Wailau Archaeological Research Project 2005 and 2006 Results Wailau and Hālawa Ahupuaʻa, Koʻolau District, Molokaʻi, Hawaiʻi

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Prepared for:
Molokaʻi Rural Development Project
Society for Molokaʻi Archaeology
State of Hawaiʻi Department of Land and Natural Resources
The Francis Brown Trust
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FINAL

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Abstract

Reconnaissance, survey, mapping, and excavation were conducted in Wailau Valley, Wailau and Hālawa Ahupua‘a, Ko‘olau District, on the island of Moloka‘i, Hawai‘i. This took place on 16 parcels: TMK: 2-5-9-005:002, :007, :008, :013, :016 (por.), :046, :052, :054, :061, :063, :064 (por.), :073, :081, :085, TMK: 2-5-9-006:002 (por.), and :009 (por.). Approximately 260 acres of the 2,313-acre valley were covered at a reconnaissance level, and 33 acres were intensively surveyed. A total of 305 surface archaeological features were recorded, most of them wetland terraces, or *lo‘i*. Four *lo‘i* complexes were mapped in detail, and 66 excavation units were opened. Nineteen radiocarbon dates obtained from excavated charcoal indicate that *lo‘i* complexes were constructed as early as the Thirteenth Century AD. This research represents the first large-scale archaeological examination of the valley.

Cover photo: Wailau Valley facing south from the Upper Eliali‘i *lo‘i* system. Photo courtesy of Steven Eminger.

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CHAPTER 1: INTRODUCTION

The Wailau Archaeological Research Project was designed to collect data on irrigated agricultural development (McElroy 2007) and to provide hands-on training in archaeological field techniques for Molokaʻi residents. This project is an offshoot of the Molokaʻi Archaeological Training Program (McElroy et al. 2005), which provided classroom, field, and laboratory instruction to the Molokaʻi community to prepare them for employment in the field of archaeology. The Wailau Archaeological Research Project served as the advanced course for this program.

The primary focus of this project was on documenting the large irrigated agricultural complexes of the valley. This was accomplished through reconnaissance, survey, mapping, and excavation. Approximately 260 acres of the valley were covered in the reconnaissance, 33 acres were intensively surveyed, and 305 features were recorded. GPS positions were taken for many of the features, and four agricultural complexes were mapped in detail. A total of 66 excavation units were opened, and charcoal was collected for wood taxa identification and AMS radiocarbon dating. An assemblage of historic materials was also collected and analyzed.

This report is organized into six chapters, beginning with a description of the project area and an historical overview of land use and archaeology in Wailau. Field and laboratory methods are delineated in the next chapter. Following this, results of the survey, excavations, and laboratory analyses are presented. Project results are summarized and recommendations are made in the final chapter. Hawaiian words, scientific names, and archaeological terms are defined in the glossary. Appendices A and B provide data on surface archaeological features and collected artifacts. Appendix C presents the results of geochemical analyses on the basalt artifacts. Oversize figures can be found at the end of the document, in Appendix D.

Project Setting

Wailau is one of four valleys on the remote windward coast of Molokaʻi, which stretches from Hālawa Valley on the east to Kalaupapa Peninsula on the west (Figure 1.1). Heavy rainfall of 1,500 to 4,000 mm per year (Juvik and Juvik 1998) feeds two perennial streams that cut through the valley and join at the coast. Topography and soils in the area consist of rough mountainous land near the coast and in the back of the valley with limited soil development, alluvial soils along the valley bottom and lower terraces of Wailau and Kahawaiʻiki Streams, and talus slopes in some places covered by colluvial deposits along the upper terraces and upper reaches of the streams (Foote et al. 1972). Substrates on this eastern portion of Molokaʻi are roughly 1.5 million years old (Stearns 1985).

A series of intact irrigated terraces forms an agricultural system that encompasses nearly the entire 936-hectare valley. Terraces such as these were used traditionally for pondfield agriculture of the staple crop, *kalo* (taro, *Colocasia esculenta*). Trails, habitation structures, ceremonial sites, and burials are part of the cultural landscape as well. The State Historic Preservation Division has acknowledged the value of these archaeological resources, designating the entire valley the "Wailau Agricultural Complex," State Inventory of Historic Places Site 50-60-04-272, but the complex has never been thoroughly documented.

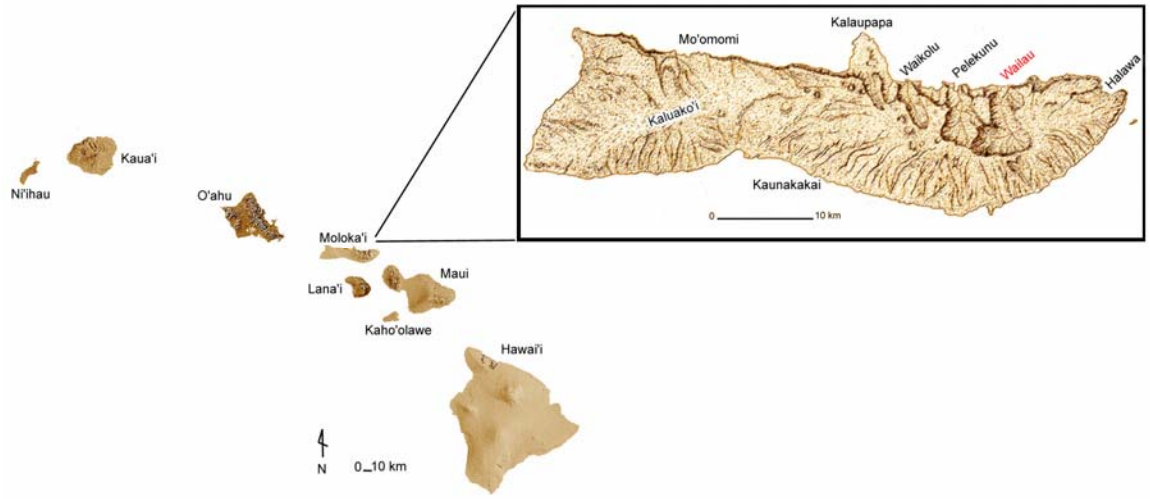

Figure 1.1: Map of the Hawaiian Islands with inset of Molokaʻi Island.

Wailau Valley is remote, remains largely pristine in terms of its archaeological resources, and has few year-round residents. Vehicular access ends outside the valley, at Hālawa, roughly 12 km to the east. Access into Wailau remains limited to a single long and dangerous foot trail or a short boat ride during the calm summer months. High sea cliffs prevent access by foot along the coastline.

Land Use

Pre-contact Land Use

The pre-contact period in Hawaiʻi begins in the first millennium AD, with initial colonization of the islands, and ends in 1778, with the arrival of Captain James Cook, and written history. In pre-contact times, each island was divided into land units known as *ahupuaʻa*. These were self-sufficient territories that ran from the mountains to the sea, providing all the resources necessary for community survival (Earle 1978). *Ahupuaʻa* were each governed by their own lesser chief or land manager, thus they were politically distinct from one another. *Ahupuaʻa* boundaries tend to follow natural topographic breaks, but Wailau Valley is an exception, with a large portion of the valley belonging to Wailau Ahupuaʻa, and a small section under the control of Hālawa Ahupuaʻa (Figure 1.2). This latter *ahupuaʻa* extends east into the large adjacent valley of Hālawa.

In pre-contact and historic times, Wailau was known for its extensive irrigated agricultural systems, with *loʻi* extending up the valley sides, in the lowlands, and to the backs of the valleys produced by its two main watercourses, Wailau and Kahawaiʻiki Streams (Handy and Handy 1972:516). The area of land under irrigated taro has been estimated from 80 acres (Handy 1940:102) to 200 acres (Anonymous 1939). Handy and Handy comment on the exceptional amount of *kalo* produced at Wailau:

> Wailau produced far more taro than could be consumed locally, so that quantities of *paʻiʻai* (hard *poi*) were shipped by boat to Kalaupapa and other localities on Molokai in early post-missionary days. The *paʻiʻai* was wrapped in *ti* leaves, and it is said that donkeys used to eat the packages – perhaps the only record of donkeys ("Kona nightingales") being fed on *poi*.
>
> (Handy and Handy 1972:519)

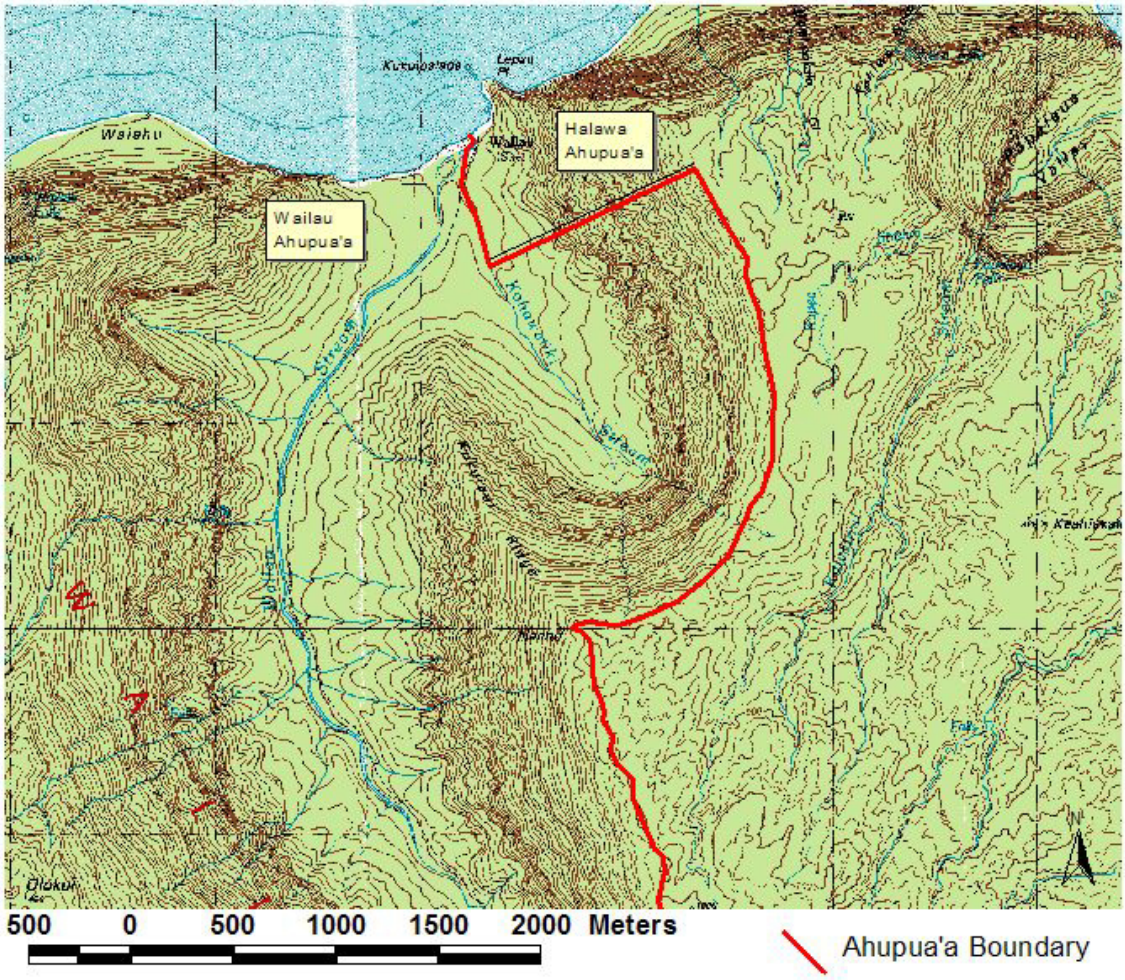

Figure 1.2: Topographic map of Wailau Valley showing the boundary between Wailau and Hālawa Ahupua‘a.

Although poi was a staple of the traditional Hawaiian diet, it was also considered a delicacy, thus the feeding of poi to donkeys attests to the overabundance of *kalo* that must have been produced in Wailau. Taro production continued in the valley until the 1930s (Judd 1938:6; Handy and Handy 1972:516).

A final observation regarding *lo‘i* agriculture comes from Sarah Sykes, a long-time resident of the valley:

> There’s a stone wall edging the area of old terraces we were clearing to plant kalo. It is four feet wide, level with the terraces we were working but nine feet high on the side facing the terraced area below….Also, there were large pohaku, standing like sentinels – one in the middle of a terrace, others at seemingly random locations – and stone work that gave the odd impression of short walls abruptly left unfinished…
>
> Years later, a terrific storm settled over the valley and the rain poured for hours…More water poured into the valley in several hours than had been gauged during a week of steady rain.

> In the morning light the purpose of the stonework was seen – the sentinel stones, and the stonewalls that seemed undone, and especially the massive wall along the lower edge of the property. All had been engineered to break the force of water, gently move water through the system of cleared terraces with such perfection that it was not even discolored. Not a speck of soil was washed out, not a single plant uprooted, and not a single stone dislodged from it's place…
>
> (Sykes in ʻOnipaʻa Nā Hui Kalo 2004:119)

Wailau was also known as a cultivation area for *wauke*, a tree utilized for making *kapa* (Hitchcock 1836 in Summers 1971:176). Two types of specialized *kapa* were manufactured in the valley, the *paʻikukui* and *mahunaliʻi* cloth (Kanepuu 1867 in Summers 1971:176). *Paʻikukui* was a pale yellow *kapa* dyed with liquid from the bark of the *kukui*, or candlenut tree. *Mahunaliʻi* was a thin, fine-scented *kapa* dyed with the bark of the *noni*, a tree renowned for its medicinal value. *Mahunaliʻi kapa* was reserved for royalty and used in sorcery and as a covering for idols (Brigham 1911 and Pukui and Elbert 1957 in Summers 1971:176).

Pre-contact ceremonial architecture was documented in the valley in the early Twentieth Century (Stokes 1909), but the descriptions lack the detail that would make them useful for modern analyses. Two refuge sites, five ceremonial sites, and two trails are recorded. An historic map shows a portion of the intact agricultural system (Podmore 1915), the construction of which likely dates to the late pre-contact period (McElroy 2004). The agricultural system depicted on the historic map is still visible on the surface. Thus, the spatial distribution of pre-contact agricultural and ceremonial features is documented, albeit patchily, but the distribution of pre-contact settlement is completely unknown.

The only hint at traditional habitation in Wailau comes from Summers (1971:158). She offers a general comment on the traditional pattern of land use of the windward valleys of Molokaʻi, stating that *heiau* were positioned above the bottomlands and houses were located along the beach and on the slopes, so that the flat valley bottoms were left for agricultural use.

Moʻolelo

Whereas written references to pre-contact Wailau are limited, oral traditions provide a rich base of knowledge about traditional use of the valley. These come from legends, proverbs, and songs.

The name "Wailau" has been translated as "Many Waters" (Beringer 1921 in Summers 1971; Pukui et al. 1974), "Four Hundred Waterfalls" (Kuda 1912), and "Water Leaf" (Ne 1970), indicating the importance of water in the valley. The latter translation has an accompanying *moʻolelo* (Ne 1970). A Maui man named Pekelo had a fishing accident and washed ashore at Wailau. He was nursed back to health with goat's milk and eventually healed with a special leaf and water from a certain waterfall. When it was time for Pekelo to return to his family on Maui, he asked what the name of the valley was, and was told that it had no name. Pekelo christened the valley "Wailau," or "Water Leaf" and he returned home. Because the name "Water Leaf" is not found in other references and the *moʻolelo* involves goats, which were introduced to Hawaiʻi in 1778, this name is likely more recent than the others.

Pukui (1983) lists six *ʻōlelo noʻeau,* or Hawaiian proverbs relating to Wailau:

> Hanohano na pali kiʻekiʻe o Wailau. *Majestic are the tall cliffs of Wailau.* An expression of admiration for a stately and regal person. Refers to Wailau, Molokaʻi. (1983:57)

> Ka piʻi no ia a kōkī o Wailau. *Ascends to the highest point in Wailau.* Praise for one who has made a worthy accomplishment. The inhabitants of Wailau, Molokaʻi, a place of tall precipices, were excellent climbers. (1983:166)

> O ka piʻi no ia a Kōkī-ō-Wailau. *Ascended to the topmost part of Wailau*. An expression of admiration for one who reaches the top in spite of difficulties. Kōkī-ō-Wailau is a peak on Molokaʻi whose sides are steep and difficult to ascend. (1983:265-266)

> Komo aku la ʻoe i ka ʻai a ka lua i Kealapiʻiakaʻōpae. *You are caught by the hold in* lua *fighting called Kealapiʻiakaʻōpae*. Kealapiʻi-a-ka-ʻōpae (ascent of the shrimp) was a deadly hold in *lua* fighting in which the victim was lifted up and killed before he reached the ground again. This expression is used in love songs to mean, "You are a goner, sweetheart. I have a deadly hold on you." Kealapiʻiakaʻōpae is a place at Wailau, Molokaʻi. (1983:198)

> Lewa ka waha o ka puhi o Laumeki. *The mouth of the eel of Laumeki gapes.* Said of one who talks so much that his mouth is hardly ever closed. Laumeki was an eel-man who lived at Wailau, Molokaʻi. When he saw that Kuʻula's fishpond at Hana, Maui, was always full of fish, he decided to assume his eel form and go there to steal some. On one of his thieving expeditions, he was caught by a magic hook and drawn ashore, where his jaw was smashed and left gaping. (1983:214)

> I Kōkī o Wailau, i ke alapiʻi a ka ʻōpae. *At Kōkī at Wailau is the stairway of the shrimp.* Refers to Wailau, Molokaʻi, where the fishing god ʻAiʻai hid all the shrimps at a ledge called Kōkī because he was annoyed at the people there for neglecting to preserve the fish spawn. He later revealed the hiding place to a youth he especially liked. (1983:132)

Kawaharada (1992) recounts a *moʻolelo* similar to that of Laumeki, the eel-man. In this account, Koʻona, an eel god worshipped by the people of Wailau, left Molokaʻi and went to live in Maui. Koʻona would steal fish from Kuʻula's pond, and Kuʻula's son, ʻAiʻai set forth to kill him. ʻAiʻai caught Koʻona with a magic fishhook and cooked his head in an *imu*. His open jaw and backbone turned into rock formations that are still visible on Maui. Upon hearing of Koʻona's fate, a Wailau *kahu* traveled to Maui to seek revenge on Kuʻula and his family. He had Kuʻula, his wife, and ʻAiʻai burned in their house, but ʻAiʻai destroyed the *kahu* and removed all the fish from Hana as revenge.

