

3.10 CULTURAL RESOURCES

3.10.1 Introduction/Region of Influence

The Department of Defense statutorily defined cultural resource as any of the following:

- A building, structure, site, district, or object eligible for or included in the National Register of Historic Places (NRHP) maintained under Section 101(a) of the National Historic Preservation Act (NHPA, 16 USC 470a[a]);
- Cultural items, as that term is defined in Section 2(3) of the Native American Graves Protection and Repatriation Act (NAGPRA, 25 USC 3001[3]). These include human remains, associated and unassociated funerary remains, sacred objects, and cultural patrimony objects;
- American Indian, Eskimo, Aleut, or Native Hawaiian sacred sites for which access is protected under the American Indian Religious Freedom Act (AIRFA, 42 USC Section 1996);
- Archaeological resources, as that term is defined in Section 3(1) of the Archaeological Resources Protection Act of 1979 (ARPA, 16 USC 470bb[1]). These include any material remains of human activities that are of archaeological interest as determined under ARPA regulations; and,
- Archaeological artifact collections and associated records as defined under 36 CFR Part 79: Curation of Federally Owned and Administered Archaeological Collections. Under these guidelines, collections include material remains, such as artifacts, objects, specimens, and other physical evidence, that are excavated or removed during a survey, excavation, or other study of a prehistoric or historic resource. Associated records include original records (or copies thereof) that document efforts to locate, evaluate, record, study, preserve, or recover a prehistoric or historic resource.

In addition to cultural resources defined by federal statute, regulation, and executive order for consideration and protection, additional sites and areas important to Native Hawaiian culture and religion may exist on Army lands. These resources are referred to as Areas of Traditional Importance (ATIs) and were identified as an issue of importance during the public scoping process. The Army continues to consult with Native Hawaiian groups and other members of the public to identify more of these sites, and, if appropriate, to evaluate their eligibility for inclusion in the NRHP.

ATIs are discussed in more detail in Section 3.10.4. The ROI or area of potential effect for cultural resources at MMR includes the proposed training areas within MMR.

The ROI for the PTA alternative includes the range footprint and the moderate to high fire spread rate areas that would be impacted by an unsuppressed fire ignited at the outer perimeter of the potential ignition area for all weapons, with high risk weather conditions. Also included in the ROI is any transportation route utilized to move between Kawaihae Harbor and PTA.

Public scoping at MMR has helped to identify specific issues and areas of interest and revealed other general concerns. The Army has worked and will continue to work with the public in identifying and preserving important resources. The preparers of this EIS have addressed comments and concerns generated through the scoping process, and the document includes a discussion of previous, ongoing, and possible future regulatory compliance actions. A review of public comments appears below.

One major issue that is shared by many of the respondents is the ancestral responsibility that Native Hawaiians have for stewardship and protection of the islands as a whole. This issue deals with the spiritual affinity and important role that the natural environment plays in Hawaiian culture and the belief that it is not possible to separate the people from the land. This perspective makes it inappropriate for Native Hawaiians to support any actions that could affect or disturb the land. In this regard, many comments received were critical of past disturbances to the land and natural resources, such as reports of filling in ponds and wells at MMR for the filming of the movie "Hawai'i."

Comments were also made stating that effects need to be looked at from a broader perspective and that impacts to cultural activities may occur outside of the immediate area. Many in attendance at the public meetings were concerned with water quality issues, both inland and offshore as they relate to resource utilization. Fish and fishing off MMR was discussed as an important cultural activity that may have been affected by past activities.

Members of the public also requested that enough information would be gleaned from oral interviews to ensure a thorough assessment of traditional areas. Questions were also raised about the completeness of the archaeological surveys both aboveground and below. Other concerns dealt with how the Army's Proposed Actions would affect cultural sites, how they have affected them over the years MMR has been in use, and how

past alterations to the environment may have fragmented cultural sites and geographic features.

Comments were received about how the disruption and fragmentation of cultural practices will affect future generations, and, unless preserved, knowledge transmitted will be degraded with each subsequent generation. This and the effect on the maka'āinana (common people) need to be evaluated using past studies, including the Earthjustice report titled, *In the Footsteps of the Parent, Impacts of Military Use in Mākua Valley on Native Hawaiian Cultural Resources*, by Eric Enos.

It was also suggested that impacts to all resources in and around MMR be evaluated, including streams, springs, wells, caves, trails, sacred places, sandy beaches, surfing sites, turtle nesting sites, muliwai, bridges, shrines, historic sites, cemeteries, native plants, native fauna, 'alae veins, historic walls, pō kāne (night marcher) routes, ponds, 'auwai (taro irrigation ditches), trails, lo'i kalo (taro pond fields), wahi pana (named places), dunes, canoe landings, kilo i'a (fish spotting sites), salt pond/pans, fishing grounds/fisheries, ko'a (fishing shrines), heiau (temples), imu, burials, archaeological sites, hunting areas, cultivation areas, hō'ailona (natural signs), sighting spots, lele (cliff jumping places), leina (jumping off point for souls to cross into the next world), 'aumakua (ancestral deities) domain, pu'uhōnua (place of refuge), hōlua slides (slides for sleds), and basaltic adze/glass veins and quarries.

Other comments included the need for more information on the extent of mitigation efforts with respect to Hawaiian cultural practices, gathering rights and religion, land containing artifacts and burial grounds, Hawaiian rights to use archaeological sites, and fire safety protection plans. Other members of the public wanted assurance that all state and federal guidelines and laws were followed regarding resource preservation.

To document traditional cultural properties (TCPs) and to determine potential areas of concern, the Army completed a study consistent with the 2001 Settlement Agreement to determine cultural impacts from continued military use of MMR (Social Research Pacific 2003a). Results of the impact study are discussed in Section 4.10.

This section presents information and research conducted on the oral traditions, ATIs, historical overview, archaeological sites, TCPs, paleontological resources, Army management of cultural resources, regulatory considerations, previous management actions, and current Army responsibilities in order to address public concerns and to comply with all applicable legislation.

3.10.2 Oral Traditions

Several Hawaiian traditions relate different aspects of cultural history relevant to Mākua and Kahanahāiki in the vicinities of MMR and PTA. More in-depth information is included in this section regarding the MMR area because members of the public specifically requested its inclusion. A summary of oral traditions regarding the PTA are included following those related to MMR.

Mākua Military Reservation

For the MMR vicinity, the account of the goddess Hi‘iaka at Mākua offers a rich description of many of the communities, culturally important natural resources, and TCPs. The account is included here because members of the public requested that it be included in its entirety. Other important traditions include the naming of Mākua, Kāneana or Mākua Cave, the Mo‘o of Mākua Valley, the ‘Ōlohe or Ha‘a People, the Mākua Mountain trail, and the maile lau li‘i of Ko‘iahi.

The Goddess Hi‘iaka at Mākua

The story of the Goddess Hi‘iaka at Mākua, presented below, is a Native Hawaiian account of the legend of Pele and Hi‘iaka, excerpted unaltered from a report by Social Research Pacific entitled *Planning Level Oral History Survey, Mākua and Kahanahāiki Valley* (Social Research Pacific 2001).

The goddess Hi‘iaka traveled from the Island of Hawai‘i to Kaua‘i with her companions Wahine‘ōma‘o and Pā‘ū-o-pala‘a. The purpose of her journey was to fetch the chief Lohi‘au-ipo (Lohi‘au) from Ha‘ena, Kaua‘i. On the journey, Hi‘iaka and her party visited numerous locations on Hawai‘i, Maui, Moloka‘i, and O‘ahu. Having reached Kaua‘i she found that Lohi‘au had died, and following the ceremonies, she revived him and began her journey with Lohi‘au to return to Pele’s domain at Kīlauea, Hawai‘i.

The excerpts below are from the epic account of the journey to Kaua‘i made by Hi‘iaka-i-ka-poli-o-Pele (Hi‘iaka), the youngest sister of the goddess Pele. Titled “He Mo‘olelo Ka‘ao no Hi‘iaka-i-ka-poli-o-Pele” (A Traditional Tale of Hi‘iaka Who is Held in the Bosom of Pele), this account was published in the Hawaiian newspaper, *Ka Hōkū o Hawana* (September 18, 1924, to July 17, 1928), and was compiled by Julia Keonaona, Stephen Desha Sr., and various contributors. While this version of the legend has yet to be translated in its entirety, the following English translations (by Kepa Maly) provide a synopsis of the Hawaiian texts, with emphasis on the main events of the narratives.

My fine readers of the wondrous tale, this account differs from some others which hold that Hi'iaka departed from the canoe at Ka'ena. But in this account she departed at the place described above, and then traveled overland to Wai'anae. It was while on her journey overland that she did a wondrous thing at the sheltered place near the sea, a little to the north side of Keawa'ula. Let us look at this event as we continue our journey in this story. At this shoreward place, mentioned above (Keawa'ula), is a place called Kīlauea, and it was there that Hi'iaka caused the sweet water to appear, thus Keawa'ula had freshwater.

... Having departed from Kaua'i on their canoe, Hi'iaka chanted a greeting to her family at Kīlauea, on Hawai'i. When her mele (chant) was finished, the canoe was near ka lae o Ka'ena (the point of Ka'ena). It was then, that Hi'iaka saw her elder relatives Ka-lae-o-Ka'ena and Pōhaku-o-Kaua'i, and called out to them:

Aloha 'olua e Ka'ena me Pōhaku-o-Kaua'i /E noho mai la i ka lae kahakai 'ai 'ole i ola nō ho'i i ka 'ehu a ke kai-e E inu 'ana i ku'u wai kumu 'ole i ka pali e Eia mai ho'i wau a pae aku e

Love to you Ka'ena and Pōhaku-o-Kaua'i Who dwell at the point, of the foodless shore You live by the mist of the sea. Drinking my water which has no source dripping from the cliffs I shall land here

Finishing her chant of affection for her elders, Hi'iaka then turned their canoe to the Waialua side of this famous point of Ka'ena. It was near the place called "Ka-leina-a-ka-'uhane" (The soul's leap). Hi'iaka leapt from the canoe, and then told Wahine'ōma'o and her companions that they were to continue their journey by sea, while she would travel overland...

As she continued her overland journey, Hi'iaka met with her elders Ka-lae-o-Ka'ena and Pōhaku-o-Kaua'i, and asked them where the canoe landing of this land was... (November 16, 1926) They told her that it was there below, where the canoe could be seen in the canoe shed... Hi'iaka bid her relatives *aloha* and then continued her journey overland, till she reached the place called "*Kipuka kai o Kīlauea.*" There she saw that there were men and women resting at the place, and some of the people were adorned in garlands of *'ilima*. The activity of many of these people that had gathered there was lele kawa (leaping and diving into the sea).

As Hi‘iaka drew near to the diving spot of these people of Mākua, they saw her beauty and their voices rose in speculation of where this beautiful stranger had come from. As Hi‘iaka drew near to the diving place, called “*Ke-ki‘o-kai-o-Kīlauea*,” the people became quiet, then some of them called out, inviting her to join them in the sport. Hi‘iaka declined the kind invitation of the natives, and at that time, one of the beautiful young women of the place, adorned with a lei of ‘*ilima*, drew near to the leaping spot and leapt. When she fell into the water, she struck a large rock that appeared to push out into the sea. This stone was of a supernatural nature (*kupua*), and the girl was killed in the water.

Seeing the tragedy that had befallen the young native woman, a result of her careless leap, Hi‘iaka leapt into the water to retrieve her body. Having gotten her, Hi‘iaka swam to the shore at a place close to Mākua. The people saw this tragic event and that the stranger had leapt in to fetch the body of the girl. The natives drew near to the place where Hi‘iaka came on shore, and the girl’s family lamented the loss of their cherished child. Hi‘iaka instructed them not to cry, telling them that she would try to restore life to their daughter who had carelessly leapt upon the stones. Setting the girl down, Hi‘iaka called out in a prayer to restore life to the dead girl:

<i>E ka pua o ka ‘ilima e,</i>	Oh blossom of the ‘ <i>ilima</i>
<i>Homai ana ho‘i he ola</i>	Let life descend
<i>E Mākua i ka nu‘a o ke kai-e</i>	Oh Mākua of the ocean swells
<i>Ha‘awi mai ana ho‘i ua ola-e</i>	Grant life
<i>E ola ku‘u kama i ka hua o ke kai-e</i>	That my child of the frothy sea may live
<i>A ola ho‘i ia Kāne i ka wai ola-e</i>	That life may be gained by the living waters of Kāne

Completing the prayer, Hi‘iaka stood up and held her supernatural *pā‘ū* (outer skirt) in her hand and struck the girl on her right side and left side with the *pā‘ū*. Hi‘iaka then knelt down and breathed into the girl’s mouth, and she was revived. Some parts of the girl’s body were bruised from the fall upon the rock, and Hi‘iaka called to the girl’s family instructing them in how to care for her wounds. Hi‘iaka told them:

There are many leaves in the forest, in the uplands of the mountain, these you must get to apply to the girls wounds. This must be done quickly to lengthen her life. And here is my task, to get the body of the stone which rises out at the place where you leap.

Hearing these words, some of the people were troubled, and asked how Hi'iaka could remove that large stone which rises out of the depths of the sea. Hi'iaka told the multitudes of Mākua, "Do not worry about how I will remove the stone, it is for me to do. This stone which brings death will be destroyed. Now, here is what you should do, take the girl to the house, and I will go to destroy this impertinent stone which rises out of the water to your leaping place..." The name of the stone was Pōhakuloa, and he was a supernatural being who dwelt in the waters of Mākua. He was a stone which destroyed canoes and killed people, and at times, he himself also took human form. It was because the young girl had refused his advances, that he caused her death at the leaping place...

This place is *ka pōnaha wai o Kīlauea* (the swirling water of Kīlauea). It is one of three places called Kīlauea. The second one is Kīlauea on Kaua'i, and the third one is Kīlauea on the Island of Hawai'i—Hawai'i of the green ridges, in the bosom of Kāne. This thing which causes tragedy here among the stones, actually has the body of a man, and his true name is Pōhakuloa. I am going to leap in and fight him so that he will end his treachery at this place. That is, the destroying of canoes, and killing of people. When you look and see the ocean rise in a spout and fall upon Kulaokalā (Kuaokalā), then you will know that I have killed the human form of Pōhakuloa.

Finishing these words, Hi'iaka then leapt into the sea of Kīlauea, where the water swirls. The ocean then rose up, as never before, rising upon the shore, with waves breaking upon the land, and the coral washing up with the waves onto the land. On the promontories the roar could be heard, and the people had never before seen such violent seas. When Hi'iaka fell into the swirling sea at Kīlauea, she was lost from sight. (November 23, 1926)

The people of Mākua thought that this stranger, the woman, had died in the violent sea. They did not know that she was the supernatural being of Kīlauea, the youngest sibling of the great goddess and ruler of Kīlauea. They felt much compassion for this woman who had been lost to them. While they were there

discussing this among themselves, the people saw the water spout rise out of the sea and go directly above Kulaokalā. They saw this and then understood that the woman had not died, but the things that she had spoken of prior to diving into the swirling sea of Kīlauea had come to pass.

Then, a strong earthquake shook the entire Island of O‘ahu, and the people of Mākuā heard a great roar from something nearby their place. Looking to the swirling water of Kīlauea, they saw a great black mass rise out of the swirling water of Kīlauea, and the people of Mākuā cried out at the wondrous sight. This great black thing seemed to fly in the direction of the point of Ka‘ena.

Now what had happened was that when Hi‘iaka leapt into *pōnaha kai o Kīlauea* (the swirling water of Kīlauea), she met with the shark body (*kino manō*) of Pōhakuloa. This Pōhakuloa was one of the evil dual formed deities of the ocean of Wai‘anae. A great battle raged between Hi‘iaka and the shark form of Pōhakuloa. The two moved out into the depths of the dark sea and Hi‘iaka was victorious over the shark form of Pōhakuloa. Hi‘iaka then returned to *pōnaha kai o Kīlauea*, where she thrust her hand down into the core of that supernatural stone and tossed it into the sky. That is how the earthquake came to shake the whole Island of O‘ahu. Being thrown from the sea, the stone flew and fell upon the land. Hi‘iaka then returned to the shore at *pōnaha kai o Kīlauea* and stood near the people of Mākuā. Everyone was filled with awe at what this woman, the stranger had done.

The stone fell on the side of the point of Ka‘ena, near to Waialua. To this day, the people of Waialua and Wai‘anae still call the stone “Pōhakuloa.” The people who ride the train can see the long stone among the multitude of stones near the point of Ka‘ena. At the time when the ocean became very rough, Wahine‘ōma‘o and Lohi‘au landed at the shore of Keawa‘ula, and that is how they were saved from the rough seas. Hi‘iaka went to meet her companions and then she spoke to the natives of the area, telling them to:

... take the girl who had lost her life and been revived, to bathe in the ocean five times—that is kua lima (doing something in fives, symbolic of a full hand, a complete task). Then, you are to bath her five times in freshwater. In completing the bathing ceremony, take a crab, the ‘ōhikimakaloa, and bury it at the foundation of the door to the house in which the girls lives.

Having finished her instructions to the natives of Keawa‘ula, one of them spoke out and said: Oh! The great trouble of this place, is that there is no water. We have only brackish water which we drink. This is a ‘āina wai ‘ole (waterless land) in which we live, and it has been this way since the time of our ancestors.

Hearing these words of the native, that there was no freshwater on their land, Hi‘iaka spoke to them:

This is a waterless land. When one travels from Waimanalo to Waialua, there is water at Waimanalo, water at Wai‘anae, and water at Waialua. Waialua, that is that land of Waia, the child of Hāloa and Hinamauouluae. The water of this place is there below the surface of the sandstone flats (papa one). Follow me, and I will show you a place where you can find water for yourselves, a water source that is unknown to you.

Hi‘iaka led the natives of Keawa‘ula to the place that she had pointed out, it was on the side of the cliff at Keawa‘ula. Upon reaching the place, Hi‘iaka told them, “Break open this sandstone and dig a little below it, then you will find sweet water. But indeed, so you will not be burdened in digging, I will dig to the water for you.” Hi‘iaka then pulled up her supernatural pā‘ū (outer skirt), and drew it above her right shoulder, she then struck the base of the sandstone flats, and everyone heard the rumbling as a deep pit opened in the place where Hi‘iaka struck. All of the people of that place spoke in hushed tones among themselves at the astonishing thing done by Hi‘iaka. Hi‘iaka then told the people:

Here is the mouth of your hue wai (water gourd). You can hear the murmuring of the water below. This water flows below the surface of the land and reaches out to the depths of the sea at Ka‘ie‘iewaho. This stream branch, and the stream branches of the four mountains of Ka‘ena, join together at this spot. Now, I will continue my travels, but don’t forget what I told you concerning the girl. Fulfill my instructions for her bathing in the sea five times, and then in the cold freshwater five times.

