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KAULANA O‘AHU ME HE ‘ĀINA MOMONA
MAMULI O NĀ HA‘AWINA ‘AUMĀKUA
E KAHEA AKU NEI, “HUI, E HELE MAI ‘AI, A‘AI I KA MEA LOA‘A!”

O‘ahu is famous as Land Fat with Food
because of Ancestral Teaching that allows us
to call out, “Hello, Come and Eat, and Eat What There Is!”

by Lilikalā Kame‘eleihiwa, PhD

Kaulana O‘ahu me he ‘Āina Momona Mamuli o Nā Ha‘awina ‘Aumākua

In 1782, when Kahekilini‘ahumanu, the Mō‘ī, or King, of Māui, planned his invasion of O‘ahu, he did so because he said that O‘ahu was an island “Fat with Food” (Kamakau 2002). What did he mean by this odd phrase?

He was referring to the great abundance of fresh water on O‘ahu used to build 114 fishponds, comprising 3,600 acres, more fishponds than the other 108 found on all the other seven other islands of the Hawaiian archipelago. O‘ahu also had the largest fishpond, named Kuapā, also known as Keahupua fishpond, comprising 523 acres, located in Maunalua, an ‘ili, or smaller land division, of the Ahupua‘a of Waimānalo, in the Moku district Ko‘olaupoko (Cobb 1904). Until it was made into the Hawai‘i Kai marina in the 1960s, Kuapā was the largest fishpond in the Pacific. Moreover, working fishponds in the 1800s were known to have produced 300-500 pounds of fish per acre per year, so that O‘ahu was minimally producing 1 million pounds of fish per year, not counting the fish obtained from the reefs and beyond (Keala 2007). That is what made O‘ahu an “‘Āina Momona.” There was so much food!

In the 1880s on O‘ahu, 78% of all Ahupua‘a, or valley land divisions, were so extremely well-watered that Lo‘i Kalo, or wet land taro terraces, were constructed from the back of valleys down to shoreline. These Lo‘i Kalo systems were built in 63 out of the 80 Ahupua‘a of O‘ahu. While the construction and maintenance of Lo‘i Kalo required extensive and skilled manpower, wetland taro produced 10-15 times more food per acre than dry-land taro. Extensive wetland taro terracing was then an indication of a high population that needed to be fed (Kelly 1989).

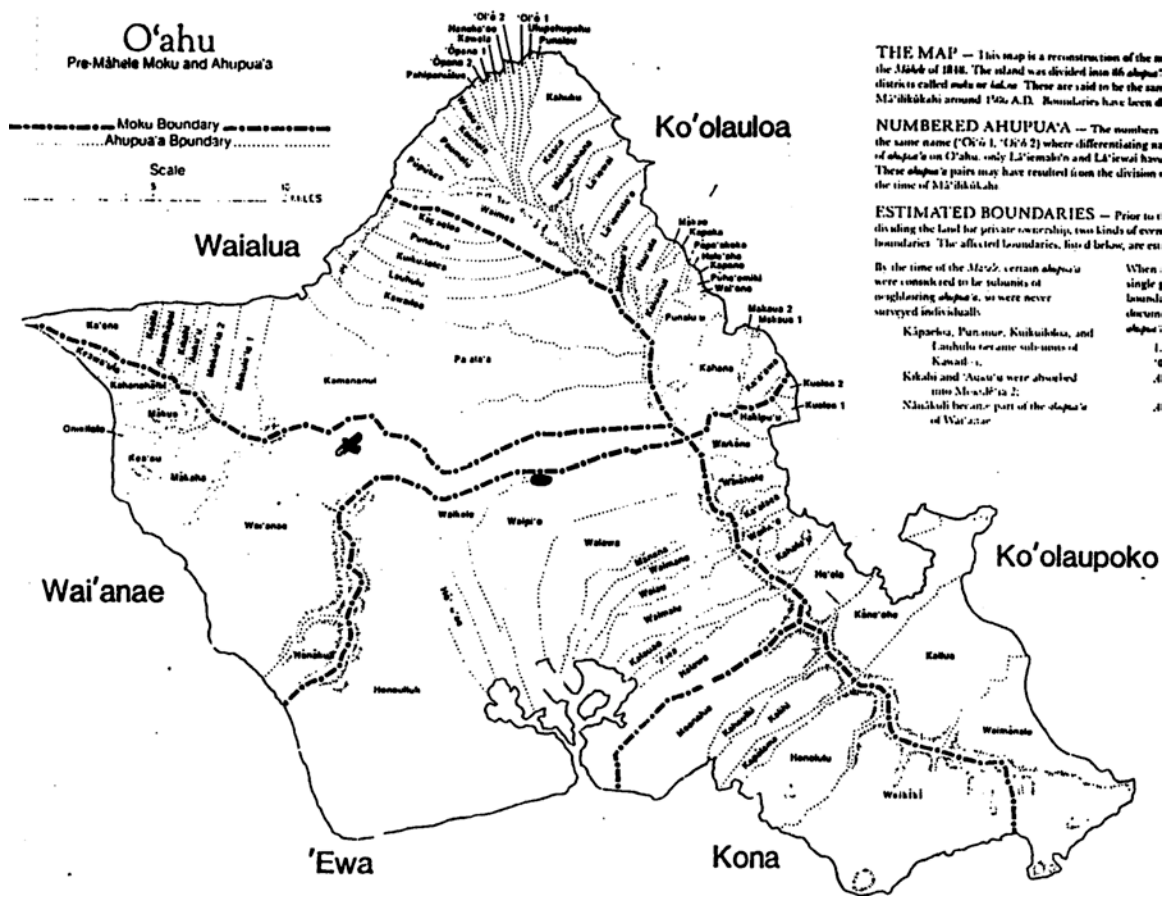


Figure 1. Map of 80 O‘ahu Ahupua‘a, Kamehameha Schools Hawaiian Studies Institute.