Thrum (1907) expands on the *ʻōpae* (shrimp) *moʻolelo*: On a trip around the Molokaʻi coast, ʻAiʻai, stopped at Wailau and saw men, women, and children diverting the stream water on both sides of the valley in an effort to catch *oʻopu* and *ʻōpae*. Upon lowering the water level, the people filled their gourds with the fish and shrimp, without regard for the propagation of the stream creatures. Because of this, ʻAiʻai prayed for the *oʻopu* and *ʻōpae* to be taken away. Those in the gourds transformed into lizards, and those in the stream escaped to Kōkī, a place at the top of a steep *pali*. ʻAiʻai was fond of a boy named Kahiwa and he revealed to him the location of the *oʻopu* and *ʻōpae*. Kahiwa went to the place and found the creatures there, giving rise to the *ʻōlelo noʻeau*, "Koki of Wailau is the ladder of the opae" (Thrum 1907:140). The cliff is also known as Kahiwa. Before ʻAiʻai left, he also showed the boy the location of a *kuʻula* and a fishing station off the coast of Wailau.

The Kōkī cliffs of Wailau were also the setting of a friendly climbing competition (Pukui et al. 1974:186). A boy from Maui and a boy from Molokaʻi both boasted about their climbing skills. They devised a competition, in which the Maui boy was to climb Kōkī o Wailau and the Molokaʻi boy was to ascend Pōhaku Kāʻanapali, an equally treacherous cliff on Maui. The boy who was not able to complete the climb would be put to death. The Maui boy reached the top of Kōkī o Wailau, but the boy from Molokaʻi could not finish the Pōhaku Kaʻanapali climb. The Maui boy did not follow through with the death sentence, however, and the two became friends.

Another *moʻolelo* involves the eradication of a *moʻo* that lived along the windward cliffs of Molokaʻi (Emerson 1915 in Sutherland 1978:43-44). *Moʻo* were said to infest the area, and their lair was at Kikipua, which was also the name of their leader. Kikipua was a female *moʻo* and often disguised herself as a woman. On a quest to eliminate the *moʻo*, Hiʻiaka, sister of Pele, traveled around the treacherous cliffs of the north shore of Molokaʻi. One point seemed impassable, with no footholds to escape falling into the sea. As Hiʻiaka and her attendant Wahineomaʻo considered the situation, a narrow plank formed, and Wahineomaʻo began to cross. Hiʻiaka restrained her, for she knew that the bridge was actually the tongue of the *moʻo*, set to lure them to their death. Hiʻiaka used her magic skirt as a bridge and chased Kikipua into a cave and killed her.

Nineteenth Century historians Fornander (1996) and Kamakau (1992) noted a Wailau *heiau* that has an accompanying *moʻolelo*. The *heiau* was called Kapukapuakea, and a structure of the same name exists on Oʻahu. The Oʻahu Kapukapuakea Heiau is said to be ancient, having been constructed by *menehune* (Beckwith 1970). The Wailau *heiau* was consecrated in the early historic period:

> After the return of Kalaniopuu to Hawaii in January 1779, Kahahana went over to Molokai to consecrate the Heiau called Kapukapuakea at Wailau, and to build or repair the large taro patch at Kainalu known as Paikahawai. Here he was joined by Kahekili, who was cordially welcomed and royally entertained. On seeing the fruitfulness and prosperity of the Molokai lands, Kahekili longed to possess some of them, and bluntly asked Kahahana to give him the land of Halawa. Kahahana promptly acceded to the request, not being moved by the same considerations regarding the Molokai lands as those of Oahu.
>
> (Fornander 1996:219)

Stokes' (1909) Wailau informants did not know of a Kapukapuakea Heiau in the valley, although Stokes did record a *heiau* named Kapukapuahakea located in Honomuni, on the southeast shore of Molokaʻi. Summers (1971) suggests that the similarity in the name implies that the Honomuni *heiau* is the same structure noted by Fornander (1996) and Kamakau (1992) but their report that it was located in Wailau was erroneous. A substantial *heiau* on Raiatea, French Polynesia, also shares the same name (Taputapuatea in Tahitian).

Wailau is also mentioned in song. The most famous is probably *E Hihiwai,* in which the Wailau people are compared to the *hihiwai* and called back to their roots:

Aia i ka nani o Molokaʻi la	There in the beauty of Molokaʻi
I na pali weliweli o ke koʻolau	In the fearful cliffs of the windward side
Hea mai ka leo hone	The sweet voice calls
I ke ahiahi la	In the evening hours
I ka makani ʻekepue o ke awawa	In the cold wind of the valley
Hui:	Chorus:
E hihiwai la lae lae	O hihiwai tra la la
E hoʻi mai kaua la	Come back to me
I ka ʻaina uluwehi o Wailau	To the lush and beautiful land of Wailau
Hanohano wale no	So glorious
Ka wailele Kahiwa la	Is the waterfall of Kahiwa
A me ke kuahiwi o Olokuʻi	And the mountain, ʻOlokuʻi
Mele kakou nei a pau	Let us all sing together
I ka mele ʻaina la	The song of the land
ʻO ka nani mae ʻole o ke ola mau	Of the never fading beauty of life eternal
ʻO ka makani kuʻu leo	The wind is my voice
ʻO ke kai kuʻu puʻuwai	The sea is my heart
ʻO ka ʻaina ʻuluwehi kuʻu nui kino.	The lush and beautiful land is my whole body

(Kamakahi 1978)

Nā Makani ʻEhā, or "The Four Winds" pays tribute to the winds of each of the north shore valleys: The name of the fierce north wind of Hālawa is "Hoʻolua;" the wind of Wailau is "ʻEkepue," which translates to secretive, or to bend or crouch; the wind of Pelekunu is Puʻupilo, which connotes a damp scent; and the Kikioʻopu wind blows through Waikolu, swaying the grass in a rhythmic fashion (Martin 1997). One verse of the song details the ʻEkepue wind of Wailau:

He wahine ʻoe no Wailau mai	You are a woman from Wailau valley
He nani maoli nō	A beautiful local girl
Ka heke no ʻoe i ka ʻike la	Your unsurpassed beauty is seen
He wehi no kuʻu nui kino	An adornment for my body
Hoʻi mai au iʻa nei	I am returning here
Ka uluwehi o ke Koʻolau	The lushness of the mountains
Me ka lei	The lei
I ka makani ʻEkepue	The wind named ʻEkepue

(Kamakahi n.d.)

Wailau is also referenced in the traditional song *ʻAina Molokaʻi*, which describes the north shore of Molokaʻi:

He aloha a o Wailau	I love Wailau
He wahi mehameha no ia	A place of solitude
He nani no ke ʻike aku	You're beautiful to see
Pumehana me ka ua noe	With a warm misty rain

(Davis n.d.)

Wailau in the Historic Era

Information regarding historic land use can be found in *māhele* land claims, traveler's accounts, newspaper articles, a mission report, historic maps and aerial photos, and an oral history interview. During the *māhele* of 1848, 35 awards were made for Wailau (Table 1.1), and maps show that most of these cluster along the streams (W.C.H. 1934). The land divisions of Kuʻele and Kukuinui had the largest number of awards, with 10 awards for the former, and nine for the latter. Land claims indicate that both *kula* and *loʻi* agriculture took place in the valley.

Table 1.1: Māhele Awards for Wailau Valley

Location	Awardee	LCA	Area
Ahiki	Kahaukapu	5070	0.83 acre
Eliali‘i	Hulu	240-R	0.28 acre
Eliali‘i	Kawaapalaole	5008-B	1.5 acres
Eliali‘i	Keawe	8924	11.06 acres
Halawa	Kahalau	9103	0.49 acre
Kamakea	Kahiamoe	4952	713 fathoms
Kamakea	Palauolelo	4622	558 fathoms
Keiu	Kaule	4989	2.5 acres
Keiu	Kauwa	9090	0.305 acre
Keiu	Kekahuna	5095	1.92 acres
Keiu	Mahimahi	4808	910 fathoms
Keiu	Puhili	10869	840 fathoms
Kuele	Kaaiumi	8923	0.65 acre
Kuele	Kahaolekaukau	6302	3.48 acres
Kuele	Kahaolekaukau	6302	0.78 acre
Kuele	Kaiholua	5009-B	1.125 acres
Kuele	Keino	8925	458 fathoms
Kuele	Kukoa	5195	0.685 acre
Kuele	Kunaku	5053	0.36 acre
Kuele	Moa	10097	461.50 fathoms
Kuele	Opunui	4626	0.61 acre
Kuele	Puali	10868	1.11 acres
Kukuinui	Haluku	8130	0.4 acre
Kukuinui	Kalaahaaina	9105	0.34 acre
Kukuinui	Kaneakua	4950	2.29 acres
Kukuinui	Kaneakua	4950	1.47 acres

Table 1.1: Māhele Awards for Wailau Valley (continued)

Location	Awardee	LCA	Area
Kukuinui	Kanihomole	9106	1.13 acres
Kukuinui	Kaunuhipuka	8926	0.4 acre
Kukuinui	Kekuakamauna	8660	72 acres
Kukuinui	Paa	10684	0.27 acre
Kukuinui	Paaua	4623	0.32 acre
Lahikea [Lahokea]	Paele	4619	2.76 acres
Palikoki	Mahina	4717	1 acre 303 fathoms
Pawaa	Kuku	8965	1.5 acres
Pepeiaoloa	Pihi	4628	1.15 acres

A mission report from 1848 mentions mission stations in Wailau and the neighboring valley of Pelekunu and provides a population estimate for each valley:

> One of the [mission stations] is 60 feet by thirty – stone laid up in mud-mortar, plastered & whitewashed; with substantial roof panel doors, glass windows & fine clean mats…In Pelekuna [sic] & Wailau, two deep dismal vallies [sic] with only about 100 or 150 inhabitants each, by dint of hard labor they have each a house of the same kind, but of less size…
> (American Board of Commissioners for Foreign Missions 1937:43)

In 1854, French biologist Jules Remy traveled by row boat from Hālawa to Pelekunu, a valley just west of Wailau (Remy 1893:13). Remy was not able to stop along the way because of dangerous surf, and this attests to the extreme isolation of the valley.

An article in the *Hawaiian Gazette* recounts a trip around the windward coast of Moloka‘i, describes the village at Wailau, and notes that Kalaupapa was supplied with *pa‘i‘ai* from the windward valleys:

> Rounding a point that struck out into the sea like the ridge of some extinct crater, the steamer lay to in the shelter it afforded, while the boat was sent ashore at Wailau. On the gravel beach was a row of 9 or 10 houses, the homes of a few people that have acres of fertile taro land in the narrow valley, lying in a rift of the rocky side… [illegible text] …surf was high and so the paiai in its bundle of ki leaves, had to be floated off, twenty bunches or so, on either side of a piece of scantling. Sometimes the surf is so high at the Leper Settlement, that this is the only way in which bundles of the food can be landed. Hon. David Kahanu, a member of the Privy Council, who has a leper wife at the Settlement, and a well built establishment there has the contract for supplying the lepers with poi from the neighboring valleys.
>
> (Hyde 1885:4)

On an 1889 trip to Hawai‘i, distinguished author Robert Louis Stevenson passed along the north shore and described the small village at Wailau:

> For Wailau we had a passenger, two pigs, and three sheep, besides the mails. Here a green valley runs back deep and tortuous among the mountains, the bed of a small stream; and about its mouth a single row of houses lines the beach, their windows hanking westward down the coast. Impassable surf broke at the very doorsteps; and far to seaward the sound of its dissolution hung already in our ears. Communication with the shore was beyond hope.
>
> (Stevenson 1973:73-74)

By 1893, the valley was described as "not frequently visited" but "once thickly populated" (Keola 1893), and an early Twentieth Century newspaper article delineated plans for repairs to the church that once stood in Wailau because it had been "carried twenty feet inland by a heavy tidal wave" in 1902 (Anonymous 1908). A 1903 map shows a row of houses at the coast and scattered structures inland, mostly along the streams (Monsarrat 1903). Much of the land along the streams to the southern end of the map, roughly 1.5 miles inland, is labeled "TARO" (Monsarrat 1903).

In 1909, only 40 people lived in the village of Wailau, and by 1938 the valley was abandoned (Judd 1938:6). Henry P. Judd made more than one overland trip to Wailau and described the village in 1909:

> The people of Wailau in those days (the valley is now uninhabited) lived in frame houses stretching in a row from the stream to the east wall of the valley. There were nine or ten of such houses, besides the native church, of the Congregational order. The location of these houses was on "iliili" – small black pebbles which covered the house-yards and formed the community side-walk between the houses and over to the stream. The waves as they receded after each oncoming wave caused a strange sound, reminding one of the beach at Keauhou, North Kona, Hawaii which is termed "kai nehe i ka iliili," "where the sea nestles the pebbles."
>
> (Judd 1938:6)

In 1912, Kaua‘i resident George Kane described his five-and-a-half hour journey to Wailau over land (Kane in Summers 1971:134-136). He recounts trekking up and down "fearfully steep" ridges and mentions a boulder on the narrow trail that forced him to pass by sideways (Kane in Summers 1971:135). "This is a stone that takes away a wife of a husband…" warns Kane (in Summers 1971:135). The trail was obviously treacherous and not passed effortlessly.

Kimu Kuda also traversed the Wailau Trail in 1912 and he described the spectacular view of the valley from the clifftop:

> Wailau burst on the vision with a startling suddenness…We understood why the valley was named Wailau, which means four hundred waterfalls. From every part of the semi-circular rim of green, ribbons of white stretched down to the floor of the valley below; that is, some of the ribbons did; others only stretched half

> way down and caught by the winds, ascended again in fleece, still others dropped out from lava ledges half way down; scores of these falls literally poured out from the rocks as though some Moses had passed that way with his miraculous wand.
>
> (Kuda 1912:327)

By 1919, only one Hawaiian family remained in the valley, and they were visited by John Franklin Stone:

> Nelson and I had arrived that afternoon, having come by sampan from Pukoo, and had hoped to find in Wailau a village of Hawaiian folk – ten or twenty families at least – busy with their fishing, or perhaps mending their nets or pounding poi. We had found only the family of Na-ki, hugging its bit of land between the sea and cliff and clinging to the customs of its fathers.
>
> For Wailau Valley has acquired a certain fame for the richness of its taro lands, and Chinese planters bringing coolie laborers and sad-eyed donkeys, are coming in ever greater numbers, turning the waters of Wailau from their old channels and spreading them across a checkered maze of bogs and fens.
>
> One after another the natives have sold their lands to these planters and have departed for the city to squander their new-found wealth.
>
> (Stone 1919:98-100)

A 1922 account states that only six Chinese and no Hawaiians remained in the valley, and that the structures along the coast lay uninhabited (Coelho 1922). One of the Chinese residents, interviewed in 1939, remembered a wild herd of buffalo in the valley that later fell prey to hunters (Anonymous 1939). A state survey map depicts historic settlement in Wailau (W.C.H. 1934), indicating that many of the structures were still standing in 1934. Property boundaries, a church, a road, and agricultural lands are illustrated.

In 1935 the steamer *Hawaii* stopped at the valley with a team of Alika Dowsett's men who planned to reinstate the *lo'i* to relieve a poi shortage. Two articles detailing the project stated that a ship had not called on the abandoned valley in more than ten years (Anonymous 1935; Williams 1935). The articles maintain that more than 40 Hawaiian and Chinese families cultivated the valley in 1915, and they left because their *kalo* was not fetching a high enough price and the cost of shipping was too great. At the time of Dowsett's visit, the school building, two churches, and all but one of the houses had been demolished. Goats, an abandoned dog, and three male donkeys were the only inhabitants left. No other records of the taro-planting venture were found, suggesting that it did not materialize. *Lo'i* are visible along Wailau Stream in a 1938 aerial photograph, although it cannot be discerned if they are in cultivation or abandoned (Figure 1.3).

A 1951 informant remembered the prosperity of the windward valleys in "earlier days" (Reppun 1951:2). In those times, each of the valleys had one leader who was in charge of taro exports to Kalaupapa. The leader would accept payment for the goods and then divide it fairly between the farmers. Once these men no longer organized the exports, the *kalo* business was neglected, "due in part to an indifference on the part of the

Figure 1.3: 1924 Aerial photo of Wailau Valley (U.S. Department of the Interior 1941). Note the agricultural terraces along the stream near the bottom of the photo.

younger generation, and a tendency to dishonesty" (Reppun 1951:2). After that time, the Chinese farmers took over many of the Wailau fields, but the taro industry was never fully revived.

In 1973, 69 year-old Rachel Naki, who was raised in Wailau, returned to the valley and was interviewed (Curtis 1973); she later did another interview for a local newspaper (Goodhue 1993). Naki remembered that supply boats came only from May to August with barrels of salmon, crackers, sugar, and other staples. Taro, coffee, pigs, goats, horses, cows, and a variety of fruits were raised by residents, but there were never coconut trees in the valley. The Wailau Trail was traversed on foot because horses or mules could not ascend the steep and narrow sections, thus all supplies brought in over land had to be carried on one's back. A doctor came over the trail from time to time, although residents generally used traditional medicines. Roughly 45 families lived in the valley in the early 1900s, and wooden houses once lined the beach, from *pali* to *pali*, and traditional thatched *hale* stood near the *loʻi* farther inland. An unmarked cemetery was located near a mango tree on the east side of the valley, fairly close to the coast. Naki stated that the valley was abandoned because of a disastrous flood in 1913 or 1914. The entire village was damaged, and her family was the last to leave Wailau. A 1946 tsunami wiped out the last remains of the village (Clark 1989).

Previous Archaeology

The inaccessibility of Wailau has served as an impediment for archaeologists, thus very little archaeological work has been conducted in the valley. In the early Twentieth Century J.F.G. Stokes included Wailau in his island-wide survey (Stokes

1909); an informal investigation took place during a trail maintenance expedition roughly 70 years later (Reeve 1973); and a small cultural resource management project was carried out recently (McElroy 2004). Hālawa Valley, to the east, has received much more archaeological attention (e.g., Riley 1973; Kirch and Kelly 1975).

Summers (1971) compiled the archaeological information available for the island of Molokaʻi, consisting primarily of unpublished manuscripts. The descriptions and locations of archaeological sites in Wailau came from a brief 1909 island survey by J.F.G. Stokes of the Bishop Museum.

Two *puʻuhonua*, five *heiau*, and two trails were recorded for Wailau Valley (Summers 1971:134-136, 175-178). The *puʻuhonua* called Puʻualiʻi was located roughly 2,500 ft. from the coast on the west side of Wailau Stream. This terraced structure measured 65 ft. long and 30 ft. wide, including a 6 ft. wide bench. The *puʻuhonua* at Olokuʻi occurred on a clifftop north of Pelekunu and may have functioned additionally as a fortress and an area for catching *ʻuaʻu* birds for *aliʻi* consumption.

The five *heiau* in Wailau included Kanane Heiau on the southern slope of the west side of the valley. This partially demolished platform had a 70 ft. long wall, 8.5 ft. high in places, and 45 ft. wide. Kapalaʻalaea Heiau, located 4,500 ft. from the coast on the east side of Wailau Stream, consists of a small terrace. Hawaiian informants indicated that this terrace served as a preparation area for *iwi* of the *aliʻi* before burial. Kapanui Heiau was located in the Hālawa Ahupuaʻa portion of the valley and consisted of a small enclosure with lower paved terraces. The locations of Waipulea and Kapukapuakea Heiau in Wailau remain unknown.

