

Salt Pond Locations on Hawai‘i Island



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Abstract

Knowing the importance of pa'akai (salt) and its cultural significance is critical to the survival of the people of Hawai'i. Through the 1950s pa'akai was an important resource for the endurance of people in Hawai'i due to the non-existence of electricity and refrigerators. Hana pa'akai (making salt) was a cultural practice needed for the people to survive during traditional before western influences in the 1800s because they had nothing to help preserve their food. Kūpuna (elders) believed that every moku (district) had a coastal wahi hana pa'akai (sacred salt pond) of either kāheka (tide pools) with small hollows in the shoreline pohaku (stone) or loko pa'akai (salt lakes). Pa'akai was commonly valued for preserving food, medicinal and spiritual uses. The goal of this project is to identify traditional and modern wahi hana pa'akai on the island of Hawai'i. The importance of salt, the process or methods used to harvest salt, and the change of the practice will be looked at as an ideal backing to this cultural practice over time. Within this research project, I will analyze cultural assessments, books, and newspapers that documented salt making locations and the process of the practice. As well as contacting kūpuna and lawai'a (fisherman) experts known in the communities of Hawai'i to discuss the importance of salt to their families and salt lands. As a result, the kūpuna and lawai'a experts I interviewed believe that every moku had a wahi hana pa'akai and if not, they would have to hike down to the coastline or trade in order to get pa'akai. Cultural resource assessments and land development plans between 1994 and 2014 the documentation of salt ponds in several ahupua'a (land division) around Hawai'i. Today, salt can easily be bought in stores for \$7.00 or more depending on per pound. Families around the island still holoholo (cruise or hang out) to the kai (ocean) and harvest salt to feed them. Not many records of wahi hana pa'akai were found in the newspaper, books, and resources I looked in. There was also a lack of map records for these types of places. A salt taste survey was conducted in this research to identify the skills of salt and ocean experts vs. people who simply know the areas of salt harvested from. Overall the cultural practice and wahi hana pa'akai are not as common.

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Introduction

According to Olelo Noeau Hawai‘ian Proverbs and Poetical Sayings (Pukui 1983), “E ‘ai I kekahi, e kapi kekahi. Eat some, salt some” was often expressed to young people to eat some now and save some for another time. This statement makes me think of how often we use salt in our lives. Salt was a very important way that Hawaiians used to preserve their food and any time they catch fish or meat it needed to be salted. I never realize how much salt our bodies absorb on a daily basis until I learned to make my own salt and give it away. In one week of long and intense work of making salt, I would harvest 5 pounds of salt. In less than a day, all of it would be gone from giving salt bags as gifts. I have been practicing hana pa‘akai (salt making) for three months and this cultural practice has opened my eyes to the importance of salt all around the world.

Today on Hawai‘i Island there are a few active pa‘akai (salt) ponds that people still benefit from for personal uses such as salt for their family or as an educational environment to teach younger generations about the practice of salt. Keita (2008) refers to a mo‘olelo (story) about Pele, the goddess of fire, teaching the Hawaiian people to use salt to preserve and save their meats such as fish and pork for days without going bad. The mo‘olelo talks of a young woman from Hanapepe who would often traveled to the shores of ‘Ukula on the western side of Kaua‘i to fish and gather food from the sea. One day she caught more fish than her family, friends, and even strangers could possibly eat in a single day. She was upset about not wanting to waste the fish. Suddenly an elderly woman heard the young woman crying and went over to help. The elder woman took the young woman to a beach near by and began to dig a pit in the ground until it filled up with water that came from within the earth. She told the young woman to place her fish in the pond and when the day is sunny to dry them out. The salt from the ocean spring will help preserve the rest of her catch. The young woman was so happy that she didn’t have to waste the fish that she cried in joy and her salty tears are believed to be the first harvest of salt. The old woman in the story is referred to as Pele.

Sroat (2014) reports that women would carry salt water in gourds and pour the water into shallow ponds, called kahekas, along or near the shoreline. The water would be left there to be evaporated and eventually become water with a really strong and salty taste. From there it was transferred to another hollow tub where the all the water would evaporate causing the salt crystals to dry. Buck (2003) informs that Hawaiians would make small salt pans out of natural rocks, which they place on their house platforms. These stone pans were called poho kahapa‘akai (salt evaporating dish) and were used for household value. These type of pans were made by the upper level surface of the rock would be chipped out to form a hollow or depression. Hawaiians by hand would grind the edges of the hollow with an adz, which cut down abruptly to the floor of the pan making it smooth. The process of making pa‘akai once was and still is a very important practice to the survival/existence of the Hawaiian people in preserving food (fish and meat), medicinal uses, spiritual uses and flavoring. Malo (1951) claims that pa‘akai was a condiment used with fish, meat and as a relish with fresh food. It was to be made in certain places on each island. Pa‘akai was medicinally used for throat problems, burns and injuries, nasal problems, bee stings, toothaches among with other healing uses. Hawaiians would use salt for spiritual purposes to cleanse and protect a person, place, or object from bad or evil spirits. According to Leina‘ala Lightner, pa‘akai was the closest source to a refrigerator because there was no electricity or refrigerator in Hawai‘i and you don’t always catch food everyday.