Imagine all of Mānoa valley filled with wetland taro from the foot of Mānoa Falls all the way down to Kalākaua Avenue at Waikīkī beach! Nearly every valley on O‘ahu was like that. In 1792, Captain George Vancouver landed in Waikīkī seeking a fresh water source to replenish his ship supplies, and wrote in his journal a description of the Waikīkī Taro fields:

Our guides led us to the northward through the village [Waikīkī], to an exceedingly well-made causeway, about twelve feet broad, with a ditch on each side. This opened to our view a spacious plain...the major part appeared divided into fields of irregular shape and figure, which were separated from each other by low stone walls, and were in a very high state of cultivation. These several portions of land were planted with the eddo, or taro root, in different stages of inundation, none being perfectly dry, and some from three to six or seven inches under water. The causeway led us near a mile from the beach, at the end of which was the water we were in quest of. In this excursion we found the land in a high state of cultivation, mostly under immediate crops of taro and abounding with a variety of water fowl, chiefly of the duck kind ...

At Woahoo [O'ahu], nature seems only to have acted a common part in her dispensations of vegetable food for the service of man; and to have almost confined them to the taro plant, the raising of which is attested with much care, ingenuity, and manual labour (Vancouver 1798).

Accompanying Captain Vancouver was the British naturalist Archibald Menzies who wrote in his journal:

We pursued a pleasing path back into the plantations which was nearly level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes and the cloth plant. These in many casts, were divided by little banks on which grew the sugar carte and a species of Draccena without the aid of much cultivation, and the whole watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to supply the most distant fields at pleasure, and the soil seems to repay the labour and industry of these people by the luxuriancy of its productions (Menzies 1920).

Some 23 years later, in 1805, not much had changed in Waikīkī, when the Russian Captain Otto Von Kotzebue observed:

The luxuriant taro-fields, which might be properly called taro-lake, attracted my attention. Each of these consisted of about one hundred and sixty square feet, forms a regular square, and walled round with stones, like our basins. This field or tank contained two feet of water, in whose slimy bottom the taro was planted, as it only grows in moist places. Each had two sluices. One to receive, and the other to let out, the water into the next field, whence it was carried farther. The fields became gradually lower, and the same water, which was taken from a high spring or brook, was capable of watering a whole plantation. When the taro is planted, the water is lowered to half a foot, and the slip of a gathered plant stuck into the slime, where it immediately takes root, and is reaped after three months. The taro requires much roost, having strong roots; it strikes forth long stalks and great leaves, which appear to swim on the water lot the spaces between the fields, which were between three and six feet broad, arc pleasant shady walks, planted on both sides with sugar-cane or bananas.

They also use the taro-fields as fishponds. In the same manner as they keep the river-fish here, they keep the fish in the sea, where they sometimes use the outer coral-reefs, and form from them to the shore a wall of coral stones, thus making fish-preserves in the sea. Such a preserve

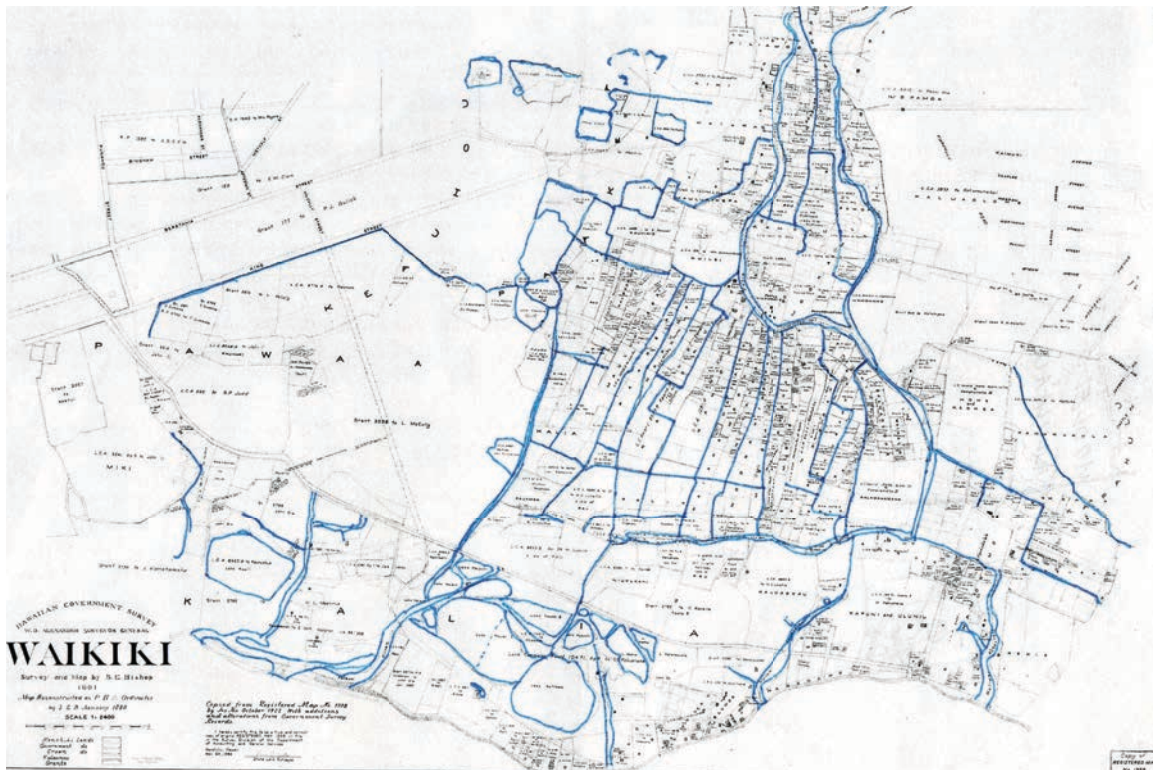


Figure 2: Here is a Map of Waikīki in 1881 by Sereno Bishop, with the blue lines showing the inland fishponds and the numerous ‘auwai, or water channels, flowing from

mountain to sea, that fed the numerous wet-land taro fields of the area. Register Map No. 1398, DLNR.