Finishing these words, Hi‘iaka then bid *aloha* to these people and went to join her companions. (November 30, 1926)

She told them, “It is good for you to go by sea, and I by the inland route, to the place where we will meet again.” Now, the natives of this place, Keawa‘ula, had followed, and met with Hi‘iaka at the

canoe of Lohi‘au. These people told Lohi‘au, “Get on your canoe, and we will carry you into the ocean.” Wahine‘ōma‘o agreed to these pleasant words of the natives of this place, and the people took up the canoe, carried it, and floated it in the ocean.

When the canoe was in the water, Wahine‘ōma‘o took up her paddle at the stern of the canoe and Pā‘ū-o-pala‘a took up her paddle at the bow and they set off to continue their journey... Hi‘iaka then continued her journey over land, and came to the “*one ‘ōpiopio o Mākua*” (clean white sands of Mākua). Hi‘iaka then saw the people of this place, and they were adorned with the *maile lau li‘i o Ko‘iahi* (small leafed maile of Ko‘iahi). They were indeed beautiful to behold along the shore, adorned in the famous *maile* of this mountain. Drawing nearer, Hi‘iaka also saw her relatives in the uplands, Mailelauli‘i and Ko‘iahi, and her love for them overflowed. Hi‘iaka called out in a chant to them:

<i>Aloha wale ho‘i ‘olua e nā wāhine-e</i>	Love to you two women
<i>E nā wāhine noho kuahiwi, noho kualono—e</i>	The women who dwell on the mountain slopes and ridges
<i>E Mailelauli‘i me Ko‘iahi ho‘i—e</i>	Oh Mailelauli‘i and Ko‘iahi
<i>I ke kilikili hau o Ka‘ala e</i>	In the fine dew of Ka‘ala
<i>‘A‘ala mai ana ka maile lau li‘i</i>	With the fragrance of the small leafed <i>maile</i>
<i>Ho‘olalawe i ke kino o ke aloha</i>	Bearing affection to one’s body
<i>Aloha ‘olua e noho mai la i ke anu,</i>	Greetings to you two who dwell in the coolness
<i>Eia no ho‘i wau la ke ho‘i nei—a</i>	Here I have returned
<i>Aloha ‘olua, a aloha mai ho‘i a</i>	Love to you, greetings of affection

Then continuing her on her way, she went to the place where the people had gathered on the shore of Mākua, and she greeted them, “Affection to you who dwell here upon the clean white sands of this land (*ke one ‘ōpiopio o kēia ‘āina*) - Aloha!”

The people then asked Hi‘iaka, “You are a stranger, that has come to visit us here at Mākua?” Hi‘iaka confirmed this, saying, “Yes, I am a visitor from Hawai‘i, having gone to Kaua‘i, and now I have arrived here...I travel across the land, while my companions travel by the sea...” The people then inquired “What land do you come

from?” Hi‘iaka answered, “My land is there in the east, in the fragrant hala (pandanus groves) of Kea‘au. It is like the place that you call Kea‘au. My land is at Puna with its walls of *hala*...”

The people then asked Hi‘iaka to call her companions to land on the shore and partake in a meal before continuing on the long journey. It was agreed, and before long, Wahine‘ōma‘o drew the canoe near to the shore and the people of Mākua helped to carry the canoe inland. Looking upon the visitors, the natives of Mākua recognized the beauty of their guests, and the most beautiful among them was the one whom they had first met, Hi‘iaka... The people of Mākua were skilled and quickly had a pig ready for the *imu*, along with chickens, broiled fish, and mixed bowls of *poi ‘uwala* (sweet potato poi). Others of the men and women went diving for *wana* (urchins), while others went to gather ‘*opihi* (limpets), and ‘*ina and haukeuke* (other varieties of urchins). The ‘*inamona* (*kukui* nut relish) was set out in a bowl, and the people of Mākua had their welcoming feast prepared.

Calling to the *Ali‘i wahine* (chiefess) and people of this land, Hi‘iaka said that she would first offer a prayer of thanksgiving for the foods that had been set before them. Hi‘iaka chanted:

<i>O Mākua ‘āina o Mailelauli‘i,</i>	O Mākua, land of Mailelauli‘i
<i>‘āina aloha o Ko‘iahi i ka uka</i>	Land loved by Ko‘iahi in the uplands
<i>Ma uka ho‘i kā‘u hele ana mai</i>	My journey takes me over land
<i>I ka nopu hulili a ka lā</i>	In the dazzling heat of the sun
<i>La o lalo o Wai‘anae e</i>	Sun which descends below Wai‘anae
<i>O ku‘u nae aloha i ke oho o ke kupukupu,</i>	The fragrant sprouts of the <i>kupukupu</i> fern are loved by me
<i>O kupu o lāua ka mana‘o e ai,</i>	The thought of them two is to eat
<i>E ‘ai i ka ‘ai a ke aloha</i>	Partake in the food made with love
<i>Ua ‘ai iho la wau e ke hoa e</i>	I have eaten my companions
<i>I kō ‘ai leo ole, he ho‘okahi no leo</i>	Of the food without a voice, there is only one voice
<i>He mai, he ma-i ho‘i e.</i>	Come, come partake

E kamau a hele a'e ke kamahele, That the journey of the companions
may be continued

Ua 'ike iho la no ho'i i ke one So seen are the fine clean sands (of
'ōpiopio. Mākua).

Finishing her prayer, Hi'iaka invited Lohi'au to eat to his contentment. She called to him to eat of the generosity of the *Ali'i wahine* (chiefess) of Mākua, 'Ōhikilolo, and Kea'au. Lohi'au then partook of the feast... (December 7, 1926)

... The chiefess inquired, and learned that her beautiful visitor was Hi'iaka-i-ka-poli-o-Pele, the woman with the lightning skirt of Halema'uma'u. The chiefess herself was very beautiful, and Hi'iaka compared her beauty to the fine clean sands of Mākua (*ka u'i o ke one 'ōpiopio o Mākua*). Hi'iaka called out in chant to the chiefess:

Onaona wale ka maile lauli'i o Ko'iahi The Mailelaui'i of Ko'iahi is
very fragrant

He ahi ke aloha, he 'apa ka pauku Love is like a fire, rolling over
kino... the body...

As Hi'iaka chanted, the sweet fragrance of the *maile and hala* surrounded the people who had gathered for the feast at Mākua. The fragrance of the *maile* came from the uplands of Ko'iahi, and the sweet essence of the *hala* came from the land of Kea'au, which is there on the south side of Mākua, next to 'Ōhikilolo... Everyone partook in the feast that had been prepared by the natives of the land. And as they ate the *poi 'uwala* (sweet potato poi), the pieces of pig, the *wana* (urchins), the *'ina* (small urchins) in their gravy, poke *uhu momona* (raw fish made of the rich parrot fish), and various foods that had been prepared, three beautiful women arrived at the gathering.

One woman was completely covered with garlands of *maile lauli'i*. Another woman was adorned in garlands of *lehua*, *lehua* of every color. And the other woman was adorned in garlands of *hala and hinano*. These women with all of their adornments were truly beautiful, but the beauty of Hi'iaka surpassed them. Hi'iaka knew that these women were her relatives, who dwelled in the uplands.

These women had heard Hi'iaka's chant, and had descended from the uplands to greet her. Hi'iaka called out to her relatives in chant:

<i>O 'oukou 'ia e nā wāhine kūpaoa i ke 'ala</i>	So it is you, the women surrounded in fragrance
<i>Onaona hala o Kea'au me Maile lauli'i</i>	The fragrant hala of Kea'au and small leafed <i>maile</i>
<i>Ku'u lehua nenehiwa pua ho'ohihi a ka manu</i>	And my cherished lehua blossoms admired by the birds
<i>He manu ke aloha, a'ohe lala kau 'ole</i>	The birds are beloved, and there is no branch that they don't land on
<i>Eia wau la o Hi'i</i>	Here I am, it is Hi'i
<i>Hi'i pū no me ke aloha o ka ipo</i>	Hi'i together with the loved one,
<i>O ku'u ipo, na'u anei?</i>	the sweet heart (Pele's lover Lohi'au) My sweet heart, is he for me?

The three women then entered the area of the feast. They were Mailelauli'i, Ko'iahi, and Hala-i-ka-ipo of Kea'au, Wai'anae. They greeted one another with kisses. Hi'iaka then spoke the following words to Hala-i-ka-ipo.

Hala mai la no 'oe ma kēia 'ao'ao o kahi pu'u one o 'oukou a'e nei, o ka'anapa mai la nō ia o ka wai li'ula i ke kula o 'Ōhikilolo, a kau mai la ho'i ke one o Mākua nei i ka 'ōlapalapa?

(Did you perhaps pass by the side of the sand dunes, that glisten like the mirage forming waters on the plane of 'Ōhikilolo, and walk on the rumbling sands of Mākua?)

When Hi'iaka said these words to one of her relatives, the chiefess of Mākua then spoke to Hi'iaka... (December 14, 1926)

Hear me oh kind stranger, this is the place of my birth, where my food has been cooked, and I, along with the natives of Mākua have never seen the resonating sands of Mākua; sands like those of Nohili, Kaua'i. If we go, and *see* it as you have said, it will truly be a great mystery, for we the multitudes of this land, have never before seen the sands that you describe...

After completing the feast, Hi'iaka took the chiefess of Mākua along with her people, to see the *one kani* (resonating [barking] sands) of Mākua. When they arrived at the *pu'u one* (dunes), Hi'iaka climbed to the top of the dune. As Hi'iaka climbed up the

dune, everyone was startled because of the ringing and sounds like purring, that rose from each place where Hi'iaka stepped. It was like the growling of a dog. Then, from atop the dune, Hi'iaka called to the chiefess of Mākua, inviting her to climb up to where she was standing. As she ascended the dune, everyone heard the same sounds as when Hi'iaka had ascended the dune. Seeing this mysterious characteristic of the sands of their land, the natives of Mākua began to follow their chiefess up the dune. From the very top of the dune, Hi'iaka said to the chiefess:

Say, oh chiefess of Mākua, if you will lay down with your head above and your feet below, I will call the chief (Lohi'au) to come and pull you by your feet, then you will hear a different sound. This sound can be discerned as being different from the one heard when we climbed up the dune.

Hearing this, the chiefess of Mākua laid down, with thoughts of pleasure, at being pulled by the ali'i of Kaua'i. Hi'iaka then called to Lohi'au, to get the chiefess of Mākua and to pull her by her feet: Oh Lohi'au-ipo, from the hala groves of Naue by the sea! Take the chiefess by her feet and pull her down. You will hear again, the resonating of the sands of Mākua (*ke kani o ke one o Mākua*), and indeed, you will think that it is the sound of the sands at the land of your birth ... With pleasure and desire for the chiefess of the fine clean sands of Mākua, Lohi'au pulled the chiefess down the *pu'u one* (dune). A ghostly sound, like that heard in the night (*hanehane o ka pō*) rose up when the chiefess was pulled down the dune.

Now Mailelauli'i, Ko'iahi, and Hala-i-ka-ipo, adorned in their finery saw this, and in them arose the desire to also be touched by the handsome chief of Kaua'i. So they ascended the resonating dune of Mākua (*pu'uone kani o Mākua*) and laid down, asking Hi'iaka to call Lohi'au to pull them as well... Hi'iaka cautioned her relatives not to become enamored with Lohi'au, for he was chosen for Pele, and no others could enjoy his affections...Lohi'au first took Maile-lauli'i and as she was pulled down, her garlands of *maile* were ruffled. He then took Ko'iahi, followed by Hala-i-ka-ipo who was adorned in garlands of *hala* and *hinano*. As each of the chiefesses were pulled down the dune, the soft crying of the dune (*ka 'uwe hone o ke pu'eone*) was heard by all.

Hi'iaka then descended the *pu'u one*, joining the women and said to them:

You have truly been blessed by the handsome child of Kaua‘i, but I say to you that it is well to remember the words spoken by our ancestors, “*He ‘i‘imi loa‘a a na ha‘i na‘e e inu ka wai.*” (Searched for, it is found, but indeed, the water will be tasted by another).

Hi‘iaka then asked the chiefess of Mākua if she had been mistaken about the resonating sands of the land of her birth. She responded that yes she had been wrong in denying the presence of resonating sands of Mākua. But from her youth, she had played at the dune, and leapt down its slopes, and never heard the mysterious sounds...(December 21, 1926)

Most of the group then returned to the chiefess’ compound, though some of the people of Mākua remained at the dune playing in the sands, with fond thoughts of this wondrous place... The chiefess of Mākua invited Hi‘iaka to spend the night at Mākua so that they could rest prior to continuing their journey. This was agreed to, and while they were talking, everyone was startled at hearing the sounds of wailing coming from along the *ala loa* (trail), from the Wai‘anae side. This voice filled with pain, was the cry of a man. His hands were clasped behind him and he was crying out. Hi‘iaka asked the people to bring the man to the house, so that they could inquire if they could be of help.

Brought to the house, Hi‘iaka asked, “Has someone died?” The man wiped his face, looked at Hi‘iaka, and with a trembling voice he said:

Yes, it is I who will die. I have been on a journey seeking knowledge. I have traveled around O‘ahu, and not found that thing which I seek. I then thought that perhaps I would find life at the hill of Ha‘upu, Kaua‘i. Yet traveling around Kaua‘i, I did not find that which I seek. I have also been to Maui, Lana‘i, and Moloka‘i, and not been able to find that which I seek.

Hearing this, Hi‘iaka asked, “Is it a riddle that someone has spoken to you that you seek the answer to?” Surprised, the man confirmed this and told Hi‘iaka that she was the first one to discern the trouble that had befallen him. “So here perhaps is the place where I can be rid of this trouble, and I will escape the death that awaits me...” (December 28, 1926)

... Hi‘iaka then asked the man to tell them the riddle that he had been given. The man said, “Let me tell you a little story and then I will tell you the riddle.”

Hi‘iaka said, “Before starting your story, let me tell you, ‘You are perhaps Kaulana-a-ka-lā, a chief of Moloka‘i.’” Astonished, the man confirmed this, and asked, “Are you a native of Moloka‘i, that you should know my name?” Hi‘iaka simply told him that she had traveled throughout the islands. She then told Kaulana-a-ka-lā:

It was at Waipi‘o, Hawai‘i, that you received this riddle. And, if you can answer it, you will be awarded one half of Waipi‘o, but, if you are unable to find the answer, you will be killed. Is that not so?

The *Ali‘i* of Moloka‘i confirmed this, and he was filled with awe at the wisdom of Hi‘iaka. Hi‘iaka then continued:

You have journeyed around Hawai‘i, and yet found no one who could explain the riddle to you. You have traveled around Maui, Kanaloa Kaho‘olawe and found no one who could answer it. Now arriving at O‘ahu, at the point of Koko, you have traveled and met with us here.

The man confirmed that all of this was true. Hi‘iaka then asked Kaulana-a-ka-lā to tell them the riddle. Standing up the *Ali‘i* of Moloka‘i began to chant, offering a prayer first. He then spoke the riddle. Hi‘iaka then said that she would inquire of the natives of this land, if they could answer the riddle, and found that none could. Hi‘iaka then asked the chiefess of Mākua, “Is there not a fishpond at the side of the cliff of Ka‘ena, and its name is Manini?” The chiefess answered:

Yes there is a fishpond on the cliff side of Ka‘ena, and it is named as you said. In that pond, I have seen all manner of fish, and there is one large fish, Moanawaike‘o‘o (That is the *moanakai* as it is known from here to Kahuku).

The editor then notes that the paper with the next part of the story has been lost. And he observes that there is perhaps someone still living today, who remembers the riddle, and they might share it with us at *Ka Hōkū o Hawai‘i...* (January 4, 1927 - a reader replied to the request on Jan. 18, 1927)

The account continues in describing a game of *kilu* played between the chiefess of Mākua and Lohi‘au. In *kilu*, a small coconut or gourd cup (quoit) is tossed at an item in front of an opponent; if the quoit hits the item, the one who tossed it wins a kiss from the other contestant. In a conversation during the contest, the chiefess mentioned a place called Pu‘uohulu. Hi‘iaka asked:

“Where is this place called Pu‘uohulu, is it in Wai‘anae.” The chiefess of Mākua responded that it was indeed in Wai‘anae, a place with which all of the people were familiar... Hi‘iaka then chanted:

<i>Lele ka huna kai</i>	The ocean mist flies
<i>Pi‘i a‘e la i ka makalae</i>	Rising upon the coastal point
<i>Aloha wale ka lae o Ka‘ena i ka ehū kai</i>	The point of Ka‘ena greets the sea
<i>Kai o lalo o Wai‘anae</i>	The sea of Wai‘anae is there below
<i>Ke he‘e nei i ka pu‘eone</i>	Sliding across the dunes
<i>‘Oia one aloha o Mākua e</i>	It is the beloved sands of Mākua
<i>Mai ho‘omākua ke aloha o hewe au—e</i>	Don’t let this affection (for Lohi‘au) mature lest you be found at fault
<i>O kou inoa ia la e Pu‘u-o-hulu</i>	Your name is Pu‘u-o-hulu
<i>Ua ‘ike a ho‘i e...</i>	So now it is revealed...(January 11, 1927)

Hi‘iaka’s chant brought great pleasure to the people at Mākua, and the game continued for some time... The next day preparations were made, and Wahine‘ōma‘o Pā‘ū-o-pala‘a, and Lohi‘au boarded the canoe to depart from Mākua and continue their journey through Wai‘anae. With one dip of Pā‘ū-o-pala‘a’s paddle the canoe was out in the deep sea beyond the clean sands of Mākua.

Hi‘iaka then turned and looked to the uplands of Wai‘anae and turning around, she saw two of their cherished elders, Kua and ‘Aleikapōki‘i. These were shark-formed elders (*kupuna mano*) of her family. These elders saw Hi‘iaka, and Kua said to ‘Aleikapōki‘i, “Behold, here is our descendant (grandchild),

Hi‘iaka-i-ka-poli-o-Pele.” The other shark agreed with the words spoken by its companion. The two continued to speak among themselves, and they feared that perhaps Hi‘iaka would be angry with them (Earlier in the account, these two sharks had tried to stop Hi‘iaka from going to get Lohi‘au at Kaua‘i because they did not believe that a human was a good companion for Pele.). The two sharks were afraid that Hi‘iaka might try to kill them, and that they would have no way to escape from her great power. Kua told his companion, “We will not die if we go and hide.” The two sharks at first thought that they might go hide in their caves, but then they knew that they could be found, so they then thought that perhaps they should go and hide upon the land (*pae i kula o ka ‘āina*). So the two sharks agreed and went inland, where one lies on one side and the other lies near by (to this day). Hi‘iaka saw her shark elders swim away and hide, she called affectionately to them in a chant:

<i>A makani Kaiaulu o lalo o Wai‘anae</i>	The kaiaulu breeze blows to the lowlands of Wai‘anae
<i>Ke wehe aku la i ka poli o ka hoa</i>	Making known what is in the heart of the companions
<i>Ha‘i ka nalu o Kua me ‘Aleikapōki‘i</i>	The waves are broken by Kua and ‘Aleikapōki‘i
<i>I hiki i moe aku i uka ka luhi o ke kai...</i>	So that they may rest in the uplands away from the burden of the sea...

