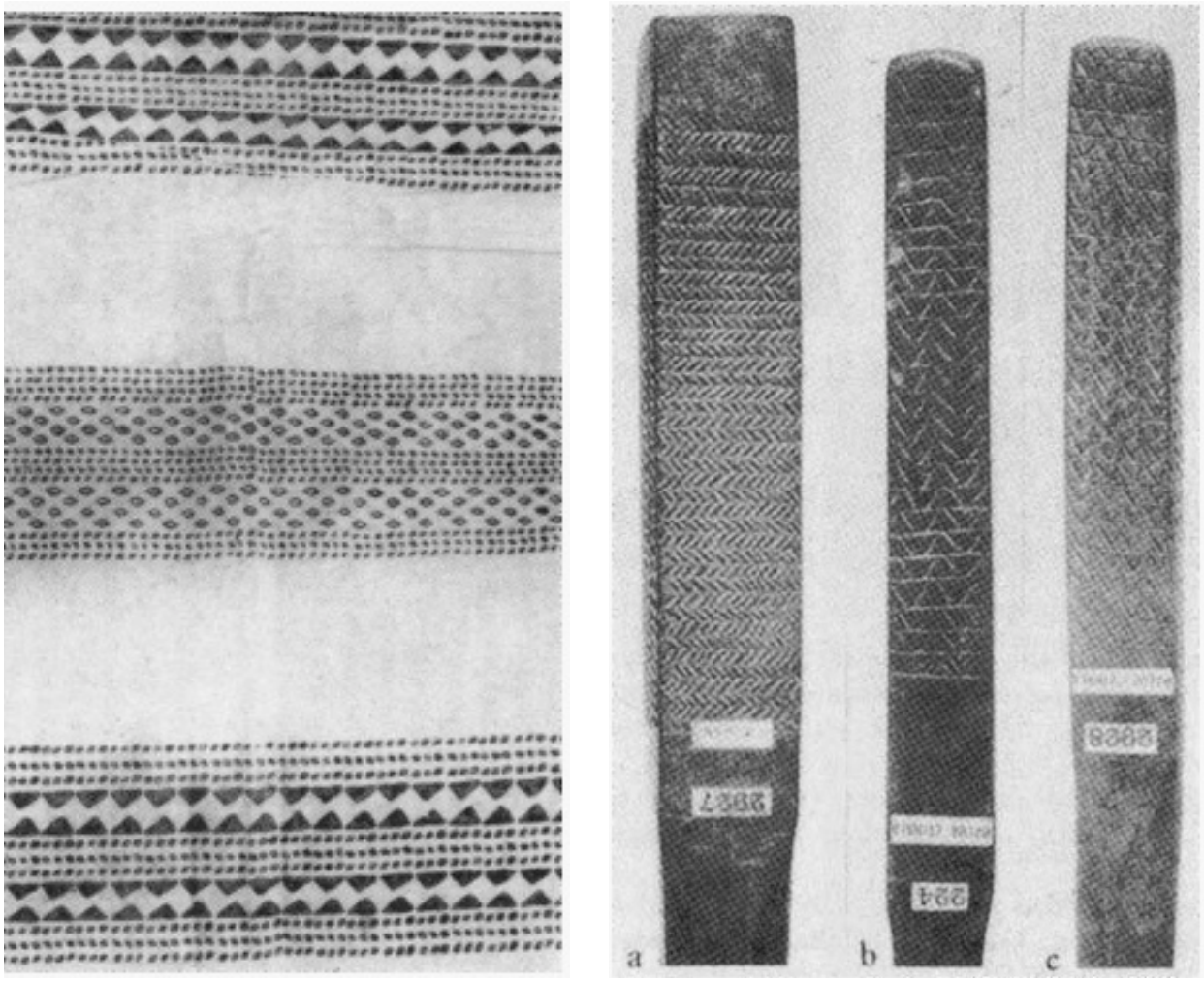


Figure 3.13: Kapa cloth (left) & kapa beaters (right), Source: Hiroa, 1957.

Moloka‘i & O‘ahu in Brief

Moloka'i

Geography & Climate

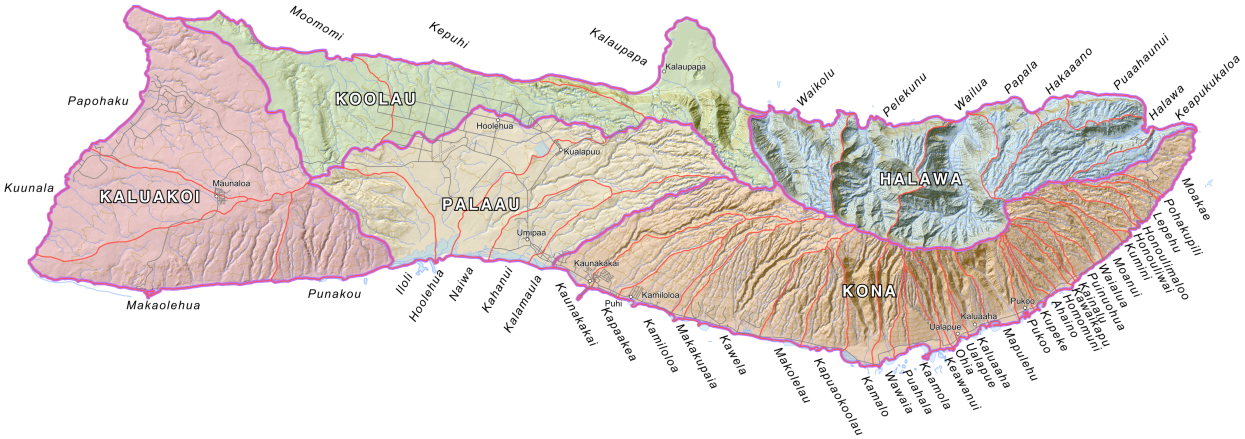


Figure 3.14: Moku of Moloka’i. Source: Islandbreath.org

Moloka’i (seen in Figure 3.14) was formed from a combination of three separate volcanoes—Pu’u Nānā (near Maunaloa) on the west side, Kalaupapa on the north, and Kamakou on the east (Juvik 1998). Running east and west along the trade wind route, the island is known for its year round wind as well as the dramatic ecosystem change between the west and east sides of the island. The east side of Moloka’i houses lush, dense forests and valleys, and high sea cliffs that are inaccessible by vehicle. The eastern tip features the valleys of Pelekunu, Wailau, and Hālawa, which used to be acres and acres of *lo’i* fields, but now only dot the landscape of these valleys (Juvik 1998). Hālawa valley is home to dozens of small land parcels, *kuleana* lands that bought or awarded in the *Māhele* and proceeding land awards and owned by the original buyers combined descendants. The west side of Moloka’i is drastically different, with dry, desert like conditions, and dirt as red as brick. The lack of any high mountains (with Pu’u Nānā only being

1,300 feet), the trade winds, and lack of rainfall have created a dry and harsh environment, with sand dunes along the northwest coast at Mo'omomi Bay (Juvik 1998). The west side was largely agricultural land until the 1980s, with pineapple and cattle grazing being the main usages.

The most extensive system of *loko* i'a or fishponds in the Hawaiian Islands can be found on Moloka'i's south shore. Because of the south shore's shallow reef system it provided the perfect environment to build fishponds and at one time housed over 60 ponds along the south shore alone (Costa-Pierce 1987; Juvik 1998)! Many of these *loko* have been damaged—whether by soil erosion from cattle grazing and pastures, the invasive mangroves, or natural weather events. However, as on most other islands, there are many concerted efforts to repair, and restore several of the fishponds. Another unique feature of Moloka'i is its isolated Kalaupapa peninsula, which is accessible only by foot, donkey, or plane/boat. The peninsula once housed a colony for those with Hansen's disease, but is now Kalaupapa national park, with a small town and airstrip remaining on the peninsula, home to the remaining families and residents of the colony (around 60), who receive food and supplies by plane.

Population & Community

Moloka'i is a unique island in that it has been able to retain much of the traditional Hawaiian lifestyle that has been compromised on the other bigger islands. There are no traffic lights, no chain stores of any kind, 75% of the population is of some sort of Hawaiian descent, and subsistence living is not just done out of necessity, but also out of upholding cultural traditions and knowledge. On average, 28% of the food for all families is acquired through subsistence means (Matsuoka, McGregor, & Minerbi 1998). Moloka'i also boasts an average unemployment