requires much labour, but by no means so much art as the taro-fields, which serve for both purposes. I have seen whole mountains covered with these fields, through which the water Rowed gradually down, each sluice forming a cascade, and falling between sugar-canes and banana-trees into the next tank. Sugar plantations, taro-fields, and far-scattered plantations succeeded each other on our road...(Kotzebue 1821).

Sixty-six years later in 1881, Waikīkī, which means spouting water in reference to its many subterranean springs, was still a marvelous network of waterways filling Lo‘i Kalo and fishponds with an astonishing volume of fresh water, that intensified food production to feed the population.

What happened to Waikīkī?! What happened to O‘ahu?! What happened to the ‘Āina Momona? Hawaiians had so much food in pre-contact Hawai‘i that stealing food was unheard of. If you did not have any food, you just walked by somebody’s house. When they saw you going by, the first thing they would do is call out, “Hui, e hele mai ‘ai!” [Hello, come and eat!] And you would go into their house to eat! It didn’t matter if the people of the house did not know you, or had very little food themselves; they would share whatever they had with you. Perhaps they only had a little pa‘akai (ocean salt) and poi (pounded taro); they would offer all they had to you (Kamakau 1976).

Conversely, one always ate of what was provided, and never complained. As children we were told, “‘Ai i ka mea loa‘a,” or “Eat what there is,” and until the rise of American television and supermarket chains in Hawai‘i, we never thought to ask for anything else that was not on the table. We were happy with the delicious food of the land.

Today on O‘ahu many people are hungry and homeless. Since our Hawaiian ancestors have lived in the small islands of the Hawaiian archipelago for the past 100 generations, or roughly 2,000 years, with such great food producing ingenuity, we might want to consider how they did it. Moreover, Hawai‘i had an estimated population of about 1 million at point of contact in 1778 (Stannard 1990, Kame‘eleihiwa 1992), which roughly mirrors the current State of Hawai‘i population of 1.3 million. How did the ancestors feed everyone when they could not import 90% of their food from the North American continent?

Hawaiian ancestral wisdom is especially critical in these times of peak oil concerns. As the cost of oil rises, we see too that the cost of imported food rises. Hawai‘i already has one of the highest cost of living indexes in America, and many of us, even university professors and other professionals wonder how much more we can afford. Many of us are worried about what would happen if anything, like a terrorist attack, prevented the Matson shipping line from bringing food to Hawai‘i. We hear that Safeway has only four days worth of food in stock; if the ships stopped coming how would we eat? What would the ancestors do and how did they become such efficient producers of food? Let’s take a look at the ancestral methods.

Ancestral Wisdom: Moku and Ahupua‘a Management Systems

What are Moku and Ahupua‘a? Our ancestors divided islands into large land districts called Moku. Each Moku district was divided further into Ahupua‘a, or land areas that went from the mountain all the way down on to the reefs and into the sea (Malo 1959). The ridgelines of various valleys were usually the horizontal boundaries. On

O‘ahu it is easy to see that the Ahupua‘a boundaries actually demarcated surface water management areas. When one studies fishponds and how they were connected by underground waterways, it seems likely that the larger Moku districts were subterranean water management areas.

Kāne, the god of the sun and the new knowledge of the day, was also the god of fresh water (in his female form), and one of his male body forms was the Kalo plant. In Hawaiian mythology, Kalo is the elder brother of the Hawaiian people, as well as our favorite food – poi. Thus, the management of water, a divinity, was also a religious calling, and prayers to Kāneikawaiola, Kāne of the life giving waters as she was sometimes called, reminded us of the sanctity of water, and guided us in our very efficient use of water for the growing of food (Sproat 2009).

As a result of population increase, Ahupua‘a boundaries were carefully established within the Moku districts, so that people would know that they were to only use the water from their own Ahupua‘a for agriculture (Nakuina 1894). Ahupua‘a law taught that they were to only eat from within their own Ahupua‘a, and not go next door to another Ahupua‘a for food. This practice ensured that people took very good care of their own Ahupua‘a where they lived, and it ameliorated any possible disputes anyone might have over water, land and resources. It is interesting to note that while similar large districts comprised of river valleys were found in other parts of Polynesia, the term Ahupua‘a, literally “Pig Altar,” and the building of such an altar on every boundary of Ahupua‘a, was only found in Hawai‘i (Malo 1959, Henry 1928, Kame‘eleihiwa 2009).

Ahupua‘a were further divided into smaller land divisions called ‘ili, mo‘o, lo‘i, kuana, and mala subdivisions (Malo 1959). Each of these smaller land divisions had

specific names given to them to make it easier to keep track of who was supervising the planting of each and so as to avoid confusion in reference. Those different names also implied different planting systems that were employed. For instance, Mala were dry land gardens that did not need to be irrigated, whereas Lo‘i Kalo were wet land taro terraces that resembled the more widely known rice paddies of Asia, full of flowing water, connected to rivers by a system of ‘auwai, or water channels that took water into the Lo‘i for circulation amid Kalo patch, and then delivered it back into the river. In this way folks downstream could get as much water as they needed (Nakuina 1894).