As of right now there is a lack of knowledge and natural resources due to land development and climate change, which has caused a valuable cultural practice to disappear. Many traditional pa‘akai ponds have been lost with a lot of other important practices. Most people don’t realize but salt is one of the few key elements that kept the Hawaiian people alive. Hawai‘i’s most famous pa‘akai ponds throughout the whole state are the Hanapepe pa‘akai beds in Kaua‘i. On Hawai‘i Island the most famous pa‘akai ponds is Kalaemano in north Kona. Overall, my project will be focusing on locating traditional and modern pa‘akai pond sites on the Island of Hawai‘i.

Methods

Literature:

The literature research and recording methodology I used to collect factual information for this research project was from previous site management projects, oral historic interviews, and cultural resource books. I looked through previous oral historical reports and cultural resource assessments specifically searching for key subjects of pa‘akai (salt) or relative to the subject. I accessed the cultural resource assessments from Office of Environmental Quality Control. I looked through all reports and assessment specifically done or prepared for sites on Hawai‘i. Keeping track of any assessments mentioning pa‘akai and each report and page number were recorded in Microsoft Excel. Notes were taken and recorded in Microsoft Word and organized by site report. All reports on Office of Environmental Quality Control are online copies. During my research I analyzed the research that I find and understood the content of each literature and resource. I noted sites that state a wahi hana pa‘akai (place of salt works) into Excel. I also noted the uses of salt in that area, and other relating situations involved with the making of salt to the trading of it into Microsoft word.

Interview:

The interview recording methodology I used to collect the field data for this research project was a 100 percent pedestrian interview starting with contacting kūpuna (elders) and kumu (teachers) I have previously worked with who are familiar with cultural lawai‘a (fishery) practices, knowledge of the land and genealogical connections to land sites on Hawai‘i Island. Each kūpuna and kumu was asked of any knowledge of salt, salt making, salt lands, or people who have knowledge of these categories. I selected my candidates to interview by identifying how his or her genealogical ties into early residents of specific land areas on Hawai‘i Island. I looked at the way each individual referred to be identified in his or her community with knowledge of historical wisdom in land, families, practices, and land use. I limited my possible candidates to Hawaiian or long-term Hawai‘i residences over the age of 18.

Once candidates to interview were selected I met with each individually on their free time. I gave them a consent form to sign at the beginning of our interview and a small makana (gift) or ho‘okupu (offering) to give as a symbol of my respect and gratitude for their time and knowledge. I identified the candidate as who they are and get a background of how they grew up and the history of the landscape. We discussed the stories of places that were mentioned presently or in previous forms of contact and record each memory of knowledge of his or her events. A small recorder was used during each interview along with me recording important facts in a notebook. I used GIS mapping tool to print maps for people to draw on and show me salt or important shoreline sites. Each interview was given approximately 1 hour or more if needed to talk story.

Below is a list of questions from my interviews.

Salt Interview Questions:

1. *How did you grow up? (Lifestyle)*
2. *What places do you know of that practice hana paakai or have salt ponds?*
3. *Are these salt ponds more recently made or been there for a long time?*
4. *What personal connections have you had with pa'akai?*
5. *Why do you believe salt was such an important resource?*
6. *How do you think this cultural practice in modern society has changed compared to traditional times?*

Once the interview was done I reviewed my notes and created a summary of my interview with each candidate. I sent each summary to the belonging candidate for their final approvals on what they want to release or take away. In return to those who have participated in my research project, I made copies of my report and map to give to them as a big mahalo.

A salt taste survey was given to 6 people, half of being experts and the other half being random. I identified an expert as someone I interviewed who knew a lot about the usage of salt or were ocean and paniolos people who use or were around salt in their field of work or interest. I identified a random as someone who I randomly walk up to who at least knew of the three locations each salt was from. He or she was asked to taste a minimum of three different salts that were harvested in different areas. Each was given the option to eat the salt plain or with raw flavorless ahi (tuna). Salt 1 is harvested and dried in Kaloko, Kona. Salt 2 is harvested and dried in Hanapepe, Kaua'i. Salt 3 is harvested from Otec, Kona or experts were given the option to taste their own salt as Salt 3. Each salt tester was asked to describe the taste of the salt and identify where they believe the salt was harvest from. Each response to the three different salts was recorded for each tester in Microsoft Excel.

Results

Literature:

This summer, I identified 23 pa'akai literature sources, 60% were cultural resource assessments and site management plans between 1994 and 2014 for Hawai'i Island. Out of the 23 literature sources, 11.5% were books from the UH Hilo Hawaiian Collection with information of the history of Hawai'i through someone's perspective during the late 1800s to mid 1900s. Within my readings three themes stood out, which are the importance of salt, the process, and the locations of salt as claimed in kuleana awards.

Pa'akai was an important resource to the Hawaiian people in each community. The three major things pa'akai was used for were food preservation, medicinal and healing practices, and curing animals during the early historic period. Salt was a condiment used with beef or fish and would be traded with the ma uka and ma kai families. Coastlines such as Pūako, Kawaihae, and Honu'apo were very important because they had to feed several villages and communities in the uplands where salt and marine resources were not accessible to them. Later on during the late 1800s and 1900s, many of the ranchers and paniolo would use gallons of salt to cure pipi (cow) or goat to make saddles, boots, and other this nessessary for someone in this field of work (Lightner 2015). For people near the ocean such as fisherman, salt was important for drying opelu and other fish for the winter seasons when the ocean was too rough.