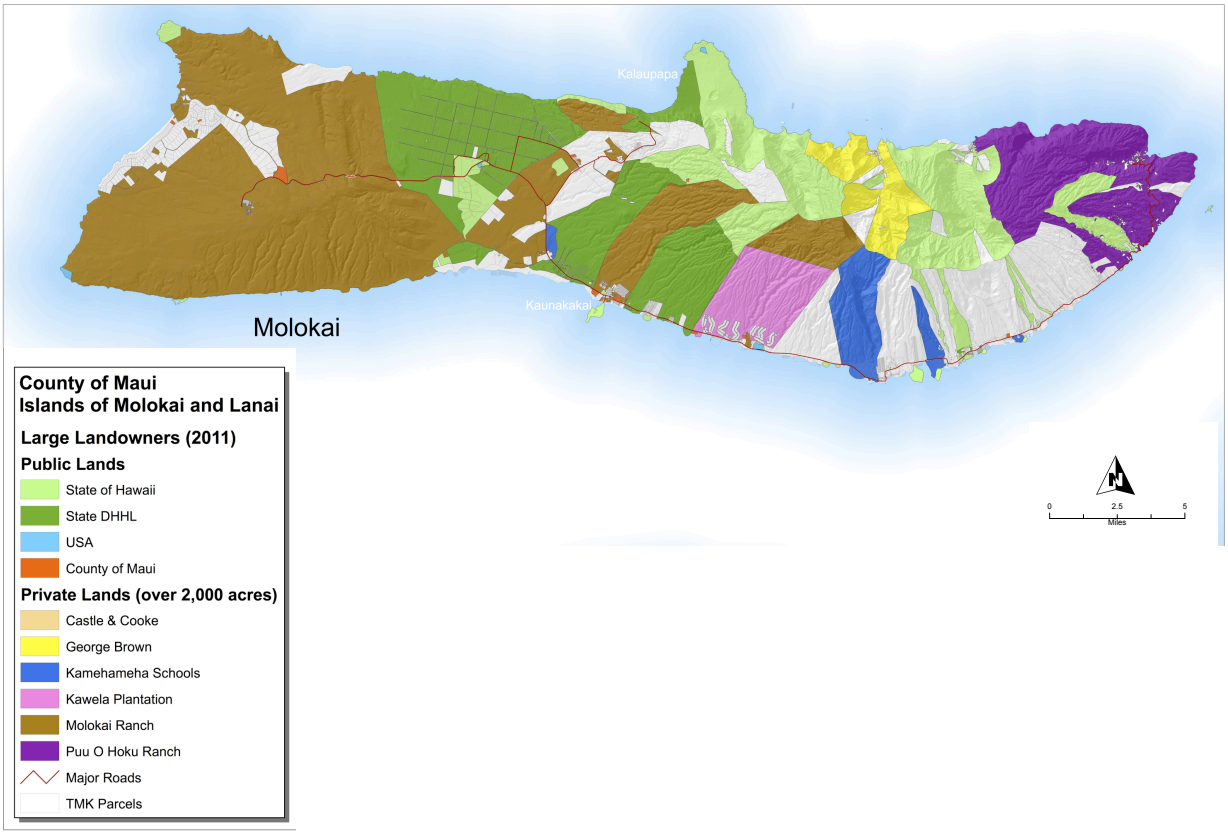
rate of 17%, and, like most cultures that have been subjected to white acculturation, a struggle with chemical dependency, especially meth, is well known but not well documented among Moloka'i's adolescents (Cluett 2011; Chao 2012).

One of Moloka'i's biggest strengths is its ability to speak with one voice and speak strongly against large development projects that would harm Moloka'is natural resources and its traditional way of life. After successfully stopping real estate development at La'u point on the west side and cruise ship access to the Moloka'i port, they are currently working to ensure that a wind turbine project that would provide energy for O'ahu is not built on Moloka'i (Cooke 2011). While this may seem counterproductive to energy sustainability, in actuality, the development project could severely impact Moloka'is land and water resources—including using explosives to lay cable on the ocean floor from Moloka'i to O'ahu in the path of whale migration routes—to harness energy that will never even be available to residents on Moloka'i (Cooke 2011). Residents in Moloka'i have seen how O'ahu's natural environment have been compromised by development, and it appears to them now that O'ahu is looking to siphon resources from other islands that have taken better care. Astronomical energy prices for Hawaii residents are a problem on every island, including Moloka'i, which has higher energy costs than O'ahu. The fact that developers want to use Moloka'i purely for its wind without there being any usefulness for Moloka'i appears as a completely unsustainable proposal to local residents.

Land ownership in Moloka'i

According to the acreage figures published by the Hawai'i Department of Business, Economic Development & Tourism in 2011, the seven largest landowners on Moloka'i own over 80% of

the total acreage on the island (135,527.4 acres out the island's 165,800 acres). Moloka'i Ranch tops the list, owning over 58,000 acres, which makes up the vast majority of the west side of Moloka'i save for the Ho'olehua Hawaiian homelands. In 2008, Moloka'i Properties Limited, which owns the ranch, attempted to develop hundreds of luxury homes on La'au point (a sacred site for Hawaiians), but was successfully blocked by locals. As a result, the company pulled all of their business out of Moloka'i, keeping the land but closing a resort, hotel, movie theatre, restaurants, golf course, and gas station. They also tried to close down the utility plants they own on Moloka'i which serve many residents on the west side, but were legally blocked from following through with this endeavor.



Map 3.1: Large Landowners on Moloka'i. Source: Hawai'i Department of Business, Economic Development, and Tourism, 2011.

The State of Hawai'i is another large landowner, with the Department of Hawaiian Homelands owning over 24,000 acres, and the state owning just over 24,000 acres (mostly in parks, and forest reserves). Pu'u O Hoku Ranch owns a large amount of land on the eastern tip of Moloka'i, just over 13,000 acres. Kawela Plantation, which is less a plantation and more of a homeowner's association, owns over 5,500 acres, and Kamehameha Schools owns just under 5,000 acres. Lastly, George Brown owns 4,500 acres on the northeast side of Moloka'i, largely uninhabited.

O'ahu

Geography & Climate

Two parallel mountain ranges form the island of O'ahu, the Ko'olau range on the windward side and Wai'anae range on the leeward side. Unlike Moloka'i's parallel siting along the trade wind route, O'ahu is aligned perpendicular with adequate mountain ranges to provide protect from wind for certain areas and very distinct climate differences between the two sides—windward and leeward. The Ko'olau mountain range is known for it's torrential rain, over 250 inches annually, while the leeward side of island enjoys a dryer, sunnier climate receiving less than 20 inches of rain per year (Juvik 1998).

The southern coast of O'ahu, running from Hawai'i Kai to Ewa (including Honolulu and the Pearl Harbor area) form a natural harbor through the coralline limestone seafloor creating a coastal plain ideal for a harbor and commercial ports (Juvik 1998). The Leilehua Plateau, lying in between the two mountain ranges, was transformed into agricultural land by missionaries and *haole* businessmen in the 1800's; however, after sugarcane production stopped on O'ahu in 1996 the area was committed to urbanization—especially the Ewa plain. However, there are still many

acres of agricultural land in the interior up closer to the north shore (Juvik 1998). In addition, the Plateau is heavily inhabited by military personnel at Schofield barracks and other military installations or training areas.

Population & Community

The island of O'ahu houses around 70% of the state's total population, with a total of six *moku* (Figure 3.15). On the leeward side of the island houses the Wai'anae, and Ewa *moku*, which extends from the southern leeward coast to the south half of the central plateau. Kona *moku*, which incorporates Honolulu, runs from the central south coast to the southern tip of O'ahu, and Ko'olaupoko encompasses the southern half of the windward coast. Ko'olauloa is the *moku* on the northern half of the windward coast, and Waialua includes the north shore surfing destination and the northern half of the central plateau.

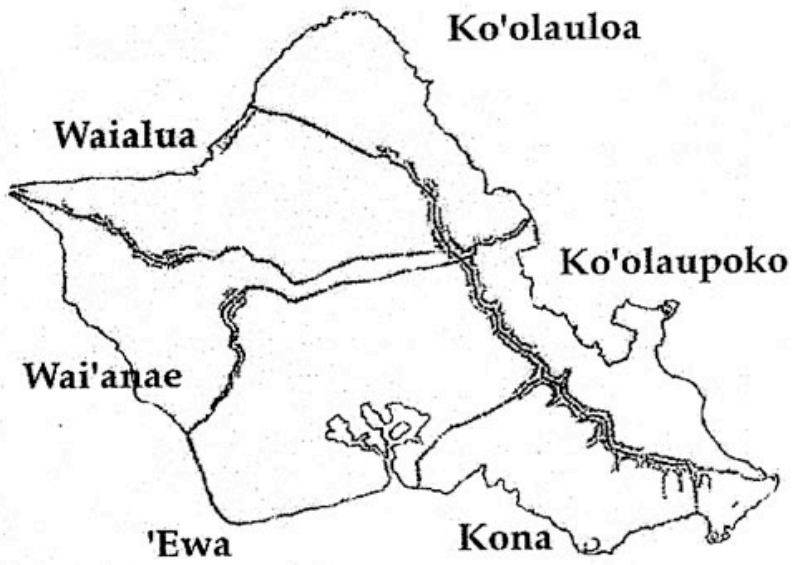


Figure 3.15: Moku of O'ahu. Source: Office of Hawaiian Affairs 2011.