Hi‘iaka’s chant was carried to the shore and heard by Pōka‘ī, who saw that Hi‘iaka was drawing near. Pōka‘ī bent her head down and thought that perhaps Hi‘iaka would kill her. The canoe with Hi‘iaka’s companions then landed on the sandy shore of Wai‘anae, at the landing place called Ke‘a‘ali‘i. Joining them, Hi‘iaka looked all about this famous land of the wind *lau-niu*. Hi‘iaka’s tears then fell from her eyes down her cheeks, and Wahine‘ōma‘o inquired why Hi‘iaka was crying (*Ea! He mau waimaka aha ho‘i kēia e helele‘i wale mai no i ka lihilihi o ka lehua makanoe*-Why are the tears falling from the fringes of the dewy centered lehua blossoms?). Hi‘iaka responded to her companion, you have asked a good question, and the reason is that this is the land of the *kaiaulu* breezes which cause the coconut leaves to sway back and forth, and it is greatly loved. Here before me, I have had a vision, that there will be great treachery here, and the saying of the children shall be fulfilled. The saying is this, “*No ke kai ka hale, e noho ia e ka puna, no ka puna ka hale e noho ia ana e ke kai a mohala ka lau ke naenae*” (The house is on the shore, situated there on the

coral, the house is on the coral rocks there on the shore and the leaves of the *naenae* bloom forth). This is the reason that my tears are shed, my companion.

Hi‘iaka stopped speaking for a moment, then resumed her explanation of the prophesy, “*Ke kū ka makai‘a a ke Ali‘i o O‘ahu nei i kēia wahi ma luna o ke kanaka o ke akua, a laila, No keia ‘āina o O‘ahu nei i ‘Āina one ‘ai ali‘i*” (The chief of O‘ahu will bring forth treachery upon a man of the gods here, thus this land of O‘ahu will become a land in which the sands consume the chiefs.)... (January 18, 1927)

Now some people say that this name Pōka‘ī is a recent name, given from the time when Mo‘ikeha traveled from Kahiki, when he left his relative Olopana; but it is not so, because it is from the time when Pele came to these islands. Hi‘iaka then went a short distance inland, and the *kupua* (supernatural being) Pōka‘ī of Wai‘anae came face to face with her and they met with *aloha* (affection). Pōka‘ī instructed her people to go to the uplands to gather *lū‘au* (taro greens) and *kalo* (taro) from the taro lands of Lehano in the uplands of Wai‘anae. She also commanded that some of her people bake a pig and prepare food for the chief of Kaua‘i and Wahine‘ōma‘o. The sweet, tender *lū‘au* of upper Wai‘anae was gathered and cooked in the *imu* along with all the other foods. The baked pig, *poi uwōuwō* (thick poi) of Wai‘anae, were among the foods eaten by the Lohi‘au and his companions.

Pōka‘ī then said to Hi‘iaka, “My lord, I have no other gift to give you.” Hi‘iaka responded, telling her that her hospitality had been more than adequate, for great indeed is the food which you have prepared for us to satisfy our hunger. And this is what I give to you ‘o Pōka‘ī, “Your dwelling upon the land shall be relieved by the gentle *kaiaulu* breezes. Your name shall be spoken by the generations which are yet to come. And I also tell you that Wai‘anae shall become the corner post (*pou kihi*) for this land of O‘ahu which consumes its chiefs (*‘Āina ‘ai ali‘i o O‘ahu nei*).”

There will be a day when one who betrays the gods shall stand here (this is a reference to the chief Kahahana who in betrayal ordered the death of his priest and bard, Ka‘opulupulu, at Nānākuli (see Kamakau 1961:134) ... Hi‘iaka and her companions then prepared to depart from Pōka‘ī. She told Lohi‘au and Wahine‘ōma‘o that they would travel by canoe, while she would travel for a while over land, and that they would meet again at Kou (Honolulu)....Hi‘iaka

then continued her journey along the upland trail. Now the trail upon which Hi‘iaka chose to travel, is the trail which passes above Pohakea. Hi‘iaka passed along the *kula* (plain) of Ma‘ili, and then turned to look at the uplands. She saw the dazzling light of the sun on the uplands of Lualualei and Hi‘iaka chanted:

<i>Wela ka lā e! Wela ka lā e!</i>	The sun is hot! The sun is hot!
<i>Ua wela i ka lā ke kula o Lualualei</i>	The heat of the sun is on the plain of Lualualei
<i>Ua nau ‘ia e ka lā a ‘oka‘oka...</i>	The sun chews it up entirely.

Hi‘iaka then continued her ascent on the trail in the stifling heat of the sun and she chanted:

<i>A Waikonene i ke alanui</i>	The path is at Waikonene
<i>Ka pi‘ina i Kamoā‘ula</i>	Ascending at Kamoā‘ula
<i>Ka lā wela i ka ‘umauma</i>	The heat of the sun is upon the breast
<i>Waha ka ‘io i ke kua o Puhamalo‘o</i>	‘Ilio is born upon the back of Puhamalo'o
<i>Ke ho‘ohaehae mai la i ka nalu</i>	The <i>nalu</i> winds rage
<i>Moku kahawai, miha ka poli o Puhawai</i>	Breaking the stream, but the breast of Puhawai is quiet
<i>Ua hakakā, kipikipi ke kaiāulu me ke kanaka</i>	The <i>kaiāulu</i> breeze seems to fight and rebel against the people
<i>Ua kuikui wale a haena nā ihu</i>	Striking and causing the noses to rage
<i>Ua kā wale i ka hupe</i>	The mucus flows freely
<i>Ka lā wela o Lualualei e</i>	In the hot sun of Lualualei.

Hi‘iaka then continued her journey onto the plains of Lualualei.

The Naming of Mākua

The word *mākua* translates in different ways, generally meaning parents or adults, and it does not necessarily differentiate between mothers, fathers, aunts, or uncles. Handy et al. (1972: 306) used the word *mākua* in the context of kinship: “(T)he *keiki* (the little ones), particularly those avid for knowledge of their elders’ ways ... were instructed regularly in manners,

in the more important of the kapu, and in practical manners by mākua (parents) and kūpuna (grandparents).”

Malo’s use of the word mākua suggests that the term may apply to grownups (1951: 260). According to one source however, the word mākua “cannot be better than liberally translated. The word means ‘full grown,’ but whether it was named for some mighty chief of a bygone day, or for the wide and deep valley behind it, none can say” (Honolulu Star Bulletin, April 4, 1925, cited in Sterling and Summers 1978: 81). Another interpretation is that Mākua was the name of a fisherman who, with a chief named Kawela, fished off Ka’ena Point for the Traveling Uhu, a great fish of sacred power (Pukui and Curtis 1951; Kelly and Quintal 1977).

Kāneana or Mākua Cave

Kāneana, often referred to as Mākua Cave, lies at the *makai* end of the large ridge that separates Mākua Valley from ‘Ōhikilolo Valley. The original entrance to the cave, destroyed in 1950 by road construction, was narrower and taller than it is today (Kelly and Quintal 1977: 9). According to McAllister (1933: 123), “Kāneana cave was the dwelling place of a shark goddess who held sway from Ka’ena Point to Kepuhi Point. When she took the form of a woman, she came up through a sea entrance and lived in the cave.”

Kāneana may also mean cave of God...with *ana* translated as cave, and Kāne being the supreme deity of the ancient Hawaiian pantheon. According to an old Hawaiian who was born at Mākua village, *kahuna* performed religious ceremonies in the cave as recently as 1875 (Sterling and Summers 1978).

Kāneana is summarized as follows:

Once upon a time there was a shark god known as Kamohoali‘i, who was king of all sharks. Kamohoali‘i could change into a dignified and majestic man. He wooed a woman by the name of Kalei, who did not know he was actually the king of sharks, and married her. When it came time for the couple’s child to be born Kamohoali‘i warned Kalei to guard the child’s body from the sight of man, and never allow it to eat the flesh of any animal. Kamohoali‘i then disappeared. Kalei bore a man-child, and named it Nanaue. Kalei was very surprised to discover that the child had an opening in its back. She covered the opening with *kapa* and often wondered about it. One day Nanaue plunged into the water and opened the mouth on his back to catch any passing prey. Kalei kept this secret to herself. The boy eventually grew to manhood and began eating with the men in the men’s house. Nanaue stayed to himself and his dual nature

developed. When the people of his village were deep-sea bathing or fishing, they would suddenly be visited by a shark that bit and tore at the limbs and dragged them down into deep water. Then one day, a man working beside Nanaue in a taro patch inadvertently tore the *kapa* from Nanaue's back. A shout went up "See the shark mouth! A shark man!" Nanaue escaped to the sea and wandered from place to place and island to island. The *kahuna* were asked to help, but it was some time later that Nanaue was actually captured and killed. At one time he lived near Kāneana. He would drag his victims into the cave through a subterranean channel at high tide. He would place his victim on a certain slimy stone to await his leisure and appetite (Honolulu Star Bulletin, September 9, 1939, cited in Sterling and Summers 1978).

The Mo'ō of Mākua Valley

The term *mo'ō* is translated as "lizard." *Mo'ō* were not harmless small geckos, but rather they were large creatures with long and terrifying bodies (Kamakau 1964; Kelly and Quintal 1977). Traditionally, *mo'ō* are associated with fish ponds, and they are considered guardian spirits (Kelly and Quintal 1977). The particular *mo'ō* of Kalena stream and pond was said to have once been a beautiful girl who lived in the valley. Her parents changed her into a *mo'ō* so that she could not marry the shark man of Kāneana (Kelly and Quintal 1977). The following story pertains to the *Mo'ō* of Mākua:

In heavy rains, the *mo'ō* came down the stream from Ko'iahi to meet her boyfriend, the shark from Kāneana Cave. When the stream flows strong, it breaks through the sand beach and flows into the sea. The *mo'ō* goes into the sea and goes on the big rock next to the blow hole at the Wai'anae end of the beach. The rock is called Pōhaku-kūla'ila'i. On this rock, she would turn herself into a beautiful princess and call to him. The shark would come out of Kāneana Cave through the undersea channel and swim out to the blowhole. He would then swim into the underwater entrance, and be tossed ashore through the blowhole. He would then turn into a man, and he and the princess would make love. When they were ready they would go to live in the stream. And when the water is green the *mo'ō* is in the stream. When it is clear, she is not. No swimming is allowed when the *mo'ō* is in the stream (Kelly and Quintal 1977).

The 'Ōlohe or Ha'a People

The 'Ōlohe or Ha'a people were a class of individuals skilled in the art of wrestling and bone breaking (*lua*). They reportedly pulled their hair out and smeared their bodies with oil to provide no hold to an opponent. Oral traditions portray these people as professional robbers with possibly cannibalistic habits who stationed themselves at a narrow pass along the

highway to rob and kill travelers. Mākua Valley is a traditional haunt of the ‘Ōlohe or Ha‘a. Similar traditions occur in the islands of Maui and Hawai‘i (Beckwith 1940).

Mākua Mountain Trail

John Papa ‘I‘i relates the following concerning the Mākua Mountain Trail : “There was a mountain trail from Mākua to Kawaihāpai (*ahupua‘a* in Waialua) where it joined the trail from Ka‘ena. It was said that this was the trail on which the red-eyed one became lost, but it might have been another one. The saying was, ‘Red eyed person who strayed to Mākua.’” A slightly different version, which was eliminated from the text, read: “A red eyed one went from Mokulē‘ia intending to go to Mākaha but he went up by Kawaihāpai thinking that was the way to Mākaha. He found that it was not his destination and hence the saying for this was, ‘Red eyed one goes by mistake to Mākua.’” (John Papa ‘I‘i manuscript pp. 218-220, cited in Sterling and Summers 1978).

Maile Lau li‘i of Ko‘iahi

Maile lau li‘i o Ko‘iahi, the small-leafed maile was noted for its fragrance. The maile of Ko‘iahi was believed to have the finest leaf of any *maile* on O‘ahu. It was said to have been destroyed by goats (Pukui 1953, cited in Sterling and Summers 1978).

This famous plant also plays a role in the legend of Kalelealuaka, a warrior of supernatural prowess associated with the well known king Kakuhihewa (Thrum 1998). Kalelealuaka’s adventures take him to a number of districts around O‘ahu, where he appears adorned with *lei* representing the area, performs tremendous military feats, is promised the region as a spoil of war, and disappears again mysteriously. In the end, he inherits the kingdom from Kakuhihewa. In the legend’s Wai‘anae episode, Kalelealuaka appears bedecked in *maile lau li‘i*.

Mailelauri‘i was also the name of a beloved relative of Hi‘iaka, who greeted her at Mākua, as described in more detail in the Hi‘iaka tradition related above.

Pōhakuloa Training Area

Oral Traditions regarding the area around PTA indicate that the Ahu a ‘Umi heiau on the slopes of Hualālai south of PTA is said to have been built by the legendary chief ‘Umi a Līloa around 1600. Both ‘Umi and his father, Līloa, are credited, in different accounts, with unifying the Island of Hawai‘i and with creating the system of land division that persisted through the end of the traditional era. In a broad sense, the entirety of

Mauna Kea, whose southwestern slopes form part of PTA's base, is considered holy. From cultural practitioners to academic specialists to oral history informants, that sacredness has been expressed in a number of different ways that are briefly summarized here.

Attempts to translate the Hawaiian sense of Mauna Kea's spiritual meaning for a general audience often focus on two concepts, hiapo (first-born, recipient of special privileges and responsibilities) and lōkahi (unity or harmony). The mountain is seen as the first-born child of Wākea and Papa, the original father and mother, and thus as a personal ancestor of living Hawaiians. It is also seen as the piko or navel through which the Island of Hawai'i came into being. In addition, its height helps to make it sacred.

This sense of Mauna Kea as a living elder and holder and transmitter of tradition complements a sense of lōkahi, in which the mountain participates in the larger cycle of life, where each element has a crucial part to play. For example, its height attracts clouds, which bring precious rain. Through hiapo the mountain reaches up to the sacred realm, while through lōkahi it reaches out to the natural world—Hawaiian tradition did not see those two realms as separate.

Several deities are associated with the mountain, perhaps most famously Poli'ahu, the snow goddess of the summit, and Lilinoe, embodying the mist and rain of the Pōhaku area. In legend, the region was also the scene of conflict between Poli'ahu and the fire goddess Pele. In geologic terms, this conflict may be seen in the ancient meeting of volcanic fire and mountain ice that produced exceptionally high-quality basalt prized by traditional adze makers.

Water is an important part of the mountain's sacred aspect. These sacred water sources include springs and their importance as part of cultural landscapes, rain clouds attracted by the peak, mist and snow representing its deities, and the icy water of Lake Waiau near the summit, prized for use in religious and medical practice. Water that had not touched the ground was considered especially precious, whether it collected in the cupped part of a taro leaf, in high Lake Waiau, or in the top of a bamboo shoot. Interestingly, the ahupua'a that stretches from the Hāmākua shore to include both Mauna Kea and Mauna Loa peaks and much of the land base for PTA is named Ka'ōhe, or bamboo—a plant that was often used as a water carrier.

3.10.3 Historical Overview Mākua Military Reservation

Historical Setting of the Wai‘anae District

One ruler’s name stands out from the early centuries of Wai‘anae history: Huanui-i-ka-lā-la‘ila‘i, born at ‘Ōhikilolo and ruling the northern coast. His reign has been tentatively dated to either the 8th or the 11th century (Kelly and Quintal 1977; Eblé et al. 1995). Little seems to be known aside from his name and the fact of his reign.

Cordy (2002) suggests that around the 14th century, Hawaiians saw the formation of *moku* or larger districts and the development of a ruling class of *ali‘i*. By this time, the coast and lower valleys of Wai‘anae were probably settled. It would take another three centuries to settle the upper valleys. Wai‘anae and Waialua would have been part of the larger *moku* of ‘Ewa. Centralized power in the Island of O‘ahu waxed and waned over the centuries. An ‘Ewa chief named La‘akona is thought to have unified O‘ahu in the early 15th century and ruled from Līhue in the central plateau of the island. The center of power probably moved to Waikīkī about a century later under the rule of Mā‘ilikūkahi. In the 17th century, a separate kingdom briefly arose in Wai‘anae under Nāpūlānahumahiki. A generation later, a strategic marriage between Kākuhihewa and an heir of the breakaway kingdom unified the island again.

The power Kākuhihewa established began to dissipate again under his descendants, as the *moku* chiefs gained strength at the expense of the center, until Kualī‘i reestablished centralized rule around 1720. The Wai‘anae uplands were the site of the last resistance to Kualī‘i. By this time, Wai‘anae constituted a separate district, and chiefs probably lived at Pōka‘ī Bay.

After the time of Kualī‘i, Wai‘anae was often a site of resistance or refuge. When Kahekili conquered O‘ahu in 1785, he faced a rebellion by the island’s chiefs, who made their last stand in the Wai‘anae Mountains (Cordy 2002; McGrath et al. 1973).

With Kahekili’s death nine years later, war broke out between would-be heirs Kalanikupule and Kā‘eokulani. After various skirmishes and truces, Kā‘eokulani—who was actually encamped in Wai‘anae on his way home to Kaua‘i—made an abrupt about-face and, with the support of Wai‘anae warriors, attempted an attack. He was defeated and killed (Cordy 2002; Kuykendall 1968). When Kalanikupule lost O‘ahu to Kamehameha I a year later, the Wai‘anae coast again became a refuge for those unwilling to submit to the new rule (McGrath et al. 1973).

Even after the islands were unified and pacified, political and cultural resistance continued to find a home in Wai‘anae. Chief of Wai‘anae and governor of O‘ahu until his disappearance at sea in 1829, the *ali‘i* Boki offered intermittent but sometimes bitter opposition to the queen regent Ka‘ahumanu and to the missionary faction. At times, he “seemed on the point of attempting to overthrow Ka‘ahumanu” (Kuykendall 1968: 123). Shortly after his disappearance, the “Pahikaua war,” another plot against the queen regent that briefly held O‘ahu in a state of siege, also had a strong Wai‘anae base (Kamakau 1992). Ka‘ahumanu’s death in 1832 signaled another brief “revolt against Puritanism” by the Wai‘anae chiefs (McGrath et al. 1973). After the death of the Liliha, widow of Boki, in 1839, Christianity began to make vigorous inroads on the Wai‘anae coast (Hall 1839; McGrath et al. 1973).

Issues common to all of Hawai‘i also played out on the Wai‘anae coast. The sandalwood trade, beginning in 1811 and intensifying after Kamehameha I’s death in 1819, is widely believed to have caused famine and to have increased vulnerability to disease throughout the Hawaiian Islands. In Wai‘anae, inhabitants are said to have uprooted sandalwood saplings to avoid having to harvest them later (McGrath et al. 1973). Kelly and Quintal (1977) found no references to sandalwood harvesting in Mākua Valley specifically, but ample documentation indicates that the harvest took place in the Wai‘anae district in general.