The two trails are the Wailau Trail and an unnamed trail that leads from Wailau to Pelekunu. The Wailau Trail begins at ʻIliʻiliʻōpae Heiau in Mapulehu and extends for 19 miles into Wailau. It is said that *menehune* used the trail to gather stones from the beach at Wailau to construct ʻIliʻiliʻōpae Heiau (Summers 1971:134). The unnamed trail forks from the Wailau Trail at Waiakeakua Stream and heads west toward Pelekunu Valley. A rockshelter, Malihini Cave, was located two-thirds of the way from Wailau. The cave was furnished with mats, poi pounders, and other necessities for travelers. In the mid-1900s the cave was destroyed in a stream bank collapse (Whitten 1970 in Summers 1971:178).

Reeve (1973) relocated three of the sites recorded by Stokes (1909) during a trail-maintenance expedition sponsored by the Sierra Club. He visited Puʻualiʻi Puʻuhonua, Kanane Heiau, and Kapalaʻalaea Heiau but only had time enough to spend at Puʻualiʻi. This site consisted of a 6.5 ft. high terrace associated with multiple small enclosures. Reeve produced a rough field sketch (1973:20) but lacked the equipment to clear and map the site in detail. The preservation condition of Kanane and Kapalaʻalaea Heiau remained largely unchanged from Stokes' visit over 60 years earlier. In addition to relocating the three sites, Reeve discovered a Nineteenth Century bottle cache beneath a *kukui* tree, 40 ft. east of the trail and 15 minutes from the beach. He interpreted the cache as a traveler's resting place and not a dump associated with historic habitation. Based on his findings, Reeve (1973) recommended a thorough archaeological survey of the valley.

In 1974 the statewide inventory of historic places recorded the Wailau Agricultural Complex as site 50-60-04-272. The Hawaiʻi Register of Historic Places Feature Description Form, completed by Robert D. Connolly, III, describes the site as follows:

> The site was named Wailau Agricultural Complex by the Bishop Museum Statewide Inventory Team. The site area includes approximately 936 hectares on the floor and sides of Wailau Valley . . .

> The site itself consists of an extensive wet-land taro agricultural system with an associated *heiau*. . .
>
> The taro system is quite extensive and impressive. It compares favorably to the systems found in Pelekunu Valley to the W and Halawa Valley to the E on Molokai. The terraces of this system possess the same degree of variety as those of Halawa and Pelekunu, varying from one stone to more than 2 meters in height. . .
>
> The other feature located by the Inventory Team was the Puʻuhonua of Puʻualiʻi. . . The Inventory Team did not have time to map and record the numerous individual terraces or the *puʻuhonua*, as that task would take at least a month in the field. Terraces were observed from the mouth of the valley extending continuously back into the valley as far as the team was able to travel during the day used to record this area. Many of the sites recorded by Summers (1971:175-178) could not be relocated because of sketchy location data . . .
>
> The most important archaeological aspects of the Wailau Valley are its isolation, distance from developed areas, and its consequent undisturbed state—all of the physical aspects of a wet-taro agricultural society, unchanged since the valley was abandoned early in the 20th century . . .

The Hālawa Valley portion of Hālawa Ahupuaʻa received archaeological investigation during the 1970s (Riley 1973; Kirch and Kelly 1975). This settlement pattern study focused on the south side of Hālawa Valley. Excavation of agricultural, residential, ceremonial, and midden sites indicated nucleated settlement at the coast as early as AD 650, with dispersed settlement and cultivation of inland areas occurring later, from ca. AD 1250–1750. A wide array of artifacts, including fishhooks and fishhook manufacturing implements, ornaments, weapons, adzes and other tools, a large assemblage of basalt and volcanic glass flakes, and a variety of food remains attested to the nature and temporal associations of these valley occupations. Excavation of irrigated agricultural fields, similar to those found in Wailau Valley indicated two horizons of agricultural use (Kirch and Kelly 1975:113-114). The most recent horizon consisted of surface architecture associated with irrigated *kalo* farming. An earlier horizon indicative of shifting cultivation occurred below these surface remains. Riley's (1973) dissertation details the excavations of the agricultural complexes.

Waikolu Valley, to the west of Wailau was the focus of recent investigation (Kirch 2002). This two-day reconnaissance noted an extensive network of irrigated fields to 1.5 km inland and a large *heiau* overlooking one of the field complexes. An agricultural terrace near the coast dated to the Thirteenth Century AD.

In 2004, the author conducted an archaeological inventory survey, photography, and test excavations in the Hālawa Ahupuaʻa portion of Wailau Valley. This two-day investigation examined two small parcels where a single-family residence was proposed for construction (McElroy 2004). The surface survey confirmed historical map information about *loʻi* boundaries, *ʻauwai*, streams, and other topographic features. One *ʻauwai* and six terraces occurred in the survey area. Whereas the survey findings support the map drawn by Podmore (1915), they indicate localized alteration of the landscape by extensive erosion and slumping. Two test units, excavated in one of the *loʻi* yielded buried segments of stone walls, pondfield deposits, a metal nail, charcoal fragments, decayed basalt fragments, and a tiny volcanic glass flake. Seven stratigraphic deposits relating to the construction, use, and expansion of the *loʻi* system occurred in the profile

exposures. Bayesian calibration of a dated fragment of charred *ʻakoko* wood (*Chamaesyce* sp.) recovered from the test excavation indicated a construction date of AD 1635–1914 for the upper *loʻi* wall, and some time before AD 1724 for the buried *loʻi* wall. The nail and historical documents, including the Podmore map, suggest that use of the upper *loʻi* continued into the historic era, with the most recent modifications reflecting traditional architectural expansion based on construction methods and designs established in the pre-contact era (McElroy 2004).

Summary of Background Research

Although information from each line of evidence is limited, written sources, *moʻolelo,* and archaeology, when meshed together, begin to illuminate what life was like in pre-contact Wailau. Ritual, farming, *kapa*-making, and fishing were important activities. Farming was dominated by wetland cultivation, although dryland farming was practiced as well. Fishing was carried out in the streams and in the sea. *Heiau* and agricultural terraces were located on both sides of the valley, while *puʻuhonua* stood on the valley's western slopes and on the Olokuʻi clifftop. House sites were probably located along the coast and on the slopes above the inland fields. Wailau was celebrated for its majestic cliffs, which are admired in proverbs, songs, and *moʻolelo*.

The historic literature paints a picture of a small taro-growing community in Wailau from the mid 1800s to the early 1900s, thriving on the export of *paʻiʻai* to the more arid Kalaupapa settlement. Houses were nestled along the coast and the mouth of Wailau Stream, and a church and schoolhouse were part of the neighborhood as well. High surf often pounded Wailau shores, making it difficult for ships to enter the bay. Chinese farmers became part of the small community in the early 1900s, and animals such as donkeys and buffalo were introduced into the valley. By the 1930s the historic village was abandoned, probably due to a combination of factors, including flooding and economic conditions.

CHAPTER 2: METHODS

Archaeological survey, mapping, and excavation were conducted in Wailau Valley from June 3 - 28, 2005 (26 days), July 12 - August 4, 2005, (23 days), and June 17 - July 14, 2006 (27 days) for a total of 76 field days. Windy McElroy, M.A. served as principal investigator and field supervisor for the project; crew chiefs were Alvin Burrows for the 2005 season and Steven Eminger for 2005 and 2006. The field crew for 2005 consisted of Kaleo Dudoit, Kyle Eminger, Makani Greg, Nalani Kealoha-Copp, Nanikehau Keama, Susan Marshall, Nona Naboa, Jacce Mikulanec, Josh Pastrana, Manuwai Peters, Pualani Puaoi, Jeff Putzi, Dave Whitehill, Ben Zablan, and Pu‘u Zablan. The 2006 field crew included Carly Antone, Marion Ano, Cassidy DeBaker, Kyle Eminger, Nalani Kealoha-Copp, Kari Nishioka, Amanda Simms, and David Quisenberry. Reconnaissance, survey, and excavation took place in 2005 and 2006.

The reconnaissance was designed to get a general idea of where *lo‘i* systems were located throughout the valley. A rough walk-through was conducted of the reconnaissance area, sketch maps were produced for all *lo‘i* complexes identified, and GPS positions were taken for every complex. A sub-meter accuracy Trimble Geo XT handheld GPS unit was utilized for all GPS work. Surface artifacts were not collected on the reconnaissance. Approximately 260 acres of the valley were covered, and 19 *lo‘i* systems were recorded.

Twelve discrete blocks of land were selected for intensive survey. (see Chapter 3). Within these blocks, 100% of the area was systematically surveyed, except in a small portion of Keiu that was impassable due to extremely dense vegetation. Heavy vegetation hindered the survey and obscured the ground surface in every survey block. The survey was conducted on foot, with archaeologists spaced 5-10 m apart, visually inspecting the ground surface for archaeological remains. Roughly 33 acres of the valley were covered, and ten large agricultural complexes and various other features were documented. Archaeological features were described, and many were GPS mapped and photographed. Biodegradable flagging tape was used in all areas of the valley. Surface artifacts were scarce but were collected and described.

In addition to the formal survey, three Wailau sites described by J.F.G. Stokes (1909) were relocated. This was done on an informal basis and was not part of the archaeological survey work. The sites were located by entering Stokes’ coordinates into a GPS unit and navigating to the correct position. These sites were minimally cleared by hand, and photographs were taken. No mapping or excavation was conducted at these sites.

Within the 12 survey blocks, four agricultural complexes were chosen for detailed plan view mapping. This was accomplished with either a plane table and alidade or tape and compass. Line maps were generated for the other six complexes in the survey areas. A tape and compass were used to produce these maps. In addition to the plan view maps, cross-sections were taken of six of the agricultural complexes by running a level line down the center of the complex and measuring heights from the line at designated intervals. Profile drawings were done for a sample of walls. These were generated from photographs after the fieldwork was completed. Features that were not mapped in detail were described and measured, and compass bearings were taken of wall orientations.

Excavations were conducted in ten of the 12 survey blocks and four of the *lo‘i* systems found on the reconnaissance that were not surveyed. Two kinds of excavations were employed: controlled test units and shovel trenches. Throughout this report, test unit numbers are prefixed with “TU” and trench numbers are prefixed with “TR”. A total of

28 test units were opened. All test units were excavated by hand, with trowel and whisk broom, in arbitrary 10 cm levels. Vertical provenience was measured from an arbitrarily-established datum. Charcoal was not collected from the first level. All sediment was screened through 1/8-inch mesh. Most screening was done dry, but wet screening was employed in locations close to a water source. A total of 38 trenches were opened. These were excavated by both shovel and trowel with natural stratigraphic layers. Vertical provenience was measured from the surface, and screening was employed as deemed necessary by the excavator. Charcoal was not collected from the upper 10 cm of excavated deposit. For every test unit and trench, wall profiles were drawn and sediments were described using Munsell soil color charts and a sediment texture flowchart (Thien 1979). All test units and trenches were backfilled after excavation.

Collected materials were sorted in the laboratory by material type and described, weighed, measured, and photographed where appropriate. Historic artifacts were analyzed with the help of Susan Lebo of the Bernice Pauahi Bishop Museum and Steven Eminger. Traditional artifacts were analyzed with the assistance of Jo Lynn Gunness of the University of Hawai‘i at Mānoa Archaeology Laboratory. Geochemical analysis of basalt artifacts was conducted by Peter Mills, Steve Lundblad, Arian Drake-Raue, and Jacob Smith at the University of Hawai‘i at Hilo. Selected charcoal samples were submitted for wood taxa identification and AMS radiocarbon dating. Wood taxa identification was performed by Gail Murakami of the Wood Identification Laboratory at the International Archaeological Research Institute, Inc. in Honolulu. Radiocarbon dating was conducted by Beta Analytic, Inc. in Miami, Florida and the NSF Arizona AMS Laboratory in Tucson. Conventional radiocarbon ages were calibrated using OxCal software, version 3.10.0.1.

The red and white scale in the field photographs is marked in 10 cm increments. The north arrow on all maps points to magnetic north. Artifact and charcoal weights are rounded to the nearest 0.1 g. Distance of each *lo‘i* system to the coast was measured as a straight line from the northernmost feature to the nearest point on the coast.

CHAPTER 3: RECONNAISSANCE AND SURVEY

This chapter presents the results of the reconnaissance and survey of portions of site 50-60-04-272, the Wailau Agricultural Complex. Nineteen *loʻi* complexes were identified during the reconnaissance, and ten of these were further investigated during the survey.

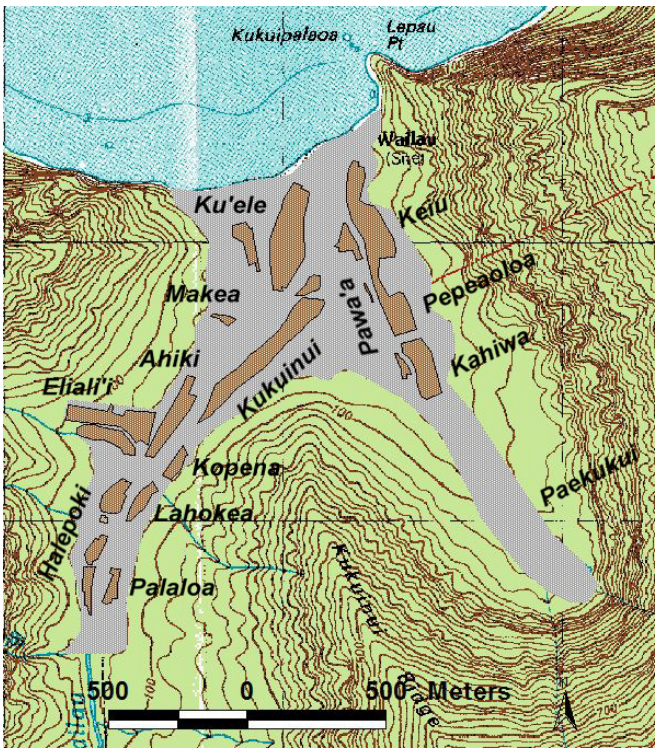

Figure 3.1: Topographic map of Wailau Valley, showing traditional land division names, reconnaissance area in gray, and *loʻi* in brown.

Reconnaissance

The reconnaissance was designed to get a general idea of where *loʻi* systems were located throughout the valley. Approximately 260 acres of the valley were covered, and 19 *loʻi* complexes were identified (Figure 3.1). The nine *loʻi* that were not surveyed will be described in this section. These were found in Pawaʻa, Kahiwa, Kukuinui, Kopena, Ahiki, Palaloa, and Halepoki. No *loʻi* were found in Paekukui, although only the land closely bordering Kahawaiʻiki Stream was inspected.

Pawaʻa

The land division of Pawaʻa flanks the west side of Kahawaiʻiki Stream. Three small *loʻi* complexes were found in Pawaʻa; the largest of the three is on the *makai* side of the land division, the smallest is in the central portion of Pawaʻa, and a third system is farthest *mauka* (Figure 3.2). The central system was surveyed in detail and is described on page 34.

The *makai* complex is located 300 m inland on a flat expanse of land between Kahawaiʻiki Stream and a smaller unnamed stream. A steep slope with historic features is to the northwest, and the Pawaʻa Central *loʻi* system is to the northeast (see Figure 3.23 for the relationship of the *makai* terraces to those features). The Pawaʻa Makai complex consists of 12 terraces and a substantial wall (Figure 3.3). The wall is located on the north side of the system and is currently being used as a trail. The east and west sides of the system have been destroyed by stream erosion. The remaining terraces are in good condition, although the south side is heavily overgrown with Maui rose, the east and west sides are blanketed in *hau*, and the two northernmost terraces are covered in bamboo. The central portion of the system has been recently cleared of vegetation. The two northernmost terraces fell within the Pawaʻa survey area and are described in detail on page 36. Two units were excavated along the east wall of the northernmost terrace.

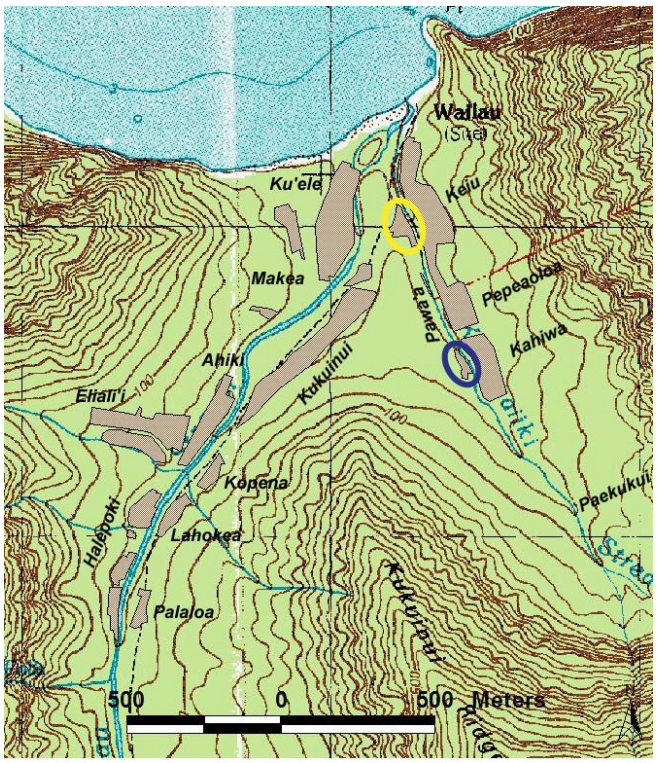

Figure 3.2: Location of the Pawa‘a Makai *lo‘i* system, circled in yellow, and the Pawa‘a Mauka *lo‘i* system, circled in blue.

The Pawa‘a Mauka complex is located 800 m inland along the west bank of Kahawai‘iki Stream. It is composed of approximately 12 terraces, an *‘auwai* remnant, two enclosures, and a stone mound (Figure 3.4). The slope to Kukuinui Ridge is on the west side, and a slight cliff cut by Kahawai‘iki Stream is on the east. A small elongated hill is in the center of the complex. Most of the system is in poor condition, especially where the stream has eroded away the east side, and on the south where the terrain is uneven with jumbled boulders, stones, and cobbles. Terraces are oriented around the slopes and step down to the north. Walls are typically low and eroded but some exhibit stacked faces and stand 1 m tall. The complex is heavily overgrown with *hau* and clidemia.