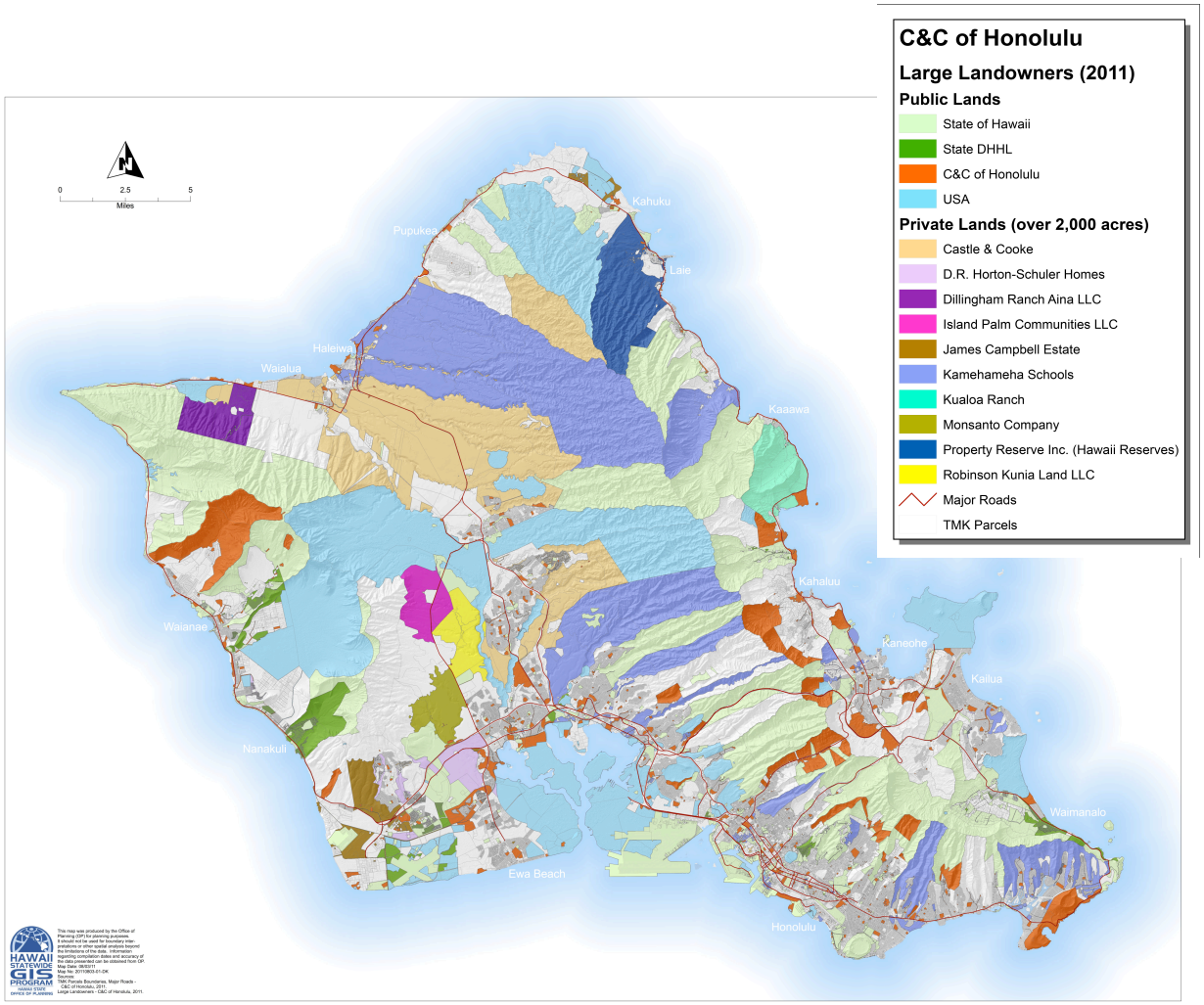
As the most populated of the Hawaiian Islands, there is a unique and important history in each *moku*, each *ahupua'a*, each city, which would be impossible to properly represent here. In lieu of that, this section will provide a brief overview of some of the demographics of the communities on O'ahu.

The Wai'anae *moku*, and Wai'anae itself, as well as some of the areas in the southern Ewa *moku* (like Pearl City and Waipahu) are largely lower income, with higher poverty rates, and higher rates of native Hawaiians residing here as well (especially in Wai'anae which is where a large Hawaiian Homelands area is located). Haleiwa, in the Waialua *moku* to the north also has a high poverty rate, however it's plantation style of the town and fame of the north shore waves brings a large tourist population and lower crime rate than Wai'anae.

Mililani in the Ewa *moku* is one of the weathiest areas on O'ahu, along with Kailua in the windward Ko'olaupoko *moku*. Indeed, many of the windward Ko'olaupoko areas have low poverty rates and high incomes, like Kanehoe and He'eia. Whereas, Honolulu is a patchwork of both rich and poor (including the Kahala neighborhood which houses some of the most expensive houses in all of Hawai'i), confined to a densely packed urban area, which contributes to a high concentration of environmental concerns. The polluting of Ala Wai canal that leads out into Waikiki beach and the Pacific Ocean is one of the most chronic environmental problems for the island.

Land Ownership in O'ahu

Utilizing the acreage figures published by the Hawai'i Department of Business, Economic Development & Tourism in 2011, the top eight land owners in O'ahu own 65% of the island, or 251,709.7 acres of the islands 386,188 acres. The State of Hawai'i and the US government ranks as the top two land owners on O'ahu, owning over 80,000 and over 60,000 acres respectively. These areas consist of state parks and state preserves, federally owned bases and airfields for various military branches.



Map 3.2: Large Landowners on O'ahu. Source: Hawai'i Department of Business, Economic Development, and Tourism, 2011.

Kamehameha Schools owns over 47,000 acres on O'ahu, owning large tracts of land on the windward most of which is set aside for education and conservation. Castle & Cooke owns almost 30,000 acres largely dedicated to monoculture agriculture. They are one of the companies well known in Hawai'i as the "big five"—a group of five companies originally in the sugarcane business (controlling almost 90% of the sugar industry, and 80% of all cargo ships carrying supplies to and from the mainland) that held an unethical amount of political power in the late 1800's, early 1900's (Wiener 1982; Danninger 2002). Members of the "big five" sat on each other's boards and conspired to keep prices high for their products and services, representing a Hawaiian oligarchy. It was not until the 1950's and 60's that the advent of unions and legal action against the companies ended the big five's half century reign in Hawai'i.

The Honolulu County owns over 18,000 acres all over the island in the form of golf courses, parks and other recreation areas. Property Reserve Inc, or Hawaii Reserves, is a subsidiary of the Church of Latter Day Saints, and owns 6,600 acres of land in the Laie area on the windward side of O'ahu. This represents a strong haven for Mormons, including a Mormon temple, and a Bringham-Young University Campus. The Hawai'i state Department of Hawaiian Homelands owns 4,500 acres mostly on the leeward side running from Ewa to Wai'anae, and some land on the windward side in areas like Waimanalo. Kualoa ranch owns a tract of 3,600 acres on the windward side of O'ahu. This land is owned by the descendants of G.P. Judd, one the *haole* advisors to the *Mō'ī* who was awarded the land in the *Māhele*. Although originally opposed the sale of land to foreigners, he ended up with great tracts of valued land on Maui and O'ahu anyway, including Kualoa (Silva 2006). Today, the ranch is a sort of recreation center, and a large tourist attraction with tour buses lined up in it parking lot on most days.

Chapter 4: Methods & Analysis

Lawe I ka ma'alea a ku'ono'ono.
Acquire skill and make it deep.

- Hawaiian Proverb

The information presented in this chapter only begins to recognize an area of practice and study that has experts all their own, notably, the *konohiki* and traditional practitioners whom participated in this research. The time spent researching and collecting information has only scratched the surface of increasing the researcher's knowledge of traditional Hawaiian resource management. This data is a peek into the work and the knowledge of expert *konohiki* and educators, and could not exist without their insight and willingness to share with the researcher.

Research Design

In undertaking this study, a qualitative interviewing method was utilized to interview *konohiki* and educators about traditional management practices and the successes and obstacles they have encountered in practicing and teaching traditional Hawaiian natural resource management. To analyze the data collected through interviews, both quantitative and qualitative analysis methods were used including theme coding of interview transcripts and use of data tables of land ownership and acreage.

Interview Methods

In approaching the interviewing with *konohiki*, or practitioners, and educators, a semi-directive ethnographic interviewing method was used that incorporates visual aids and maps to facilitate the interview process. This method has been utilized frequently in study involving traditional ecological knowledge (*TEK*), as it is ideal for cross cultural communication, and its effectiveness documented by Huntington (1998) in his study with Inupiaq and Yupik communities in Alaska. The method, while guided by the interviewer, has no fixed questions or preset limit, and allows the participant to identify the direction and scope in order ensure that the important topic areas are covered even if unknown to the interviewer. The interviews take on format similar to conversation, with the help of visual aids, maps, recordings, and other useful aids to generate discussion. Huntington observes, "… the technique allowed participants to make connections that they saw and that might not be anticipated by an interviewer…" (240).

For the purposes of this study, interviews were done "on site", at the locations managed or used in educational activities by *konohiki* and educators. This facilitated the communication of broad information about the land and site itself (ie: ownership, history) and detailed information about the management goals, practices, and obstacles. The interviews were either audio recorded, or the interviewer took notes (if either the participant did not give permission or the wind interfered with audio).

Sites of Study

Kahina Pōhaku Fishpond, Moloka'i

On Moloka‘is south shore, along 28 miles of uninterrupted coral reef, ancient Hawaiians built over 60 fishponds in the 13th century (Costa-Pierce 1987). Many of these fishponds no longer function as once was intended, although in the late 1990‘s the state instituted a “traditional use” policy for these fishponds and efforts to restore many of them are ongoing. One of the last fishponds as you head east is Kahina *pōhaku* fishpond, and it‘s *konohiki*, Uncle Leimana Naki (Figure 4.1). Dressed in traditional *malo*, Uncle lives at the fishpond, welcoming and teaching school groups and visitors about the pond, its resources, and Hawaiian culture. With the help of volunteers and many school groups, Uncle is working to rebuild the kuapa and eventually restore the *loko*.