Each district used a method of pa'akai gathering. The way they made their salt ponds

were different, the way they gathered water to fill their salt ponds were different, and the way they dried it was different. Some of the districts shared a common technique, but still shared a difference. The people who hana pa‘akai on the east side of Hawai‘i used a technique of ti leaves and kāheka as their salt pond. People from the west side of Hawai‘i used kāheka and loko pa‘akai as their salt pond when hana pa‘akai. Salt was a main resource for preserving fish during the winter season and if they didn’t have any salt, fisherman would have to put them in fresh water ponds or loko i‘a to keep cool and fresh for them to stay alive and become a natural “ice-box” during the winter. In each district, some of the families would chisel smaller salt ponds out of the coastline and place them on their homelands. Others personally made their salt ponds out of large pohāku near their homes. The Bishop Museum has several salt rocks that are all different sizes and shapes that were once used for salt making. Today, very few families still have their salt rocks on their home properties that they used or their ancestors used to hana pa‘akai.

The kūleana awards are records of land that was awarded to hawaiians within each ahupua‘a as a result of the Māhele. The kūleana awards was passed by King Kalākaua and Privy Council on the December 21, 1849. This law pertaining to native tenants granted native Hawaiians to access, subsistence and collection of resources from ma uka to ma kai, which was necessary to sustain their lives. Those who were awarded land that included salt ponds or beds lived in different districts such as Honu‘apo, Kaloko-Honokōhau, Kawaihae, Kiholo, and Puako. More than two families in each of these districts were awarded and given these properties. In Honu‘apo five families were awarded a kuleana award ma kai of what now is Highway 11. In Kaloko-Honokōhau there were no claims of kuleana awards but there was one family who shows proof of residency at Kohanaiki along with other landmarks that reveal residential clues. Previous oral interviews were discussed of the coastal resident landmarks mentioning pa‘akai within this area (Kaloko Makai 2011:65). In Kawaihae there were sixteen claims of house lots in this district and others in south Kohala and all were given a kuleana award. In Kiholo several landmarks that are still upright today show proof of residency with the area along with families who still own parts of the land. At Puako three family claims of a 40 by 40 fathom lot.

Interview:

After two months of surveying, I interviewed 9 people in all different communities on the Big Island and the majority strongly believe that salt making was an important cultural practice for people before 1950s. During the first 6 weeks, over 100 hours were put into contacting and meeting with people to discuss with. I reached out to 22 people who are experts in lawai‘a, salt making, and wise about the Hawaiian culture. I was referred to 16 people who people in the community felt were experts in these fields of knowledge. Out of the 22 contacts, 6 were interviewed by phone call or email. An amount of 3 were interviewed face to face. Through my interviews three major themes were brought to my attention, which include the importance of salt, the cultural practice of hana pa‘akai in different locations, and the culture practiced in traditional and modern times.

The significance of pa‘akai to the Hawaiian culture and lifestyle is that the ocean was a resource and the kānaka (people) learned and were able to adapt to the environment to get the supplies they needed to survive. Before the late 1950’s, Hawai‘i lived without electricity and refrigerators so they had no way to store their fish and meats.. During my interviews the term pa‘akai was thoroughly mentioned into as more than a resource of preservation but as lifestyle in each district on Hawai‘i. To many native Hawaiian families salt was harvested for home usages. In each home, gallon barrels or rice bags were filled with salt and would be sitting in the kitchen.

During the summer families and communities went to the coastline to hana pa‘akai because the days are long and sunny, which is perfect weather for drying pa‘akai. Kānaka would need to harvest for the winter months because the weather and coastline would not have ideal conditions to hana pa‘akai. The winter months were about sustainability and preservation. If a family ran out of salt during the winter, there would be a low chance of their survival (Mitchell 2015).

The majority of people interviewed were taught or raised around the making of pa‘akai during their childhood years when salt was a resource that was needed. In many of their families salt was made out of a kāheka or a loko pa‘akai. A kāheka is a naturally made pond or rock basin where the ocean water washes in through an opening and dries on the rock eventually forming salt crystals. This was a traditional way of making salt. A loko pa‘akai is a man made salt pond commonly made of cement that is built from coral. None of the kūpuna or Hawaiian practitioners could figure out the formula for that type of cement that their kūpuna used. This type of salt pond was a modern technique developed during pre-contact of western civilization. Many of the interviews used different terms to describe salt ponds and the process of salt during their discussion (see figure 1).

<u>Hawaiian</u>	<u>English</u>	<u>Description</u>
Pa‘akai	Salt	
Kāpī	To salt	
‘Alaea	Ocherous earth used to color and flavor	Rust color
Kāheka	Salt pan	Naturally formed in pahoehoe
‘Aina Pa‘akai	Salt pan	
Hāhā Pa‘akai	Salt bed	
Ālialia	Salt bed	
Lo‘i Pa‘akai	Salt pond	Man-made with cement from coral
Loko Pa‘akai	Salt pool	Man-made with cement from coral
Kāpī Pua‘a	Salted pork	
Kāpī Pipi	Salted beef	
Po‘e ho‘o hāhāpa‘kai	Salt Gathers	
Wahi Hana Pa‘akai	Place of salt works	

Figure 1. Hawaiian salt terms and English translation.

In some districts such as Kaena Point and Kawaihae used ti leaves as a salt pond as place them between leveled platforms to create a wind blocker. Rows of ti leaf would lie on the rocks and the people would fill each leaf with salt water just as they would with a kāheka or loko pa‘akai.