Although every Kalo variety that is grown in water can also be grown in dry-land Mala, because Lo‘i Kalo produces 10-15 times more Kalo per acre than does Mala planting, it is preferable to Mala as Lo‘i can feed more people. Over the 100 generations that our Hawaiian ancestors lived in this archipelago, they became excellent water managers, especially for the production of food, and our favorite food was Kalo made into poi. Not only is Kalo extremely nutritious, but also it is high in calcium, preventing tooth decay and creating strong bones. I ate poi almost exclusively as a child until I was 4 years old, and as a result I never had a single cavity until I was 15 years old!

Other Hawaiian vegetable foods that grew easily in Hawai‘i were ‘Ulu, or breadfruit, Mai‘a, or banana, and ‘Uala, or sweet potato. ‘Uala is actually the most wondrous of those crops because unlike Kalo, which takes 18 months on average to mature, ‘Uala is a 3-6 month crop that can produce hundreds of pounds in a small area, like a mo‘o small division. Although ‘Uala originates from South America, where it is called Kumara (cognate to ‘uala), it seems by ancestral accounts to have come into the Central Polynesian island of Ra‘iātea about 2,000 years ago (Henry 1928). From there it

spread to all of Polynesia. Like the wetland farming of Kalo, 'Uala growing on slopes with good drainage, can feed ever-increasing numbers of population (Handy 1995).

The larger the Ahupua'a, the more the 'ili subdivisions by which it was divided, with Konohiki, or water managers, overseeing every level of subdivision. In this way, every arable square foot of land was managed for the most efficient food production. Konohiki were expert water managers who were trained to understand just how the water had to flow from mountain to sea, in order that everyone in the Ahupua'a got their fair share of water for the growing of Kalo. Water was only ever diverted from the stream for the growing of Kalo, and was closely regulated so that on some days some 'auwai, or water channels, were closed in order that the Kalo growers downstream had a little more water on that day. On the next day the water would be restored. If anyone took water without the permission of the Konohiki, the punishment was death (Nakuina 1894).

Yearly inspections of the Ahupua'a agricultural systems began with the celebration of Makahiki, or the New Year, which was presided over by the God Lono, a younger brother of the great god Kāne. Both were born of the Haumea Earth Mother lineage and the intellectual tradition called Palikū, or the erect cliffs. In fact, the Lono priests were called Palikū priests, and they were in charge of demarcating the ridgeline boundaries of the earth that made up the Ahupua'a boundaries.

As a god, Lono represented the atmospheric elements, and thus was the deity of wind, rain, fertility, and agriculture. His advent was heralded by the rising of the Makali'i [Pleiades] Constellation on the eastern horizon after dark (Malo 1959). While Makahiki first year ceremonies, and the subsequent coming of Lono, were celebrated all

over Polynesia with the rise of Makali‘i stars, different practices arose in Hawai‘i (Kame‘eleihiwa 2009).

Although the God Lono was worshipped in all other parts of Polynesia, only in the Hawaiian archipelago did the Lono Priests, accompanied by the God Lono, make a clockwise circuit of the island, stopping in each Ahupua‘a boundary to receive food tribute, which included an inspection of the food production efficiency of the Ahupua‘a (Malo 1959). If the Ahupua‘a was deemed to be under-producing, then another Konohiki who knew how to be more efficient in water management would replace the head Konohiki. This kind of Makahiki ceremony was called Lonoikamakahiki, after the Lonomākua traditions that first arose at Kualoa, O‘ahu. Another name for the Lonoikamakahiki image was Akualoa, or the long god, and Kualoa is the only place in Polynesia so named (Kame‘eleihiwa 2009).

The Ahupua‘a pig altar, constructed on each Ahupua‘a boundary along the main road that encircled the island, represented the God Lono, as the pig is a body form of Lono. Thus Lono was in attendance at all times, even between yearly Makahiki celebrations. Moreover, Kamapua‘a, literally, “the Pig child,” is the ‘Aumākua, or family guardian of Lo‘i Kalo farmers, who would put the navel of their new born sons in the carved pig head on the pig altar, to ensure that the next generation would be excellent Kalo farmers. Kamapua‘a is not an ‘Aumākua of dry land kalo planters. Again it is significant that Kamapua‘a, a God of wet-land taro farmers, as well as Lonoikamakahiki, God of yearly inspections of water systems, are first known as O‘ahu traditions. Both are intimately connected with advancements in the increased production of food through the efficient use of O‘ahu’s abundant water resources. Like the Lonoikamakahiki ceremonies

that began on O‘ahu, Kamapua‘a, who was born to a human mother as a divine being in pig form on O‘ahu, is only known in the Hawaiian archipelago as a God, and no where else in Polynesia (Kame‘eleihiwa 1996). This is perhaps because large scale wet-land Kalo gardening, and the Lonoikamakahiki ceremonies wherein Kamapua‘a was worshipped, are not found elsewhere in Polynesia either.

It was the kuleana, or responsibility, of the Mō‘ī, King or Queen of the island, and of the Ali‘i Nui, or high chiefs, both male and female, as administrators of the land, to make sure that no one starved on the lands under their jurisdiction. Their judicious appointment of Konohiki water managers, usually their lesser lineage relatives, trained in efficient water management for maximum food production made sure that every plot of arable land was accounted for. This two tier organizational system of Ali‘i Nui, or high chiefs, and Konohiki, or lesser lineage water managers, was the secret to ensuring maximum food production (Laimana 2011). Good administration of water ensured the abundance of food, and people flocked to Ali‘i Nui who excelled in this profession.