Figure 4.1: Leimana Naki, konohiki at Kahina Pohaku, Source: Heckathorn 2010

Halawa Valley, Moloka'i

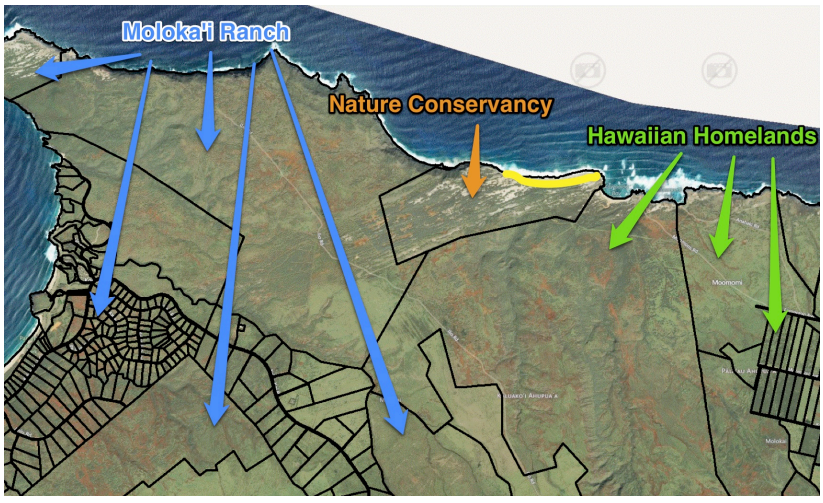
While this area once housed an abundance of taro patches, lo‘i ponds along the stream bank, today it is mainly overgrown (Figure 4.2). Most of the valley consists of small parcels of *kuleana* lands, purchased by Hawaiian family‘s after the Mahele in 1848, and passed down to their ancestors to today, and land owned by the Pu'u O Hoku Ranch. Mahina Hou Ross, a Hawaiian

Language Immersion teacher at Moloka'i High School, manages and cares for his family's *lo'i* fields that they build several years ago on their *kuleana* land, and spoke about the history and importance of this area.

Figure 4.2: Halawa Valley, Moloka'i, Photo by Melissa K Pico

Mo'omomi Bay, Moloka'i

A favorite spot for sea turtles and Hawaiians alike, Mo'omomi Bay houses harsh trade winds, and dry warm weather, which creates its characteristic sand dunes. Uncle Mac Poepoe is the *konohiki* here—responsible for ocean resources and trespassers, and everything in between. Hawaiian Homelands, and Moloka'i Ranch are the big landowners, with The Nature Conservancy owning a small portion of land as well. Uncle Mac and Hui Mālama O Mo'omomi closely monitor the resources at Mo'omomi Bay, and often have school groups that come out to participate in these scientific investigations.



Map 4.1: Map of Mo'omomi Bay land parcels and owners, modified from Counties of Kauai, Maui, and Hawaii 2011.

Ko'olaupoko Moku, O'ahu

The *moku* of Ko'olaupoko is located on the windward side of the island of O'ahu and extending from Kualoa *Ahupua'a* in the north to Waimanalo *Ahupua'a* on the south (depending on who you talk to or what map you are referencing). In Ko'olaupoko there is a concerted and focused effort to bring the traditional management system back into the community—normalize it as a part of everyday life. In January 2012, The Ko'olaupoko Hawaiian Civic Club spearheaded a collaborative effort with various non-profit organizations in Ko'olaupoko and city and state officials to put up *Ahupua'a* boundary markers for the eleven *Ahupua'a* in the Ko'olaupoko *moku* (as they are depicted on the 1876 Hawaiian Kingdom Map) (Murray 2011; M. Matsuzaki, personal communication, March 2012). Mahaelani Matsuzaki, a land legacy education specialist with the Kamehameha School's 'Āina Ulu Program, spends much of her time in Ko'olaupoko, working with community organizations that are currently leasing Kamehameha school lands to strengthen the connection between native Hawaiian communities and the organizations, many of whom practice traditional management methods.

Kawainui Marsh, O'ahu

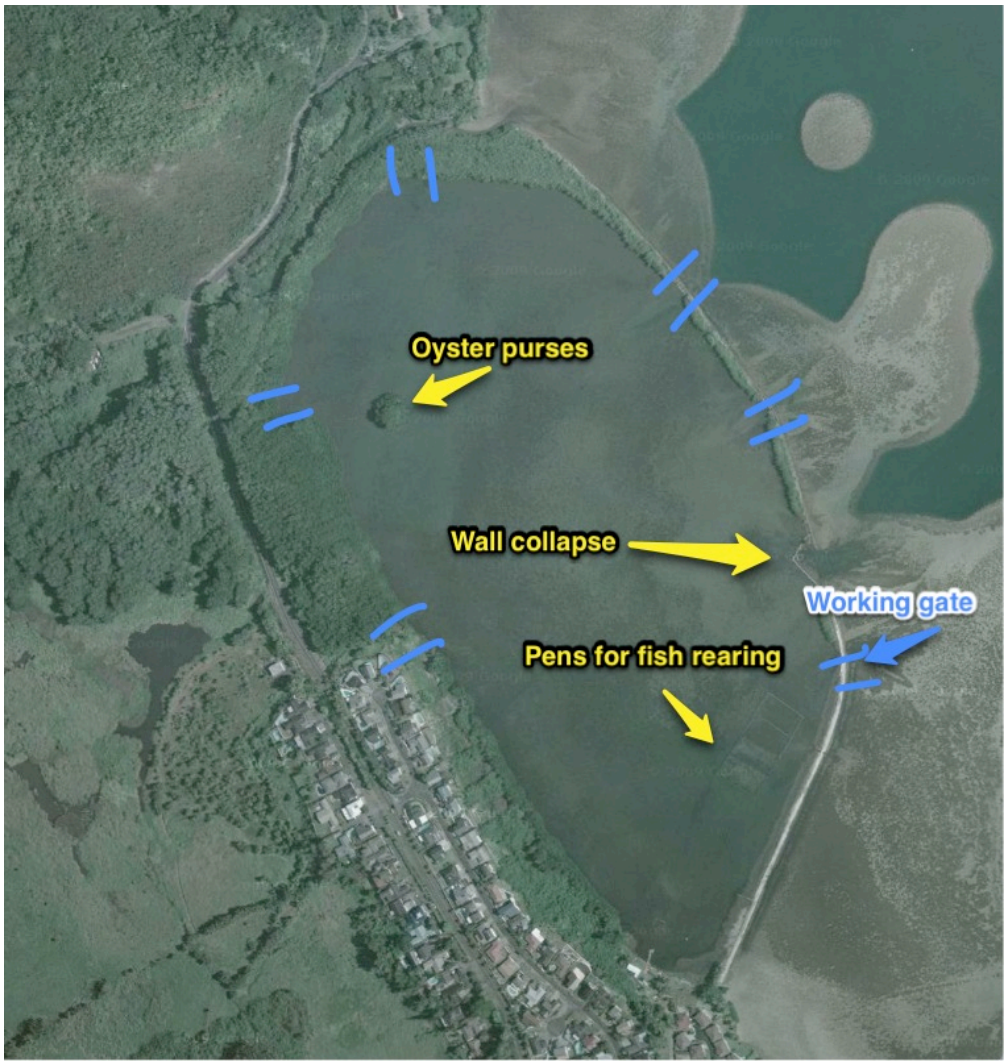
Located in windward Kailua, Kawainui marsh used to be a thriving wetland, fishpond, and site of two heiau (Hawaiian sacred sites) Ulupō and Nā *Pōhaku* O Hauwahine. Kailua, the *ahupua'a* where Kawainui is located, has been drastically transformed since the late 1800s when the change from a subsistence to capitalist economy lead to the diversion of natural water ways, and the building of dikes and canals to turn wetlands, sandbar, and waterways (marked in Map 4.2) into cattle grazing and rice paddies. While the heiau still remain, what used to be a 400-acre fishpond and wetland area for birds (both native and migratory) and taro patches is now covered

with mats of invasive floating grass (C. Burrows, personal communication, March 2012). From the surface, you would never know that a few inches below the seemingly serene grasses lies a body of water. Doc Burrows, and Ka'imi Scudder are two of the caretakers for Kawainui Wetlands, under the auspices of the non-profit organization 'Ahahui Mālama i ka Lōkahi, that work to restore and preserve Native Hawaiian ecosystems through "ethnobotanical restoration" (C. Burrows, personal communication, March 2012). In 2005, Kawainui was recognized as a wetland site of international importance by the organization Ramsar.

Map 4.2: Map of Kawainui Marsh and surrounding area, modified from Google Maps 2012.

He'eia Fishpond, O'ahu

This five acre *loko* kuapā in the He'eia *ahupua'a* of the Ko'olaupoko *moku* has been the site of Paepae 'O He'eia for over 10 years. What started out as a project for part of a University of



Map 4.3: Map of He'eia Fishpond, O'ahu, modified from Google Maps 2012.

Hawai'i Hawaiian Studies class developed into an organization working to restore and revitalize the He'eia fishpond as well as the He'eia community. Hi'ilei Kawelo, the Executive Director of Paepae O He'eia, and the rest of the staff have created various opportunities for community and youth involvement in the fishpond's restoration efforts. Besides restoring the pond, the group also has an education, and community-based economic development element in that their ultimate goal is to feed people from the fishpond (M. Matsuzaki, personal communication, March 2012). The fishpond itself is unique in that the kuapā or seawall actually runs around the whole pond, even on the *mauka* (inland) side, with three *makahā* facing *makai* (seaward) and

three facing *mauka* (marked in map 4.3). Only one of the *makahā* has been restored, and while Paepae O He'eia has done a tremendous amount of work clearing out invasive mangroves—which torment fishponds all around Hawai'i—surrounding the pond, they are still in process of restoring the kuapā itself. In the 1960s, a river flood broke out a portion of the wall on the *mauka* and *makai* side (H. Kawelo, personal communication, March 2012). The organization is currently in the process of doing archaeological surveys and permitting in order to restore the wall. The fishpond produces fish through installed fish pens (put in by Paepae), and oysters (marked in map 4.3), although the water quality prevents any commercial use or sale of either (H. Kawelo, personal communication, March 2012).