Larger salt ponds in areas such as Kawaihae and Kahalu‘u commonly belonged to the chiefs or royal family. This left a lot of the maka‘ainana to either harvest salt from smaller kāheka or buy at the stores. Salt took a while for it to dry and process and in fishing villages similar to Miloli‘i had a high demand rate for the need of salt for when they would dry opelu. The people in these fishing villages would have to buy their salt at the store because the amount of salt they needed on a daily basis would take too long. In modern times many people have been hesitant to reveal salt harvesting locations on the east side of Hawai‘i. A lot of the families within this land division still harvest but share a fear of their resource to feed their families being taken away from them or over harvested by another family. Kūpuna on the west side of Hawai‘i are open to sharing their mana‘o (knowledge) of salt harvesting and their experiences with this practice. Some of the popular places for salt harvesting on Hawai‘i that my interviews referred me to was Kalaemano and Honu‘apo. Kalaemano is a cultural center in North Kona and one resource that this place is known for is pa‘akai. This coastal area is very hot and dry, which is a perfect place for salt making. There is the Hualalai resort on the south end of Kalaemano. Kalaemano was known to feed the communities of Hualalai, Pu‘uanahulu, Pu‘uwa‘awa‘a, Pukala, Ka‘upulehu, Kala‘oa, O‘oma, and Hu‘ehu‘e. Honu‘apo is a rock land environment setting consisting of pāhoehoe (lava bedrock) covered in places by a thin layer of soil material.

A large decrease in the amount of families who practice hana pa‘akai has occurred over time to today’s modern time along with the lack of wahi hana pa‘akai still present or actively in use. A lot of the new developments that have occurred between the 1900s and 2000s have played a large role in these places and this practice becoming extinct. Many of the development have been built on these land structures without knowledge of the significance of an area. Several lava flows have also played a role in the disappearance of these salt ponds because of the coverage from the lava. Very few salt ponds still exist on Hawai‘i compared to ancient and traditional times. As a result of my research through my literature resources and and conducted interviews, I was able to located 22 salt ponds. Majority of the locations were found in the Kona district. Observations were made that these locations have hotter elements that benefit salt making (see figure 2).

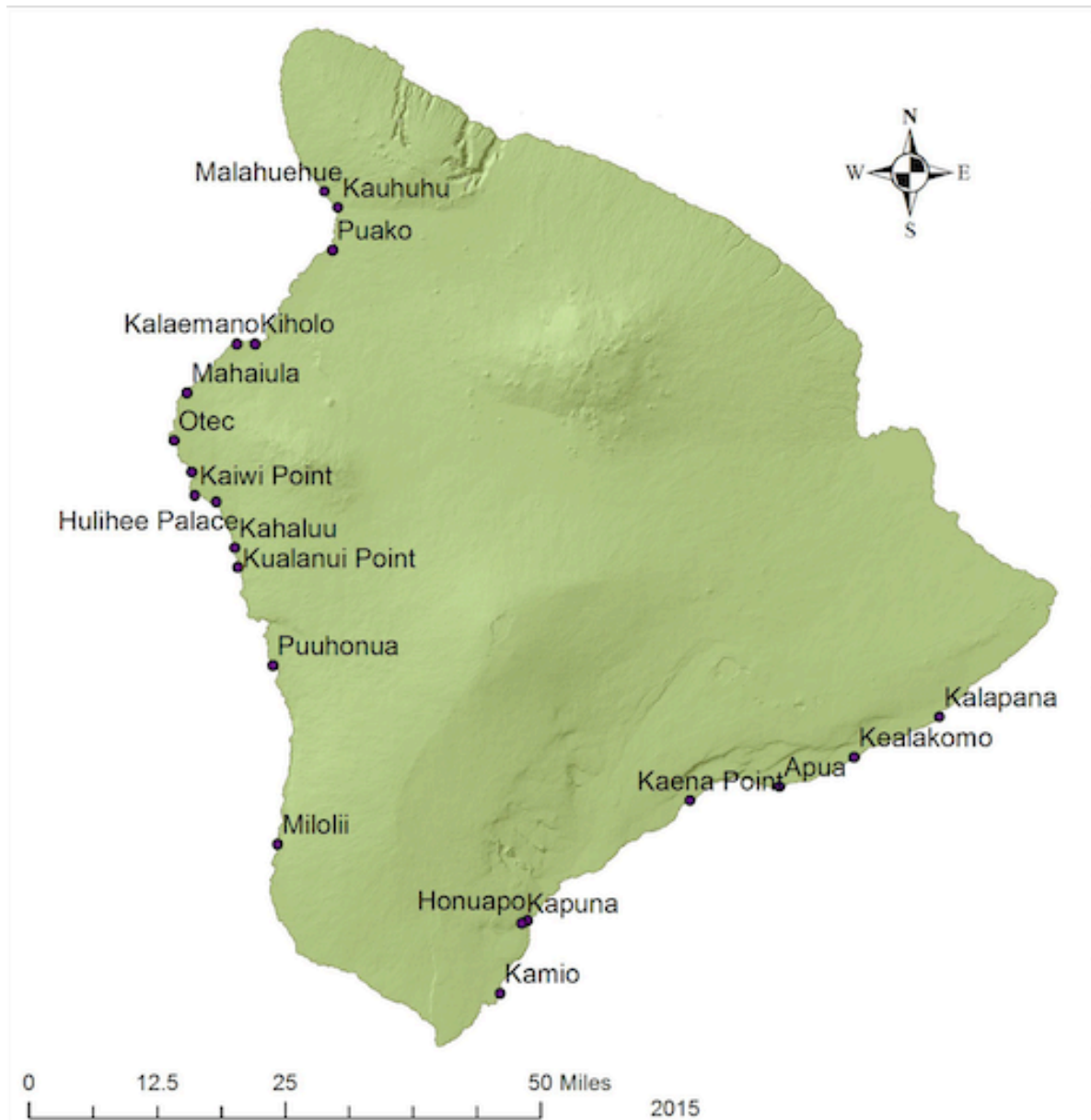


Figure 2. Salt pond locations on Hawai'i (2015 map)