Since the Ahupua‘a system, as well as the Hawaiian version of Makahiki, or Lonoikamakahiki began on O‘ahu, let’s take a closer look at how that worked on O‘ahu. Around 1480 AD, it was the O‘ahu island Mō‘ī, Mā‘ilikūkahi, who first instituted the Ahupua‘a system within the Moku districts. Moku districts had been established at least nine generations earlier in the time of Mā‘ilikūkahi’s ancestor, Māweke, around 1300 AD. (Fornander 1996, Kamakau 1996).

On O‘ahu there were 6 Moku districts, and that was typical for the larger islands of Kaua‘i, and Hawai‘i as well. Māui was the only island that had 12 Moku, and that is

very unusual. On O‘ahu, these 6 Moku districts were divided into 80 Ahupua‘a. Each of the 6 Moku had an Ali‘i Nui who served as the Konohiki of that Moku. Under him or her were Konohiki who were appointed to oversee each Ahupua‘a. Often times these positions, and the training in water management, was hereditary (Kame‘eleihiwa 1992). Under each Ahupua‘a Konohiki leader were a team of Konohiki of ‘ili divisions who worked with a set of konohiki in charge of lo‘i kalo and mala within the ‘ili.’

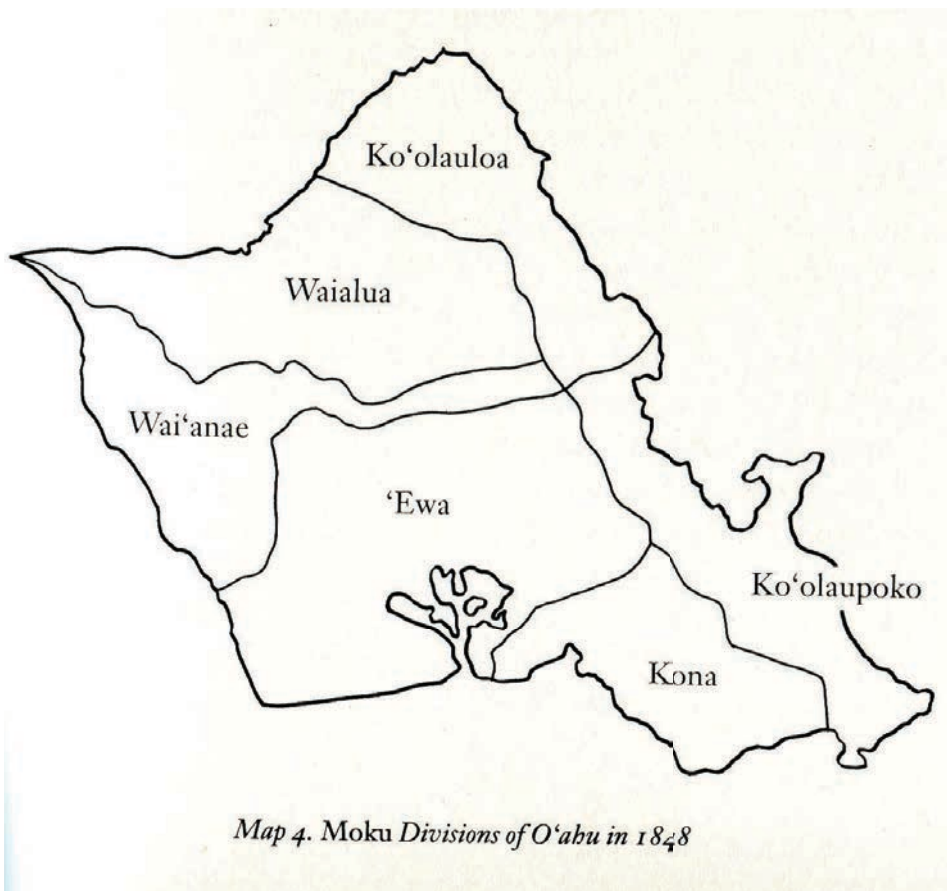


Figure 3. 1848 Map of O‘ahu created by Carlos Andrade for Native Land and Foreign Desires; Pēhea lā e Pono ai? Bishop Museum Press.

On O‘ahu, the Konohiki system was able to run a continuous series of Lo‘i Kalo networks in 63 of the 80 O‘ahu Ahupua‘a. The remaining 17 Ahupua‘a were in mala, or

dry land gardens. All of this required the Konohiki to master cajoling the maka‘āinana, or common people, who actually farmed the land, to cooperate for highest crop yields, to be checked by the Moku Konohiki every year during the Makahiki celebrations for the fertility god Lono. Maintaining Ahupua‘a wide Lo‘i Kalo systems took a great deal of community labor on a weekly basis. On the other hand, food was plentiful and work hours were short when all worked together in the laulima, or ‘the many hands,’ system. In 1824, the Calvinist missionary Charles Stewart stationed on O‘ahu stated, “The Hawaiians are the most industrious of Polynesians; they work about 4-5 hours a day” (Stewart 1826, Handy 1996).

‘Āina Momona: Land Fat with Food, as defined by Fishponds

But the greatest testament to the Konohiki system was the management of hundreds of acres of fishponds on O‘ahu. Fishponds are one of the most efficient ways of creating animal protein (Kelly 1989). And the knowledge of how to run fishponds was embodied in the Mo‘owahine, or the Lizard Women, clans of Haumea, the Earth Mother. Born on O‘ahu on the cliffs of Nu‘uanu, Haumea and the Mo‘owahine were worshipped in the Hale o Papa, or the female temple. According to Kamakau (1976), the first Hale o Papa was built on the cliffs of Nu‘umealani where Haumea was worshipped. Only women worshipped at the Hale o Papa, and female temples were only found in the Hawaiian archipelago, nowhere else in Polynesia. Every fishpond had a Mo‘owahine guardian, and it was said that when she was absent, the fish left with her. Hence, this kind of mythology suggests that knowledge of surface and underground water was closely guarded by Hawaiian women of the Mo‘o clans, and only shared with their male relatives.