Data Analysis

The analyze interview data, the interviewer produced transcripts of each interview from audio recording and/or written notes. A code was assigned to specific topics and keywords covered in the transcript, and then each topic or keyword was assigned to a corresponding theme category that was used to perform data analysis determining frequency of themes in each interview, on each island, and as a whole. The defined themes and sub-themes were generated from the specific topics themselves and consisted of the following:

- Traditional Management Practices
    - Sub themes: Aquaculture, Marine Resources, Agriculture, Traditional Management Principles
- Hawaiian Culture, Values, & History
- *TEK* Education
- Development & Economy
- Community Involvement
- Lack of Institutional Support
- Long-term Ecological Planning

These themes, analyzed based on frequency, are discussed in the context of broader themes in which they intersect or correspond. For instance, traditional management practices, development and economy, and a lack of institutional support all involve issues of the clash between the traditional and conventional management systems and cultures (as seen in Figure 4.3). These broader themes allow for conclusions to be drawn about the successes and obstacles that the six traditional practitioners interviewed for this study encounter in the field of traditional Hawaiian natural resource management.

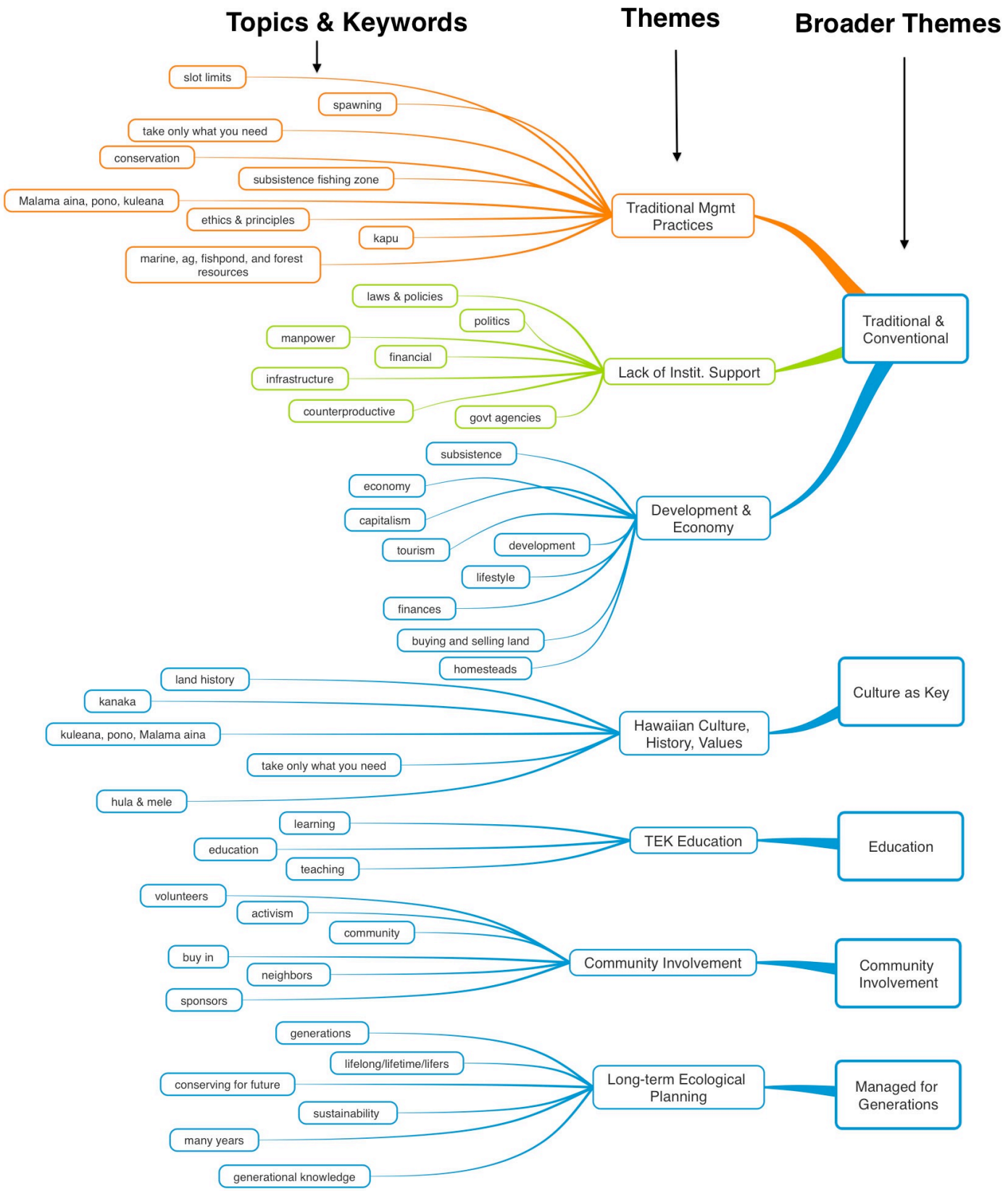


Figure 4.3: concept map of code analysis grouping, topics and keywords are samples, not extensive list of topics and keywords identified, created by Melissa K Pico.

Results

In general, there was not a large disparity between the themes most frequently discussed on Moloka'i versus O'ahu. Traditional management practices and Hawaiian culture, values, and history were the most frequently discussed themes, as depicted in the Table 4.1. The high value of these two themes is logical considering the topic of study is a management system particular to the Hawaiian culture. However, the fact that culture was *equally* important as the management practices themselves provides insight into how traditional management is framed, and is a topic to be delved into in the proceeding discussion section.

Table 4.1*: Frequency of Coding Themes from Qualitative Interviewing for Moloka'i, O'ahu, and both islands, %*

Theme	Both Islands	Moloka'i	O'ahu
Traditional Management	26%	28%	23%
Hawaiian Culture, Values, History	26%	26%	25%
TEK Education	13%	16%	9%
Community Involvement	10%	6%	15%
Long-term Eco Planning	9%	9%	10%
Development & Economy	8%	7%	10%
Lack of Instit. Support	8%	9%	8%

When looking at the frequency variation between islands, long-term ecological planning, development and economy, and lack of institutional support were all equally discussed themes, while *TEK* education and community involvement require further analysis. The variance of *TEK* education on Moloka'i and O'ahu (16% and 9% respectively) may be simply due to the fact that one of the interviewees on Moloka'i was a school teacher; however, when looking at the individual frequencies (in Table 4.2) there does not seem to be a disparity among the traditional practitioners on Moloka'i. What seems to be the issue is that *TEK* education was more of a focus

for all three practitioners on Moloka'i; whereas on O'ahu, while all three practitioners spoke about education, in was more in the realm of community involvement rather than education—especially for Mahaelani and Hi'lei. For example, discussion of how to educate or reach the community to have more involvement or "buy-in" for the work they are doing (C. Burrows, personal communication, March 2012; H. Kawelo, personal communication, March 2012). Practitioners on Moloka'i frequently spoke about direct traditional education, referring to topics such as the incorporation of traditional practices in classroom settings, teaching school groups traditional observation or science methods, and changing behavior through education incorporating traditional practices (K. Poepoe, personal communication, March 2012; M. Hou-Ross, personal communication, March 2012; L. Naki, personal communication, March 2012).

***Table 4.2**: Frequency of Coding Themes in Qualitative Interviewing for individual practitioners, %*

Theme	Mahina	Leimana	Mac	Doc Burrows	Mahaelani	Hi'ilei
TEK Education	17%	17%	15%	10%	9%	7%
Community Involvement	7%	9%	4%	18%	12%	15%

Similarly, the theme of community involvement was focused on more with practitioners on O'ahu than on Moloka'i (15% and 6% respectively). A possible explanation may be that Moloka'i's small, rural community has an already established history of working together to protect their island and lifestyle. In this sense, because a high level of community involvement is customary on Moloka'i the issue was not as frequently discussed as much on Moloka'i. On O'ahu, with its much larger, mostly urban, population the practitioners seemed to working to get

back to that place, speaking about community investment and buy-in as part of the restoration process (H. Kawelo, personal communication, March 2012).

Looking at the sub-themes of traditional management practices in Table 4.3—aquaculture, marine resources, agriculture, and traditional management principles—the variation between resource units is dependent upon the area in which the practitioner focuses. This is most notable in marine resources, where one of the practitioners on Moloka'i oversees these resources; however, none of the practitioners on O'ahu focused mainly on marine resources unless in the context of aquaculture like fishponds. The large variation in the frequency of discussion of principles of management between Moloka'i and O'ahu is explained by the differing focuses by the two educators that were interviewed (one on Moloka'i, and one on O'ahu). On O'ahu, the educator interviewed had no direct management role, and her discussion of traditional management focused more on the foundations and principles rather than any specific resource unit (M. Matsuzaki, personal communication, March 2012). In comparison, the educator on Moloka'i, who also cares for his family's *lo'i* fields, tended to speak about traditional management in the context of a specific resource unit and site that was familiar, and for which he felt kuleana toward (M. Hou-Ross, personal communication, March 2012). The following section will discuss the trends and themes

***Table 4.3**: Frequency of Coding Sub-Themes in Qualitative Interviewing for Moloka'i, O'ahu, and both islands, %*

Theme/ Sub-theme	Both Islands	Moloka'i	O'ahu
Traditional Management	26%	28%	23%
Aquaculture	20%	16%	25%
Marine Resources	34%	47%	11%
Agriculture	17%	12%	21%
Principles of Management	30%	22%	43%

more specifically and thoroughly, illustrating connections and patterns among interview themes and broader themes.