The epidemics that battered the islands after contact with the West took their toll in Wai‘anae as well. Kuykendall (1968: 386) says “In those years (1848 through 1853) epidemic diseases, like a gigantic scythe, cut great swaths through the native population and its ultimate extinction came to be quite generally thought of as inevitable.”

McGrath et al. (1973) estimates that by 1854, the Wai‘anae coast population was at a quarter of its pre-Contact level.

Role of Mākua and Kahanahāiki in the Wai‘anae District

Handy et al. (1972) state that there were small villages in Mākua. Clark (1977:96) describes Mākua as a “densely populated valley with a thriving community,” mostly clustered inland at Pu‘u Pa‘i, well watered, and full of fruit-bearing trees. This description conflicts with the impression of aridity and poverty that some early European visitors reported after their short visits to Mākua. In a setting where the rainfall varies seasonally and annually, these seemingly contradictory descriptions may be seen as presenting a range of variable conditions present at different times.

Kelly and Quintal (1977) and Cordy (2002) estimate the population in Mākua at between 300 and 420 persons around the time of contact with the West. Population on the northern Wai‘anae coast was sufficient in Levi Chamberlain’s time (in the early 1800s) to support two schools, including one at Keawa‘ula and another at Mākua.

Cordy (2002:119) summarizes how the existing archaeological remains reflect the past settlement pattern in the area: “Based on some historical information and limited archaeological information, it appears that the bulk of the permanent housing of Mākua and Kahanahāiki was along the shore and in the immediately adjacent areas of the lower valley... Archaeological work has found some habitations (enclosures and platforms) on the sides of Ko‘iahi gulch at the front of Mākua valley and some scattered habitations in the back of the valley.”

The region under study is known to have been unified under a single ruler, Hua-nui-i-ka-lā-la‘ila‘i, many centuries before the arrival of Europeans. The portion of the coast from Keawa‘ula to Kea‘au also fronts what is said to be the richest part of the Wai‘anae coast fishery. It also shared a common post-Māhele fate in the sense that most of the large land areas that came under foreign control were devoted to a relatively “wild” form of cattle ranching, rather than to plantation agriculture.

Two well-known events of the late pre-Contact to early post-Contact era may be linked to Mākua. These events are the death of the *kahuna* Ka‘opulupulu and the attempt by Kamehameha I to invade the Island of Kaua‘i.

The Mākua and Wai‘anae shores have both been suggested as the place where the late 18th century O‘ahu king Kahahana betrayed his close adviser Ka‘opulupulu. Ka‘opulupulu and his son were summoned to Wai‘anae and killed. The act is believed to have cost Kahahana his credibility and support, and he soon thereafter lost his kingdom to the invading Maui chief Kahekili.

Before his death, the *kahuna* Ka‘opulupulu made a prophecy that has been paraphrased and translated a number of different ways. Pukui (1983) offers:

E nui ke aho, e ku‘u keiki, a moe i ke kai, no ke kai la ho‘i ka
‘āina. Take a deep breath, my son, and lay yourself in the sea, for
then the land shall belong to the sea.

Mākua and Mākaha beaches offered the best canoe landings along the Wai‘anae coast, frequently used by travelers on their way to Waialua or Kaua‘i (McGrath et al. 1973; Kelly and Quintal 1977). One of the two was the likely site from which Kamehameha I launched his unsuccessful invasion of Kaua‘i in 1795.

Traditional Activities in the Mākua Military Reservation Vicinity

In oral history interviews, the most frequently mentioned crop in Mākua and Kahanahāiki was sweet potato (Kelly and Quintal 1977). Post-Contact era crops reportedly grown in the valley included watermelon, pumpkin, cucumber, tobacco, and cotton (Kelly and Quintal 1977). At one time, the *Territory* suggested that there were at least 550 acres (223 hectares) of agricultural land in Mākua Valley. However, in a letter from McCandless to Charles T. Bailey, Commissioner of Public Lands, McCandless doubted the presence of 500 acres (202 hectares) of agricultural land, and instead he stated that the number of acres farmed at any one time in lower Mākua Valley since 1900 was probably 100 acres (40 hectares) or less.

As in other places where rainfall was insufficient to support irrigated pondfields or *lo‘i*, the staple crop was sweet potato, although a small amount of taro may have been grown in Ko‘iahi Gulch and perhaps elsewhere. Few if any streams in the valleys of Mākua and Kahanahāiki flowed year-round, but careful seasonal planning allowed farmers to take advantage of seasonal rains to produce a sweet potato crop that was known for its size and sweetness. Plants growing wild on the lower and gentler slopes of the mountains supplemented the diet and also provided medicines.

Salt could be gathered easily from the lava rocks along the shore, particularly at Kalaeopa‘akai, a lava outcrop on the ‘Ōhikilolo shore, but also in Mākua. Numerous interviewees remembered the abundance and purity of the salt supply, now described as no longer present in significant quantity or quality due to various factors (Kelly and Quintal 1977).

The area south of Ka‘ena Point is one of the richest fishing grounds on O‘ahu, directly accessible from the Mākua and Kahanahāiki valleys. In addition to the ocean, streams, *muliwai*, and human-made fishponds were sources for fish. At least into the 1930s, Mākua residents participated in a community fishery mentioned in the Kelly and Quintal oral history interviews (1977). Participants remembered a wide variety of freshwater sources in the valleys of Mākua and Kahanahāiki, especially at Ko‘iahi Gulch, La‘ihau, and other inland places.

Early Written Documents

Perhaps the earliest written eyewitness account pertaining to the Mākua area is that of the missionary Levi Chamberlain, who toured O‘ahu in 1826 and again in 1828. “Mākua is situated on a sand beach and opens to the sea between two bold head lands S.E. and N.W. ... there are no trees in this place, a few clusters of sugar cane are seen here and there, potatoes are cultivated but not taro” (Levi Chamberlain Journals 1822-1849: cited in Sterling and Summers 1978: 84).

Early Historic Period Settlement

A sketch by missionary Hiram Bingham depicts a village apparently at Mākua Beach ca. 1821 to 1830 (Bingham 1847). The same sketch also indicates a few houses scattered on the lower slopes of the valley. This description is consistent with the expected settlement pattern of a small community living in a dry leeward setting. The expected pattern includes residences dispersed along the beach, as well as scattered agricultural fields in the interiors of the valley that supported smaller habitation compounds.

Based on census data from the 1800s and assuming a much larger pre-Contact population prior to the devastation brought by foreign diseases, Cordy (2002) estimates that 420 people once lived in Mākua and Kahanahāiki. Mākua and Kahanahāiki appear to have supported about the same size of pre-Contact population as most valleys in the Wai‘anae district, except for the much larger population in Wai‘anae Kai and the very sparse population in Keawa‘ula. In this context, the *ahupua‘a* of Mākua and Kahanahāiki may be seen as typical moderately populated valleys in a leeward Hawaiian setting.

Hawaiian Land Records

In 1848, the Great Māhele replaced the previously existing land use practice with a system of private ownership. *Kuleana* claims were petitions for land by Native Hawaiians based on ancestral use of certain areas that resulted in land commission awards (LCAs). LCAs were properties worked by generation after generation. *Kuleana* land was recognized as 111 acres (45 hectares) awarded to claimants in Mākua and 70 acres (28 hectares) awarded to claimants in Kahanahāiki (Kelly and Quintal 1977). The remaining land in the area became property of the Hawaiian government, and large sections of this land would later be leased and sold in smaller parcels as a source of income (Kelly and Quintal 1977).

Church

Levi Chamberlain noted the existence of mission schools at Mākua Valley and Keawa‘ula in reports that he made in 1826 and 1828 (Chamberlain 1956, cited in Kelly and Quintal 1977). The first mention of actual parishioners in Mākua Valley was in 1860. The first Mākua Church was reportedly built of stone by Samuel Andrews, and the next was constructed of wood (Kelly and Quintal 1977). The second church was later moved to Pearl City and subsequently to Kuhio School in Mo‘ili‘ili. As an entity, Mākua Church was part of the Hawaiian Protestant Congregation, but it remained independent of the United Church Council. Its official name was Mākua Church, but its parishioners referred to it as Ko‘iahi Church (Kelly and Quintal 1977).

Railroad

Construction of a railroad along the leeward portion of the O‘ahu coast was started in 1888 by Ben Dillingham. After several years, the railroad of the O‘ahu Railroad and Land Company extended into the Wai‘anae District, past Mākua, and around Ka‘ena Point to Kahuku (Kelly and Quintal 1977: 61). “The existence of railroad transportation at that early date allowed easy movement of cattle and hogs from Mākua Ranch to slaughterhouses located in urban centers, as well as transportation for vegetable produce to urban markets. The railroad provided transportation to and from Mākua...for families as far away as Kahana Bay” (Kelly and Quintal 1977: 59).

Ranching Period

A series of ranchers acquired ownership and leases of land parcels in the Mākua and Kahanahāiki valleys. The following summary is synthesized from Kelly and Quintal (1977):

The first lease of this area for ranching activities was issued to Joseph and John Booth in 1864, and it was to run for 25 years. This lease included Mākua Valley, Kahanahāiki Valley, and the government portion of Keawa‘ula. In 1873, the lease was transferred to Samuel Andrews, and the lease was extended for an additional 21 years to terminate in 1910. In 1910, this ranch land was leased to L. L. McCandless, and the lease was up for renewal in 1920. These properties again became available for lease in 1925, when James Frank Woods obtained a 21-year lease. This lease included Kuaokalā, Mākua Valley, Kahanahāiki Valley, and the entirety of Keawa‘ula. In 1929, Woods assigned these leases to L. L. McCandless, who had already purchased ‘Ōhikilolo (directly to the south of MMR) in 1899. The McCandless Estate maintained control of these lands until the Army took over the area in 1941.

Historic Land Use

Mākua and Kahanahāiki Valley s correspond to traditional Hawaiian land units known as *ahupua‘a*, which incorporate the natural and cultural resources from the inner mountain ridge to the ocean. The concept of the *ahupua‘a* provides a context to understand daily, seasonal, and annual functions of society and relations with the natural environment. The *ahupua‘a* units in and adjacent to MMR are shown in Figure 3.9-3.

Soils in Mākua and Kahanahāiki Valleys evidently supported the growth of sweet potato and sugar cane, and non-Native Hawaiian ranchers in the 1800s reportedly grew watermelon, pumpkin, cucumber, tobacco, and cotton (Kelly and Quintal 1977). Sediment types in the area appear to include mostly rocky clay loam colluvial deposits derived from erosion of the basaltic mountains that surround the valleys. Variable silty and gravelly deposits are present in the streams and drainages.

Given the leeward setting of Mākua and Kahanahāiki Valley s, freshwater sources are limited and fragile. These same sources are vital to sustain traditional Hawaiian land uses in the area and to provide clean drinking water. The locations of streams very likely determined the distribution of traditional Hawaiian cultivation fields and associated residences in the valleys. A number of streams and drainages are present, generally following physiographic features of the landscape. Mākua Stream is the principal stream, roughly in the center of Mākua Valley, and likewise Kahanahāiki Stream (now referred to as Punapōhaku Stream) is roughly in the center of Kahanahāiki Valley. When flowing, these two streams join and issue into the ocean at the middle of the sandy beach. Stream flows have also been noted in the narrow Ko‘iahi Gulch (referred to in this EIS as Kaiahi Gulch) at the south edge of Mākua Valley and in Piko Gulch on the north edge of Kahanahāiki Valley (Zulick and Cox 2001).

Figure 3.10-1 shows cultural resource features at MMR.

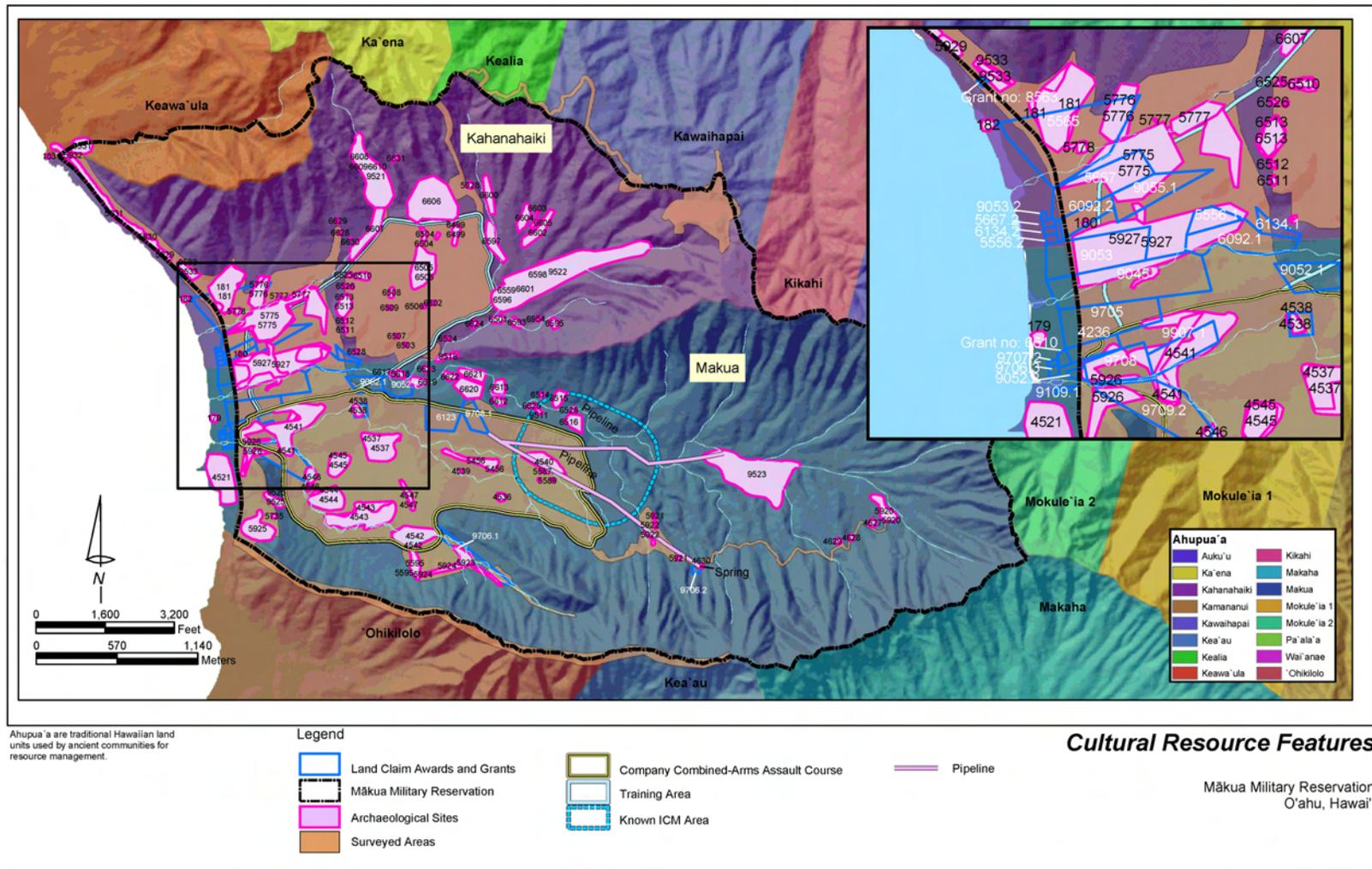


Figure 3.10-1 Cultural Resource Features, MMR

Stream flow in the Mākua and Kahanahāiki Valleys is at present intermittent. USARHAW and 25th ID(L) (2001a: 53) reports, “The Mākua Stream system is an intermittent system and flows only about 5 percent of the year. The stream rarely flows for two consecutive days.” Zulick and Cox (2001: 6) comment, “This statement may actually be overly generous, as this percentage would indicate two weeks of flow a year, something that has not happened in the last five years.” The apparent low volume of stream flow probably limited the kinds of cultivation practiced in Mākua and Kahanahāiki Valleys in the past, thereby contributing to a set of local adaptations of water-conserving techniques.

Limited rainfall may partially explain the intermittent quality of the streams. Mean annual rainfall is estimated at less than 20 inches at the beach and less than 50 inches at the backs of the valleys (Giamabelluca et al. 1986). This rainfall pattern is considered typical of leeward valleys in O‘ahu, where rain is minimal at the beach and moderate in the backs of the valleys. This pattern would seem to restrict large agricultural fields and especially irrigation complexes to the upper portions of Mākua and Kahanahāiki Valleys, whereas smaller fields and dryland (unirrigated) complexes would be more appropriate for the lower portions of the valleys.

Prior to historic and modern disturbances of Mākua and Kahanahāiki Valleys, the local vegetation was most likely typical of leeward Hawaiian valleys. Speaking generally of lowland grasslands and shrublands in dry leeward zones, Cuddihy and Stone (1990: 12) offer, “It is likely that endemic annual grasses of the genus *Panicum*, such as *kākonakona* (*P. torridum*), were formerly more important components of dry lowland vegetation, where they probably grew intermixed with native shrubs.” Native shrubs may have included ‘*a‘ali‘i* (*Dodonaea viscosa*), ‘*ākia* (*Wikstroemia* spp.), ‘*āweoweo* (*Chenopodium oahuense*), *ko‘oko‘olau* (*Bidens menziesii*), *pūkiawe* (*Styphelia tameiameia*), *alahe‘e* (*Canthium odoratum*), and low-growing ‘*ōhi‘a* (*Metrosideros polymorpha*) (Cuddihy and Stone 1990). The upper portions of Mākua and Kahanahāiki Valleys likely contained more diverse grasses, shrubs, and trees (Cuddihy and Stone 1990).

The local fauna in Mākua and Kahanahāiki consists of birds and rare fruit bats in the forested areas of the valleys, as well as diverse marine life at the coast and in the deep ocean waters off the coast.

US Military Period

Prior to 1941, US military use of the Mākua and Kahanahāiki Valleys was limited to war games at Mākua Beach, as well as the takeover of one *kuleana* parcel (LCA 9052) and two parcels registered to the Territory of Hawai‘i for the installation of gun emplacements (Kelly and Quintal 1977).

After the attack on Pearl Harbor in 1941, the US military assumed a defensive posture along the coastlines of all of the Hawaiian Islands, including the placement of barbed wire and pill boxes. In order to prepare Mākua and Kahanahāiki Valleys for simulated battle training, the military arranged to relocate residents from this area.

Pōhakuloa Training Area

PTA is part of a larger cultural landscape that includes the sacred mountains Mauna Kea and Mauna Loa and the Saddle area between them in addition to Mt. Hualalai. Research by Pualani and Edward Kanahelo (1999), Kepā Maly (1997, 1999), Holly McEldowney (1982), Charles Langlas (Langlas et al. 1997), and Usha Prashad and Keone Nunes (SRP 2002), among others, has helped to identify some of the factors that make the area spiritually and historically one of the most important places in Hawaiian tradition and history.