Kahiwa

The land division of Kahiwa is on the east side of Kahawai‘iki Stream, approximately 750 m inland, just south of Pepeaoloa. A substantial terraced system exists here, beginning 40 m south of the Keiu *lo‘i* complex, across the stream from the Pawa‘a Mauka complex (Figure 3.5). Several natural springs occur in the area, producing small side drainages that run downslope to Kahawai‘iki Stream. Small terraces occur along these side drainages, with larger ones between the drainages and at the base of a slope that marks the east edge of the complex. The largest terrace wall is substantial, rising 1.72 m tall, with a step or bench on the downslope side. The system is heavily overgrown with

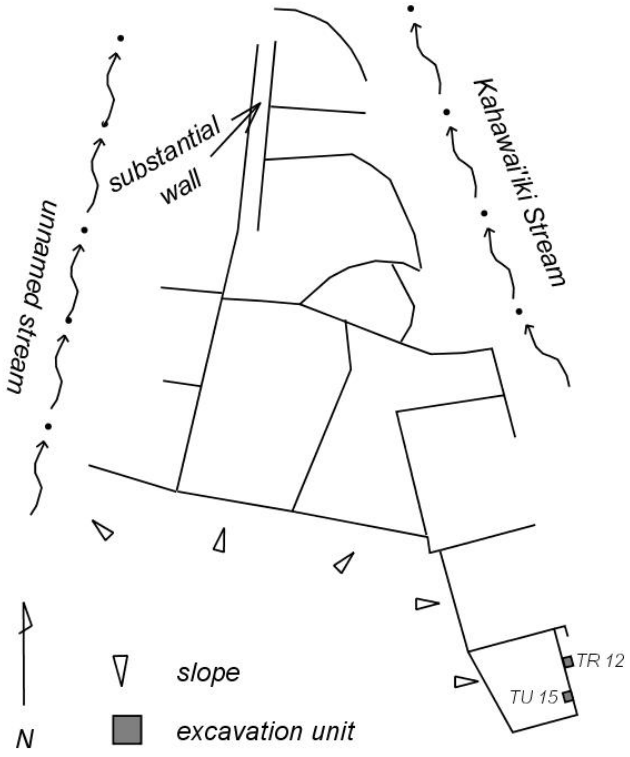

Figure 3.3: Schematic of the Pawa‘a Makai *lo‘i* system (not to scale).

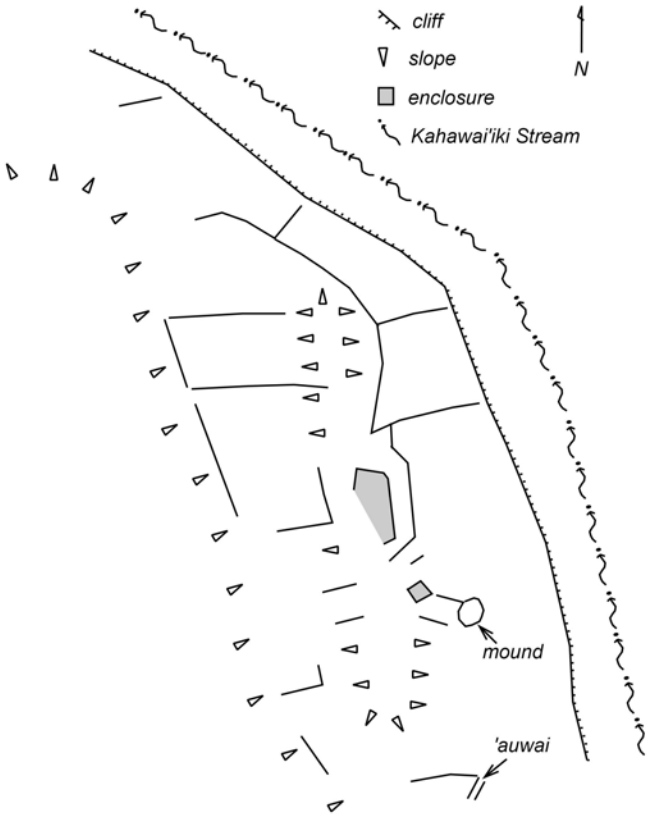

Figure 3.4: Schematic of Pawa‘a Mauka *lo‘i* system (not to scale).

bamboo, *hau*, guava, clidemia, and ferns. A total of 47 terraces and one *‘auwai* segment could be discerned.

Kukuinui

The Kukuinui land division is located on the east side of Wailau Stream on the flat land at the base of Kukuinui Ridge. Two *lo‘i* systems were found here: a small complex on the *makai* side of the land division and an extensive system on the *mauka* side (Figure 3.6). They are separated by a probable historic road (Figure 3.7). The *makai* system was surveyed in detail and is described on page 60.

The Kukuinui Mauka system begins roughly 450 m from the coast. It is composed of 84 terraces and at least two *‘auwai* segments. On the north side of the system a faced gulch or historic road remnant runs down the center of the complex and a larger natural gulch runs along the western terraces (Figure 3.8). This western portion has eroded into the large gulch that runs along the west edge of the system. The Wailau Trail skirts this edge of the complex as well. On the north end, the trail borders the west side of the system. The trail veers away from the central portion of the complex and meets up with the terraces again on the south side. The south end is bounded by a smaller gulch with a faced remnant of the historic road crossing it. The Kopena *lo‘i* system begins on the south side of the gulch. The Kukuinui Mauka *lo‘i* is generally in good condition but severely overgrown with *hau* (Figure 3.9). Two excavation units were opened on the north end of the complex.

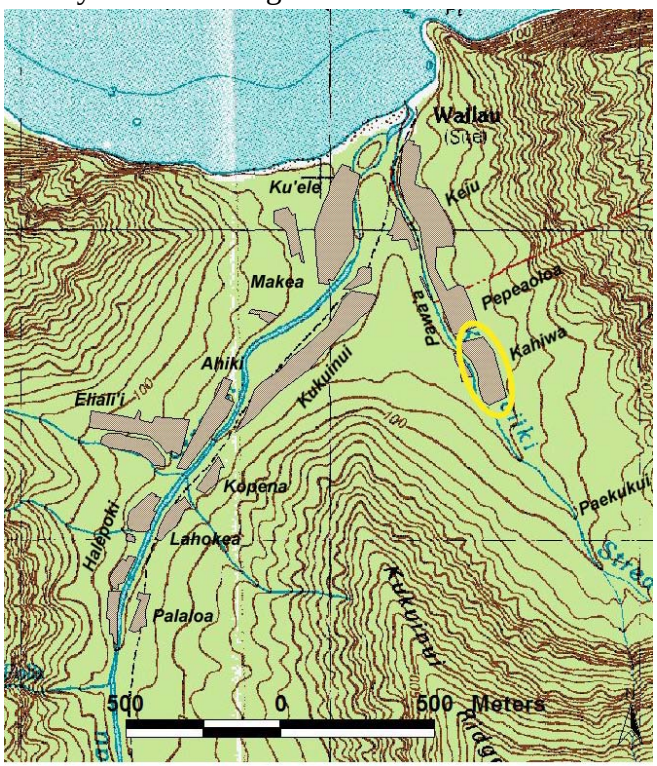

Figure 3.5: Location of the Kahiwa *lo‘i* system.

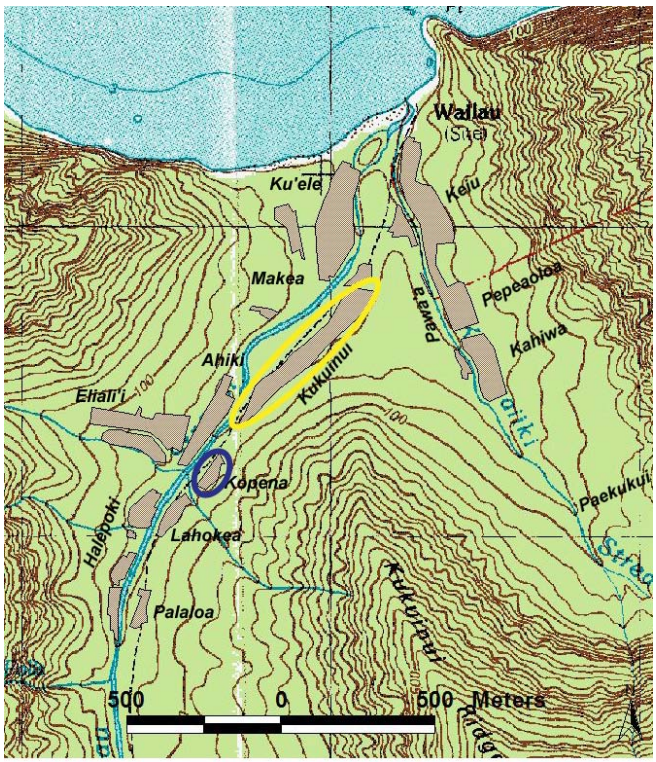

Figure 3.6: Location of the Kukuinui Mauka *lo‘i* system, in yellow, and the Kopena *lo‘i* system, in blue.

Kopena

The Kopena system is located just south of Kukuinui Mauka, approximately 900 m from the coast (see Figure 3.6 and Figure 3.8). The Wailau Stream and Wailau Trail border the west side of the complex but they do not cut into the terraces and have not eroded them. The complex is bounded by the slope leading to Kukuinui Ridge on the east.

The system is composed of 16 terraces. They are in good condition, especially on the south side of the system, where walls are roughly 1 m tall. The entire complex is overgrown with *hau*. No *‘auwai* could be discerned, but it could have been obscured by the heavy vegetation.

Ahiki

The Ahiki reconnaissance area is located approximately 650 m inland, between Makea on the north

Figure 3.7: Probable historic road that separates the *mauka* and *makai lo‘i* systems of Kukuinui.

and Eliali‘i on the south. A steep slope marks the west boundary of the reconnaissance area and Wailau Stream marks the east boundary. A secondary drainage known as Waikane or Waiakane Stream runs downslope to meet Wailau Stream just south of the reconnaissance area. A long, narrow *lo‘i* complex occurs between the slope and the stream (Figure 3.10). Approximately 25 terraces and at least one *‘auwai* make up the system. Five small barrage-style terraces occur on the north end of the system. Larger, more defined terraces are in the central part of the complex. These are in good condition with walls as tall as 1 m. A number of fresh water springs appear at the base of the slope in the central portion of the system, and the terraces in this area are continually wet and muddy from the springs. Remnants of an *‘auwai* run along the base of the slope from a small stream on the south to the drier southern terraces. In this southern portion, the flat land narrows and the complex has three tiny *lo‘i* sandwiched between the slope and the river bank. *‘Auwai* remnants can be seen at the base of the slope on the west. South of these three terraces, the flat land opens up again, approaching Waiakane Stream, and terraces occur on both sides of the *‘auwai*. The terrace walls in the central portion of the system are more substantial and in better condition than the others. The entire complex is covered in heavy vegetation, consisting primarily of *hau* and clidemia.

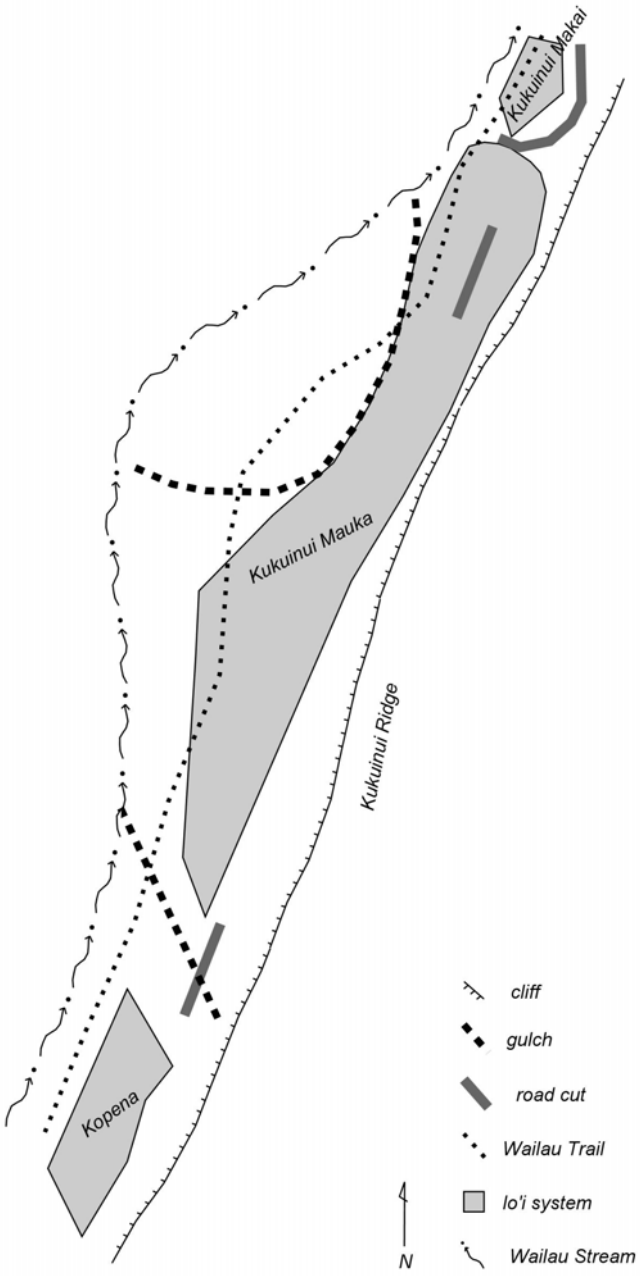

Figure 3.8: Schematic of the Kukuinui Makai, Kukuinui Mauka, and Kopena *lo‘i* systems (not to scale).

Halepoki

The land division of Halepoki is located approximately 1,100 m inland, south of Eliali‘i. Waikane/Waiakane Stream marks the northern boundary of the reconnaissance area, Wailau Stream marks the east boundary, and an unnamed side drainage is on the south (Figure 3.11). A steep slope serves as the west boundary of the reconnaissance area. Two unnamed secondary drainages run down the center of the land

Figure 3.9: Central portion of the Kukuinui Mauka *lo'i*, facing south.

division, although only one of these drainages is depicted on the topographic map in Figure 3.11. *Lo'i* systems can be found on both sides of these two central streams. The northern system is Halepoki Makai, the central complex is Halepoki Central, and the southern system is Halepoki Mauka. Halepoki Makai was intensively surveyed and will be discussed on page 81.

Halepoki Central is a small complex sandwiched between Wailau Stream on the east, a steep slope on the west and two unnamed streams on the north and south (Figure 3.12). A number of fresh water springs along the slope provide water to the complex, keeping the upper terraces continually wet. The system is comprised of approximately 18 terraces. Three small terraces occur on the steep slope above the south side of the complex, overlooking the agricultural system. These are not agricultural terraces, and their function was not further explored. An historic house platform and possible traditional habitation area are on the northeast side of the reconnaissance area. A second smaller terrace system abuts the base of the slope on the northwest, although it is unclear if this is a wetland agricultural

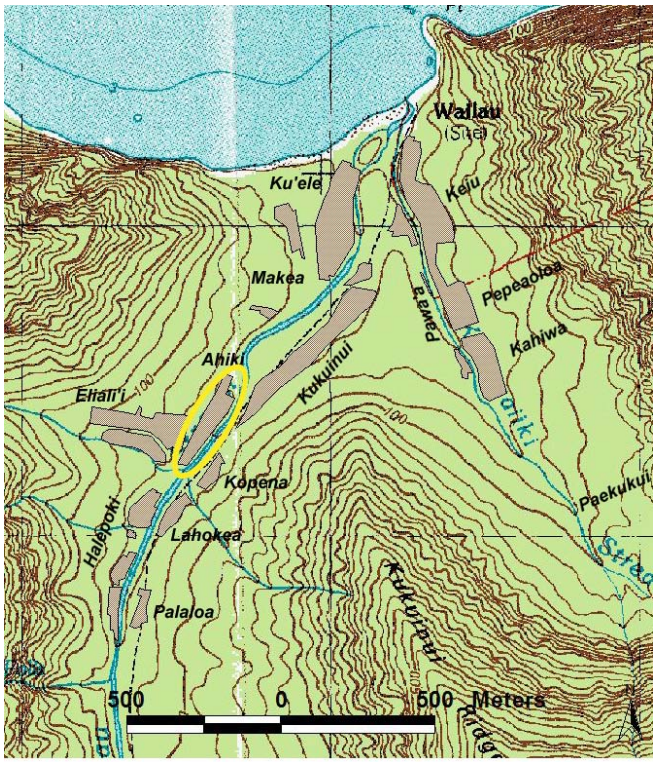

Figure 3.10: Location of the Ahiki *lo'i* system.

complex. Traces of terracing can be seen on the south side of Waikane/Waiakane Stream, but the area is heavily eroded. The 18-terrace system is in good condition, with the walls of the larger terraces extending to roughly 2 m high. The complex is completely overgrown, however, with ferns and ginger in the upper reaches and clidemia blanketing the lower terraces. Two test units were excavated in this system.

The Halepoki Mauka complex is just south of Halepoki Central, between two unnamed streams (Figure 3.13). The complex occupies the only bit of flat land in this area, and extends from Wailau Stream to the western slope. The flat land tapers off to the south, where the system ends near the southernmost unnamed drainage. The complex is composed of 28 terraces and at least two *ʻauwai* segments. Two test units were excavated in the center of the complex. The system is in good condition, although cobbles have littered the surface of many of the upper terraces. The area is overgrown with clidemia, and a single *loulu* palm stands along the south bank of one of the unnamed streams, just outside the northeast corner of the system.

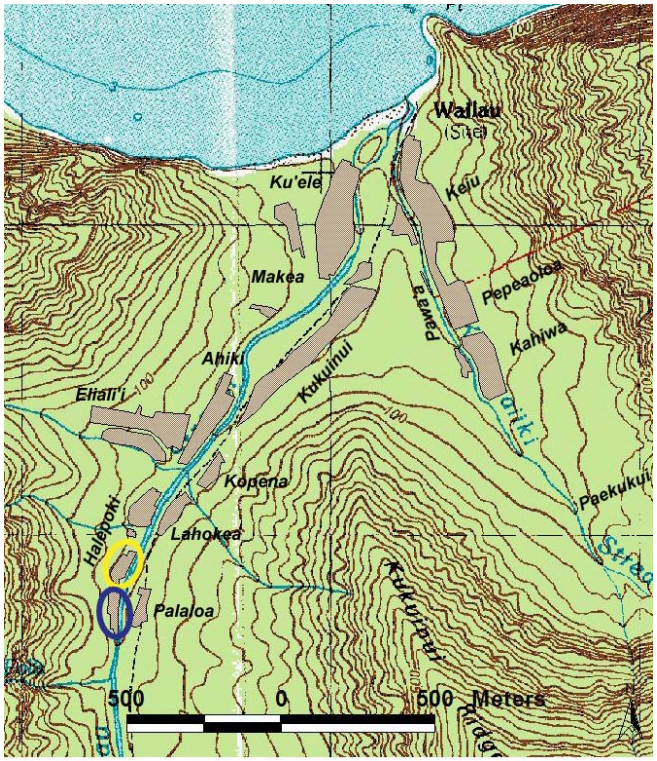

Figure 3.11: Location of the Halepoki Central *loʻi* system, in yellow, and the Halepoki Mauka *loʻi* system, in blue.