Discussion & Interpreting the Data

The Traditional & the Conventional

The most prominent theme that came up throughout the interviews, especially in speaking about traditional management practices and work, was the juxtaposition of traditional practice and conventional methods, laws, and policies. This section focuses on a lack of institutional support, the enduring commitment of the *konohiki* and educators that do traditional work, and the development and economy issues prevalent for most island economies. These were all topics that came up in the broader context of the clash between traditional culture-based management and today's detached yet rigid government-directed management.

Development and economy issues are a prime example of where traditional ethics and practices diverge from conventional capitalist or profit-driven policies and practices. For practitioners on Moloka'i, their ability to maintain their subsistence economy ways against the increasingly crushing yoke of capitalism is an every day struggle, as more and more developers and profiteers turn their eyes on Moloka'i. Mahina Hou-Ross explains:

> We call [Moloka'i] a pu'u honua or a place of refuge for the Hawaiian people, where they can still maintain traditional lifestyle and traditional ways of doing things. Whereas a lot of the other islands have kind of compromised to allow for development and things and it kinda went rampant. Capitalism rules on most of the islands. On Moloka'i it's still kind of balanced, but it's still an ongoing struggle. (Personal communication, March 2012)

Development projects like luxury housing and large wind farms for off-island energy threaten Moloka'i's natural resources and consequently, their traditional subsistence economy and Hawaiian culture. Equally threatening are profit-driven ventures, like fishing charters from other islands using Moloka'i waters and resources to make money and harvest fish. Fishing charters

from other islands are paid to bring people to Moloka'i, known for its lush fishing grounds, and use island resources or camp, and fish day after day, and then return home. Uncle Mac, *konohiki* for Mo'omomi Bay, criticized the idea of mixing natural resources and profit, saying, "They do charters there [Mo'omomi Bay]…They dive, they camp, and they don't go home for one week, sometimes two weeks, so they constantly fishing every day, making money… my thing down here is nobody use the resources to make money, just for food" (personal communication, March 2012). Mahina spoke about the work being done to try and mitigate the impact of these charters on the Moloka'i economy:

> They are taking back as much as they can, to sell to the markets to make their trip more productive. That's one of things we've been trying to look at is setting regulations for those types of people coming in. We're looking at creating a subsistence fishing zone for the whole island, maybe allowing only commercial activity on-island—If you're going to catch it and sell it, you need to sell it on Moloka'i, because there are people who cannot go catch fish… but when we sell it off island, there's almost like an endless population off-island, so there's no end for the demand for the resources. (M. Hou-Ross, personal communication, March 2012)

This type of problem solving looks to find common ground between the traditional ways and conventional market economy expectations. Since traditional ways dictate that one has a *kuleana* to the *ahupua'a* or area in which they live, keeping the fish from Moloka'i's fishing grounds in the community honors that *kuleana* and contributes to the local economy. Mahaelani Matsuzaki, a Land Legacy Education Specialist with Kamehameha School's *'*Āina Ulu Program in O'ahu spoke about this type of resource exploitation at O'ahu fishing grounds, saying that most locals recognize that it is not okay to go to someone else's "backyard" and use their resources simply because you have neglected your *kuleana* to your own "backyard" or *ahupua'a* (personal communication, March 2012). From the traditional practitioners interviewed for this study, it was clear that much of traditional management work is often disrupted by development and

economy priorities linked to the potential profit that the county, state, or federal government and private corporations see in a particular area or resource.

Most of the experts that were interviewed expressed a general lack of institutional support, not just financially, but also politically (in laws and policies, as well as infrastructure investment in traditional work). Politically, traditional practitioners, who utilize adaptive management to implement and change site specific strategies with the ever-changing nature around them, are often stalled by a bureaucracy that moves in excruciatingly slow increments that can be detrimental to the very natural resources they are trying to conserve. Uncle Mac Poepoe expressed his frustration over not being able to uphold traditional *kapu* and laws because of state laws and policies, saying, "…according to traditional way[s]… you are breaking the law… it gets conflicted. And I blame the state for that… I'm getting to the point where it's almost out of desperation that I have to go rewrite the law… it's the state that made laws and they cannot uphold their end of the deal" (personal communication, March 2012). While Uncle Mac acknowledged that there was a lot of work to do on the law and policy side alone, one of the policies that he spoke about was the slot limits for fishermen in Hawai'i. Slot limits, a policy of Hawai'i's Department of Land and Natural Resources (DLNR), set a size range for fish species defining what is legal to catch, and anything above or below the "slot" must be released. While slot limits of conventional management dictates that fishermen leave smaller fish and catch the bigger adult fish, traditional conservation methods are actually the other way around—dictating that adult, reproductive aged fish be left alone, while allowing fishermen to catch the smaller fish. Mahina explains, "…it's kind of foreign to the western conservation people, where they think save the babies so that they can grow to become big ones, but traditional practice is more

of save the mamas so they make more babies" (personal communication, March 2012). This type of long-term, generational planning often conflicts with conventional management, which has either not caught on to more effective conservation methods that have been practiced for centuries by traditional practitioners, or have yet to change existing policies and laws to catch up to traditional methods due to the nature of bureaucracies.

On O'ahu, this lack of support is usually a mixture of financial and political. At Kawainui Wetlands in Kailua, Doc Burrows and Ka'imi Scudder are two of a handful of 'Ahahui Mālama i ka Lōkahi members that relies on donations and volunteers to take care of and restore under 1000 acres of marshy wetlands, and three heiau. What is odd about this reliance is that the Hawai'i state government DLNR owns the wetlands. This means that while 'Ahahui raises the money and implements the restoration plans, they also have to contend with and adhere to the regulations of multiple state agencies. This can be frustrating for all parties—for Hawaiians who recognize the cultural importance of restoring and conserving the native plants and animals and fishponds at this site, for 'Ahahui staff and members who work with minimal manpower and even less financial assistance, and for the state who cannot find the money or manpower to support restoration efforts. Doc Burrows explains:

> That is a unique thing to know about because the ownership of the land is state government—department of land and natural resources, and the agencies or divisions that we work with is state parks and DOFAW [department of forestry and wildlife], and both state agencies don't have personnel or money, so they depend upon community organizations such as us. (Personal communication, March 2012)

This set-up, where community organizations and individuals care for state owned land with no help from the state, is not uncommon. Indeed, Uncle Leimana Naki on Moloka'i operates in much the same way. As the *konohiki* for Kahina Pōhaku fishpond, Uncle Leimana relies

completely on donations and community volunteers to restore and care for the fishpond. Additionally, Uncle also lives at the pond, in an improvised hale, or house, with no electricity and no running water, and relies on "sponsors" in the community to provide what little financial support he receives.

Ultimately, the traditional approach and conventional management are ideologically and culturally very different, and in order to exist together traditional practitioners find themselves negotiating to try and achieve a balance that will see the resources properly managed and Hawaiian cultural practices kept intact. Ross's (2011) argument, that traditional practitioners and state agencies have an uneven power dynamic, with the former putting in all the time and energy and the latter holding the decision-making power with none of the knowledge, was supported by many of the experiences of the practitioners interviewed on Moloka'i and O'ahu. As Mahina Hou-Ross explains, "...people depend heavily on the natural resources to supplement their diet… A lot of times when we have state or agencies coming in and setting up conservation areas and no take zones… it's kinda counterproductive to the lifestyle" (personal communication, March 2012). Without considering the local resource environment or consulting with local experts, state agencies undermine the traditional resource management work that is continually taking place through *konohiki* and traditional practitioners. Uncle Mac talked about an incident that happened several years in which the filefish population around Moloka'i started dying off, and scientists scrambled to try and discover the cause:

> You have to go out all the time, and you have to... The years of experience help you to understand this. All these cycles that go on, they happen at certain times, different events that people don't understand about. It happens, its part of nature… I remember back in the 70's had the same exact event going on and scientists never know what was going on and I said, that's part of nature. They're gonna die off because there's an imbalance in the population, an imbalance in you… so now

> new set of people dealing with this and I'm still here and I remember everything. (personal communication, March 2012)

Many believed that poison pellets, used to kill off Moloka'i's rat population that damage native plants and bird nests, were to blame, "So they finally contact me… I said, anybody in their right mind should now that if that gonna happen it's not really gonna be one fish, one species. So, right after that, they kinda like—get educated before you make that kinda call" (K. Poepoe, personal communication, 2012). This is a prime example of how ignoring the inherent value of local experts—the *konohiki*, whose knowledge of the area has developed over a lifetime—western managers and scientists create more work for local experts without assuming any responsibility.