While the 114 O‘ahu fishponds made up 51% of all the 222 fishponds in the Hawaiian Archipelago in 1885, they were so large in acreage that they comprised 78% of all Hawaiian acreage in fishpond production. On O‘ahu, the fishponds were fed by fresh water springs, not by rivers, and some kūpuna, or elders, believe that there were at least 2 springs per acre of fishpond, and probably more. For O‘ahu, that means there were at least 7,200 fresh water springs (Thompson 2013). Others have suggested that fishponds were not made of a series of individual springs, but rather were an area comprised of a fresh water lens where the water sprang everywhere from the ground where ever one disturbed the surface. (Naehu 2013).

Fishpond walls were built to keep the salt water out because fish reproduce and grow faster in fresh water. That is why in a typical 100-acre fishpond, there would only be 3 makahā, or sluice gates, that were occasionally opened to allow the exchange of salt water and of fish with the surrounding outside ocean (Apple and Kikuchi 1975, Thompson 2013). The ancestors knew that efficient management of fresh water could exponentially increase the production of Kalo and of fish, the main staples of the Hawaiian people.

From studying O‘ahu fishponds we see that Moku districts were most likely subterranean water management districts. We have found that fishponds were connected underground from several miles away. For instance, the Kuapā pond in Maunalua [now called Hawai‘i Kai], which at 523 acres was the largest fishpond in the Pacific, was connected underground to the Kailua fishponds of Kawainui and Ka‘elepulu, and that the fish would migrate underground from one pond to the next (Summers 1970).

That is why Maunaloa was considered a part of the Moku of Ko‘olaupoko instead of the Moku of Kona, even though it faces south like the rest of Kona.

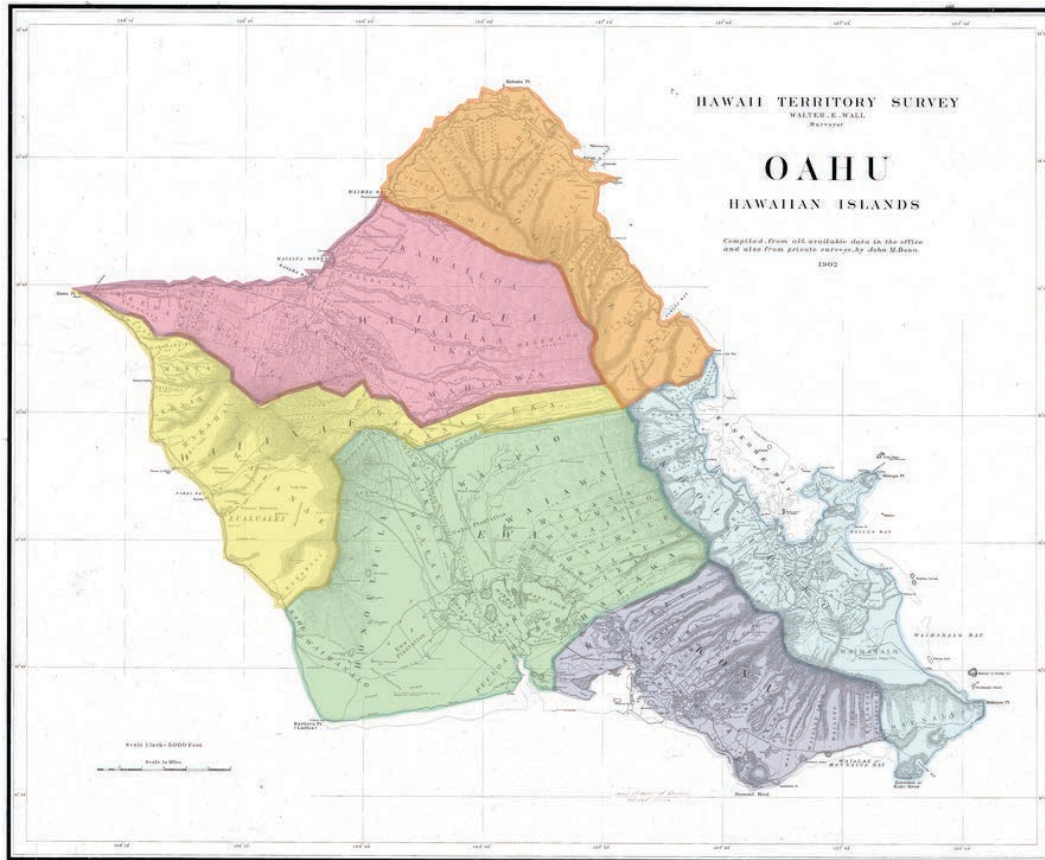


Figure 4: 1902 Map of O‘ahu, ‘Āina Momona, with its 6 Moku districts and 80 Ahupua‘a. Territory of Hawai‘i, DLNR (Department of Land and Natural Resources).

Similarly, on the 1848 maps, Wai‘anae Moku has an upland area called Wai‘anae Uka [now called Wahiawā] that connected to the Ko‘olau mountain range. Since, as Dr. Pualani Kanahale teaches us, mountains are the source of fresh water, the ancestors must have known that there was an underground water passage from Ko‘olau to Wai‘anae. Moreover, the ancestors used to swim into those underground waterways (Thompson 2013), and in some instances such as the Pohukaina aquifer, they would paddle canoes underground from one entrance to another (Kamakau 1992).