Palaloa

The land division of Palaloa is approximately 1,400 m inland, south of Lahokea, on the east side of Wailau Stream. The Palaloa *loʻi* system is located 180 m south of the Lahokea system (Figure 3.14), and consists of 17 terraces and a possible *ʻauwai* (Figure 3.15). Terraces are cut into a slope, with the Wailau Trail above on the east and Wailau Stream below on the west. The three smallest terraces are disconnected from the rest of the system. They are closest to Wailau Stream and border a possible historic road that skirts the base of the slope below the main complex. In general, terrace walls are low and roughly constructed, although the east wall of the largest terrace is substantial, rising 1.06 m tall. A natural drainage runs through this largest terrace to the terrace below it and down the slope to the west, filling the seven terraces on the south side of the complex with water. A double alignment runs through the center of the northern terraces and this might represent a silted-in *ʻauwai*, although further testing is needed to confirm this. A hearth was found near the center of one of the northern terraces. Two excavation units were opened in the complex: TU 28 over the hearth, and TR 36 within the largest *loʻi* terrace. The system is heavily overgrown with *hau*, clidemia, coffee, and an occasional Java plum.

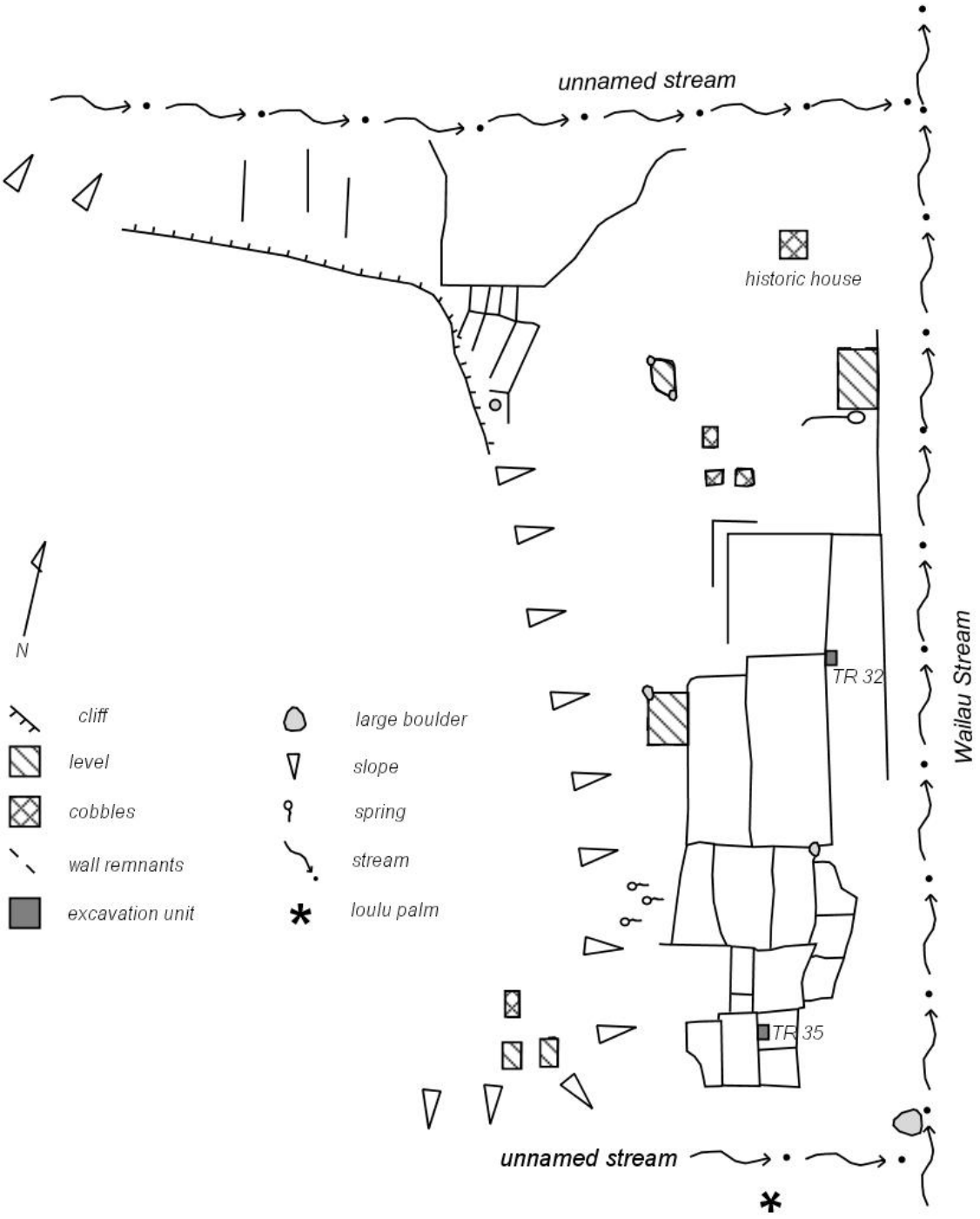

Figure 3.12: Schematic of the Halepoki Central *lo'i* system (not to scale).

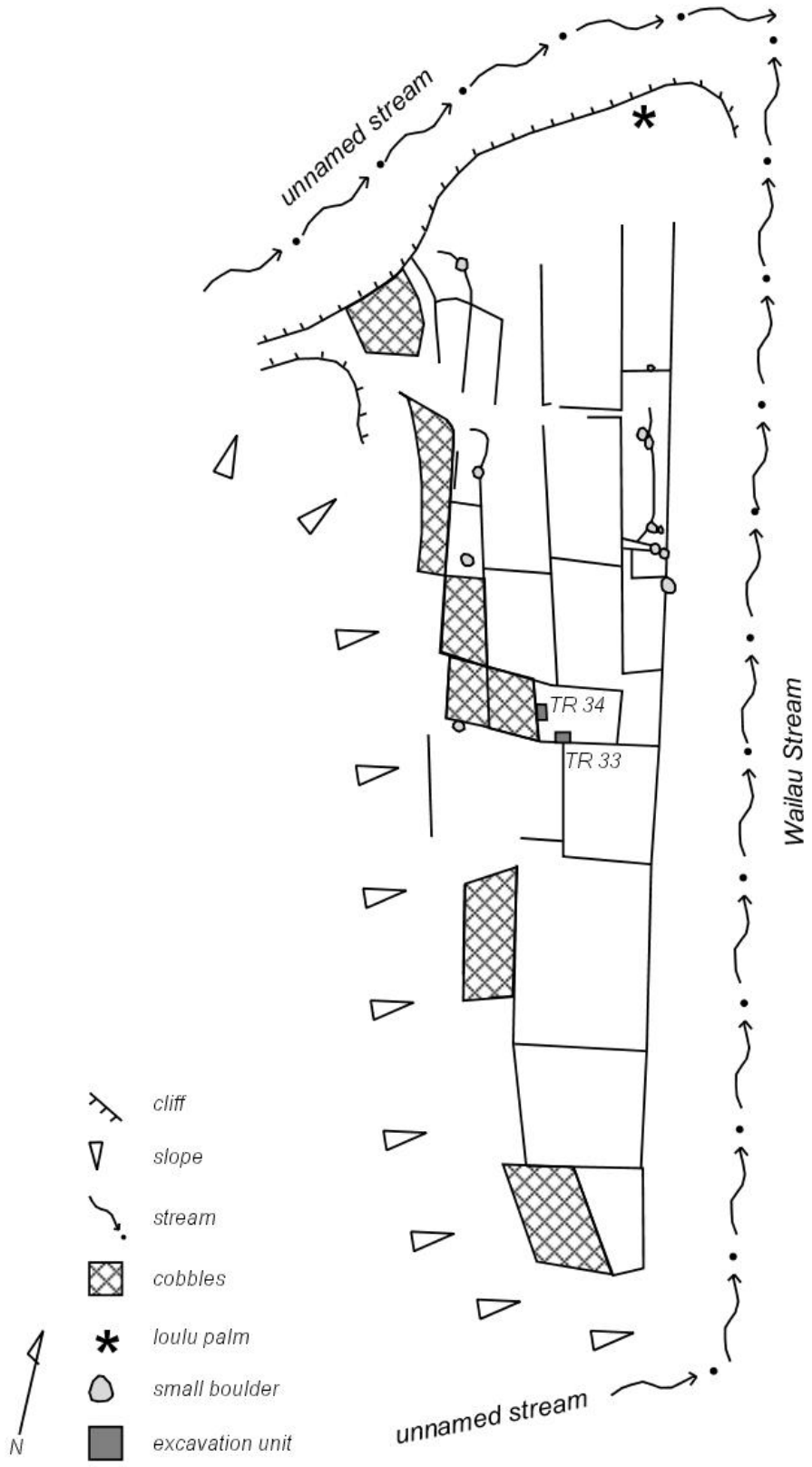

Figure 3.13: Schematic of the Halepoki Mauka *lo'i* system (not to scale).

Summary of Reconnaissance Findings

Lo‘i systems that were not intensively surveyed were described in this section. These consisted of nine complexes found in the land divisions of Pawa‘a, Kahiwa, Kukuinui, Kopena, Ahiki, Palaloa, and Halepoki. All complexes were located near either Wailau or Kahawai‘iki Stream, and many were fed with additional water from natural springs or small drainages. All were heavily overgrown, but most were still largely intact.

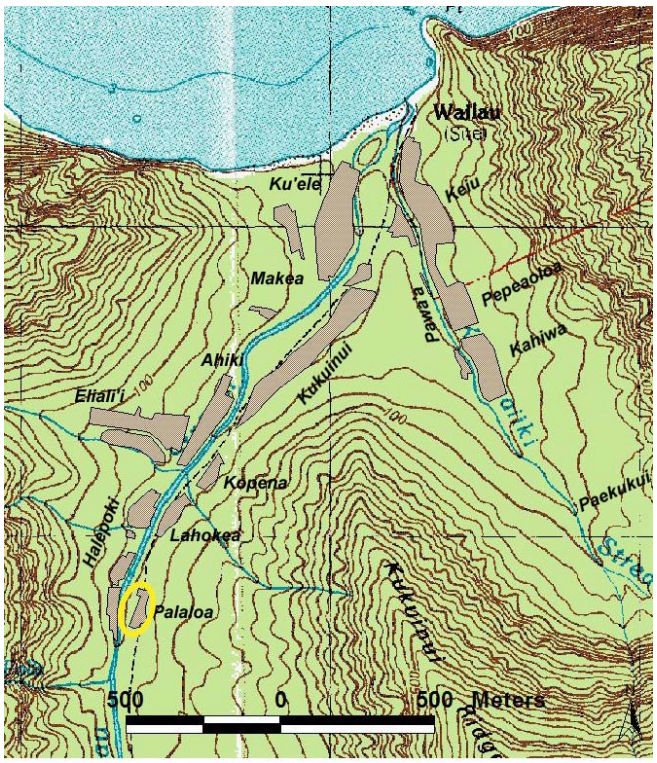

Figure 3.14: Location of the Palaloa *lo‘i* system.

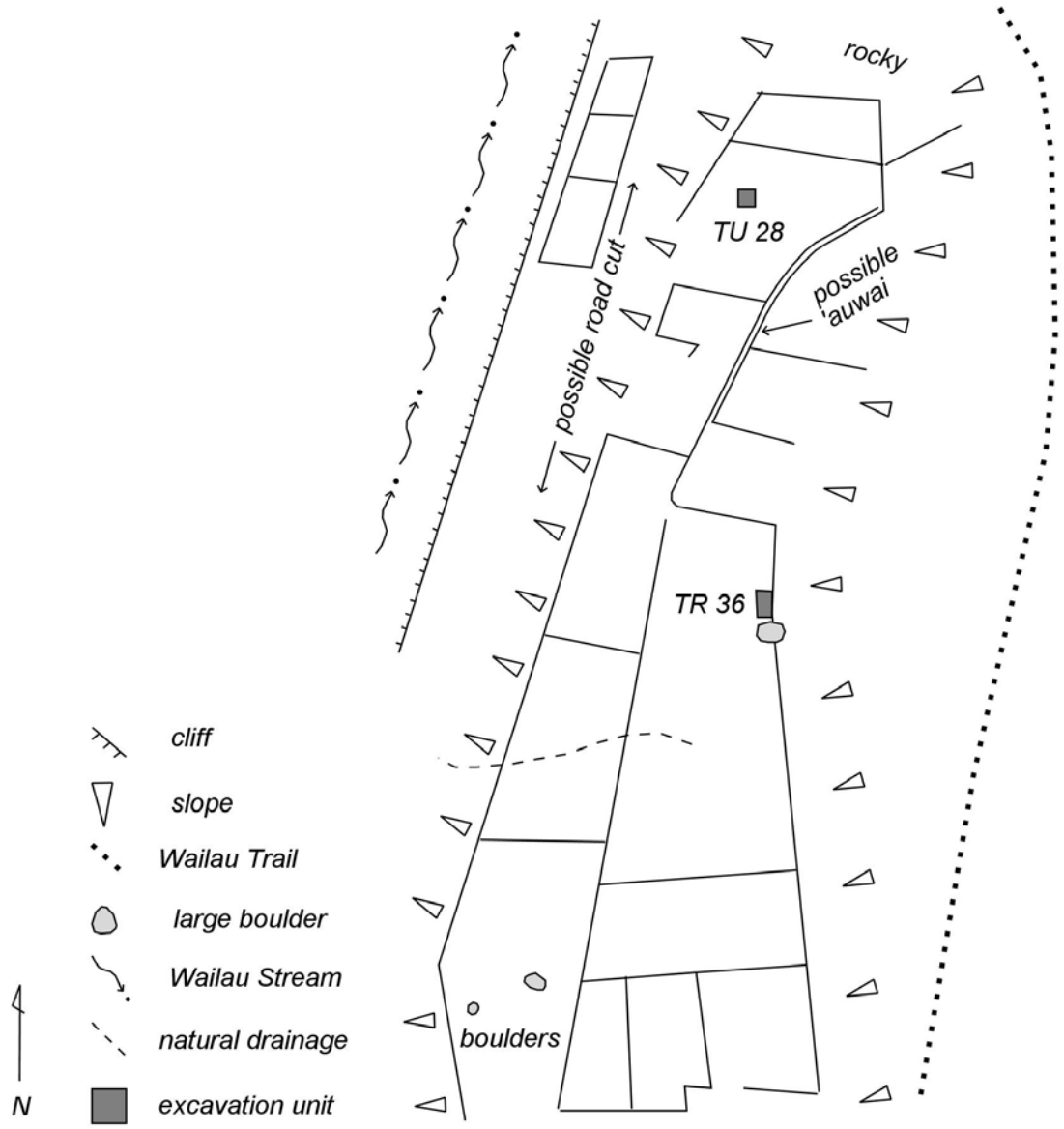

Figure 3.15: Schematic of the Palaloa *lo'i* system (not to scale).

Survey

Approximately 33 acres were surveyed on 12 discrete blocks of land (Figure 3.16). These are grouped into the eight broad land divisions of Keiu, Pawa‘a, Ku‘ele, Makea, Kukuinui, Eliali‘i, Halepoki, and Lahokea, based on traditional land boundaries. A total of 305 features were found within the survey blocks in these areas. Individual features were numbered according to land division. For example, the 19 features found in Pawa‘a were designated P-1 through P-19, and the 26 features in Lahokea were given the numbers L-1 through L-26.

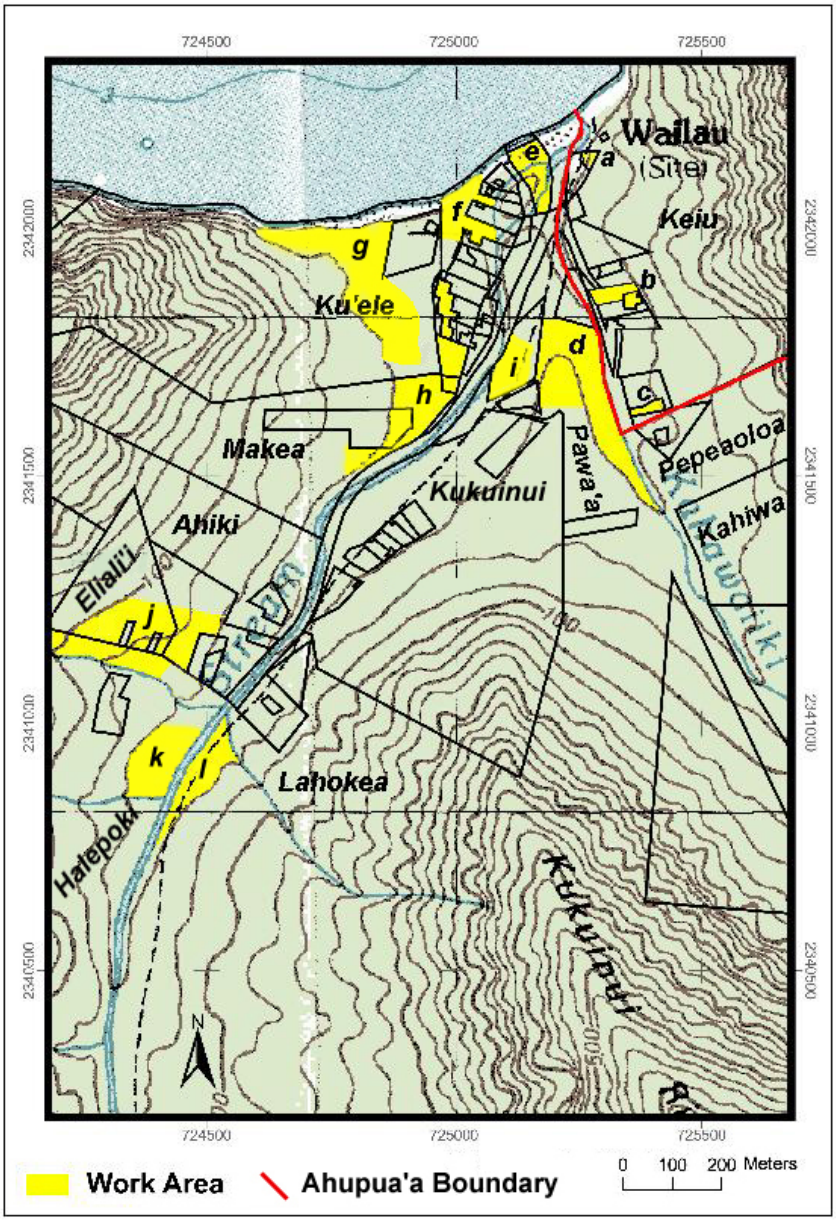

Figure 3.16: Topographic map of Wailau Valley with TMK map overlay, showing traditional land division names and work areas. Survey blocks *a*–*c* are in the land division of Keiu; *d* is in Pawa‘a; *e*–g are in Ku‘ele; *h* extends from Makea to Ku‘ele; *i* is in Kukuinui; *j* is in Eliali‘i; *k* is in Halepoki; *l* is in Lahokea.

As a whole, survey conditions were very difficult due to mud, continual rain and heavy vegetation. This consisted primarily of bamboo in Keiu and Pawa‘a, and *hau* in Ku‘ele, Makea, Kukuinui, and Lahokea. Eliali‘i was covered in both bamboo and *hau* in different portions of the survey block. Clidemia and Maui rose also obscured many of the survey areas.