Salt Survey:

A total of 6 people were surveyed within a one-month time period. Each participant was identified on their skills of knowledge before given the survey. Experts were identified to know the areas each salt was harvested and have a salt gathering or lawai'a background. Randoms were identified to know the areas each salt was harvested from. An equal amount of 3 experts and 3 randoms were surveyed. As a product of the final results, the experts were able to identify where each salt was harvested from correctly (See figure 4).

Participant	Salt 1 (Kaloko)	Salt 2 (Kaua'i)	Salt 3 (Own salt or Otec)
Leina'ala Lightner	Identity: Kaloko Description: Very sharp, sharper than the first salt. The taste of the salt was clean.	Identity: Kaua'i Description: Mild and have no bite to it. There is a slow transition to tasting the saltiness because of the alaea.	Kalaemano Salt Identity: Kalaemano Description: Very strong and very salty.
Nainoa Quinn	Identity: Kaloko Description: Taste fine like a snow cone and not as salty	Identity: Kaua'i Description: Taste not like normal salt but with a lot of flavors	Kona Sea Salt (Otec) Identity: Otec Description: Taste like rock salt
James Akau	Identity: Kaloko Description: Big chunks of salt that crumbled easily and had a strong bridal taste	Identity: Kaua'i Description: Very flavorful that hits different sections of the mouth	Ka'u Salt Identity: Ka'u Description: Really sharp and strong taste that had a hard texture.

Figure 4. Experts survey of identifying salt and describing salt taste.

The final result product for the randoms were incorrect. Participants mention they thought they would be able to identify the Kaua'i salt because there are other elements. All randoms believed Salt 1 was harvested from Otec, Kona. One of the participants in the random category was able to identify Salt 2 correctly (See figure 5).

Randoms (people who just know the areas)

Participant	Salt 1 (Kaloko)	Salt 2 (Kaua'i)	Salt 3 (Otec)
Judy Ross	Identity: Otec Description: Taste like table salt that melts in mouth	Identity: Kaloko Description: Taste super salty.	Identity: Kaua'i Description: Taste super intense taste that was overwhelming.
Kaimana Kalei	Identity: Otec Description: Fine salt and not very crunchy.	Identity: Kaua'i Description: Taste was clean but with a lot of taste	Identity: Kaloko Description: Taste really salty
Raymond Liu	Identity: Otec Description: Clean and pure salt that just tasted like straight salt.	Identity: Kaloko Description: It had an ocean taste	Identity: Kaua'i Description: It had a woody taste, with more ground or dirt taste and not as salty

Figure 5. Randoms survey of identifying salt and describing salt taste.

Discussion

Over a two-month time period, this project explored the coastline of Hawai‘i with a main focus on pa‘akai pond locations. My research questions targeted locating and mapping out traditional and modern salt ponds, the significance of this resource to the people of Hawai‘i, and the overall change of the traditional methods practiced and modern methods practiced when harvesting pa‘akai. The amount of effort put into this project resulted in over 300hrs within a two-month range. On the island of Hawai‘i, 22 sites were identified to have been or still are salt lands where salt was harvested. I was able to identify 5 out of 9 districts on the island that showed record or reference to having salt lands. Within the 8 interviews I organized, I was able to classify the use of salt to the people of Hawai‘i and the value of it before the 1950s. All interviews strongly agree salt was a necessary resource for preservation and existence. The existence of hana pa‘akai has become less of a primary practice due to the introduction of electricity, refrigerators, and stores. Very few families still carry on the tradition of hana pa‘akai in today’s society.

The districts that were recorded or referred to have salt lands were South Kohala, North Kona, South Kona, Ka‘u, and Puna. The most popular and well known salt lands were located at Kalaemano, North Kona. This area was referred to me by almost all contacts who participated in my interviews and is one of the most productive salt lands that are still going today. Other well known areas include Honu‘apo in Ka‘u, Kaena Point in the Valcano National Park, Kualanui Point in North Kona, Kahalu‘u in North Kona, Puako in North Kona, and Otec in North Kona. I found the salt lands in Otec to be very interesting because they are the only manufactured salt that is gathered, packaged, and sold in Hawai‘i. My results reached a portion of my expectations because I hypothesized that each moku and ahupua‘a would have salt ponds. I was proven incorrect when interviewing Auntie Leina‘ala Lightner at Kalaemano. The Kalaemano salt ponds were known to feed the communities of Hualalai, Pu‘uanahulu, Pu‘uwa‘awa‘a, Pukala, Ka‘upulehu, Kala‘oa, O‘oma, and Hu‘ehu‘e (Lightner 2015). She shares of how one salt pond back when she was little could produce a thousand pounds of salt, but that was never enough for one family to survive on. In an interview with Uncle Mitchell Fujisaka from Kahalu‘u, the salt ponds at Kahalu‘u were for the royal family only. The maka‘ainana in this ahupua‘a had to create their own smaller salt pans to survive and were restricted to take from another ahupua‘a (Fujisaka 2015). In my interviews and literature research, I found 17 salt ponds that either belonged to specific families who took care of them. These sites were less referred to due to they were not as common or development has over ruled these areas causing the salt ponds to be destroyed.