The importance of Mauna Kea, Mauna Loa, and the surrounding landscape may be seen in the abundance of physical or archaeological remains and through the many oral histories that describe historical events and uses of the area (Maly 1999). The region around PTA contained a rich resource zone that supported traditional activities that included bird hunting for feathers and meat, quarrying volcanic glass, and lithic workshop locations for manufacturing the adzes made from Mauna Kea basalt. The Saddle region has numerous trails and served as a much-used passage for travelers moving both cross-island and to the Mauna Kea and Mauna Loa summits.

Evidence of occupation in the upland areas of PTA spans a period from the 10th through the 18th centuries. The Ahu O ‘Umi heiau on the slopes of Hualalai south of PTA is said to have been built by a legendary chief ‘Umi a Liloa in the early 17th century. This chief and his father, Liloa, are credited with unifying the island and creating the traditional system of land division. The chilly heights of the Saddle and the peaks are not thought to have been the locations of permanent residences, but many groups routinely exploited the natural resources of the area and also used the region for religious and spiritual reasons.

Cave shelters are abundant due to the extensive natural lava tube systems in the area. These shelters provided refuge from the elements and, because there is relatively low rainfall within the region, they also served as a source of capturing and collection of limited water. Archaeologists speculate that ancient Hawaiians practiced different economic activities in this uplands area. Radiocarbon dating of PTA sites (primarily caves) indicates occupation between the 12th and 18th centuries. Some reports indicate the presence of burials at PTA (Haun 1986; Athens and Kaschko 1989; Reinman et al. 1998). Past archaeological work has also suggested that Native Hawaiians planted sweet potato crops in stony excavated pit areas (Reinman and Schilz 1999), but more recent work supports the hypothesis that excavated pits were used for enhancing bird (petrel) habitat (Hu et al. 1996; Moniz-Nakamura 1999; Williams 2002a, 2002b).

Traditional Activities in the Pōhakuloa Training Area Vicinity

It is considered unlikely that the chilly heights of the Saddle area and above were ever the site of permanent homes, but many people passed through the region in pursuit of the numerous and unique natural resources available. These individuals included bird hunters, and gatherers of various plants and other forest resources, and craftsmen in search of high quality wood and fine quality basalt for adze manufacturing. Lava that cooled quickly on the frigid mountaintop yielded an especially fine-grained form of basalt that could be turned into high quality adzes and other tools in the days before metal was available. Quarry sites were probably workshops, with associated shrines and temporary dwellings located in caves at lower warmer elevations, some of them within PTA.

Craftsmen turned to the high forest when they needed particularly large trees from valuable upland hardwoods such as māmane. According to Kanahale and Kanahale, the upper slopes were considered more sacred than the lower forests and were left alone as much as possible as conservation areas; when one of the larger and more valuable trees was taken, a major offering, often a human sacrifice, was given in return.

Perhaps the most valuable of the traditional forest resources were the birds. Songbirds were snared for their plumes, and seabirds that nest were hunted as food. Participants in early 20th century interviews remembered a variety of bird-catching techniques, from tethering alive 'io (hawk) next to a trap, to setting tiny nooses alongside lehua blossoms, to snaking a gummed snare made of 'ie'ie vines into a shallow cave to catch 'ua'u chicks, a delicacy reserved for the ali'i. Most techniques required a great deal of finesse and patience and, in the case of the larger birds, strength and speed as well. Natural holes in the lava beds were improved to make them more attractive nesting places. Birds hunted for their feathers were,

hunters recalled, released again in viable condition (Reinman et al. 1998a; Moniz-Nakamura 1999).

Cows, sheep, and other ungulates are a post-contact introduction, but as they were released into the uplands and multiplied, hunting them became a pastime and sometimes a living, pursued by Hawaiian and non-Hawaiian alike. For decades, hunting of the wild/feral creatures continued as more structured and privately owned ranching began to grow. Hawaiian participation, both in the wild hunts and in ranching, has become an island tradition in its own right.

People using the upland resources, as well as people traveling cross-island, developed a network of trails in the prehistoric and early historic eras. Some of those trails are now underneath lava flows, others lie under modern roads, and others may be of questionable location and antiquity, but it is clear that a number of trails crossed the Saddle region connecting the various coastal districts around the island with one another. The Ahu a 'Umi heiau derives some of its importance from its location at the juncture of several of these trails.

The sacredness of the area and Native Hawaiian connection to the Mauna Kea landscape manifests itself in many ways. Oral testimony (Maly 1997) has revealed a number of activities and traditional practices that have been less documented than the ones described above, possibly because they are not as readily reflected in the archaeological or archival record. Some of these practices involve secret family worship, a place of refuge from enemies, and a general sense of the magical deity-inspired restorative and healing power of the higher elevations of Mauna Kea. Prayer and worship are reported to continue to this day (Maly 1997).

Water from Lake Waiau (the small lake on the summit platform of Mauna Kea, described above) is considered sacred and is associated with the god Kāne. Healing power and a spiritual connection is associated with the water, and it is still used by Native Hawaiians. Many generations are reported to have deposited their children's umbilical cords (piko) into the lake, as well as on the summit peak of Pu'u o Kukahau'ula, and this tradition is still practiced by some families (Maly 1997). In addition to reported historic burials, some use Mauna Kea as a place to spread the cremated remains of their deceased loved ones (Maly 1997).

It is likely that in historic times, the landscape and forms of Mauna Kea and Mauna Loa were used as navigation aids both at sea and on land. Mountains to this day are used as physical and emotional benchmarks that help people regain their sense of place. Astronomy, although an important

Native Hawaiian traditional component, has not been directly tied to Mauna Kea in the archival record. Because of the “significant association of gods and deity whose forms are seen in the heavens and whose names are also commemorated at locations on Mauna Kea...it is very likely that practices of the native kilo hoku occurred on Mauna Kea” (Maly 1999, 20).

The area of the cloud line is considered wao akua (inhabited by gods and spirits, the creators of life), and as such, the kama ‘aina (children of the land, or natives) have an even greater respect for these higher elevations. Most of the population were commoners, or maka‘āinana, whose daily activities did not involve lands in the wao akua region and were not likely to have visited. However, according to Maly (2004) an elite few, the akua (gods), ali‘i (royalty), or kahuna (priests) of high rank, and the class of specialized practitioners who gathered resources or worshipped in the wao akua and mountain region areas in which they practiced cultural activities made use of natural resources and cared for both natural and cultural resources in the area.

It is difficult to describe the emotional and spiritual link that exists between Native Hawaiians and the natural setting. Hawaiians generally believe that all things in nature have mana, or a certain spiritual power and life force. A custodial responsibility to preserve the natural setting is passed from generation to generation, and personal strength and spiritual well being are derived from this relationship. Because of this belief, Mauna Kea may be the most powerful and sacred natural formation in all Hawai‘i.

Historic Context

In the late 1800s in the PTA area, the owners of two large ranches competed over the rights to raise cattle and sheep and to hunt feral animals in the Saddle Region. John Parker II held a lease to the Kaohe lands of PTA from before 1876 through 1891. The Waimea Grazing and Agricultural Company leased Humuula east of PTA from Kamehameha III around 1860 to raise sheep and hunt wild cattle for their hides. The company built a wagon road through PTA from its sheep station along the current Saddle Road in Humuula to the harbor at Kawaihae. A portion of this road is still in PTA and to the east (US Army and USACE 2004).

By 1891, the Humuula lease was held by the Hackfield’s Humuula Sheep Station Company, which also obtained the lease for the east side of Kaohe. The company built a number of stonewalls. Standing stonewalls in the northeast part of PTA may be the ones referred to in the oral history documents. After 1900, Parker obtained control of the Humuula Sheep

Company and controlled most of the saddle. Military use of PTA began in 1942 with the construction of the Kaumana Road (now the Saddle Road, SH200) for access between Hilo and Waimea. The Saddle Training Area, which included BAAF and the PTA cantonment area, was developed later. Most of the cantonment area consists of Quonset huts built between 1955 and 1958 (US Army and USACE).

Hawaiian Homelands

In 1920 the US Congress established the Hawaiian Home Lands Program, which provides a means by which eligible Native Hawaiians can obtain 99-year leases on Hawaiian Home Lands. Hawaiian Home Lands are intended for three purposes: residences, agriculture, and ranching (Department of Hawaiian Home Lands 2003). The Humu‘ula and Pi‘ihonua Hawaiian Home Land parcels, consisting of 52,315 acres (21,171 hectares), are adjacent to PTA’s western boundary, and the Kawaihae parcel, consisting of 10,153 acres (4,109 hectares), is on the coast north of KMR.

Military History

Kawaihae Military Reservation is located on fill land built onto the reef of Kawaihae Bay in the ahupua‘a of Kawaihae in the district of South Kohala. From Kawaihae Harbor, the proposed military vehicle trail will extend southward and inland through the other ahupua‘a that make up South Kohala, Kawaihae, and Waimea.

3.10.4 Areas of Traditional Importance

The term ATI is used in this EIS as a broad category encompassing places of cultural importance to native, aboriginal, or local groups. Most of these places have not been formally evaluated. These areas have either been identified through oral testimony or are associated with other cultural or natural components. This is unlike the term “historic property,” which pertains only to a site that has undergone formal analysis, evaluation, and consultation in accordance with Sections 106 and 110 of the NHPA, where applicable. The term ATI is used to acknowledge the potential cultural importance of these areas without implying they have received formal evaluation. ATIs may qualify as historic or cultural properties once they undergo formal evaluation and consultation.

ATIs at MMR and PTA may also include cultural landscapes (defined below), properties of traditional religious and cultural importance to a Native Hawaiian group, prehistoric and historic archaeological sites that may include *heiau* (temple complexes) and burial sites, traditional gathering places and traditional use sites, and sites used for subsistence and other cultural purposes. Other natural resources may have cultural

significance, although they can be difficult to specify in terms of location and individual physical properties. Exceptions are where springs, ponds, caves, or other natural features are incorporated into the physical structures of archaeological sites. Other ATIs may be specific landforms, such as a mountain peak or large stones that are clearly mentioned in oral traditions.

Executive Order 13007 protects Indian and Native Alaskan sacred sites on federal lands, and the same protections have generally been extended by the Army in Hawai'i to sites considered sacred by Native Hawaiian organizations. ATIs may include sacred sites, although they may not necessarily be the same as properties of traditional religious and cultural importance (PTRCIs), which are defined in Section 3.10.5, and they may or may not be eligible for listing on the NRHP.

As shown in the legends cited above, some areas can derive traditional importance from oral histories that describe ancestral or mythical events, many of which explain how places or landscapes were named or created. These affiliations also illustrate how Native Hawaiian spirituality and religion is intertwined with the land, landforms, plants, water, ocean, sky (cosmology), mountains, and all things natural and supernatural. Native Hawaiian cultural landscapes, discussed below, share many of the same interconnected and difficult to explain qualities and intangible elements in nature and the environment that are significant and sacred to Native Hawaiians but that are generally not readily apparent or objectified by non-Native Hawaiians.

ATIs may also be associated with flora and fauna. For example, Native Hawaiians feel a spiritual and even genetic connection to plants, specifically kalo or taro, because it plays a large role in their creation traditions (the Kumulipo). One version of this story describes how Wākea, the sky god, coupled with his daughter, resulting in a stillborn and misshapen male fetus that was buried in the earth on the east side of their house (Enos 1998). From out of the ground where the baby was buried the kalo grew, nourished by the tears of his mother. When Wākea's daughter became pregnant again, she bore the first male human, named Hāloa. All future Hawaiians would be related to him, and consequently, related to the kalo, the plant that grew out of Hāloa's stillborn brother.

With such direct links to plant life, much of Hawaiian religion and ceremony is centered around traditions regarding when to sow, fish, harvest, or process natural resources. This focus implies that the definition of "ancestor" to Native Hawaiians includes every water source, geological characteristic, plant, insect, and animal that exists in any given area. It also implies the belief that "Native Hawaiian" extends beyond the human form,

encompassing the natural landscape and the physical forms of their gods held within earth, water, plants, and animals.

Given the above, ATIs may therefore include more than specific areas where identifiable activities occurred. Because of the interconnected nature of Native Hawaiian beliefs, ATIs may also represent links in a chain of places. MMR, for example, fits in the area between Pōka‘ī Bay and Ka‘ena Point, which is all sacred land, or *wahi pana*.

Another example of ATIs are LCAs, which are land parcels where families engaged in subsistence farming and other activities for a number of generations. Available records for LCAs are sometimes incomplete and may contain contradictory information. Land records indicate that LCAs were apportioned to a number of different families in Mākua and Kahanahāiki in the mid-1800s as *kuleana* claims. Table 3.10-1 lists recorded names of LCA claims in Mākua and Kahanahāiki. These LCA plots, in addition to other recorded parcels, are depicted in Figure 3.9-1. They are considered ATIs and may be eligible as TCPs.

Archaeological sites may be considered ATIs and be evaluated as PTRCIs, especially when their locations coincide with LCAs, religious sites, or other places known from Hawaiian traditions. In this context, most archaeological sites in Mākua and Kahanahāiki may be considered ATIs. These sites are listed in Table 3.10-5 at the end of this section and are depicted in Figure 3.10-3.

Native Hawaiian Cultural Landscapes

The Department of the Army has encouraged a cultural landscape approach in its cultural resources management planning strategy. This entails a holistic, integrated analysis of human cultural activity within an ecosystem and that takes into consideration the spatial and cultural relationships between all resources of cultural significance within a landscape.

Federal guidelines recognize four cultural landscape categories, two of which are most relevant for this discussion: historic vernacular landscapes that illustrate peoples' values and attitudes toward the land and reflect patterns of settlement, use, and development over time; and ethnographic landscapes associated with contemporary groups that are typically used or valued in traditional ways (Stoffle et al. 1997).

**Table 3.10-1
Summary of LCAs in Mākua and Kahanahāiki**

‘ahupua‘a	LCA #	Claimant	Location	Acres	
Mākua	9750	Hoewaa	Haunouli	14.931	
	(4)236-K	Kalama	Haunouli	3.136	
	9709:1	Kuli	Haunouli	0.35	
	9709:2	Kuli	Kaawa	14.62	
	9054	Kaawa, for Manua	Kalena	18.06	
	6123	Napuupaa	Kamakaakuholu	8.889	
	9052:1	Kahueai	Koahai	10.26	
	9052:2	Kahueai	Kaohai	0.41	
	9706:1	Kauhi	Ko‘iahi	10.26	
	9706:2	Kauhi	Kaolekea	0.694	
	9706:3	Kauhi	Kihanau	0.38	
	9707:1	Puiwa	Kihanau	ca. 6.13	
	9707:2	Puiwa	Kihanau	ca. 0.2	
	9053	Keolohua	Kulaelawa	12.92	
	Kahanahāiki	5556:1	Kalauli	Kapalai	ca. 3.3
		5556:2	Kalauli	Kapalai	ca. 0.3
		5565	Kamaka	Kahaniki	23.94
5667:1		Kaheana	Keawioe	12.24	
5667:2		Kaheana	Keawioe	0.29	
9055:1		Kanae	Keawioe	ca. 9.94	
9055:2		Kanae	Keawioe	ca. 0.2	
6134:1		Nika, for Kalua	Kahaniki	ca. 1.87	
6134:2		Nika, for Kalua	Kahaniki	ca. 0.2	
6092:1		Moo	Kahaniki	6.832	
6092:2	Moo	Kahaniki	3.9		

Source: Zulick and Cox 2001

National Park Service (NPS) Cultural Resource Management Guidelines describe cultural landscapes as complex resources that range from rural tracts to formal gardens, further defined by the way the land is organized and divided, settled, and used, including the types of structures that are built on it (Stoffle et al. 1997). Natural features, such as landforms, soils, and vegetation, provide the framework within which the cultural landscape evolves. In its broadest sense, a cultural landscape is a reflection of human adaptation to and use of natural resources (Stoffle et al. 1997).

It is difficult to define using the English language what cultural landscapes mean to Native Hawaiians, and it has become evident that labeling and evaluating geographic units that are usually loosely defined and based on interdependent and intermingled cultural traditions presents only a part of the overall picture. Although a number of different terms may be used to describe these cultural areas, the term “cultural landscape” is used here because it is widely understood and has official standing in federal cultural resources compliance.

Native Hawaiian cultural landscapes may consist of culturally specific components reflecting Native Hawaiian spiritual, religious, and cultural values. In *Kalo Kanu o Ka 'Āina*, a report on the cultural landscape for Ke'ānae and Wailua Nui, five somewhat overlapping types of sites were identified (McGregor 1998). These categories (after McGregor 1998) necessarily reflect the importance of culturally significant natural resources, in addition to human-made archaeological sites, and are as follows:

- Areas of naturally occurring or cultivated resources used for food, shelter, or medicine;
- Areas that contain resources used for expression and perpetuation of Hawaiian culture, religion, and language;
- Places where known historical and contemporary religious beliefs or customs are practiced;
- Areas where natural or cultivated endangered terrestrial or marine flora and fauna used in Native Hawaiian ceremonies are located, or where materials for ceremonial art and crafts are found; and
- Areas that provide natural and cultural community resources for the perpetuation of language and culture, including place names and natural, cultural, and community resources for art, crafts, music, and dance.

Cultural landscapes have not been formally evaluated at MMR nor at PTA. Landscapes that are connected to Native Hawaiian culture as described above are considered ATIs.

Traditional Place Names

Traditional Hawaiian place names are important culturally, not only for their sometimes poetic and philosophical description of the landscape but also for their reflection of historical events that took place at certain locations. The naming of the landscape in Mākua and Kahanahāiki and in the PTA vicinity is an example of traditional Hawaiian values and perceptions of the natural environment. Locations and areas that correspond to traditional place names may be considered ATIs. Table 3.10-2 lists traditional place names in Mākua and Kahanahāiki. The 2004 SBCT EIS, Appendix J-2 contains a list of traditional place names associated with Pōhakuloa.