Surface artifacts were collected from each survey block. These included a wide variety of historic items, such as ceramics, glass, and metal, and a few traditional lithic artifacts, including a hammerstone, a chopping tool, adze blanks, and basalt flakes and cores.

Keiu

Three discontiguous areas were surveyed in Keiu: a coastal parcel (Figure 3.16 *a*), three adjacent parcels located 350 m from the coast (Figure 3.16 *b*), and a parcel at the Hālawa-Wailau *ahupua‘a* boundary, roughly 600 m inland (Figure 3.16 *c*). These three survey blocks encompassed roughly one acre. The land division of Keiu was mapped in 1915 by G. Podmore, providing an accurate illustration of the *lo‘i* complex and historic structures in that area (Figure 3.17). The *lo‘i* complex is extensive (Figure 3.18), and parts of the it were found in two of the survey areas.

Coastal Parcel

TMK: 2-5-9-005:002 is located 100 m from the coast, on a slope just behind the boulder beach to the east of Kahawai‘iki Stream. This is a small State-owned parcel, 0.19 acre in area. The entire parcel was surveyed. It lies within a gulch cut into a steep slope, and no surface structural remains or cultural material were found.

Inland Lowland Parcels

TMK: 2-5-9-005:007, 008, and 081 were surveyed in the lowland of Hālawa Ahupua‘a. Parcels 007 and 081 are 0.68 acre and 0.01 acre respectively and owned by Linda Dunn. These are located along Kahawai‘iki Stream, roughly 350 m from the coast. Parcel 081 lies adjacent to parcel 007 on the south, while Parcel 008, a 0.27-acre piece of land owned by the State, lies between the two parcels on the

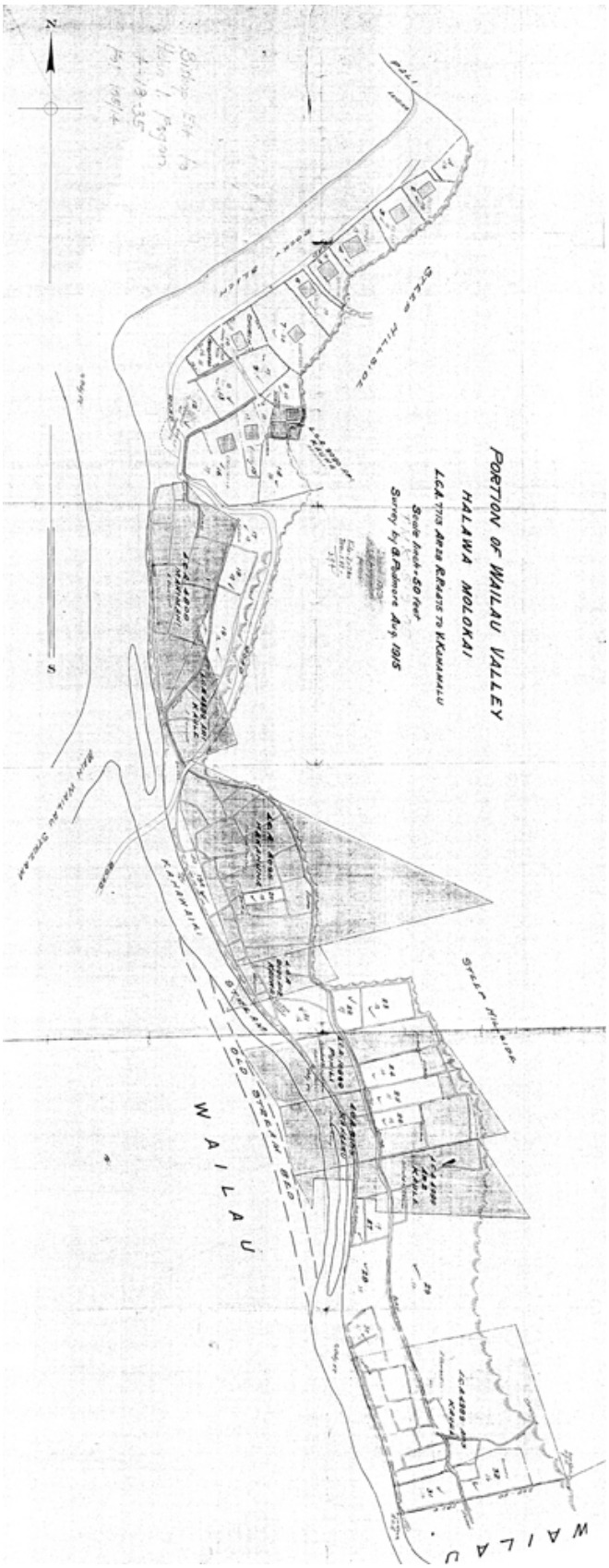

Figure 3.17: Map of the Hālawa Ahupua‘a portion of Wailau Valley (Podmore 1915).

southeast (Figure 3.19). Parcel 007 extends west to the other side of Kahawai‘iki Stream, while the other two plots are entirely on the east side of the stream. The area is overgrown with *hau* and clidemia, but terrace walls are generally in good condition. The terraces step down to the north and to the west, and land within the terraces is flat and free of stones (Oversize Figure 1).

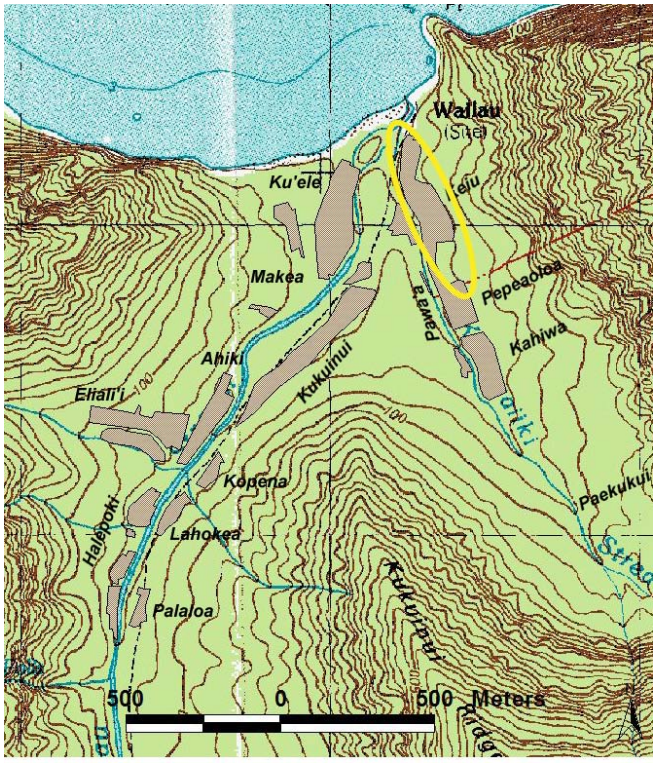

Figure 3.18: Location of the Keiu *lo‘i* system.

Parcels 007 and 081 are the only areas of the valley that were previously surveyed and excavated (McElroy 2004). The 2004 survey confirmed historical map information about *lo‘i* boundaries, *‘auwai*, streams, and other topographic features (Podmore 1915). One *‘auwai* and six terraces occurred in the survey area, and these were designated features 272-a through 272-g. For consistency, these features have been renumbered K-1 through K-7, according to the numbering system presented here (see Appendix A). Two test units excavated in terrace K-4 yielded a buried wall segment, pondfield deposits, charcoal fragments, and a few historic and traditional artifacts. In TU 2 (McElroy 2004), an earlier terrace was discovered below the wall visible on the surface, buried by 20 cm of soil. Charcoal was found beneath the foundation stones of the upper wall, and an historic metal nail was found near the surface. The charcoal was identified as *‘ākoko* (*Chamaesyce* sp.), a short-lived native shrub. This sample yielded a calibrated radiocarbon age of 330 ± 30 BP, and the

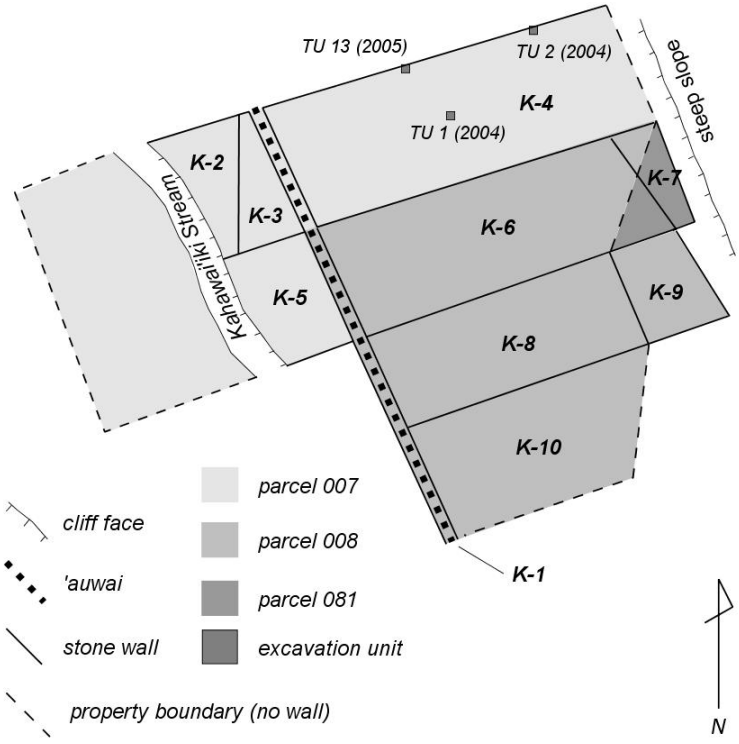

Figure 3.19: Schematic of lowland parcels surveyed in Hālawa Ahupua‘a (not to scale).

nail, found above the wall, dated to the Nineteenth Century. Bayesian analysis of dated materials showed that construction of the upper terrace wall occurred earlier than AD 1724, and the lower wall is thought to predate it considerably. In 2005 an additional test unit was placed in parcel 007 to recover charcoal from beneath the lower wall (see Chapter 4). The lower wall, however, was not found within the unit.

In 2005 the adjacent State parcel (008) was surveyed, and four terraces were found, features K-6, -8, -9, and -10. Portions of K-1, an *ʻauwai*, and K-7, a small terrace, were within this parcel as well (see Figure 3.19). Features K-1, K-6, and K-7 were previously described (McElroy 2004:14-15) and will not be discussed here.

Feature K-8 is a terrace that steps up from terrace K-6 on the south. It measures 12 by 34 m in area. The south wall is composed of small stones stacked five to eight courses to a height of 95 cm. Its east wall is a low alignment of small stones stacked two courses to a height of 25 cm. The *ʻauwai* serves as the western boundary. The terrace is in good condition although overgrown with *hau*. A small stand of coffee grows along the western edge of the terrace. Coffee is not found in the surrounding area and this likely represents historic use.

Feature K-9 is a small terrace that lies to the east. This measures 9 by 12 m in area. Its east wall is composed of small stones stacked two to three courses to a height of 50 cm. It is bounded on the east by a steep slope and on the other sides by surrounding terraces. This terrace is in good condition although heavily overgrown with *hau*.

Feature K-10 is the southernmost terrace in this survey block. It measures 22.5 by 47 m in area. Its south and east walls are outside the property boundary. It is bounded by a steep slope on the east, the *ʻauwai* on the west, and terraces on the north and south. This terrace is in good condition, although heavily overgrown.

Parcel on the *Ahupuaʻa* Boundary

TMK: 2-5-9-005:013 is a small State-owned parcel, 0.26 acre in area, located at the boundary of Hālawa Ahupuaʻa and Wailau Ahupuaʻa, at the edge of Kahawaiʻiki Stream, roughly 600 m inland. An attempt was made to survey the entire parcel, but the survey was not completed due to dense bamboo blown down at an angle, obstructing the ground surface of nearly the entire property. A substantial stone wall was encountered 10 m east of the stream, and this likely marks the *ahupuaʻa* boundary. Podmore (1915) indicated that he inscribed an "x" in the wall designating the southwest corner of the property. This survey mark was found (Figure 3.20), confirming the location of the *ahupuaʻa* boundary. This wall also divides two terraces, features K-11 and K-12 (Figure 3.21). The boundary wall runs east at an orientation of 70º into thick bamboo. The visible portion of the wall is composed of stones stacked three to four courses to a height of 60 cm. The wall is 50 cm wide and in good condition. The ground surface on the south is level with the top of the wall.

Figure 3.20: Podmore's (1915) survey mark on the *ahupuaʻa* boundary wall.

Two excavation units were placed at the base of the wall, within terrace K-11. A perpendicular wall runs along a slope, forming the west side of the two terraces. This perpendicular wall has a slight jog where it meets the *ahupua‘a* boundary wall, continuing south at an orientation of 170º and north at a 330º angle. At feature K-12, the wall is 110 cm wide and eroding down the slope. The stones of this wall appear to have once been stacked five courses high. At feature K-11, the wall is in better condition, composed of stones stacked two to three courses high and three stones wide (50 cm in width). The ground surface on the east is level with the top of the wall, and on the west it falls sharply to a flat lowland bordering Kahawai‘iki Stream.

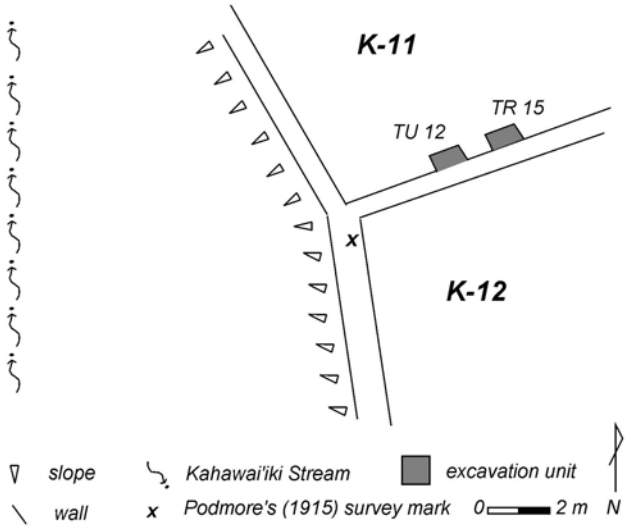

Figure 3.21: Terraces at the *ahupua‘a* boundary.

Keiu Discussion

In sum, the entire land division of Keiu was mapped in the early Twentieth Century (Podmore 1915), illustrating a large *lo‘i* complex that is still visible on the surface today. Three discrete areas of Keiu were surveyed; the coastal survey area had no surface archaeological remains, and the lowland and *ahupua‘a* boundary survey blocks exhibited agricultural terraces that are part of the large system depicted on the historic map (Podmore 1915). In 2004, two test units were excavated in the lowland, representing the only previous archaeological excavation in the valley (McElroy 2004). In 2005 and 2006 an additional unit was opened in a lowland terrace, and two units were excavated at the *ahupua‘a* boundary (see Chapter 4).

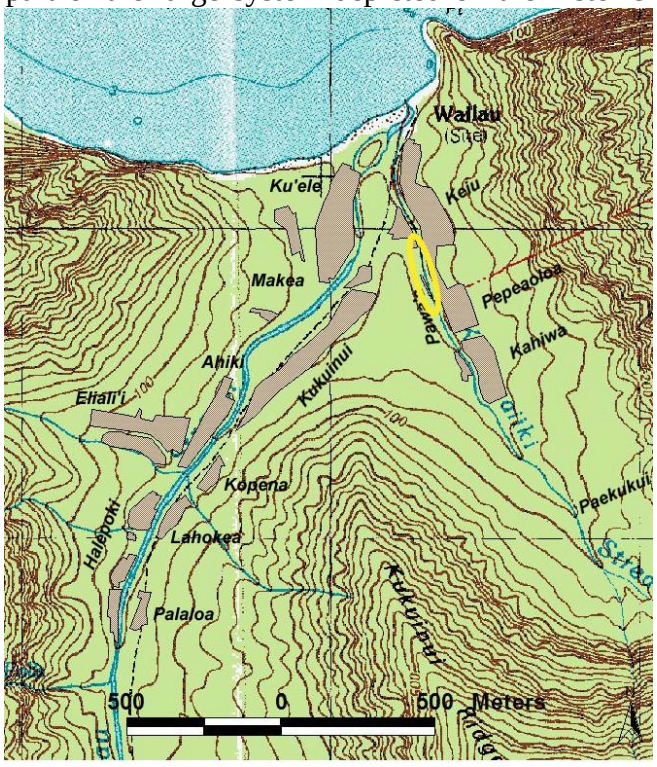

Figure 3.22: Location of the surveyed Pawa‘a *lo‘i* .

Pawa‘a

Approximately three acres were surveyed in Pawa‘a on a State-owned parcel, TMK: 2-5-9-006:002 (see Figure 3.16 *d*). This is an 8,540-acre property that extends over a wide expanse of the inland lowland and valley slopes of Wailau. The three-acre survey area is bounded on the east by Kahawai‘iki Stream, on the north and west by adjacent parcels, and the southern boundary

was arbitrarily drawn. Features within the Pawa‘a survey block were located on two distinct landforms: *lo‘i* terraces on a flat next to Kahawai‘iki Stream (Figure 3.22) and historic features on a hill above the flat to the west (Figure 3.23). The Pawa‘a Central *lo‘i* system occurred in the southeast corner of the survey block (features P-1 through P-5), and part of the Pawa‘a Makai system was found on the northeast side (P-6 and P-7). This latter system extended out of the survey area, so that only the two southernmost terraces were within the survey area. The Pawa‘a Mauka system is to the south, outside the survey block, and was discussed on page 18.