The significance of this resource I found through my research was practiced by every family before the 1950s when electricity was introduced to Hawai‘i. based from my results, my hypothesis was proven incorrect due to the lack of knowledge that salt was used for. Salt was used by everyone such as fisherman, farmers, paniolo, and even the royal families. Salt had that important role in everyone’s lives because it was a resource of survival, healing, a tool for supplies, and many other things. Comparing the two time periods of today and before the 1950s, the importance of salt is still in the mind sets of everyone but now it is less of a rare and delicate

recourse than before. Majority of the literature and interviews shared a common understanding of salt being a very valuable resource for preserving foods, animal skins, and trade. In many districts around the Hawai'i numerous inhabitants supported themselves by producing salt and dried fish, which was traded both inland and along the coast (Maria T.K. Sweeney & Greg C. Burtchard 1994:12).

The majority of my people I interviewed were born after the 1950s, which didn't have to experience the struggle of no electricity and having to work for everything you needed to survive. Many of the families discussed with were recently introduced to the practice of hana pa'akai within a range of the past 10 years. My results showed that many of the families on the east side of Hawai'i were hesitant to talk with me about salt pond locations because majority of them today are family own. They worried of the public finding their family ponds and raping the ponds of their salt that they use to feed their families. While hearing these responses, I understood where they came from and moved forward. However, the people I contacted on the west side of Hawai'i were very open to sharing the locations they knew that had salt ponds. I believe this was the case because on this side of the island was very hot and had a larger amount of salt ponds and large in size as well to feed many communities.

For the future, more data should be looked into towards interviews and contact with native Hawaiians born before the 1950s and after. This I recommend to anyone who would like to get a strong amount of data. Also, a better understanding of archeological maps of the coastline should be looked at with care. For a prevention in conflict and misunderstandings during interviews, I would identify the purpose of your project in a way that benefits the community. As well as stating what you are asking for in a very open ended and broad way. Overall, I feel this project was very successful in bringing together and mapping out the salt pond areas that are either still active or lost forever from land development. I feel this project should be continued with because this was a very important resource to our ancestors and if it wasn't for their knowledge of salt, we would not be here today. I strongly feel that salt making is one of the most important cultural practices that should be passed down from generation to generation.

Evaluation

Although a lot of work was put into my research project, I enjoyed interviewing people of several different districts and hearing about the way they grew up around salt. At first it was scary to call or meet with them because most of the people I talked with were highly educated kūpuna who had a lot of cultural mana'o, which was a little intimidating. However, I when I actually did talk with them, they were really happy about sharing their knowledge with someone who is passionately interested in it. I did run into a few people who felt they didn't have enough knowledge about salt or were hesitant to share their family secrets. I completely understand their reasons of resistance to talk and would thank them and move on.

A lot of my research was finding literature resources and reading them, which was a completely different way of taking my project than I expected. It was fun to find and read through all the cultural assessments and books that I found, but it was a lot of work and I would get exhausted from reading especially since I'm not a big fan of reading. However, I did enjoy everything that I read and kept growing my own mana'o of pa'akai.

With those who I met with in person and interviewed, I asked of them to take a salt taste survey and I was so happy so see the joy of them wanting to take it. I could tell that

each person who took my survey had a lot of fun with it. Almost every random person that I surveyed all said the Kaloko salt tasted like it came from Otec. I would laugh because it was very interesting to see how different people, both experts and non-experts, have different perspectives to how each salt tasted.

If I learned anything at all, it would be how to work independently with a mentor to supervise me and to help me when I need guidance or to get back on track. I actually learned a few science skills, which I will use when I take my first science class in college. I couldn't believe that I actually completed and wrote a research paper because going into this internship I had absolutely no knowledge or experience of science, research, or management so everything was new to me. I did have a hard time with my writing but I give a big thanks to my mentor and writing advisor who helped fix every mistake I made and guide me in a better direction. They supported me the whole way through this and I strongly appreciate it.

I got to meet a lot of passionate people and this will sure be an experience that I will remember and carry with me. I want to thank the PIPES crew, my mentor, and my two co-workers who helped me the entire summer to write, research, and interview the people I needed to make my research paper successful and complete.

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Malo, Davida. Hawaiian Antiquities (Moolelo Hawaii). 2nd ed. Honolulu: Museum, 1951. 123. Print.

Pukui, Mary Kawena, and Dietrich Varez. *'Olelo No 'eau: Hawaiian Proverbs & Poetical Sayings*. Honolulu, Hawai'i: Bishop Museum, 1983. Print.

Roper, Summer. "Pa'akai Interview." Telephone interview. 12 June 2015.

Sroat, Ena, Megan Hawkins, Kelly Burke, Michelle Pammer, Constance O'Hare, and Matt McDermott. *Archaeological Inventory Survey Report for Block I, Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu*. Rep. Kailua, Hawai'i: Cultural Surveys Hawai'i, 2014. Print.

"The Mo'olelo....my Version." *'Pa'akai Farming in Hanapepe'* N.p., 19 June 2011. Web. 23 June 2015. <<http://paakai.typepad.com/paakai-hanapepe/2011/06/the-moolelomy-version.html>>.

Annotated Bibliography:

Akau, James. "Pa'akai Interview." Personal interview. 6 June 2015.

James is a local boy from Ka'u who grew up very close to his environment. He knows a lot of mo'olelo about areas in Ka'u and is familiar with the place names. He has a strong connection to Ka'u.