While there were 114 fishponds on O‘ahu, they were not located in every Ahupua‘a; many Ahupua‘a had several fishponds and some had none. The greatest concentrations of multiple fishponds were in the Moku districts of Ko‘olaupoko, Kona and ‘Ewa. Ko‘olaupoko had 12 Ahupua‘a with 24 fishponds comprised of 1,898 acres. The largest of these as shown in Figure 5, were Nu‘upia Fishpond (215 acres) in the Ahupua‘a of Kāne‘ohe, Kawainui fishpond (450 acres), and Ka‘elepulu fishpond (280 acres) in Kailua, and Kuapā fishpond (523 acres) in the Ahupua‘a of Waimānalo (Summers 1970), as shown in Figure 6 below:



Figure 5. O‘ahu Fisheries Map showing in the Kailua ahupua‘a the fishponds of Nu‘upia, Kawainui, and Ka‘elepulu fishponds (colored in blue) in 1913 by Monsarratt, Department of Land and Natural Resources].



Figure 6. O‘ahu Fisheries Map of the 523 acre Kuapā fishpond (colored in blue) in the ‘Ili of Maunaloa, in the Ahupua‘a of Waimānalo, by Monsaratt in 1913, DLNR.

The 6 Ahupua‘a of Kona Moku, which includes the extremely large Ahupua‘a of Waikīkī with its 8 large valleys, had 47 fishponds comprised of 1,085 acres, with the largest ponds being Lelepaua (332 acres) and Ka‘ihikapu (258 acres) in the Ahupua‘a of

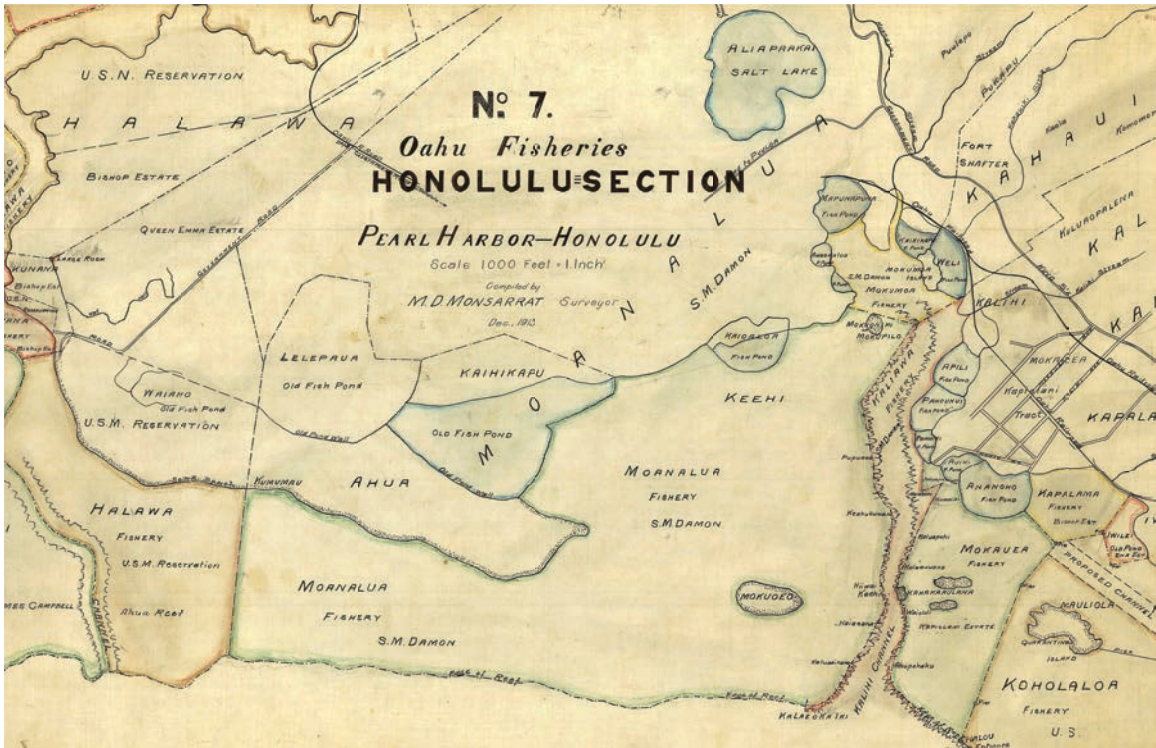


Figure 7. O‘ahu Fisheries Map of the 590 acres of Lelepaua and Ka‘ihikapu fishponds in the Ahupua‘a of Moanalua, by Monsaratt in 1913, DLNR.

Moanalua (Cobb 1903). These fishponds were filled in to make Lagoon drive today.

As seen in Figure 7 below, the ‘Ewa Moku had 12 Ahupua‘a, with 32 fishponds comprised of 605 acres; the largest of these were Hanaloa (196 acres) and E‘o (137 acres) fishponds in Waipi‘o Ahupua‘a, followed by Pa‘auau (32 acres) and Kuhialoko (13.3 acres) fishponds in Wai‘awa Ahupua‘a (Cobb 1903). Kuhialoko is the only one that remains as the others have been filled in, but Kuhialoko is one of the primary toxic dumps for the American military, and can no longer be used for food.