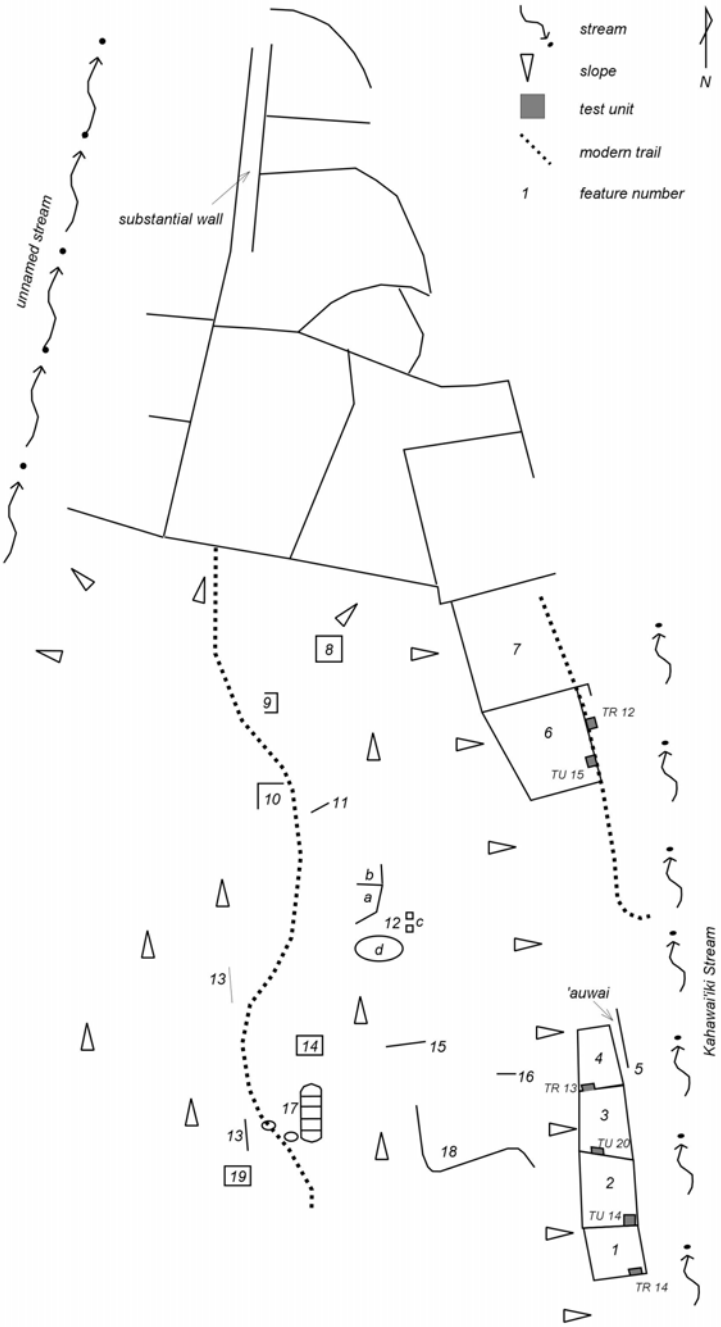

Figure 3.23: Schematic of the Pawa‘a survey area (not to scale).

Pawa‘a Central *Lo‘i*

Features P-1 through P-5, four terraces and an *‘auwai*, comprise a complete *lo‘i* system at the southeast corner of the survey area, approximately 500 m from the coast (Oversize Figure 2). The complex is bounded on the east by Kahawai‘iki Stream, and on the west by a steep hill. Beyond the *lo‘i* system to the south, the land narrows sharply, so that the stream meets the steep hillside approximately 200 m beyond the southernmost terrace. Beyond the northernmost terrace, flat land broadens and extends to features P-6 and P-7, 90 m to the north. The ground surface in the vicinity of the complex is flat and free of stones within the terraces, and relatively flat with a few scattered stones and boulders beyond the terraces. The entire complex and its surroundings are overgrown with bamboo. Terraces are laid out in a single line against the cliffside, highest in the south and stepping down to the north. Terrace walls are generally constructed with small to medium rounded stones stacked in a single alignment. Remnants of an *‘auwai* (feature P-5) are visible along the east edge of the terraces, only on the north end of the system. As a

whole, the complex is in good condition, although the *ʻauwai* is poorly defined, and part of the southernmost terrace appears to have eroded into Kahawaiʻiki Stream. Three excavation units were placed within this complex: TR 14 was excavated at *loʻi* P-1, TU 14 at P-2, and TU 20 at P-3. Charcoal was found in each unit; no artifacts were recovered.

Feature P-1 is the southernmost and highest terrace of the system. It is 10.2 m long and 9 m wide. The terrace was likely wider in the past, as the eastern portion appears to have collapsed into the stream. As a result, very little remains of the east wall of the terrace. The south wall is composed of stones stacked three to four courses to a height of 34 cm, and the ground surface south of the terrace is level with the top of the wall. A break in the northeast corner of the terrace may have been a drainage canal.

Feature P-2 steps down from feature P-1 on the north. This terrace is 20.3 m long and 7.2 m wide. The south wall is composed of stones stacked three to four courses to a height of 55 cm. The ground surface of terrace P-1 is level with the top of the south wall. The east wall roughly parallels the cliff and is made up of piled cobbles with segments of stacked stones. The height of this wall is 50-95 cm. A break near the midpoint of the wall may have functioned as a drainage canal.

Feature P-3 is a smaller terrace that abuts terrace P-2 on the north. It measures 12.7 m in length and 6.2 m in width. The south wall is composed of stones stacked three to six courses to a height of 68 cm (Figure 3.24). The ground surface of terrace P-2 is level with the top of the south wall. The east wall is made up of piled cobbles with segments of stacked stones on the north side (Figure 3.25). The stacked portions of this wall are in excellent condition exhibiting up to six courses and rising as tall as 81 cm. Two openings occur in the southeast corner of the terrace – one in the south wall and another in the east wall, and these likely functioned as drainage channels.

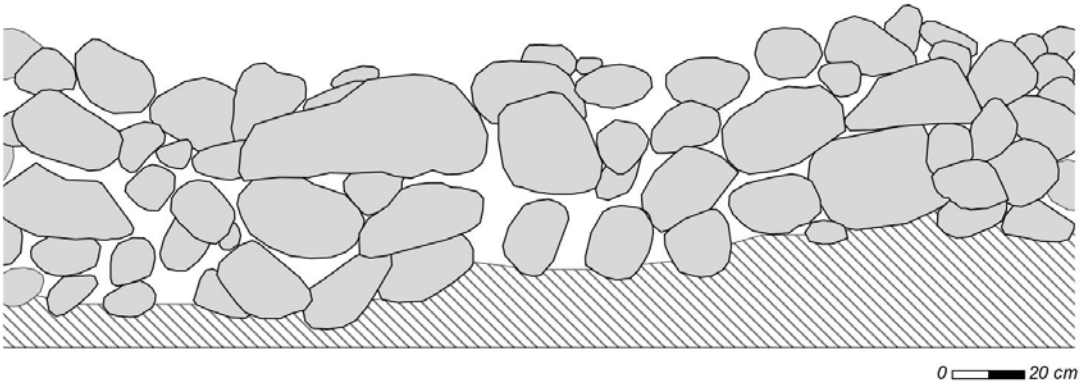

Figure 3.24: Feature P-3, portion of the south wall, south face profile near the east end of the wall.

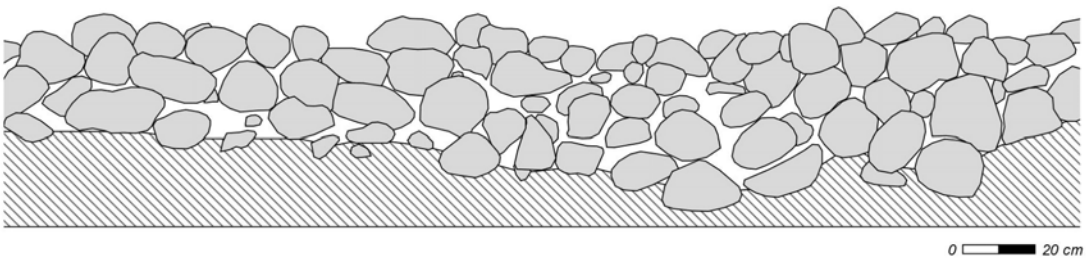

Figure 3.25: Feature P-3, portion of the east wall, west face profile near the north end of the wall.

Feature P-4 steps down from feature P-3 on the north. This terrace is 19.4 by 6.7 m in area. The south wall is made up of stones stacked two to three courses to a height of 38 cm. A drainage canal occurs on the east side of the wall. The ground surface of terrace P-3 is level with the top of the south wall. The east wall is composed of piled cobbles with segments of stacked stones on the north side. The height of the east wall is 33-55 cm. The wall is broken in two places for drainage into the adjacent *ʻauwai* on the east.

Feature P-5 is the *ʻauwai*. It is visible only on the northeast side of the complex, along the east wall of terrace P-4. The ditch is 16 m long, 1 m wide, and up to 50 cm deep. A piled stone and cobble wall parallels the east wall of terrace P-4 to form the east side of the ditch. At the north end of terrace P-4, the piled stone and cobble wall continues but resembles a natural bank, and the ditch flattens out to the north.

Pawaʻa Makai *Loʻi*

Features P-6 and P-7 are two terraces located in the northeast corner of the survey area that are part of a larger *loʻi* system extending north and west outside the survey boundaries onto privately-owned land (see Figure 3.23). The terraces are on flat land and step down to the north. They are 40 m west of Kahawaiʻiki Stream and abut the base of a hill on the west. Both terraces are overgrown with bamboo, although a modern trail that skirts the east edge of the complex has been cleared. Two excavation units, TU 15 and TR 12, were placed along the east wall of *loʻi* P-6.

Feature P-6 is the southernmost terrace. It is made up of four walls. The longest is on the north and runs at 230º for 20.3 m. It is composed of small boulders 45 cm in diameter and larger, piled to a height of 65 cm. The perpendicular walls are of the same construction and are 17.4 m in length on the east and 16.6 m on the west. The south wall is oriented at 242º and is 11 m long. This wall is composed of a single alignment of boulders and cobbles. The terrace has another smaller terrace attached to it on the northeast corner. This smaller terrace is composed of an alignment of four boulders 1 m in diameter, forming a terrace roughly 2 by 2 m in area. The interior of both terraces is level.

Feature P-7 is a terrace that is adjacent to feature P-6 on the northwest. The longest wall is 14 m long and extends from the northwest wall of feature P-6, along the base of the hill, at an orientation of 315º. The wall is composed of large cobbles to small boulders piled 30-40 cm high. This wall is in poor condition due to erosion. The north and east portions of the terrace extend out of the survey area, and more terraces are found to the north and west.

Features on the Slope

Twelve features were found on a hill above the two *loʻi* complexes (see Figure 3.23). This area is sloping down to the north and is heavily overgrown with bamboo. Many of the features on this slope are likely post-contact in age, and a number of artifacts dating to the turn of the Twentieth Century were found. These included English/American and Chinese ceramics, a brass engraved doorknob, and bottles (see Chapter 5). An adze blank and hammerstone were the only traditional artifacts recovered during the surface survey.

Feature P-8 is an historic house complex at the base of the slope, 25 m east of a trail leading up the hill. The complex is made up of two terraces and a wall (Figure 3.26). The main terrace (terrace A) is on the west and is composed of two walls that form a rough *L* shape. The east-west wall runs at an orientation of 78º for 5.5 m, and the north-

south wall runs at 180º for 6.3 m to the base of the slope. The east-west wall appears to curve south toward the slope, but it is heavily eroded. Terrace B is within terrace A, on the southeast. This smaller terrace is also made up of two perpendicular walls, one measuring 6 m long and oriented at 75º, and the other running for 5.1 m at 180º. The south portion of the former wall is eroded. The ground surface within the terraces is gently sloping, and not as steep as the surrounding land. The wall is 1 m downslope of terrace A, perpendicular to the east-west face of the terrace. It is 5.5 m long and the ground surface between the wall and terrace is level. Walls of this complex are typically single course, made up of small stones, 30 cm in diameter. The feature is in poor condition, heavily eroded and overgrown. English/American and Chinese ceramics and glass bottles dating from 1870 to the Twentieth Century were found in and around the complex (see Chapter 5).

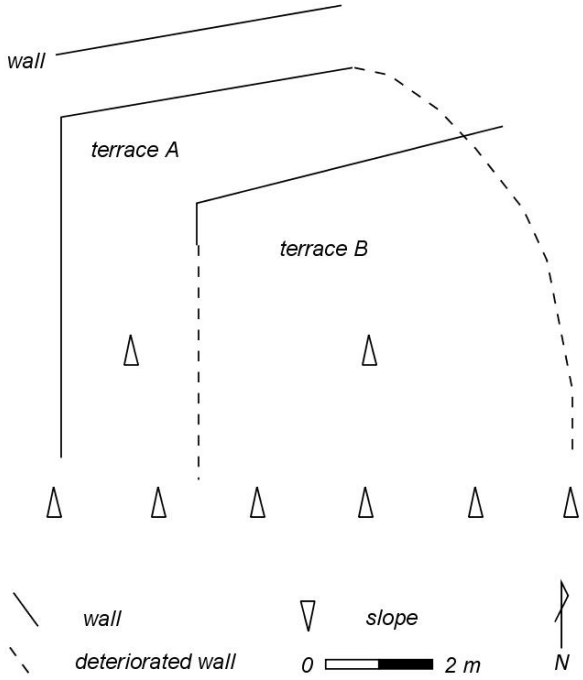

Figure 3.26: Schematic of feature P-8 complex.

Feature P-9 is located 15 m southwest of feature P-8, 4 m east of the trail. This is a terrace with one well-defined face, 4.5 m long, made up of small boulders 50 cm in diameter and larger. This is a single course wall that runs at an orientation of 349º. The northeast corner of the terrace is in good condition, although the perpendicular walls are poorly defined. The ground surface within the terrace is raised and flat for 4 m to the trail, while the surrounding land is sloping to the north. Another terrace was noted southwest of this feature, 10 m west of the trail, but it lies outside the survey boundary and was not documented.

Feature P-10 is an *L*-shaped terrace with two defined walls. The first is 5.7 m long and oriented at 270º. It is composed of small stones piled to a height of 40 cm. The perpendicular wall runs at an orientation of 10º for 2.3 m. It is made up of stones stacked one to two courses to a height of 20 cm. The land within the terrace is slightly flatter and higher than the surrounding ground surface. The east end of the longer wall abuts the west side of the trail 15 m south of feature P-9. This feature is in poor condition due to erosion.

Feature P-11 is a wall segment located 10 m east of the trail and 10 m southeast of terrace P-10. The wall is 3.2 m long and oriented at 50º. It is composed of large boulders, 50 cm in diameter and larger, stacked one to two courses to a height of 80 cm. The wall is in fair condition.

Feature P-12 is an historic habitation complex located 63 m south of feature P-11 and 25 m east of the trail. The complex consists of a) an *ʻauwai*, b) a platform, c) two square pits, and d) an historic artifact scatter (see Figure 3.23). The *ʻauwai* is *L*-shaped, running for 11 m at 59º and then turning to 148º and extending for another 8.5 m. It is up to 40 cm deep and lined with boulders and stones 80 cm in diameter and smaller. The platform is on the north end of the *ʻauwai* and covers an area of 5 by 3.2 m. The platform has well defined south and east faces, made up of large stones and small boulders stacked

one to two courses to a height of 20 cm. Basalt cobbles are scattered within the platform. A concentration of window glass along the north-south wall was not collected. The *ʻauwai* appears to serve as a device to divert water away from the platform. Two square pits are located 4 m east-southeast of the east corner of the *ʻauwai*. The pits are side by side, and roughly the same size, 2 m in length and width, and 70 cm deep. No artifacts were visible within the pits, and their function is unknown. An historic artifact scatter occurs 5 m south of the *ʻauwai*. The scatter is roughly 6 by 6 m in area; no surface structural remains occur in the immediate vicinity, although concrete bags and blocks and a metal lock were observed. Leather, window screen, and various metal items were also observed. Smaller items were collected, including leather and metal horse harness parts, turn-molded bottles, and English/American ceramic sherds (see Chapter 5). The base of a large clear glass container was not collected; "HONOLULU SAKE BREWERY & ICE CO LTD" was embossed around the side of the bottle near the base. A concentration of metal nails was observed; these were rusted together in the form of the container that once held them. One of the nails was collected and identified as a wire nail imported to Hawaiʻi as early as 1893.

Feature P-13 is a mounded stone alignment, two segments of which are visible. The northernmost segment is 40 m south of feature P-10 and 15 m west of the trail. This segment is 10.8 m long and runs at a 350º orientation. It is composed of a single course of stones, roughly 30 cm in diameter, placed on a linear mound of earth. A second segment of the alignment is visible to the south, just west of feature P-17. This alignment is of the same construction as the first alignment and runs at the same orientation. It is 9 m in length. This feature appears to be part of an old trail leading to the feature P-19 historic house paving. It is in poor condition, affected by erosion.

Feature P-14 is a small square mound located 35 m southeast of the northern alignment of feature P-13, and 20 m east of the trail. Its length is 1 m north-south and 90 cm east-west. It is composed of small stones, averaging 20 cm in diameter, piled to a height of 20 cm (Figure 3.27). This feature is in fair condition, although the function of the mound is unclear.

Feature P-15 is a low wall located 10 m east of feature P-14. The wall is 14 m long, 2 m wide, and composed of stones 30 cm in diameter and smaller, piled to a height of 30 cm. It is oriented at 240º. Waterworn cobbles are incorporated in the construction, and a hammerstone was collected from the vicinity (see Chapter 5). A modern bottle was observed near the wall but not collected. This feature is in fair to poor condition; it appears that the wall was higher at one time and has since deflated.

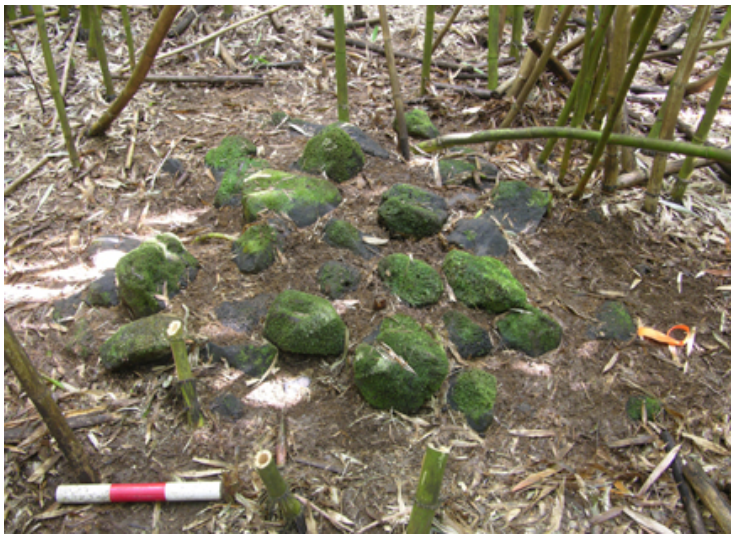

Figure 3.27: Mound feature P-14, facing south.

Feature P-16 is a rough alignment located 30 m southeast of feature P-15. It is composed of a single course of stones aligned directly east-west for 6.9 m. Stones average 40 cm in diameter. This feature is in poor condition and lacks definition.

Feature P-17 is a complex of stone-lined mounds

and depressions. One of these lies on the trail, 3 m east of the southern P-13 alignment. Another is just east, and a series of five are in a row, 30 cm to the east (see Figure 3.23). All are composed of a single course of stones, some aligned in an oval shape, and some in a roughly rectangular pattern. All are depressed in the center, except the southernmost in the row of five. The depression on the trail is oval in plan, 2.75 m in length, and 1.5 m in width. The one to the east is also oval and 1.75 m in length and 1.4 m in width. The southernmost in the series of five is rectangular in plan and 3.45 m in length and 1.5 m in width. The next to the north is oval and 3 m in length and 1.7 m in width. The central depression in the series of five is rectangular and 2.65 m in length and 1.5 m in width. The next to the north is rectangular and 2.9 m in length and 1.7 m in width. The northernmost is rectangular and 2.9 m in length and 1.5 m in width. The size and shape of these features suggests a complex of human burials, although no subsurface testing was conducted to confirm this.