Bitterman, Mark, and Jennifer Martiné. *Salted: A Manifesto on the World's Most Essential Mineral, with Recipes*. Berkeley: Ten Speed, 2010. Print.

From this book I was able to find more information about the different types of salts around the world. One of the salts mentioned in this book was the red dirty salt (alaea) from Kaua'i.

Buck, Peter Henry. *Arts and Crafts of Hawaii*. Vol. 2003. Honolulu: Bishop Museum, 2003. 72-73. Print.

This is an excellent book that shares in detail the Hawaiian material culture. Buck writes about in a clear vision every major element of Hawaiian arts and crafts, providing detailed descriptions of traditional objects, methods of construction, and traditional use.

"Energy Portfolio." *Hawaii Ocean Science & Technology Park Administered by the Natural Energy Laboratory of Hawaii Authority*. N.p., n.d. Web. <<http://nelha.hawaii.gov/energy-portfolio>>.

This website I found information about what the companies at Otec, Kona do. I was able to find information about the Kona sea salt and how they made their salt.

Fujisaka, Mitchell. "Pa'akai Interview." Personal interview. 1 July 2015.

Mitchell is an old kūpuna who was born and raised in the ahupua'a of Kahalu'u. He is very familiar with the ocean at Kahalu'u and is a master fisherman.

Honuapo Park Resources Management Plan. Rep. Vol. Townscape, Inc. N.p.: n.p., June 2010. Print.

This cultural resource management plan was designed for the Honu'apo area in Ka'u. This report includes salt pond in this area along the coastline.

Johnson-Campbell, Amanda. "Pa'akai Interview." E-mail interview. 19 June 2015.

Amanda works at the National Park in Kaloko and shares her mana'o of salt ponds at Kaloko. She has a lot of knowledge about the archeological sites at Kaloko and familiar with the Ala Kahakai trail.

Ka'awaloa, Andrea. "Pa'akai Interview." Telephone interview. 9 July 2015.

Andrea works at the Volcano National Park and shares her knowledge of salt ponds in Puna and Ka'u. She knows that a lot of the larger ponds have disappeared due to the lava flow.

Keita, K.. 2008. Crystal harvest. Hana Hou: The Magazine of Hawaiian Airlines 11(2) Available from <http://www.hanahou.com/pages/Magazine.asp?Action=DrawArticle&ArticleID=676&MagazineID=42> (accessed June 2015)..

This article shares a very simple and basic concept of the traditional Hawaiian practice of salt making specifically in Hanapepe, Kaua'i. This article provides a short version of a mo'olelo about the beginning of salt making being introduced to Hawaiians.

Kelekolio, Meleanie. "Pa'akai Interview." Telephone interview. 15 July 2015.

Meleanie works at Otec in Kailua Kona as a scientist. She helps participate in making the Kona Sea Salt. This salt is the only manufactured salt made in Hawai'i.

Lightner, Leina'ala. "Pre-Contact Interview." Personal interview. 4 June 2015.

This was an interview with a Kupuna who care takes the salt beds at Kalaemano. This interview consisted of the history of the area in relations to salt making and how they harvest salt today.

Lincoln Maielua, Kealii. "Pre-Contact Interview." Personal interview. 23 May 2015.

This was an interview with a wa'a navigator of Makali'i who shared a brief inside of different types of salt in Hawai'i.

Malo, Davida. Hawaiian Antiquities (Moolelo Hawaii). 2nd ed. Honolulu: Museum, 1951. 123. Print.

David Malo shares an important source of the ancient beliefs and practices of Hawaiians. This book shares about the practices of Hawaiians during the pre-Christian times. He also shares about material words of Hawaiians, as well as their origins, myths and beliefs.

Maly, Kepa, and Onaona Maly. *HE WAHI MO'OLELO NO NA LAWAIA MA KAPALILUA, KONA HEMA, HAWAII*. Rep. N.p.: n.p., October 2003. Print.

I was able to find salt ponds with this report in the south Kona district. Also other fishing practices and connections to the ocean.

Maly, Kepa, and Onaona Maly. *Volume 1: Ka Hana Lawai'a a Me Na Ko'a Na Kai 'ewalu*. Rep. N.p.: n.p., August 2003. Print.

This report shared information about people who lived and grew up near the ocean and their life experiences. Oral interviews were included in this report with a few kūpuna about the landmarks along the coastline.

Maria T.K. Sweeney & Greg C. Burtchard. *Archaeology in the Kiiauea East Rift Zone Kapoho, Kama'ili & Kdauea Geothermal Resource Subzones Puna District, Hawai'i Island*. Rep. N.p.: n.p., May 1994. Print.

This cultural resource assessment included shoreline activities that were useful in my report. This shared the cultural landmarks with Puna.

PLANNING SOLUTIONS, INC. *KĪHOLO STATE PARK PRE-FINAL MASTER PLAN AND DRAFT ENVIRONMENTAL ASSESSMENT*. Rep. N.p.: n.p., August 2013. Print.

The Kiholo reported shared costal activities in Kiholo and points out new developments where old cultural sites once were. This reported shared a couple salt ponds at Kiholo that were developed over.

Puakō Community Association. *FINAL ENVIRONMENTAL ASSESSMENT PUAKŌ EMERGENCY ROAD*. Rep. N.p.: n.p., August 2008. Print.

Puako was a very marine resource area that fed communities near and far. Puako was famous for salt making and this report insides the shoreline of this area.