Table 3.10-2
Summary of Traditional Hawaiian Place Names in Mākua and Kahanahāiki

Place-Name	Comments	Source
Halemōhalu	A swimming spot at Mākua Beach	Walter Kanana in scoping comments 4/9/02
Haunouli or Haumoli	An ‘ili in lower Mākua Valley; an area on Mākua shore between Punapōhaku Stream and Kaiahi Gulch	Tuggle 1997:20, 21
Ka‘a‘awa or Ka‘awa	An ‘ili in lower Mākua Valley, just south of Kaiahi Gulch	Tuggle 1997:20, 21
Ka‘aukea	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kahanahāiki Stream	Now referred to as Punapōhaku Stream	Tuggle 1997:21
Kahapapa	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kahauaiki	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kalena	An ‘ili in lower Mākua Valley, <i>mauka</i> of Farrington Highway and south of Kahanahāiki Stream	Tuggle 1997:20, 21; Kelly 1977:App. B
Kamaka‘akuholu	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kaohai	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kaolekea	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kapahu	A possible ‘ili in lower Mākua Valley	Tuggle 1997:20
Kapalai	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Keaukea	Area on Mākua shore between Punapohaku and Kahanahāiki streams	Tuggle 1997:21
Keawaioe	An ‘ili in lower Mākua Valley	Tuggle 1997:20
Kihanau	An ‘ili in lower Mākua Valley between Kahanahāiki and Ko‘iahi streams	Tuggle 1997:20, 21
Ko‘iahi	Referred to in this EIS as Kaiahi Gulch. An ‘ili in Mākua Valley, a gulch or small valley, a stream.	Pukui et al. 1974:115 Sterling and Summers 1978:84 Sterling and Summers 1978:84 Tuggle 1997:20, 21
Kōlealea, also Kolelea, Kolele‘a	The north end of Mākua Beach, fronting Kahanahāiki	Tuggle 1997:20; Clark 1977:97 Kelly 1977:interview (int) #2
Kuaiwa	A possible ‘ili in lower Mākua Valley	Tuggle 1997:20
Kulaelawa	an ‘ili in lower Mākua Valley, <i>mauka</i> of Farrington Highway and north of Kahanahāiki Stream	Tuggle 1997:20,21

Table 3.10-2
Summary of Traditional Hawaiian Place Names in Mākua and Kahanahāiki

Place-Name	Comments	Source
La‘ihau, also La‘iehau	<ul style="list-style-type: none"> Coastal portion of Kahanahāiki On the north side of Waihoe Stream Where the Honolulu telephone company building used to be May have been an ‘ili There was lots of water at La‘ihau 	<ul style="list-style-type: none"> Kelly 1977:int#14 ISD 1998:91 Kelly 1977:int#3 Tuggle 1997:20 Kelly 1977:int#3
Lamaloa	A stream in Kahanahāiki by the site of the old McCandless house: “that’s the main stream where all the water comes into one.”	Kelly 1977: App. B, int#1
Mākua to Kawaihapai trail		Sterling and Summers 1978:84, 3
Manuhi	A possible ‘ili in lower Mākua Valley, <i>mauka</i> of Farrington Highway and south of Punapohaku Stream	Tuggle 1997:20, 21
Mo‘o Puna Wai	“It’s a hole in here, on the side of a little hill. You can’t see it unless you crawl in.”	ISD 1998:110
Nāmāhana	North end of Mākua Beach	Pukui et al. 1974 Tuggle 1997:20; Clark 1977:97 Kelly 1977:int#2
Pakalana	An ‘ili in lower Mākua Valley, just north of where Farrington Highway meets Ko‘iahi Stream	Tuggle 1997:20, 21
Papahānaumoku	A swimming spot at Mākua Beach	Walter Kanana in scoping comments 4/9/02
Papaloa	A reef off Mākua Beach, reputed to have a cave underneath it with air	Pukui et al. 1974, Clark 1977; Kelly 1977:int#2
Po‘ohūnā	Eastern point of Mākua Beach headland south of Mākua Beach	Clark 1977 Tuggle 1997:20
Po‘ohuna or Loko Pu‘uone	A dune pond	ISD 1998:110
Pōhaku-kū-la‘ila‘i (also Kūla‘ila‘i or Pōhaku Kūla‘ila‘i)	<ul style="list-style-type: none"> Where the mo‘o lived in the stream A big rock by the blowhole near Kāneana Cave, where the legendary mo‘o and the shark would meet. This is on the beach now known as Pray for Sex Beach 	<ul style="list-style-type: none"> Kelly 1977:int#2 Kelly 1977:int#4,2; Clark 2002:297
Pōhakuokūmaile	A possible ‘ili in lower Mākua Valley	Tuggle 1997:20

Table 3.10-2
Summary of Traditional Hawaiian Place Names in Mākua and Kahanahāiki

Place-Name	Comments	Source
Pu‘u Pa‘i (also Pu‘upai, Hapu pai, Po‘opa‘i)	<ul style="list-style-type: none"> A place inside Mākua Valley; a flat place, in the back of the valley, good for farming; “Kupuna lived way up there.” There was a song written about this place, but the song wasn’t finished. John Naiwi (a major Mākua Valley figure) lived there until sometime after his first child was born, when he moved down near the shore. “When you get to the cemetery, you look right into that valley that’s Ko‘iahi. That’s Pu‘upai on top, flat; where the helicopters land on top.” You can see it from the beach. It was next to a stream. 	<ul style="list-style-type: none"> Kelly 1977: text p36 and interviews 1, 2, 4, 12, 15, Clark 1977:96
Puna Pōhaku/Punapōhaku	<ul style="list-style-type: none"> It was once densely populated The white rock A place somewhat inland An ‘ili and stream in lower Mākua Valley 	<ul style="list-style-type: none"> Kelly 1977:int#2 Kelly 1977:App. B Tuggle 1997:20,21
Pu‘upai Waikomo Pukano Kāneana cave	Part of Mākua Beach. Meaning: entering water a point	<ul style="list-style-type: none"> Kelly 1977:App. B Pukui et al. 1974:224 Kelly 1977:int#2 Clark 1977:233 Pukui et al. 1974:84 Sterling and Summers 1978:82 Sterling and Summers 1978:81

3.10.5 Properties of Traditional Religious and Cultural Importance

The NHPA, Section 101(d)(6)(A), specifies that properties of traditional religious and cultural importance to Native Hawaiian organizations may be determined eligible for inclusion in the NRHP and directs federal agencies to consult with Native Hawaiian organizations to identify and evaluate such properties. NPS Bulletin 38 provides nonbinding guidance on this statutory provision and created the term traditional cultural property for these sites.

The NPS defines PTRCIs as properties that at a minimum are “eligible for their inclusion in the (NRHP) because of (their) association with cultural practices or beliefs of a living community that (a) are rooted in the community’s history and (b) are important in maintaining the continuing cultural identity of the community” (Parker and King 1990:1).

Figure 3.10-2 shows archaeological resource features at MMR.

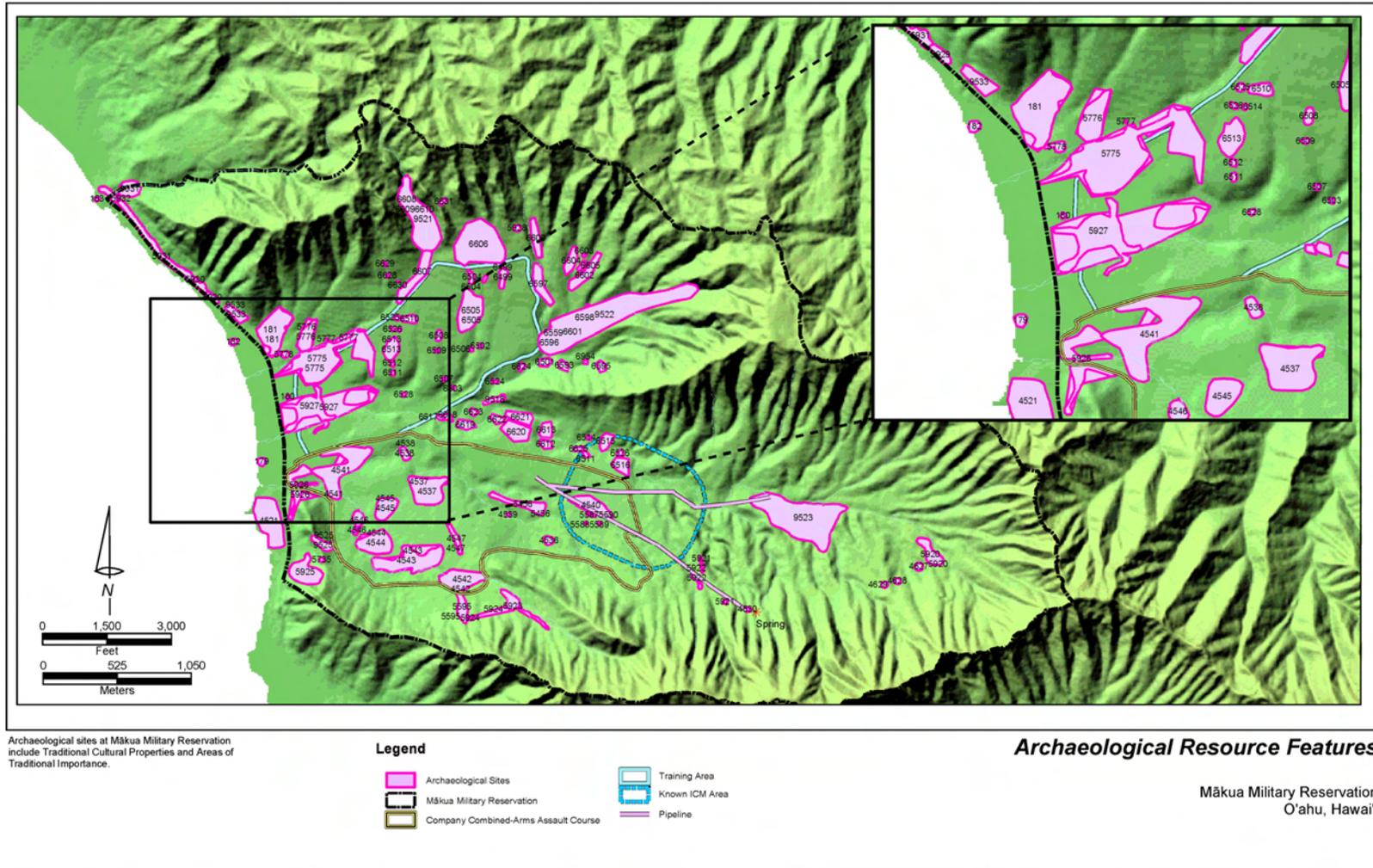


Figure 3.10-2 Archaeological Resource Features, MMR

Studies, including surface and subsurface surveys, archival research, and oral interviews, have identified a number of ATIs, as discussed above, that may be eligible as PTRCIs. The process for determining if identified ATIs are eligible as formal PTRCIs includes consultation among USARHAW, the SHPO, Native Hawaiian organizations, and other interested groups and individuals, including but not limited to those listed in Appendix C of the Ukanipo *Heiau* Programmatic Agreement (included in Appendix I of this document). The Army treats all ATIs as eligible for the NRHP until they have been formally assessed for eligibility. Some areas that cannot be surveyed due to unexploded ordnance or other safety concerns may contain cultural resources. The Army conducts additional archaeological investigations whenever possible. The areas that could be directly affected by the proposed training at MMR have been surveyed, and the identified sites are being protected and analyzed. A large portion of the area outside of the CALFEX footprint but which is included within the ROI has been surveyed (see Figure 3.10-3 (*now B-68 in ICRMP*)).

3.10.6 Archaeological Surveys and Sites Mākua Military Reservation

Although several access roads, firebreak clearings, target constructions, and gun emplacements have been established at MMR during the period of US military use, the archaeological investigations conducted since the 1970s indicate that many of the archaeological sites, features, and deposits dating to the pre-Contact era have survived in good to excellent condition.

Table 3.10-3 lists the archaeological sites so far documented in Mākua and Kahanahāiki, and Figure 3.10-2 shows the locations of the sites. Table 3.10-2 also lists the reports and documents where the sites are described in more detail.

The first archaeological surveys for Mākua and Kahanahāiki concentrated on *heiau* and other prominent monuments (McAllister 1933; Thrum 1906, 1938). These initial studies recorded site locations, noted major salient characteristics, and made brief mention of known traditions pertaining to sites.

At the time of Thrum's survey, he described Ka'ahihi or Kahana'ike *Heiau* (Site 50-80-03-0180) in "ruins," Kumuakuopio or Kuopio *Heiau* (Site 50-80-03-0178) as mostly destroyed with "little now in evidence," and Kanaloa *Heiau* (site number unknown) as "now entirely destroyed" (1906:46). At the time of McAllister's survey, he described the fishing shrine of Site 50-80-03-0179 as partially destroyed (McAllister 1933). Ukanipō *Heiau* (Site 50-80-03-0181), a swimming pool (Site 50-80-03-

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
0177	Cave	Undetermined, Kāneana or Mākua Cave	Prehistoric	Not evaluated	McAllister (1933: 123)
0178	Surface architecture no longer exists,* but petroglyphs are present	Religious site, Kumuakuopio or Kuopio <i>Heiau</i>	Prehistoric	Not evaluated	McAllister (1933: 123); Rosendahl (1977: 2-22); Thrum (1906: 46; 1938: 136)
0179	Surface architecture no longer exists*	Fishing shrine	Prehistoric	Not evaluated	McAllister (1933: 123); Rosendahl (1977: 2-22); Tuggle (1997: 23-26)
0180	Most of the surface architecture no longer exists,* but some wall segments are present	Religious site, Ka‘ahihi or Kahana‘ike <i>Heiau</i>	Prehistoric	Not evaluated	McAllister (1933: 123); Rosendahl (1977: 2-22); Thrum (1906: 46; 1938: 135)
0181	multi-stepped terrace with several surrounding structures	Religious site, Ukanipō <i>Heiau</i> ; also surrounding agricultural activities	Prehistoric	Listed 8/13/82	Cleghorn et al. (2002: 8-26, 62-65); Hommon (1980: 7-40) McAllister (1933: 124-125); Rosendahl (1977: 2-22); Thrum (1906: 46; 1938: 138)
0182	Pool of water with artificial modifications that have been altered by cattle ranching constructions*	Swimming pool	Prehistoric	Not evaluated	McAllister (1933: 124); Rosendahl (1977: 2-22)
0183	surface architecture no longer exists*	Fishing shrine, Pua‘akanoahoa Ko‘a	Prehistoric	Not evaluated	McAllister (1933: 124); Rosendahl (1977: 2-22)
0184	Cave, possibly in Keawa‘ula and not necessarily in Kahanahāiki	Undetermined, Poha Cave	Prehistoric	Not evaluated	McAllister (1933: 124); Rosendahl (1977: 2-23)
4536	terrace, wall, and well	Agricultural and livestock	Prehistoric and historic	D	Eblé et al. (1995: 7-1 to 7-5, 13-1 to 13-3)
4537	Terrace/wall, walls, and mounds	Agricultural	Prehistoric and historic	D	Eblé et al. (1995: 7-6 to 7-10, 13-1 to 13-3)

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
4538	enclosures and concrete pad	Military	Historic	D	Eblé et al. (1995: 7-10 to 7-11, 13-1 to 13-3); Zulick and Cox (2001: 38)
4539	Wall	Undetermined	Undetermined	Not eligible	Eblé et al. (1995: 7-10 to 7-13, 13-1 to 13-3)
4540	Terraces, walls, enclosures, mounds, and one double-stepped platform	Habitation, probable agriculture, and ritual	Prehistoric and historic	a, c, d	Eblé et al. (1995: 7-13 to 7-22, 13-1 to 13-3); Williams and Patolo (2000: 47-63, 77-79)
4541	walls, enclosures	Habitation and agriculture	Historic	D	Eblé et al. (1995: 7-22 to 7-25, 13-1 to 13-3); Zulick and Cox (2001: 36-37)
4542	Terraces, enclosures, walls, mounds, cupboards, platform, and stacked stones	Habitation, agriculture, and ritual	Prehistoric and historic	D	Eblé et al. (1995: 7-26 to 7-38, 8-1 to 8-6, 13-1 to 13-3); Zulick and Cox (2001: 38-44)
4543	Enclosures, walls, mounds, terraces, and pits	Habitation and agriculture	Prehistoric and historic	D	Eblé et al. (1995: 7-39 to 7-47, 8-6 to 8-9, 13-1 to 13-3)
4544	Enclosures, alignments, terraces, mounds, and two petroglyphs	Habitation and agriculture	Prehistoric and historic	D	Eblé et al. (1995: 7-47 to 7-53, 8-9 to 8-11, 13-1 to 13-3); Zulick and Cox (2001: 45-48)
4545	Mounds and one wall	Habitation and agriculture	Prehistoric and historic	D	Eblé et al. (1995: 7-53 to 7-55)
4546	Enclosures, walls, and mound with upright stone	Religious site	Prehistoric	a, c, d	Eblé et al. (1995: 7-55 to 7-56, 13-1 to 13-3); Williams and Patolo (2000: 40-47, 77-79)
4547	Mounds and a wall	Agriculture	Prehistoric and historic	D	Eblé et al. (1995: 7-56, 13-1 to 13-3)
4627	Mounds, terraces, and one enclosure	Agriculture	Undetermined	D	Carlson et al. (1996: 15-17, 24)
4628	Mound with a cupboard	Undetermined	Undetermined	Not evaluated	Carlson et al. (1996: 15, 24)

Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
4629	stone mounds	Undetermined	Undetermined	Not evaluated	Carlson et al. (1996: 15, 24)
4630	Terraces, wall, and alignment	Habitation	Historic	D	Carlson et al. (1996: 15-19, 24); Zulick and Cox (2001: 64-67)
5456	Subsurface pits	Cooking and undetermined	Prehistoric	Not evaluated	Williams and Patolo (2000: 19-40, 79)
5587	Enclosures, terrace, and mound	Habitation	Undetermined	D	Williams and Patolo (2000: 63-65; 77-79)
5588	Terrace	Habitation	Undetermined	D	Williams and Patolo (2000: 65, 77-79)
5589	Terrace and platform	Habitation or workshop	Undetermined	D	Williams and Patolo (2000: 65-66, 77-80)
5590	Terrace, mound, and boulder with artificial markings	Habitation and ritual	Undetermined	a, c, d	Williams and Patolo (2000: 66-70, 77-80)
5595	Wall and enclosure	Livestock	Historic	Not evaluated	Zulick and Cox (2001: 74)
5734	Enclosure	Habitation	Undetermined	Not evaluated	Zulick and Cox (2001: 166-167)
5735	Scatter of basalt artifacts	Workshop	Prehistoric	Not evaluated	Zulick and Cox (2001: 166-167)
5775	Enclosures, terraces, walls, mounds, alignments, modified outcrop, platform, and one mound with a crypt and possibly burials	Habitation, agriculture, and ritual	Prehistoric	D	Cleghorn et al. (2002: 28-41, 62-65); Zulick and Cox (2001: 126-147)
5776	Walls, terraces, mounds, and enclosures	Habitation, agriculture, ritual, and livestock	Prehistoric and historic	D	Cleghorn et al. (2002: 41-58, 62-67)
5777	Mound	Religious site	Prehistoric	D	Cleghorn et al. (2002: 58, 62-67)
5778	Enclosures, mounds, terraces, wall, pit, and platform	Ritual	Prehistoric	D	Cleghorn et al. (2002: 26-27, 62-65)
5920	mounds, terraces	Agriculture and ritual	Undetermined	Not evaluated	Zulick and Cox (2001: 61-62, 154- 156)
5921	Mounds, alignment, and terrace	Agriculture	Undetermined	Not evaluated	Zulick and Cox (2001: 67-70)