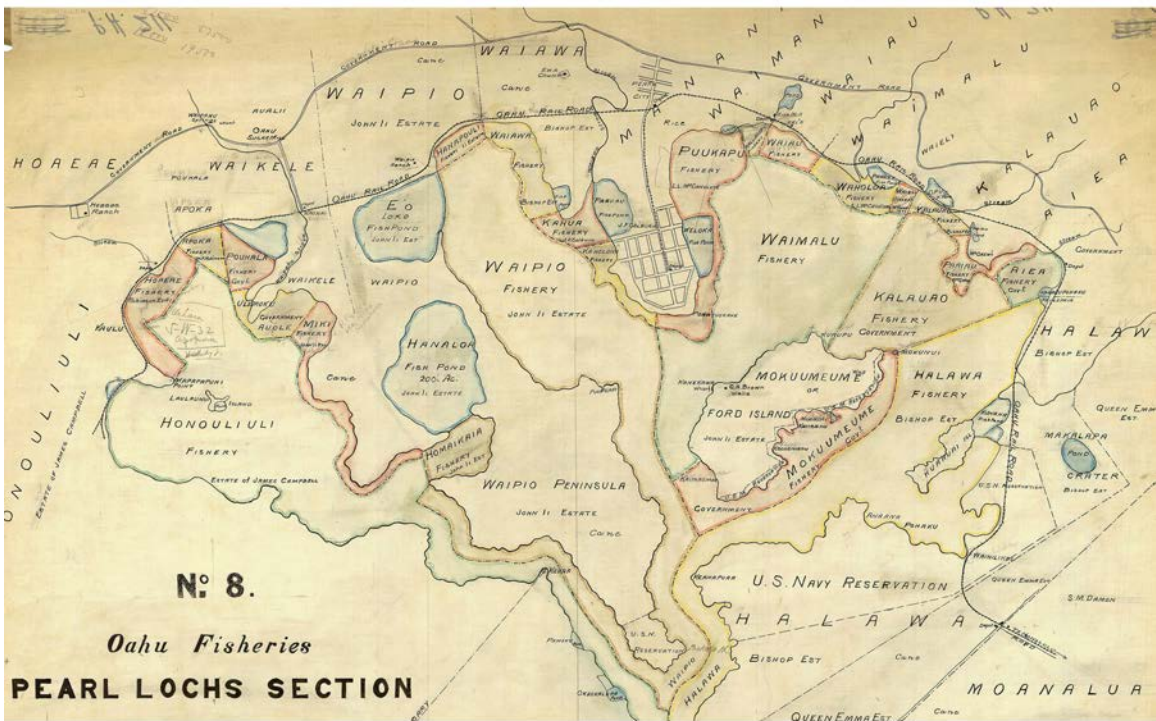


Figure 7. O‘ahu Fisheries Map of ‘Ewa Moku with the fishponds of Hanaloa, E‘o, Pa‘auau and Kuhialoko, created by Monsaratt in 1913 for the Territory of Hawaii, Collection of the Department of Land and Natural Resources.

As stated previously, as of 1885, within the 80 Ahupua‘a, there were 114 Fishponds comprised of a total acreage of 3,600 acres. As a working fishpond can create

300-500 lbs of fish per acre per year, O‘ahu was raising a minimum 1 million pounds of fish per year. The question must be asked, why would people maintain 3,600 acres of fishponds if they did not need the food? Evidently, O‘ahu was supporting a high population, because building and maintaining fishponds is labor intensive.

Today, there are only 12 fishponds left on O‘ahu, one in the Moku of Waialua, one in the Moku of Ko‘olauloa and nine in the Moku of Ko‘olaupoko, comprising about 1,332 acres of fishponds that could be used for production of perhaps 400,000 lbs of fish per year. Recharge of O‘ahu aquifers is critical to the fresh water springs needed for fishponds. Besides the critical issue of fresh drinking water on O‘ahu, there needs to be an understanding of how to best manage the surface waters of the 80 O‘ahu Ahupua‘a in order to replenish the aquifer, and to manage of the underground waters of the 6 Moku districts. Without an understanding of ancestral water management, it will be impossible to restore fishponds to their former production of 300 pounds of fish per acre per year. Moreover, as the long time Hawaiian environmental activist from Moloka‘i, Walter Ritte, teaches us, since the fishpond is the mirror of the Ahupua‘a, we will have to clean up the pesticides used upland of the fishponds before we can eat the fish from them (Ritte 2013).

1848 Māhele: Effects of Capitalism and the Private Ownership of Land on Native Hawaiian Food Production Efficiency

In traditional Hawai‘i, there was no money, no buying and selling of land or even trade of goods. When the concept of barter was first introduced to Native Hawaiians, they considered it extremely uncivilized behavior (Kamakau 1976). In Hawaiian traditional custom, food was freely given with aloha. People who planted lots of food to

give away were greatly admired, and they rejoiced in doing so. Giving food away and feeding strangers was considered good luck. The idea was that the more one gave, the more that other food would be given back as well. That system worked very well when there were only Hawaiians living here and when it was easy to make lots of food with efficient water management systems in place.

In 1820, when Calvinists from New England arrived, they had other ideas about the sharing of food and resources. As the first Christian missionaries to come to Hawai‘i, along with their new god Jehovah, they brought beliefs about private ownership and the making of money through buying and selling of goods, including food. They firmly believed that the only path to western wealth was capitalism, and they felt it their Christian duty to teach Hawaiians how to obtain western wealth as a path towards “civilization” and a rise from barbarism.

In 1838, William Richards, one of the leading Calvinists, met all summer with the Mō‘ī [King], Kamehameha III, and with the ‘Aha Ali‘i Nui [Council of High Chiefs] to teach them about the western world. He taught that the secret paths to western mana, or power, were Christianity, Constitutional Law and Capitalism. Richards taught that capitalism is based on the private ownership of land, and was based upon attaching a monetary value to land, to food, and even eventually to water. In 1839, when the idea was introduced that land should be privately owned, and bought and sold, in order to achieve wealth in the western world, Hawaiian Ali‘i Nui were resistant to this idea for many years (Kame‘eleihiwa 1992).

Meanwhile, the Mō‘ī and the ‘Aha Ali‘i Nui, or High Chief Council, were amenable to the first two secrets. They had already converted to Christianity because