Pukui, Mary Kawena, and Dietrich Varez. *'Olelo No'eau: Hawaiian Proverbs & Poetical Sayings*. Honolulu, Hawai'i: Bishop Museum, 1983. Print.

This book has many Hawaiian sayings and proverbs that have been recorded. All of these sayings are about the Hawaiian Islands, practices, places, people, and nature.

Puniwai, Noelani. "Pre-Contact Interview." Personal interview. 18 May 2015.

This was an interview with my mentor. She shared with me what she does and the projects that she has worked on through her master's projects.

Replogle, John. "Pa'akai Interview." Telephone interview. 24 June 2015.

I was referred to John by James Akau and he knew a little bit about salt ponds. He did know of the ti leaf technique used in Ka'u to gather and dry salt.

Roper, Summer. "Pa'akai Interview." Telephone interview. 12 June 2015.

Summer works at the National Park and has done a master's paper on salt around the world and salt specifically at Kaena Point in Ka'u. Here she knows of an interesting technique for harvesting salt in Ka'u that uses ti leaves as a salt drying bowl.

Roper, Summer. *PA'AKAI: THE KAENA POINT SALT DRYING AREA: AN ARCHAEOLOGICAL PERSPECTIVE ON THE TRADITIONAL AND POST-CONTACT HAWAIIAN SALT ECONOMY*. Rep. N.p.: n.p., August 2011. Print.

Summer Roper wrote a master's paper on the techniques of salt around the world. Here in Hawai'i she focused on Kaena Point in Volcano of how they utilize salt and their methods.

Sroat, Ena, Megan Hawkins, Kelly Burke, Michelle Pammer, Constance O'Hare, and Matt McDermott. *Archaeological Inventory Survey Report for Block I, Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu*. Rep. Kailua, Hawai'i: Cultural Surveys Hawai'i, 2014. Print.

This is a cultural report that was done on O'ahu. This report discusses the history of salt gathering and the protocols that were done during ancient traditional times.

Sroat, Ena. *Archaeological Inventory Survey Report for the Block B East Project, Kaka'ako Ahupua'a, Honolulu (Kona) District, O'ahu*. Rep. N.p.: n.p., July 2014. Print.

Ena Sroat's report gave a brief background of the cultural practice of salt making and referred to David Malo's book about women being the ones to harvest salt.

State of Hawai'i Department of Transportation Harbors Division. *DRAFT ENVIRONMENTAL ASSESSMENT IMPROVEMENTS TO KAWAIHAE HARBOR*. Rep. Vol. (3)6-1-03-Variou. N.p.: n.p., July 2013. Print.

This environmental assessment focusses on Kawaihae and the improvements to the harbor. This report mentioned old names of salt locations that have disappeared from the development of the harbor.

The Hawai'i Environmental Policy Act. *DRAFT ENVIRONMENTAL ASSESSMENT LEASE OF STATE LAND HOKULOA UNITED CHURCH OF CHRIST*. Rep. Vol. 6-9-002:007, 008, 009, and 010. N.p.: n.p., May 2011. Print.

This report shared some brief information of people who used to harvest salt in Puako. Kuleana awards were also recorded in this report.

"The Mo'olelo....my Version." *'Pa'akai Farming in Hanapepe'* N.p., 19 June 2011. Web. 23 June 2015. <<http://paakai.typepad.com/paakai-hanapepe/2011/06/the-moolelomy-version.html>>.

This website shares a Hawaiian story about how salt was first introduced to the Hawaiian people and specifically the people of Hanapepe, Kaua‘i. It talks about Pele and the relations to this area on Kaua‘i.

United States Department of the Interior/National Park Service. *Kaloko-Honokohau National Historical Park Hawaii*. Rep. N.p.: n.p., July 1994. Print.

Wilson Okamoto Corporation. *DRAFT ENVIRONMENTAL ASSESSMENT KAWAIHAE ROAD - WAIAKA BRIDGE REPLACEMENT AND REALIGNMENT OF APPROACHES Waiaka, South Kohala, Island of Hawaii*. Rep. Vol. AMTRK-01-99. N.p.: n.p., n.d. Print.

This cultural resource assessment includes Kuleana awards as well as the family names assigned these awards. Few of the awards included salt ponds.

Wilson Okamoto Corporation and Ho‘okuleana LLC. *KAWAIHAE ROAD - WAIAKA BRIDGE REPLACEMENT AND REALIGNMENT OF APPROACHES Waiaka, South Kohala, Hawaii*. Rep. N.p.: n.p., September 2012. Print.

This cultural resource assessment includes Kuleana awards as well as the family names assigned these awards.

Wilson Okamoto Corporation and Ho‘okuleana LLC. *Draft Environmental Impact Statement Kaloko Makai Kaloko and Kohanaiki, North Kona, Island of Hawai‘i Volume 1 of 2*. Rep. N.p.: n.p., July 2011. Print.

This report discussed the loko i‘a ponds at Kaloko and mapped out these ponds. Residential landmarks were recorded in this report.

WILSON OKAMOTO Corporation and Ho‘okuleana LLC. *AIRFIELD, TERMINAL, AND FACILITY IMPROVEMENTS FOR THE KONA INTERNATIONAL AIRPORT AT KEĀHOLE*. Rep. N.p.: n.p., March 2013. Print.

This report shared with me the cultural resources that were at Keahole before the international airport was developed. Many lawai‘a techniques were shared in this report along with the stories.