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
5922	Mound, modified outcrop, and alignments	Agriculture	Undetermined	Not evaluated	Zulick and Cox (2001: 71-73)
5923	Walls, enclosures, platforms, mounds, alignments, terrace, modified boulder, upright boulder, and pit feature	Habitation and agriculture	Historic	Not evaluated	Zulick and Cox (2001: 74-75, 77-98)
5924	Alignments	Agriculture	Undetermined	Not evaluated	Zulick and Cox (2001: 92)
5925	Walls	Agriculture	Undetermined	Not evaluated	Zulick and Cox (2001: 99-101)
5926	Walls, well, alignment, upright slabs, and petroglyph	Habitation, agriculture, and ritual	Undetermined	Not evaluated	Zulick and Cox (2001:102-114)
5927	Walls, alignment, and enclosure	Agriculture	Historic	Not evaluated	Zulick and Cox (2001: 115-122)
5928	wall	Agriculture	Undetermined	Not evaluated	Zulick and Cox (2001: 151-152)
5929	Bunker, gun emplacement, Platforms, wall, path	Military	Historic	Not evaluated	Zulick and Cox (2001: 152-154)
5930	platforms	Habitation	Undetermined	Not evaluated	Zulick and Cox (2001: 155-158)
5931	Wall	Undetermined	Undetermined	Not evaluated	Zulick and Cox (2001: 159)
5932	Trail	Transportation	Undetermined	Not evaluated	Zulick and Cox (2001: 159-163)
9518	Trail	Transportation, Mākua Mountain Trail	Undetermined	Not evaluated	Rosendahl (1977: 2-23)
9519	Multiple features	Habitation, Keawa'ula Complex	Historic	Not evaluated	Rosendahl (1977: 2-23)
9520	Walls, enclosures	Habitation, Punapohaku Complex	Historic	Not evaluated	Rosendahl (1977: 2-23)
9521	Terraces	Agriculture, Punapohaku Complex	Historic	Not evaluated	Rosendahl (1977: 2-23)
9522	Terraces, walls	Habitation, Kahanahāiki Complex	Historic	Not evaluated	Rosendahl (1977: 2-23)

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
9523	Multiple features	Habitation, Mākua Complex	Historic	Not evaluated	Rosendahl (1977: 2- 23)
9524	Multiple features	Habitation, Ko‘iahi Gulch Complex	Historic	Not evaluated	Rosendahl (1977: 2- 23)
9525	Wall	Undetermined, Ko‘iahi Gulch Wall	Historic	Not evaluated	Rosendahl (1977: 2- 24)
9526	Multiple features	Habitation, Mākua Historic Occupation Complex	Historic	Not evaluated	Rosendahl (1977: 2- 24)
9533	Terrace	Habitation, Kahanahāiki Platform	Historic	Not eligible	Hommon (1980: 41- 46); Rosendahl (1977: 2-24)
6499	Terraces, mounds, and wall	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6500	Multiple features	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6501	Multiple features	Agriculture, ceremonial	Prehistoric	D	Roberts and Robins (2003)
6502	Mound	Agriculture, land clearing	Prehistoric	D	Roberts and Robins (2003)
6503	Terrace and wall	Possible habitation	Prehistoric	D	Roberts and Robins (2003)
6504	Walls and enclosures	Agriculture, military	Prehistoric and modern	D	Roberts and Robins (2003)
6505	Enclosures, mounds, terraces, platform, and petroglyph	Agriculture, habitation, possible burial, and military	Prehistoric and modern	D	Roberts and Robins (2003)
6506	Terraces and wall	Ceremonial	Prehistoric	D	Roberts and Robins (2003)
6507	Wall	Dam	Historic	D	Roberts and Robins (2003)
6508	Mound and terrace	Possible burial, ceremonial	Prehistoric	D	Roberts and Robins (2003)
6509	Enclosure and terrace	Habitation	Prehistoric	D	Roberts and Robins (2003)
6510	Enclosure and mound	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6511	Mounds and terrace	Agriculture	Prehistoric	D	Roberts and Robins (2003)

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
6512	Terraces	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6513	Enclosures, terraces, and walls	Habitation, agriculture, and military	Prehistoric and modern	D	Roberts and Robins (2003)
6514	Enclosure	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6525	Enclosure	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6526	Enclosure	Agriculture	Prehistoric	D	Roberts and Robins (2003)
6527	Enclosure	Possible habitation	Prehistoric	D	Roberts and Robins (2003)
6528	Mounds	Possible burial	Undetermined	D	Roberts and Robins (2003)
Sites Discovered Following the July 2003 Wildfire					
6593	Complex	Petroglyph/agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6594	Mound	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6595	Complex	Ceremonial; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6596	Complex	Habitation; petroglyph; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6597	Complex	Habitation; petroglyph; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6598	Complex	Habitation; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6599	C-shape	Habitation	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6600	Complex	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6601	Enclosure	Habitation	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6602	Complex	Habitation; ceremonial; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
6603	Complex	Habitation; petroglyphs; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6604	Complex	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6605	Complex	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6606	Complex	Habitation, possible burial, agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6607	Complex	Habitation; ceremonial; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6608	Enclosure	Possible imu	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6609	Wall	Cattle wall	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6610	Complex	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6611	Complex	Habitation; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6612	Complex	Habitation; agriculture; boundary	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6613	Complex	Habitation; petroglyph	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6614	Complex	Habitation	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6615	Complex	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6616	Complex	Habitation; petroglyph; agriculture; boundary	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6617	Complex	Habitation	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6618	Complex	Habitation; possible burials	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6619	Wall	Boundary	Pending evaluation	Pending evaluation	Roberts and Robins (2003)

**Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys**

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
6620	Complex	Boundary; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6621	Complex	Habitation; possible burial, animal pen, petroglyph, boundary	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6622	Mound	Possible burial	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6623	Complex	Habitation	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6624	Mounds	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6625	Terraces	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6626	Mound complex	Agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6627	Concrete structure	Gun emplacement	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6628	Complex	Ceremonial; possible habitation	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6629	Complex	Ceremonial	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6630	Complex	Habitation; agriculture	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
6631	Wall	Cattle wall	Pending evaluation	Pending evaluation	Roberts and Robins (2003)
New Sites/Unrecorded Areas Discovered During the 2006 Subsurface Testing					
Area 2b West of Elk	Rock retained soil terraces and remnant mounds	Unknown	Pending evaluation	Pending evaluation	US Army 2007a
Area 2c North of Elk	Three mounds and other features	Unknown	Pending evaluation	Pending evaluation	US Army 2007a

Table 3.10-3
Summary of Identified Archaeological Sites in the Mākua and Kahanahāiki Valleys

Site # 50-80- 03-xxxx	Description	Probable Function	Probable Age	NRHP Eligibility	Reference
Area 2d South of Elk	<i>Kiawe</i> fence post with wire fencing	Historic; ranching	Pending evaluation	Pending evaluation	US Army 2007a

*Where surface architecture no longer exists, the sites remain important for their possible sub-surface contents, and the locations also remain important for cultural value and scientific information.

NRHP Eligibility — The specific criterion used for recommendation for the National Register of Historic Places.

0182), and one fishing shrine (Site 50-80-03-0183) were presumably in fair to good condition, as were Kāneana or Mākua Cave (Site 50-80-03-0177) and Poha Cave (Site 50-80-03-0184) at the time of these initial surveys.

In 1977, the Army commissioned a survey to identify archaeological sites in all training ranges in O‘ahu. The resulting report (Rosendahl 1977) listed 19 archaeological sites at MMR. In addition to the previously identified archaeological sites, Rosendahl (1977) recorded the presence of a trail, systems of walls, habitation complexes, and agricultural complexes in the valleys of Mākua and Kahanahāiki. Most of the newly recorded sites appeared to include late pre-Contact or early post-Contact era components.

In 1980, an archaeological investigation resulted in detailed surface mapping of Ukanipō *Heiau* (Site 50-80-03-0181) and the Kahanahāiki Terrace Complex (Site 50-80-03-9533) (Hommon 1980). Based on the information from this work, Ukanipō *Heiau* (Site 50-80-03-0181) was listed on the NRHP in August 1982.

In 1985, consultation with the Hawai‘i SHPO concluded that the development of the CCAAC would have no significant effect on cultural resources. This conclusion was based on the findings of the Rosendahl (1977) survey.

In 1992, an archaeological reconnaissance survey was conducted for a portion of the proposed firebreak road in the upper valley area of MMR. This survey was limited to the firebreak road corridor, measuring approximately 17,754 feet (5,380 meters) long by 49.5 feet (15 meters) wide. The resulting report (Carlson et al. 1996) identified several habitation and dryland agricultural features that likely functioned in the past as parts of a larger system. Some areas were mapped in detail, but

heavy vegetation and inaccessibility prevented complete recording in other areas.

Also in 1992, an archaeological reconnaissance survey was conducted in 477 acres (197 hectares) of the lower valley portion of MMR. The survey report (Eblé et al. 1995) recorded 153 features of 12 separate sites. The features included stone terraces and retaining walls, basalt cobble walls, stone mounds, enclosures, C-shaped enclosures, stone platforms, and fire pits. Limited subsurface testing was also conducted at a sample of the identified surface features. Based on the results of this work, training target fans have been adjusted to avoid potential direct fire damage near Site 50-80-03-4544.

In 1994 and 1995, archaeological monitoring and surveys were conducted for the proposed CCAAC modifications. The resulting report (Williams and Patolo 2000) documented five previously unrecorded archaeological sites. The data from these sites suggest agriculture, habitation, and religious activities in the middle elevations of Mākua Valley. At Site 50-80-03-5456, archaeological excavation of seven of ten imu (earth ovens) confirmed a pre-Contact date for the past use of this area. Based on the results of this work, the Objective Elk mortar target was moved to avoid direct fire damage near Site 50-80-03-5456.

In 1998, a fire started off the reservation and subsequently burned 105 acres (42 hectares) in Kahanahāiki Valley. In 1998 and 1999, an archaeological survey was conducted in the burned area. The survey report (Cleghorn et al. 2002) provided detailed maps of four archaeological sites associated with the Ukanipō *Heiau* complex. The information from the survey was incorporated into a programmatic agreement (PA) for the cooperative management of Ukanipō *Heiau*, signed in October 2000.

In 2000, an archaeological survey of MMR was undertaken by the Environmental Division of the Army Directorate of Public Works. The survey report (Zulick and Cox 2001) verified the locations of previously recorded sites and also identified several previously unrecorded sites. The newly recorded sites included stone alignments, walls, platforms, mounds, enclosures, a trail, and a petroglyph. The resulting data have been incorporated in a geographic information system database.

Roberts and Robins (2003) completed three surveys: 1) conducted after the Kahanahāiki prescribed burn in October 2002, which yielded newly discovered sites; 2) following the July 2003 prescribed burn; and 3)

subsurface survey of selected archaeological sites in the Mākua Valley in November and December 2003.

In 2006, the Army conducted a comprehensive subsurface testing program to determine if areas within the CCAAC that did not have archaeological remains visible on the surface contained intact buried deposits (US Army 2007a). Of the 550 shovel probes the Army excavated throughout the CCAAC, only two had a potential to contain intact cultural deposits. In addition to the two potential subsurface deposits, three potential features were located to the north, south, and west of Objective Elk, and additional features were observed at site 50-80-03-4536.

The treatment of identified cultural resources inside MMR is discussed in Section 3.10.8 under Current Management Actions.

At present, significance evaluations to determine if the sites are NRHP eligible are continuing for the archaeological sites inside MMR.

As seen in the inset of Figure 3.10-2, the locations of LCAs at MMR, or *kuleana* plots, have a positive correlation with the locations of archaeological remains. This correlation suggests that at least a portion of the archaeological landscape reflects traditional Hawaiian patterns of land use in the 1800s. However, the continued use of sites over several generations would imply that the original dates of the sites are considerably older.

A review of historic maps reveals two branches of a water pipeline issuing from sources near the back of Mākua Valley at least as early as 1912 (see Figure 3.10-2). One source appears to be associated with historic archaeological site 9523. The other source is a spring associated with Site 4630 and also LCA 9706-2. This correlation emphasizes the importance of freshwater springs in the area. The pipeline appears to deliver to LCA 9708.1, also associated with LCA 6123.

Direct links between archaeological sites and specific ATIs are often unclear, but a link is expected in some cases for the sites in Mākua and Kahanahāiki. Certainly, Ukanipō *Heiau* (Site 50-80-03-0181) is a good example of an archaeological site that is also identified as a traditional cultural property. Other identified archaeological sites also have important cultural values as locations where Hawaiian ancestors lived, worked, worshipped, or engaged in other activities.

Pōhakuloa Training Area Previous Surveys

The sections below discuss briefly the status of knowledge concerning cultural resources at PTA. This include areas where survey has occurred and known prehistoric and historic resources in addition to ATIs. In the 1970s the Army commissioned a survey of cultural resources at PTA (Rosendahl 1977). Since the 1980s, many archaeological studies have been conducted at PTA, mostly for regulatory compliance (e.g., Cox 1983; Haun 1986; Hommon and Ahlo 1983). Other studies at PTA include Athens and Kaschko (1989), Reinman and Schilz (1993, 1994, 1999), and Streck (1985, 1986, 1990). Surveys in the northern section of PTA include those of Barrera (1987), Kalima and Rosendahl (1991), and Welch (1993), among others. A biological inventory of cave and lava tube systems within PTA recorded cultural resources at the cave entrances and within the underground system (Pearthree, Stone, and Howard 1994). GANDA has completed additional survey work, including surveying potential SBCT project areas, training areas 1, 3, 4, 5, and 21, and potential Stryker maneuver areas north of the cantonment area (GANDA 2002a, 2003d).

There have been many archaeological investigations of the lands traversed by the PTA Trail corridor, including Barrera and Kelly (1974), Clark (1981), Hammatt and Shideler (1989), Hammatt et al. (1988), Langlas et al. (1997), Clark and Kirch (1983), Clark (1987), and Soehren (1980). Cox (1983) conducted a reconnaissance of the military vehicle trail between Kawaihae Harbor and PTA.

Most of the early archaeological surveys at PTA took place in the west and southwest portions of the training area along or off Bobcat Trail. In 1985, PHRI conducted a survey of the Bobcat Trail Habitation Cave Site and the surrounding kīpuka (Haun 1986), and, in 1987, Athens and Kaschko (1989) surveyed the heavily forested and (at the time) undeveloped region of the Multi-Purpose Range Complex (MPRC). In 1992, Ogden revisited the MPRC and conducted data recovery excavations of sites to be affected, as well as a survey of an additional 20,000 acres (8,094 hectares) (Reinman and Schilz 1999). This resulted in the discovery of 48 new sites.

On the east side of PTA, surveys were not initiated until 1993, when BioSystems Analysis conducted an aerial and pedestrian inventory survey of 6,700 acres (2,711 hectares) along both sides of Redleg Trail (Reinman and Pantaleo 1998b). Following this work, Ogden surveyed four areas east of Redleg Trail totaling about 970 acres (393 hectares) (Williams et al. 2002). Later, an additional area of 2,640 acres (1,068 hectares) to the east of the trail was surveyed and Phase II surface collection and testing conducted of sites in areas previously surveyed (Williams 2002 a & b). In an area with an expected low density of sites, 67 sites and over 1,800 excavated pits were recorded. Many of the sites identified in 2002 and

2003 fieldwork are now being formally evaluated. Cultural resources surveys at PTA from April 2004 to July 2007 are presented in Table 3.10-4. Figure 3.10-3 displays previously surveyed areas at PTA.

Table 3.10-4 Cultural resource surveys at PTA: April 2004 – July 2007
 Since the 2004 Transformation EIS (USAG-HI 2004), cultural resource surveys were performed for many of the projects identified in the EIS. Information regarding projects, reports, and surveys reflects their status as of July

Project Location	Project Number	Project Name	Project ed Fiscal Year Start	Contractor	Findings
PTA	57183	Anti-armor Live Fire & Tracking Range (AALFTR)	Not Funded	GANDA	8 sites in the AALFTR and 7 sites in the AALFTR extension
PTA	56994	Range Maintenance Facility	2013	GANDA	No Historic Properties
PTA	58165	Installation Information Infrastructure	2005		No Historic Properties
PTA		Fixed Tactical Internet (PTA FTI)	2005		No Historic Properties
PTA	57414	Tactical Vehicle Wash Facility (PTA FTI)	2006	GANDA	No Historic Properties
PTA	57417	Ammunition Storage	2012	GANDA	1 Archaeological Site
PTA	57197	Battle Area Complex (PTA BAX)	2007	GANDA	9 Archaeological Sites are recognized as potentially eligible for NRHP.

Table 3.10-4 Cultural resource surveys at PTA: April 2004 – July 2007
 Since the 2004 Transformation EIS (USAG-HI 2004), cultural resource surveys were performed for many of the projects identified in the EIS. Information regarding projects, reports, and surveys reflects their status as of July

Project Location	Project Number	Project Name	Project ed Fiscal Year Start	Contractor	Findings
PTA	57408	Runway Upgrade & Extension, Bradshaw Army Air Field		GANDA	No Historic Properties
PTA	57411	West PTA Maneuver Training Area Land Acquisition (Ke'āmuku)	2005	GANDA	72 Archaeological Sites
PTA	58273	Land Easement & Tank Trail, Pōhakuloa to Kawaihae	2006		7 Archaeological Sites
PTA	57412	Construct Tank Trail, Pōhakuloa to Kawaihae	2013	GANDA	

Known Prehistoric and Historic Resources

In general, archaeological resources at PTA consist of modified natural features, such as lava tubes, lava shelters, and lava blisters. A 1998 review of previous archaeological studies concluded that lava tubes made up 70 percent of all recorded sites at PTA (Eidsness et al. 1998), and they remain one of the most common site types found in more recent surveys.

Other site types include cairn sites, trails, volcanic glass quarries, excavated pits, and lithic workshops. Within these sites, material remains include grinding tools, charred wooden torches, gourds, cordage and matting, woven ti leaf sandals, kukui nuts, 'opihi shells, and other faunal remains. Surface features include stone-lined hearths, cupboards, rock-paved areas, low walls and platforms, rock-filled crevices, ramps, cairns, shrines, open-air shelters, and trails. The region has much value for archaeological research and has produced important information concerning bird hunting, trail systems, and short-term living conditions at higher elevations.

Reinman et al. (1998a) claim the cultural resources at PTA are important for addressing issues about Hawaiian prehistory and history in the uplands region, as well as the development of Native Hawaiian society.

The existence of approximately seven stone shrines attest to the likely ritual activity that went on at PTA. With prayers and ritual permeating traditional Hawaiian life, some of the structures at PTA may be occupational shrines (Buck 1957, 259, cited in McEldowney 1982, 1.10). Cairns (ahu) have been recorded at various terrains, either associated with trail systems or boundary markers, or as just isolated features. There appears to be no pattern to the distribution of cairns across the PTA landscape, and they have been quantified as representing between 10 and 15 percent of known sites. Cairns have also been constructed for military purposes, although the trained eye can usually differentiate military cairns from prehistoric ones. It is also possible that some cairns were constructed for rituals.