Consequently, Ross 's (2011) assertion that "genuine collaboration" cannot be achieved without these power issues being exposed to the light of day and explicitly admitted, is quite applicable in the Hawai'i landscape. This includes not only direct management practice, but the political arena as well, where state government has passed legislation to create groups like the *'Aha Ki'ole*, yet failed to give them any real decision-making power over resource management. In 2011, the Governor vetoed a measure that would have would have allowed the *'Aha Ki'ole* to advise the DNLR siting lack of government oversight (Ahamoku.org). This is ironic considering the same year the Hawai'i State Legislature and Governor passed legislation creating the Public Land Development Corporation (PLDC), the development arm of the Department of Land and Natural Resources (DNLR), which has faced a good deal of scrutiny from community groups due the seemingly unchecked power—or lack of government oversight—that the state-led corporation has.

The PDLC, which is a mixture of natural resources and business focused state agencies (ie: the Department of Business, Economic Development and Tourism), has been tasked with the goal of identifying state lands that are ripe for development, much of which was land gained and supposedly held in trust for Hawaiians in the *Māhele*. To do this work, the PDLC has been given the power to defining its own governing policies, partner with private corporations and developers, and bypass county permitting requirements and zoning regulations (Honolulu Civil Beat 2012). The state power exercised by this public corporation, in defining it's own regulations and moving forward with development projects before regulations are even set is a prime example of how traditional management, and Hawaiian culture in general, is appeased through toothless legislation. This legislation allows state officials and representatives to look good on paper, by seeming to support the local work of traditional practitioners, while simultaneously giving land development power to a five-person committee that has no Hawaiian voice (Cooke 2012). In July 2012, with changes to the bill requiring the state senate and Governor to appoint members to the committee and the DNLR oversight power, the *'Aha Ki'ole* DNLR advisory council was passed and signed into law. The committee members are expected to be selected by December of this year, but whether "genuine collaboration" will come to pass in the following year and beyond remains to be seen.

Education

Traditional education, or education around Hawaiian cultural values and resources promoting conservation, *mālama 'āina*, and *pono* living, was the third most frequent theme talked about by traditional experts. Beyond the educators themselves, every *konohiki* or traditional practitioner interviewed spoke about education for youth and school groups, as well as adults and the general

community around them. Uncle Mac is an example of this, having created a *Pono* Fishing Calendar for fishermen to follow, saying, "…we have our fishermen that go out, they know how to catch the fish, and that's about it. They don't know how to take care of the fish… the fisherman, they're more interested in when it's good to go fishing. They're not interested in when you're not supposed to fish" (personal communication, March 2012). The calendar (excerpt pictured in Figure 4.4), aimed at fishermen, and used by school groups, details the *kapu* (for fish, as well as other marine resources like *Honu*, *limu*, and lobster) and moon phase for everyday of each month, with additional information about how to identify when fish are spawning, *pono* fishing practices, and how ecosystem changes can trigger fish spawning earlier than expected.

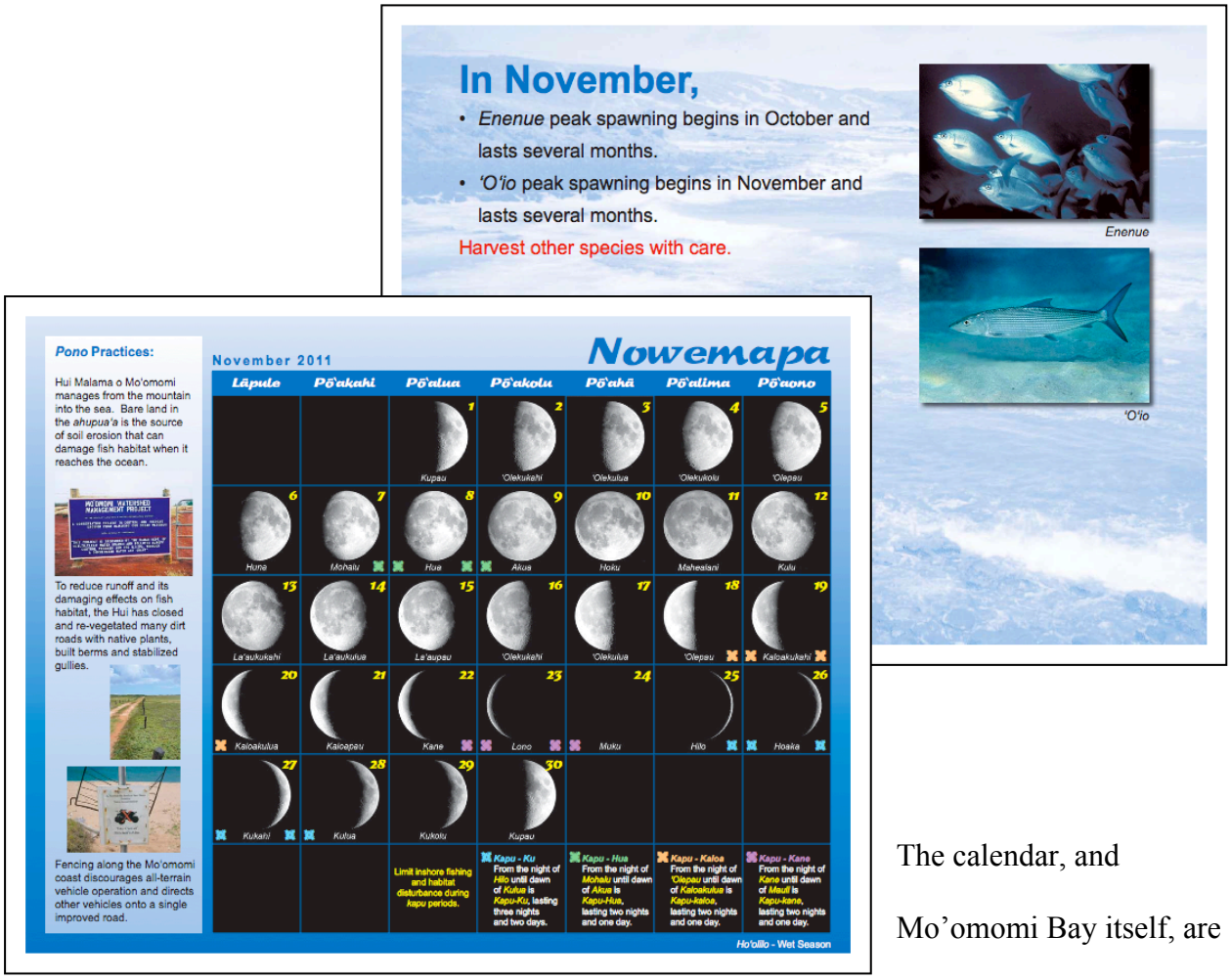


Figure 4.4: Pono Fishing Calendar, November pages, Source: Poepoe et al 2011.

The calendar, and Mo'omomi Bay itself, are

utilized by Mahina Hou Ross at Moloka'i High School's Hawaiian Language Immersion program to teach students about everything from scientific investigation, to communicating research results in presentation format. Mahina explains, "…a lot of the curriculum we have been developing has started with Mo'omomi, and looking at sustainability in our fishing resources mainly and looking at traditional knowledge…" (personal communication, March 2012). Additionally, having access to traditional knowledge resources like Uncle Mac, the *pono* calendar, and the bay itself allows Mahina to teach required subjects without losing the cultural or traditional components that are relevant to the students. "We find that… if you can make the curriculum relevant—a lot of our students spend time hunting, fishing… so one of the goals is to try and connect them with those things they are familiar with to recall their prior knowledge and experiences and try and take a look at it through more scientific investigation." (M. Hou Ross, personal communication, March 2012).

Nevertheless, while the calendar has provided school children with a great learning tool, fishermen have not been as successful to reach, Uncle Mac explains:

> I was hoping that people really take it to heart and use that calendar to their advantage to manage the resources how they should be managed. But, they don't… The thing with traditional way of doing things, all require work. So I think that in itself is something that is kinda discouraging for the modern society… If they can do them an easier way they gonna do them. Like fishing when you're not supposed to… So I stopped making the calendar and everybody start complaining. (Personal communication, March 2012)

Whether or not Uncle Mac will restart the *Pono* Fishing Calendar is unclear, but it does raise questions as to whether the calendar was effective or not, and if not, why? Is there a more effective mode in which to reach fishermen with the *pono* fishing information?

Uncle Leimana, at Kahina *Pōhaku* on Moloka'i is also someone who focuses on education. Decked out in traditional Hawaiian dress, a *malo*, a visit to Uncle Leimana—for both tourists and school children alike—comes with it the obligation to learn something about Hawaiian culture and the fishpond itself. School groups often visit Uncle Leimana to experience a combination or traditional Hawaiian culture, learn about the marine species found in and around the fishpond, and to help rebuild the kuapā by moving rocks of all sizes (L. Naki, personal communication, March 2012).

Community Involvement

Moloka'i and O'ahu have very different community involvement backgrounds, with Moloka'i's small rural community lending itself well to a high amount of community involvement and voice, while O'ahu's larger population takes more of an effort for community investment and participation. At He'eia fishpond, Hi'ilei and staff at Paepae actively include the community in their restoration efforts, hosting various school groups and community work days, explaining:

> Restoration is a slow process, very slow… but it's worth the effort, to get the community vested in it, having a stake in the place. If we chose to do it with heavy equipment, then what's the value? And, the slow pace allows you as an individual and an organization to evolve, I think if you did things too fast, you wouldn't be able to learn from it and adjust. (H. Kawelo, personal communication, March 2012)

But even with their efforts, Hi'ilei expressed disappoint over the lack of the involvement from the neighborhood where the fishpond is located. Even neighbors whose backyard abuts the fishpond and actually includes the original ala wai or irrigation ditch for the pond, have yet to be involved with the fishpond restoration and has a shaky relationship with Paepae at best (H. Kawelo, personal communication, March 2012).