Archaeological Resources

PTA is rich with archaeological resources, with 350 reported archaeological sites, including both prehistoric and historic Native Hawaiian sites and historic military structures. Tables 8- 24 through 8-29 from the SBCT EIS (2004) detail the archeological resources identified for the SBCT projects. The only site listed on the NRHP is the Bobcat Trail Habitation Cave (Site 50- 10-30-5004). Figure 3.10-4 shows archaeological sensitivity areas at PTA.

Archaeological sites have been found during surveys conducted by BioSystems Analysis along Redleg Trail and areas to the east along the west side of Redleg Trail (Reinman and Pantaleo 1998b).

Sites identified to the east of Redleg Trail include Site 18671, a small lava tube containing cultural features and material; Site 21495, a complex of excavated pits; and Site 21671, a complex of scattered chill glass quarry locations (Williams 2002a, 2000b). Archaeological sites along the northern terminus of Red Leg Trail lie within the ROI in areas considered to have a high potential for fire spread.

Seventeen sites were found in the proposed area for the BAX during SBCT-related survey work, including excavated pit complexes, rock shelters, modified outcrops, rock mounds, a cairn, a lava tube, a lithic scatter, and an enclosure. One site, a complex of lava tubes, trails, enclosures, and a shrine was identified prior to archaeological survey for the Proposed SBCT Action (Reinman and Pantaleo 1998b). The GANDA survey of the entire BAX area revealed the presence of an additional 16 sites (Roberts et al.in GANDA 2003a). Except for the ahu or cairns, whose age is uncertain, all features seem to be prehistoric in age. Figure 3.10-5 shows recorded archaeological sites at PTA (including caves).

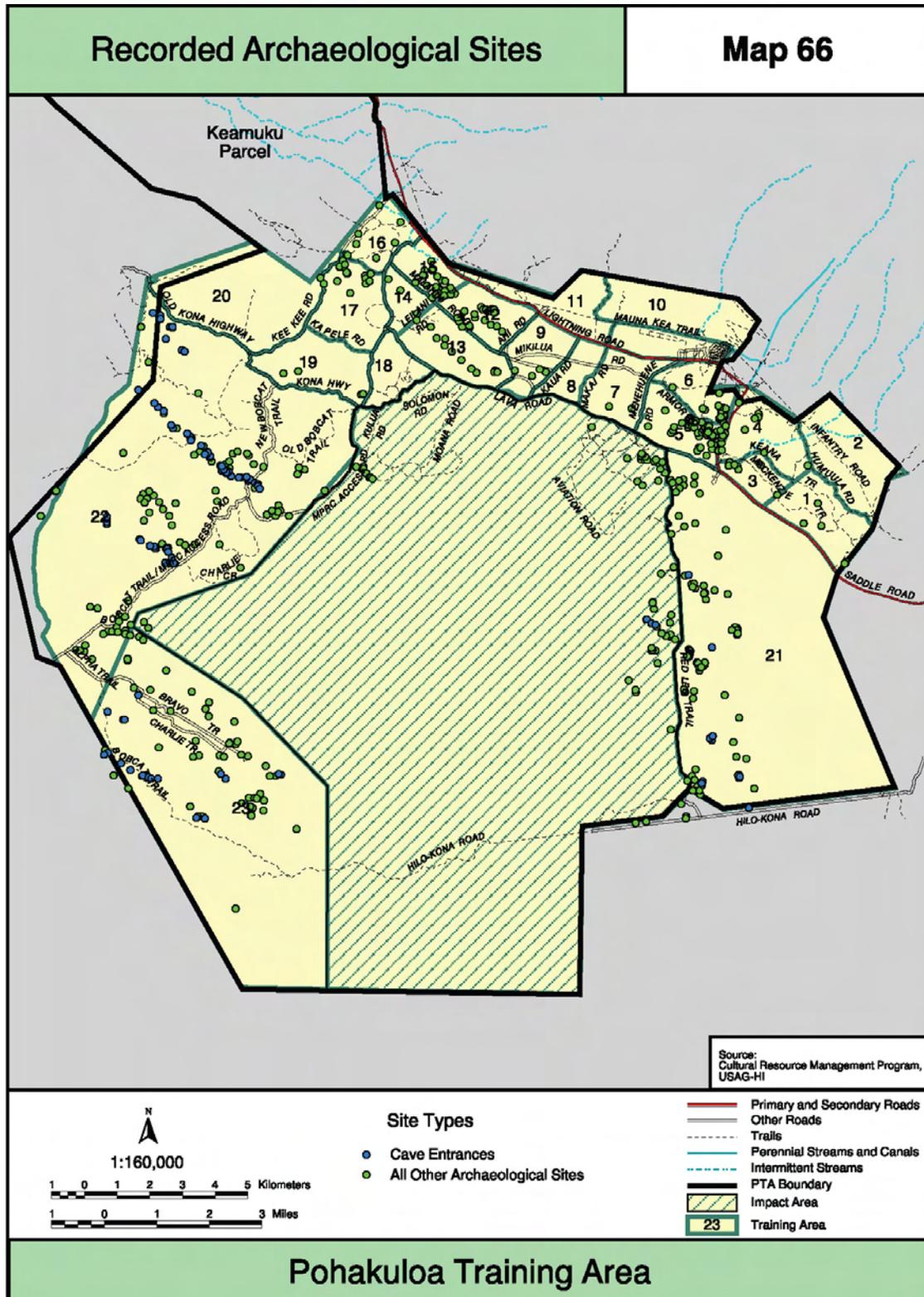


Figure 3.10-5 Recorded Archaeological Sites, PTA (including caves)

Areas of Traditional Importance Surveys

Maly (1997) conducted a series of interviews that considered not only Mauna Kea itself, but the landscape and view planes of the area. Many of the respondents had knowledge of several of the traditional practices described above. In the 1997 study, and in follow-up interviews, the researchers surmised that the Hawaiian people feel a “deep cultural attachment to the broad spectrum of natural and cultural resources” found in and around Mauna Kea (Maly 1999, 3). Maly recommended that the traditions, sites, practices, and continuing significance of Mauna Kea, both historically and today, make it “eligible for nomination as a traditional cultural property under federal law and policies” (Maly 1999, 3).

Known Areas of Traditional Importance

ATIs may include previously identified archaeological sites. Almost all sites at PTA are Native Hawaiian sites and reflect the traditional types of activities that Hawaiians conducted in this region. Activities included procurement of lithic (stone) resources, primary preparation of tools in workshops, hunting of birds, and collection of nestling birds. A few sites incorporate ritual aspects. Streck (1986b) interprets a basalt platform on a terraced mound within a lava tube as a shrine (Site 10269). Shapiro et al. (1995) identify a grouping of rock platforms and open-air sites with stone uprights near Pu‘u Koli in the southeastern portion of PTA as a place where prehistoric Hawaiian religious activities took place (Reinman et al. 1998, 17). Ritual permeated traditional Hawaiian life, including everyday work activities, and some of the religious structures at PTA may be occupational shrines, where fowlers, quarry workers, and woodcutters recited formulas and made offerings connected with their work.

Pōhakuloa Training Area Trail

A new PTA Trail is scheduled to be constructed as a result of the SBCT use of PTA. The environmental impacts of the new PTA Trail are covered in the Stryker EIS and SEIS. The trail is expected to be operational no earlier than 2010. At that time, the PTA Trail will be the primary route for convoys traveling between the Kawaihae Harbor and PTA. The PTA Trail would replace a seldom used military vehicle trail that parallels Saddle Road. The current military vehicle trail passes through grazing lands and fields. The proposed road would consist of a 24-foot- (7-meter-) wide gravel road and a 3-foot- (1-meter-) wide shoulder on either side of the road. It would run approximately 27 miles (43 kilometers), connecting Kawaihae Harbor to PTA. Work would include grading, paving, improving drainage, installing culverts at stream crossings and guardrails at drop-offs, and building storm drainage structures. Road grades steeper than 10 percent would be paved with asphalt or concrete.

**Table 3.10-5
PTA Trail Archaeological Sites**

Site Number	Site Type	Probable Function	Probable Age
50-10-05-9012	Wall	Cattle boundary	Historic
50-10-05-23601	Retaining wall	Cart road	Historic
50-10-05-23602	Mound	Marker	Historic
50-10-05-23623	Wall network	Cattle boundary	Historic
50-10-05-23624	Terrace	Possible habitation	Possibly prehistoric
None	Lava blister	Possible burial	Possibly prehistoric
None	Mound	Undetermined	Undetermined

There have been many archaeological investigations of the lands traversed by the PTA Trail corridor, including Barrera and Kelly (1974), Clark (1981), Hammatt and Shideler (1989), Hammatt et al. (1988), Langlas et al. (1997), Clark and Kirch (1983), Clark (1987), and Soehren (1980). Cox (1983) conducted a reconnaissance of the military vehicle trail between Kawaihae Harbor and PTA. See Figure 8-39 from the 2004 SBCT EIS for a depiction of the archaeological sensitivity along the PTA trail.

GANDA surveyed a 98-foot- (30-meter-) wide corridor along the proposed trail, between Kawaihae Harbor and Māmalahoa Highway, and identified seven archaeological sites (Roberts et al in GANDA 2003b). Four sites are likely post-Contact or Historic in age. Two of these are segments of rock walls used as cattle enclosures or boundaries for Parker Ranch. One site is a stone mound possibly used as a trail marker. The fourth historic site, immediately inland from Kawaihae, consists of the remains of a .62-mile- (1-km-) long stretch of a cart road probably representing the main road built in the mid-1800s between Kawaihae and Waimea. Preserved features of the road include bridge foundations built of cobbles and boulders, milled lumber from the bridges with nails in place, stone retaining walls, and possible pāhoehoe barrow pits from which construction material was obtained.

Two possibly prehistoric sites include a lava blister, which might contain a burial, and a terrace that may have been used during the prehistoric period. No cultural materials were found in association with the prehistoric features during the survey. The seventh site recorded consists of a stone mound of undetermined age.

3.10.7 Paleontological Resources

No paleontological resources are expected to be present in Mākua, Kahanahāiki, or at PTA. No surveys have been conducted expressly to identify paleontological resources in these areas, although archaeological surveys so far have not encountered any sinkholes or caves containing paleontological resources. Caves and rockshelters might be present in unsurveyed portions of the backs of the valleys at MMR, but any such locations (if they exist) are not necessarily expected to contain paleontological resources due to the geologic characteristics of these areas.

3.10.8 Army Management of Cultural Resources

Regulatory Considerations

Government statutes, federal regulations and guidelines, executive orders, and presidential memoranda define the cultural resource management processes with which the Army must comply when planning and undertaking projects, tasks, and actions in areas under Army jurisdiction. Further, the Army at USAG-HI will follow the management procedures outlined in the draft ICRMP.

The cultural resources management program at USARHAW has a staff that includes a Cultural Resources Manager, two government Archeologists, an Architectural Historian and 14 contract Archeologists. The management of the resources includes maintaining a cultural site data base, as well as GIS mapping, field survey, site evaluation, location, verification, and monitoring before, during, and after training activities, site preservation, curation, document management, Native Hawaiian consultation and coordination with other regulatory agencies. The cultural resources team also coordinates and facilitates public outreach actions that include site visits and tours and public education. Present efforts also include the formation of Cultural Advisory Committees on the islands of Hawai‘i and O‘ahu.

Army cultural resources staff members conduct regular outreach to Native Hawaiians to facilitate the Section 106 and 110 process and other consultation efforts to fulfill its obligations under the NHPA. This outreach includes offering tours and open houses, speaking to school groups and college students, and providing cultural access.

Mākua Military Reservation

Current Management Actions

Beginning in 1998, the Army undertook consultation consistent with Section 106 of the National Historic Preservation Act with Native

Hawaiian organizations, interested parties, the State Historic Preservation Office, and the Advisory Council on Historic Preservation regarding the treatment measures the Army would implement for military training at MMR. After two years of consultation with these parties, a programmatic agreement that identified treatment measures for training was executed in September 2000. Since then, the Army has implemented these measures. This PA has expired. However, the Army has reopened consultation under Section 106 of the NHPA to develop a new PA, based on the expired agreement, to address current conditions and the effects of military training at MMR. Since the previous PA was written, there have been no substantial changes requiring reevaluation of the impacts on historic properties. Consultation includes the Hawai'i State Historic Preservation Office, the Advisory Council on Historic Preservation, and interested members of the Native Hawaiian community. The Army has implemented and continues to implement the mitigation and treatment measures identified in the expired PA. Those measures are fully discussed in this EIS.

In addition, there is a programmatic agreement that deals with use and cultural access of the Ukanipō *Heiau* complex (referred to as the Ukanipō *Heiau* PA throughout this document). Signed in October 2000, the Ukanipō *Heiau* PA was developed in consultation with Native Hawaiian organizations and individuals and other regulatory agencies over two years.

Management of the Ukanipō *Heiau* complex at MMR is guided by the treatment measures developed through consultation for that PA. Other historic properties are addressed through compliance with regulations at 36 CFR, Part 800, under the NHPA. Additionally, the Army complies with all applicable laws and regulations set forth in AR 200-1. The Army employs two professional archaeologists whose duties are dedicated to cultural resource management and cultural resource access at MMR.

As part of routine management actions and consistent with the Settlement Agreement, the Army conducted a PTRCI survey and a cultural impact analysis. As part of these efforts, the Army undertook extensive consultation with Native Hawaiian organizations and individuals, documentation of oral history, and archival research.

Army management actions include the following:

The Army continues to seek, identify, and evaluate cultural resources at MMR, in accordance with Section 106 of the NHPA.

Further surveys may be conducted in areas that can be made accessible following wildland fires or prescribed burns. The presence of unexploded ordnance makes surveying hazardous. Detonation of ordnance outside the training area or close to existing sites is subject to consultation prior to any actions.

Annual status reports and/or survey reports are submitted to the Hawai'i SHPO.

The Army continues to consult with Native Hawaiian organizations, groups, families, and individuals who may ascribe traditional religious and cultural importance to historic properties at MMR. The Office of Hawaiian Affairs and Hui Mālama I Nā Kūpuna 'O Hawai'i Nei as well as other interested parties are included in this consultation.

The Army continues to conduct expanded education of Army personnel in cultural resource awareness and protection and avoidance of cultural resources during training. Instruction includes field trips, classroom training, and printed literature. This information is also included in the cultural resource annex of the range standard operating procedure. Before each exercise, senior officers are briefed about cultural and natural resources. Soldiers are briefed at MMR prior to training activities.

The Army maintains a database incorporating all existing cultural resource data and continues to revise it as new information becomes available.

Geographic information system maps of cultural resource locations are distributed to the Hawai'i SHPO, to Native Hawaiian organizations as requested, and to range and training officers to ensure site avoidance and protection during development of training plans. Cultural resources are protected from damage during training exercises. The Army has changed locations of training target objectives and has implemented other site protection measures to eliminate conflicts between locations of cultural resources and locations of training activities. No training is allowed to occur at archaeological sites, and barriers around sites serve as an extra protective measure.

Cultural resources are monitored by archaeologists to identify effects from training. Monitoring records and photographic documentation are included in the annual reports to the Hawai'i SHPO.

The cultural resource manager continues to work with the Wildland Fire Manager to develop acceptable strategies for fire containment and control to suppress wildfires and also to protect cultural resources. This

coordination will continue during site planning preparation and pre-season fire suppression operations.

Due to UXO, some portions of MMR cannot be surveyed for archaeological sites or ATIs. These areas, such as in the improved conventional munition (ICM) area, are outside of the area the Army plans for training activities. Other unsurveyed areas are the steep slopes on the sides and backs of the valleys. No archaeological sites are expected on these steep slopes, with the possible exception of a reported Native Hawaiian *holua* slide course. These portions of MMR are outside of the areas where the Army proposes to engage in training activities.

To increase Soldier and community awareness of cultural resources at MMR, the Army is developing an on-site visitor's center. This center will be used as an educational facility in conjunction with military training and with public access to MMR cultural resources, which is described below. It will contain a library and static and interactive displays concerning the cultural and natural resources of MMR.

Public Access

MMR has been under restricted access since 1941. The lack of public access has likely contributed to a general loss of knowledge of sacred sites within MMR, and because of the restrictions, the area has not been used as much as other sacred sites that allow public visits. To address this situation, the Army has continued to allow access to ATIs since 1998 when it began a program, in cooperation with members of the Wai'anāe community, to open Ukanipō *Heiau* to Native Hawaiian religious practitioners under AIRFA. The Ukanipō *Heiau* PA signed in October 2000 was a result of the meetings and consultation with members of the Native Hawaiian community. In accordance with the PA, members of the community can access Ukanipō *Heiau* for appropriate uses, independent of training activities in MMR.

Before 2001, cultural access to MMR was provided on request, with considerable access provided to the area in and around the Ukanipō *Heiau* Complex, as provided for in the PA referenced above. In October 2001, under the Settlement Agreement, the Army agreed to provide cultural access at MMR twice a month and two overnight visits a year by December 2001. The Settlement Agreement did not specify a minimum number or location of sites that were to be made available for access, but was "...subject to limitations determined by defendants in consultation with native Hawaiian cultural practitioners, including those from Mālama Mākua, based on requirements for training, safety, national security, and compliance with applicable laws and regulations." Pursuant to the

Settlement Agreement, the Army and Mālama Mākuā developed a set of protocols for cultural access to MMR in July 2002. This guidance has been in effect since that time.

Immediately after the Settlement Agreement was signed, access was provided to 12 sites within the CCAAC in areas where all vegetation was removed, the grass was kept trimmed and EOD specialists had swept the surface. In December 2005, the US Department of Defense Explosives Safety Board suspended access to several cultural sites because it determined that that access was inconsistent with regulations concerning nongovernment civilians in current and former impact areas. In order to reopen public access to the sites, the US Army Technical Center for Explosives Safety directed that all areas where the public could walk be cleared to a depth of one foot. UXO clearance within these areas is ongoing.

Pōhakuloa Training Area

Current Management Actions

Current management actions at PTA mirror those employed at MMR, except for those that are installation specific. Such actions include but are not limited to fire control, Soldier and Army personnel education, consultation with Native Hawaiian organizations, groups, families, and individuals who may ascribe traditional religious and cultural importance to historic properties, the meeting of a Cultural Advisory Committee, site monitoring, and GIS use.

As with MMR, the area of potential effect will be surveyed and historic properties and ATIs, if any, will be evaluated. Section 106 consultation will be conducted and any required mitigation measures for archaeological resources or ATIs at PTA will be conducted. Further, NRHP eligibility will be evaluated and plans for avoidance, data recovery of eligible sites, or alternate mitigation for sites in areas that are a hazard to human health and safety will be developed. Impacts on ATIs or TCPs will be mitigated through avoidance. Mitigation will be developed in consultation with the SHPO and Native Hawaiians organizations.

For PTA, a preservation guidance plan (an Historic Preservation Plan or HPP) was developed in 1998, to recommend mitigation options for adverse effects due to routine training at PTA.