Whereas, on Moloka'i, a large part of the community is regularly engaged in decisions that affect their community, from development to restoration. Whether or not they all agree with one another is not the issue, and the fact that there seem to be impassioned view points on both sides of community meetings attests to the high level of community involvement. Along with its smaller population, the island's unique subsistence economy and quiet lifestyle requires work to keep it quiet and conserve the resources against developers and profit-driven enterprises (M. Hou Ross, personal communication, March 2012).

Managed for Generations

The conservation ethic built into traditional Hawaiian resource management ensures that resources are managed with the goal of safeguarding access to resources for future generations of Hawaiians. This not only requires well-managed resources, and education for future generations, but also committed individuals to do the work. Doc Burrows confirms this idea, saying, "It's not only the ecology, it's what people do… and what they teach their children to do..." (personal communication, March 2012). Mahaelani spoke about the commitment required to do traditional work, saying, "They don't have exist strategies or career strategies, cultural management thinks in generations…", adding that most traditional or cultural managers plan for and think about seven generation after their own (personal communication, March 2012).

The traditional land managers and educators interviewed could all be classified as "lifers"—meaning they don't get paid much (if anything at all), and they usually feel a *kuleana* to do traditional work—traditional culture-based management is part of their life and their identity, not just a paycheck. Hi'ilei Kawelo, Executive Director of PaePae 'O He'eia, at the He'eia Fishpond

on O'ahu eloquently explains, "…for me personally, this is an extension of my practice which is fishing. It's not the same practice, but it's part of my evolution in the Hi'ilei Kawelo scheme of where I'm gonna end up when I'm old and gray. This is my legacy, my interpretation of being a responsible fisher person" (personal communication, March 2012). Doc Burrows at Kawainui Marsh expresses a similar idea, saying, "this is somewhat unique, when you compare to what is being done elsewhere, the lands are either government owned or privately owned and so we… are helping the state do what it is supposed to be doing but can't or don't have interest to do. You have to have interest, passion" (personal communication, March 2012).

On Moloka'i, Uncle Mac has spent his lifetime doing traditional management and work—as a child, when his friends were playing, he was with his elders, fishing and learning. Having been trained in a traditional way he recalls:

> Back in my time there was nothing that was spoken, nothing that was written, it was just, you watch, you try to duplicate that. There were some things that were spoken, but when you're actually down at the beach, you fishing, or even if you're going fishing, there's nothing spoken, that's against the rules. That's a big kapu. You talk, oh man, you get dirty lickings. You just don't say anything. (Personal communication, March 2012)

Wanting to continue his work and the traditional Hawaiian knowledge he was taught, Uncle Mac has selected and spent years training a small group of people, including his sons, to continue the traditional work and perpetuate the skills he learned as a child. He wants them to gain the knowledge, but he realizes the drastic difference between his generation and today's, expressing that, "…it's really hard to train people, even some of the boys that work with me, I train them, and I train them for years… you guys lucky because it took me a lifetime to know what I know, and I giving you guys that benefit to take the shortcut…" (Personal communication, March 2012).

Culture As Key

While it is clear from the name that traditional Hawaiian resource management involves cultural components, what the interviews and experts whom participated in this study illuminated was that the culture was equally important as the management. Ultimately, every ethic, practice, and strategy that makes up traditional Hawaiian natural resource management stems from, and is a product of the Hawaiian culture itself. This point was driven home by each and every one of the interviewees. Uncle Leimana's Hawaiian culture plays a prominent role in what he teaches, and how he manages the fishpond, "You guys say native, I don't know what that is. Native is just an American word for cultured people. We are Kanaka Maoli, or we are Hawaiian" (L. Naki, personal communication, March 2012). Living a very quiet and distraction free existence at the fishpond almost seems to allow Uncle Leimana to be more in tune with his cultural and spiritual roots. He is proud of the culture-based education that he does, teaching children important values and scientific exploration through Hawaiian values, ideas, language, and even dress, "I work with the kids… So sometimes it's the first time they are seeing a kanaka like me. Sometimes they cry, and I say, you can cry all you want, I'm not changing my clothes" (L. Naki, personal communication, March 2012). Probably the most poignant perspective on focusing on the culture to get to the management comes from Doc Burrows at Kawainui Wetlands in Kailua on O'ahu:

> From a Hawaiian or indigenous perspective, that's where we come from. That's why we do the things we do. Not entirely from an environmental perspective, or even from a state parks [perspective]… but from a Hawaiian perspective this is very very important. This is what we call a cultural kipuka. We don't have the money to purchase or own the lands, but as Hawaiians we can culturally reclaim it. (D. Burrows, personal communication, March 2012)

Indeed, the ethnobotanical demonstration garden at Kawainui, featuring *lo'i* fields, banana plants, wauke, and various other native plants with high cultural value around the Ulupō heiau provides a picture of what the area could have looked like in Ancient Hawai'i. "The focus is, if

we don't have the native ecosystems and the resources that come out of the native ecosystems, then we don't have or can't have the native culture. That's what it's based on, the use of those resources…" (K. Scudder, personal communication, March 2012). It is only by focusing on and practicing the culture, that the management practices and the system itself develops and takes shape. The Hawaiian culture, then, is at the heart of and the key to understanding traditional Hawaiian resource management, and we, Hawaiians and non-Hawaiians alike, must first try to understand the former before we can become knowledgeable about the latter.

Chapter 5: Conclusion

'Onipa'a!
Be steadfast!

- motto of Kamehameha V & Queen Lili'uokalani

It is from the Hawaiian culture, with its strong conservation ethic, that traditional Hawaiian resource management was conceived and birthed. The latter cannot exist without the former, and therefore traditional management cannot be separated from its cultural roots. It is this cultural origin that allows traditional management to stand apart from other, more conventional, management systems. In drawing conclusions about how traditional Hawaiian management is implemented and what the successes and barriers are for traditional practitioners, one must look to the culture.

What maintained the Hawaiian society for more than 1,700 years was not simply a system of abstract rules and policies, it was a holistic understanding of how to relate to and care for that which gives life—the *'Āina*. This is not to say that it is faultless, as with any manmade system, or to imply an intrinsic connection to nature as "noble savage" rhetoric often conveys. Rather, Hawaiian resource management was designed to naturally move with the current of nature itself, rather than trying to control or tame nature by going against the current. A cultural understanding of the world is what informs and guides practitioners in their management priorities. Rather than conceptualizing of traditional management as a management system with a cultural element, as is

often done in conventional western management fields, it should be seen as a culture with management integrated into it. It is from this place that both traditional and non-traditional communities alike, should act to *mālama* the land, resources, and ecosystems in which they exist.

One of the biggest challenges for traditional resource practitioners, managers and educators, is the imbalance between the traditional and the conventional that they must contend with. With little recognized authority or power with state agencies, save for symbolic gestures by state officials or agencies, traditional practitioners stand in the face of the post-western contact degradation, refusing to relinquish their cultural work and determined to find the few avenues available to them to strike a balance between conventional influences and traditional ways. Even on islands where the traditional lifestyle has an active presence, like Moloka'i, we see that *konohiki* and residents still struggle with state agencies, developers, and the PLDC to hold onto their resources and their traditional ways. The conventional western management must, in the name of restoring and conserving our land and resources, cede some of its power to older and wiser traditional systems. Without candidness about the uneven power balance that states' possess over indigenous cultures, it will be difficult for these two diverging systems to achieve a balance with one another.

An important factor in successfully achieving transparency and collaboration are the voices and knowledge of Hawaiian elders, *konohiki*, and other experts. While there is much research available about Hawaiian history, land tenure, and the *ahupua'a* system very little is written by or includes direct interviews or knowledge from traditional experts. Uncle Mac Poepoe, one of the handful of experts who has presented and published research, was the first to point this out,

saying that many times, "…everybody can talk about stuff they read or stuff they hear, but nobody is a practitioner…" (Personal communication, March 2012). However, traditional experts should not be limited to research and presentations, an expectation from western reductionist paradigms, as many times knowledge and lessons are communicated through story, song, hula, or other informal sharing. As Ross (2011) pointed out, not only are traditional experts expected to translate their knowledge into understandable terms for conventional managers, but they are not often seen as experts unless they have conformed to reductionist science standards where data is obtained through "…replicable experiments, interpreted through the application of verifiable laws of nature, and leading to independent recognition and accreditation of knowledge…" (100).

As this research demonstrates that a cultural foundation is necessary in order to successfully incorporate traditional management under the leadership of traditional experts, it stands to reason that the paradigm divide between reductionist science and traditional science stands in the way of collaboration. In short, more Hawaiian voices must be included in management practices and decision-making, and western managers must work to comprehend the value and validity of traditional knowledge communicated through story or song. Just as traditional practitioners display a holistic understanding of the land they manage—crossing disciplines in order to be a more effective caretaker—an interdisciplinary approach is needed in conventional management agencies. Whether in research, decision-making, policy-making, or actual management, an interdisciplinary approach, as demonstrated by this research, allows for all relevant knowledge to be considered collectively.

Ultimately, this research shows that the role of traditional knowledge in managing resources for the future is essential. These systems have stood the test of time and have the ability to intertwine western societies conceptualization of split environments—human and nature, cultural and intellectual. We must understand what has worked in the past, look to how to implement it for the future, and adopt a more holistic methodology, not only to give us breath and feed our stomachs, but to feed our souls and spirits as well.

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