Feature P-18 is a retaining wall located on the southeast side of the survey area at the top of the slope overlooking the P-1 through P-5 *lo'i* complex. On the south end, a 4 m-long segment runs at an orientation of 302º. The wall then turns to 260º and continues for 46 m, until it shifts to 328º and flattens out after 21 m. The wall is composed of small stones and cobbles, 40 cm in diameter and smaller, piled to a height of 60 cm. The southern segment has some larger stones and boulders at its base. The wall is in poor condition, deflated to 1.5 m in width and overgrown with bamboo.

Feature P-19 is an historic house platform located 3 m south of the southern alignment of feature P-13. It is rectangular in plan, measuring 9.3 by 6 m (Figure 3.28). The platform is composed of stones averaging 30 cm in diameter, stacked two to three courses to a height of 40 cm. A few remnants of coral mortar are evident within the walls, although the foundation appears to be largely dry-laid. The surface of the platform is roughly flat, with circular depressions around the perimeter (Figure 3.29). A rectangular concrete extension occurs on the west side, measuring 1 m by 70 cm, with a stone foundation beneath the concrete measuring 1.8 by 1.2 m. The platform is in good condition, although overgrown with bamboo. No surface artifacts were found in the vicinity. A feature reminiscent of the P-17 depressions is located 20 m west of feature P-19, outside the boundaries of the survey.

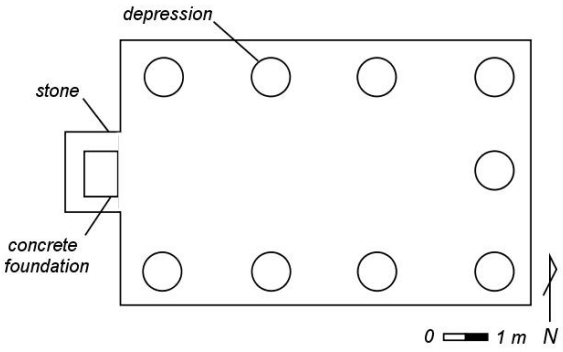

Figure 3.28: Schematic of feature P-19.

Figure 3.29: Historic house platform P-19, facing northwest.

Pawa‘a Discussion

In sum, a small *lo‘i* system and part of a larger *lo‘i* complex were found in the lowlands of Pawa‘a near Kahawai‘iki Stream. On a hill above the *lo‘i* were 12 features that included three historic house platforms, three walls, two terraces, two alignments, one stone mound, and a possible human burial complex. The occurrence of historic surface artifacts throughout the hill suggests that the features in that area were in use during the post-contact era. Additional features occur outside the survey block and are likely associated with those described above.

Ku‘ele

Three discrete survey blocks were examined in the land division of Ku‘ele. No surface cultural remains were found in the Coastal East survey block; disturbed habitation remains and an extensive *lo‘i* system occur in the Coastal Central survey area, and a hearth and possible unfinished *lo‘i* are in Coastal West (Figure 3.30). Because these survey areas are all close to the coast, features were numbered with the prefix C-, for “coastal”, so as not to be confused with the K- series in Keiu or the KU- Kukuinui features.

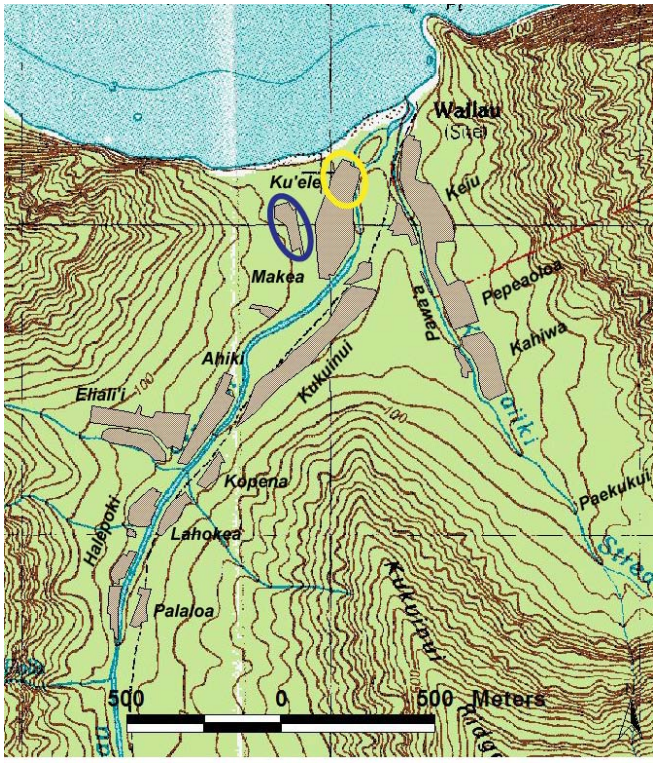

Figure 3.30: Location of the Coastal Central *lo‘i* system, in yellow, and the Coastal West *lo‘i* system, in blue.

Coastal East

The Coastal East survey block is made up of a single parcel, TMK: 2-5-9-005:085, which abuts the coast and extends inland approximately 150 m. This property is owned by the State and is 1.82 acres in area. It is bounded on the north by an adjacent State parcel on the boulder beach, on the east by Wailau Stream, and on the west and south by privately owned land. The property is low-lying and flat, and vegetation consists of Java plum, *hala* and short grass. An historic map shows a “pen” on the property, suggesting that animal husbandry took place there, and another portion of the parcel is labeled “taro” (Monsarrat 1903). Today, the parcel lies in the flood zone at the confluence of Wailau and Kahawai‘iki Streams, and no surface architecture was found. Archaeological remains may have been washed away during flooding.

Coastal Central

The Coastal Central survey area includes TMK: 2-5-9-005:046 and part of TMK: 2-5-9-006:009. Both parcels are owned by the Francis Brown Trust. The former is a small parcel, 0.615 acre in area, and the entire plot was surveyed. The latter parcel is 78 acres

in area, approximately 1.2 acres of which were surveyed in this block. The survey area abuts the coast and consists of an expanse of flat land between Wailau Stream on the east and a slope on the west (Figure 3.31). Archaeological features fell within three clusters: highly disturbed terraces just behind the boulder beach (features C-1 and C-2), historic features along the western slope (C-3 and C-4), and a *lo'i* system that extends outside the survey boundaries and into the neighboring land division of Makea (C-5 through C-17). The Makea portion of this system is described on page 52. Vegetation in this survey block consists of *hala* and coconut near the coast, short grass and Maui rose on the northern portion of the flat, and *hau* along the slope and on the southern side of the survey area and beyond.

Feature C-1 is a platform on the northwest corner of the survey block. The platform abuts the hillside on the south and the boulder beach on the north. The structure is composed of waterworn small boulders and stones, identical to the ones found on the boulder beach. It is rectangular in plan, measuring 6 by 11 m and stands slightly raised from the boulders on the beach. The feature is obscured by fallen *hala* leaves and appears heavily modified, probably by modern fishermen who favor the area to the south as a camp ground (see Figure 3.31).

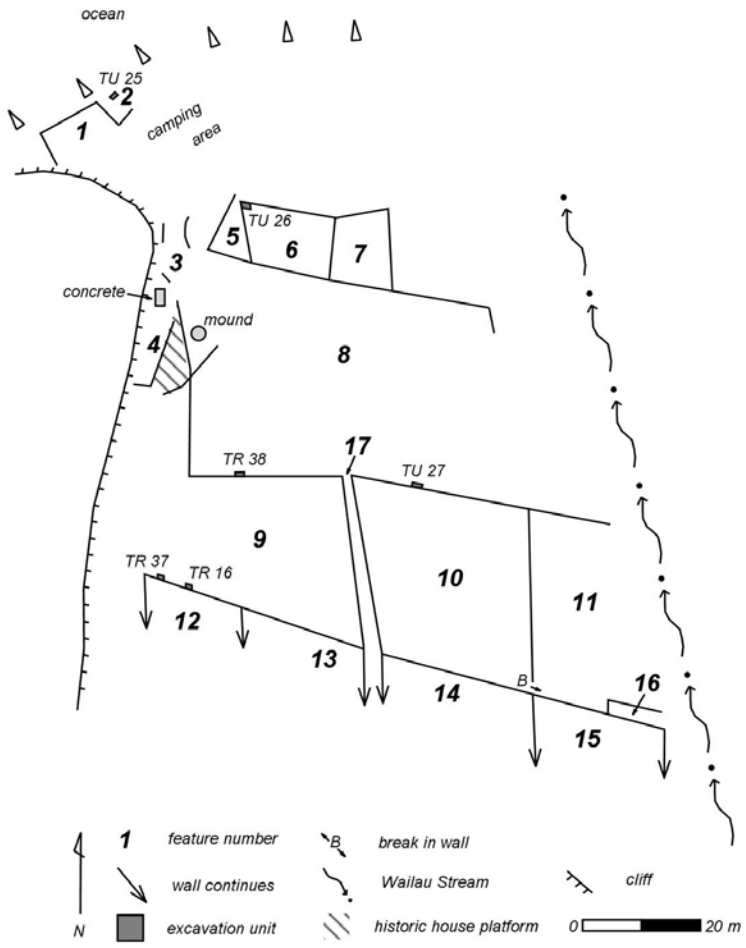

Figure 3.31: Coastal Central survey area, plan view.

Feature C-2 is an eroded platform adjacent to feature C-1 on the east. This structure is 6 m wide, and the length could not be determined because of heavy modification by recent campers. A modern hearth is located just south of the platform. In the beginning of the 2006 field season, midden and basalt flakes were observed along the west side of the platform. The feature was not excavated at this time because the area was occupied by campers. Two weeks later the midden scatter could not be relocated, so a test unit was placed over a concentration of basalt flakes along the north edge of the platform (see Chapter 4).

Feature C-3 is made up of a series of walls, an historic house platform, a stone mound, and a concrete structure, located at the base of the slope. There are at least five eroded wall segments here, scattered from just west of terrace C-5 to the west wall of terrace C-8. The corner of the platform meets the end of the C-8 west wall, and another

wall segment extends northeast from that junction. The platform is the most substantial of the features (Figure 3.32). It is composed of 25 cm-diameter stones, stacked six courses to 1.2 m tall. The south wall and southeast corner are rounded, and the surface is paved with stones. The mound is located just east of the platform, and the concrete structure is just north. These two features might mark human burials, and no subsurface testing was conducted because of this possibility. The area was severely littered with modern and historic trash, although none was collected.

Figure 3.32: Feature C-3, historic house platform in foreground, concrete structure in background with modern trash on top. Orientation is to the northwest.

Feature C-4 is a terrace that abuts the slope just west of the C-3 platform. It is made up of a single alignment of stones, and an upright stands at the south end.

Feature C-5 is a triangular terrace on the northwest corner of the *loʻi* system, between the cultivation area and the historic house area. This terrace is poorly defined, with the south wall composed of piled stones and cobbles. It is 11 by 7.5 m in area.

Feature C-6 is a terrace adjacent to C-5 on the east. Its walls are composed of stones 25 cm in diameter and larger, stacked three to four courses to a height of 50 cm. The terrace measures 13 by 11 m and probably served as a living area for the caretakers of the fields behind it. TU 26 was placed in the northwest corner of the terrace, and an abundance of traditional and historic materials were recovered.

Feature C-7 is a terrace adjacent to C-6 on the east. Like C-6, this terrace might have been part of the habitation area for the cultivators of the *loʻi* to the south. This feature measures 13.5 by 10 m, and construction is similar to that of terrace C-6.

Feature C-8 is a large flat area between the C-5, -6, and -7 terraces and the *loʻi* of C-9 through C-12. The function of this terrace-like feature is unknown. It measures 70 by 32 m, and the east wall is eroded, with only a 5 m segment remaining. Two units were excavated within this feature: TR 38 on the west side, outside terrace C-9, and TU 27 on

the east, outside terrace C-10. No artifacts indicative of the function of this terrace were found.

Feature C-9 is a terrace that steps up from C-8 on the south, forming the northwest corner of the *lo‘i* complex. The south wall is composed of 20 cm-diameter stones and larger, stacked four to six courses to a height of 90 cm. The *‘auwai*, feature C-17 runs along the east side of the terrace. TR 16 and TR 37 were excavated within this terrace along the south wall. Traditional artifacts were abundant in the excavations.

Feature C-10 is a terrace that steps up from C-9 on the south, on the east side of feature C-17, the *‘auwai*. Construction is similar to that of terrace C-9 except that there is a break in the southeast corner for drainage into the adjacent terrace C-11. Terrace C-10 measures 29.5 by 29.5 m.

Feature C-11 is a terrace that abuts terrace C-10 on the east. It measures 29.5 by 14.5 m in area and terrace construction is similar to that of C-9 and C-10. The east wall is eroded into Wailau Stream.

Feature C-12 is a terrace that steps up from C-9 on the south, on the west edge of the system. Construction consists of 20 cm-diameter stones and larger, stacked three to six courses to a height of 80 cm (Figure 3.33). This terrace is 16.5 m wide, and the length was not determined because it extends outside the survey area.

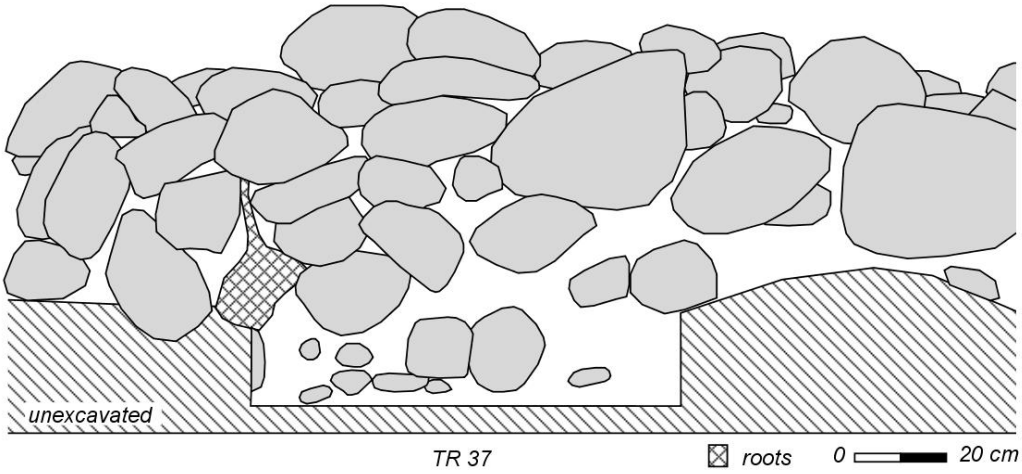

Figure 3.33: Feature C-12, portion of the north wall, south face profile near the west end of the wall.

Feature C-13 also steps up from C-9 on the south, next to C-12 on the east. This terrace measures 22.5 m wide, and the length extends outside the survey boundaries. Construction is similar to that of C-9.

Feature C-14 is a terrace that steps up from C-10 on the south. It is 26.6 m wide, and the length could not be measured because it extends outside the survey area. Construction is similar to the terraces described above.

Feature C-15 is adjacent to C-14 on the east, stepping up from the south side of C-11. This terrace is 23.5 m wide, and the length extends out of the survey block. Construction is similar to the terraces described above.

Feature C-16 is a small terrace or *L*-shaped enclosure on the north side of terrace C-15. The feature begins 12.5 m from the west wall of C-15 and is 11 m long. The function of this feature is unknown.

Feature C-17 is the *‘auwai*. It first appears between features C-9 and C-10 (Figure 3.34) and extends between features C-13 and C-14 and beyond. The *‘auwai* is 1 to 3 m

wide and 70 cm deep. It is possible that this is the same *ʻauwai* that cuts through the center of the Makea *loʻi* system, although this was not verified.

Figure 3.34: Feature C-17, *ʻauwai*, facing south. Terrace C-9 is on the right and C-10 is on the left.

Coastal West

The Coastal West survey area also lies on a portion of the 78-acre TMK: 2-5-9-006:009, owned by the Francis Brown Trust. Approximately 9 acres of this parcel were surveyed in Coastal West. This survey block is located on the western slope of the valley, above the Coastal Central survey area (see Figure 3.16 *g*). The topography is gently sloping to the east, with a steep drop to the boulder beach, far below on the north. Vegetation consists of *hala* in the northern portion, guava and Maui rose in the south, and *hau* in the center. An isolated hearth (feature C-18) and a *loʻi* system (features C-19 through C-34) were found here. The *loʻi* system is located approximately 150 m inland. It is composed mainly of cut soil terraces, with little stonework, thus it appears that the complex was abandoned before construction was completed. A long *ʻauwai* runs above the system on the west, outside the survey boundaries, but the *ʻauwai* was blocked with stones where it might have branched to the *loʻi*, so it was never connected to the system. Six excavation units were opened in this system, and no pondfield deposit was found, suggesting that it was never cultivated.

Feature C-18 is the hearth. It is located on the northern edge of the survey block near the cliff that drops to the boulder beach. It was identified on the surface by elongated stones set on edge in a square pattern, forming a 45 by 30 cm open area within the square (Figure 3.35). Basalt flakes were scattered throughout the surface in the vicinity of the hearth. TU 22 bisected the hearth, and an abundance of charcoal was recovered (see Chapter 4).

Figure 3.35: Feature C-18, hearth, surface plan view. The trowel points north.

Feature C-19 makes up the northwest corner of the *lo‘i* system (Figure 3.36). This terrace measures 25 by 22.5 m in area. It is composed almost entirely of cut soilconstruction, with soil faces as tall as 80 cm. Breaks occur in the soil walls on the north to a seemingly unterraced area, and on the east to terrace C-20. The only stonework is present on the south end, where a 12.5 m-long wall holds back soil from terraces C-3 and C-4.

Feature C-20 is a terrace that steps down from C-19 on the east. Its maximum length is 35 m and maximum width is 24 m. The northeast corner is open, and the south wall exhibits the only stonework of this terrace. This wall is composed of 20 cm-diameter stones stacked five to seven courses to a height of 79 cm. The east end appears unfinished, and the cross-section of the wall is exposed (Figure 3.37). TU 21 was excavated at the base of this wall and no charcoal or cultural material was found.

Feature C-21 steps up from the south side of C-19. This terrace measures 35 by 6.6 m in area. It is open on the northwest and northeast corners. The north wall is composed of 20 cm-diameter stones stacked four courses to 58 cm tall. This is the only stonework of this terrace and this wall is gently *U*-shaped, appearing to retain the soil of this terrace from eroding into terrace C-19. TU 23 was excavated on the high side of this retaining wall (see Chapter 4).

Feature C-22 is adjacent to C-21 on the northeast and steps up from terrace C-20 on the south. This is a triangular terrace that measures 20 by 15 m in area. Walls are cut soil construction, except the north wall, which this terrace shares with feature C-20.

Feature C-23 abuts feature C-22 on the east and steps up from C-20 on the south. This terrace is 15 m long and 7 m wide and is composed almost entirely of cut soil, except for a small portion along the north wall that it shares with terrace C-20. Breaks in this north wall allow drainage into terraces C-20 and C-26. The south wall is curved and 64 cm tall.

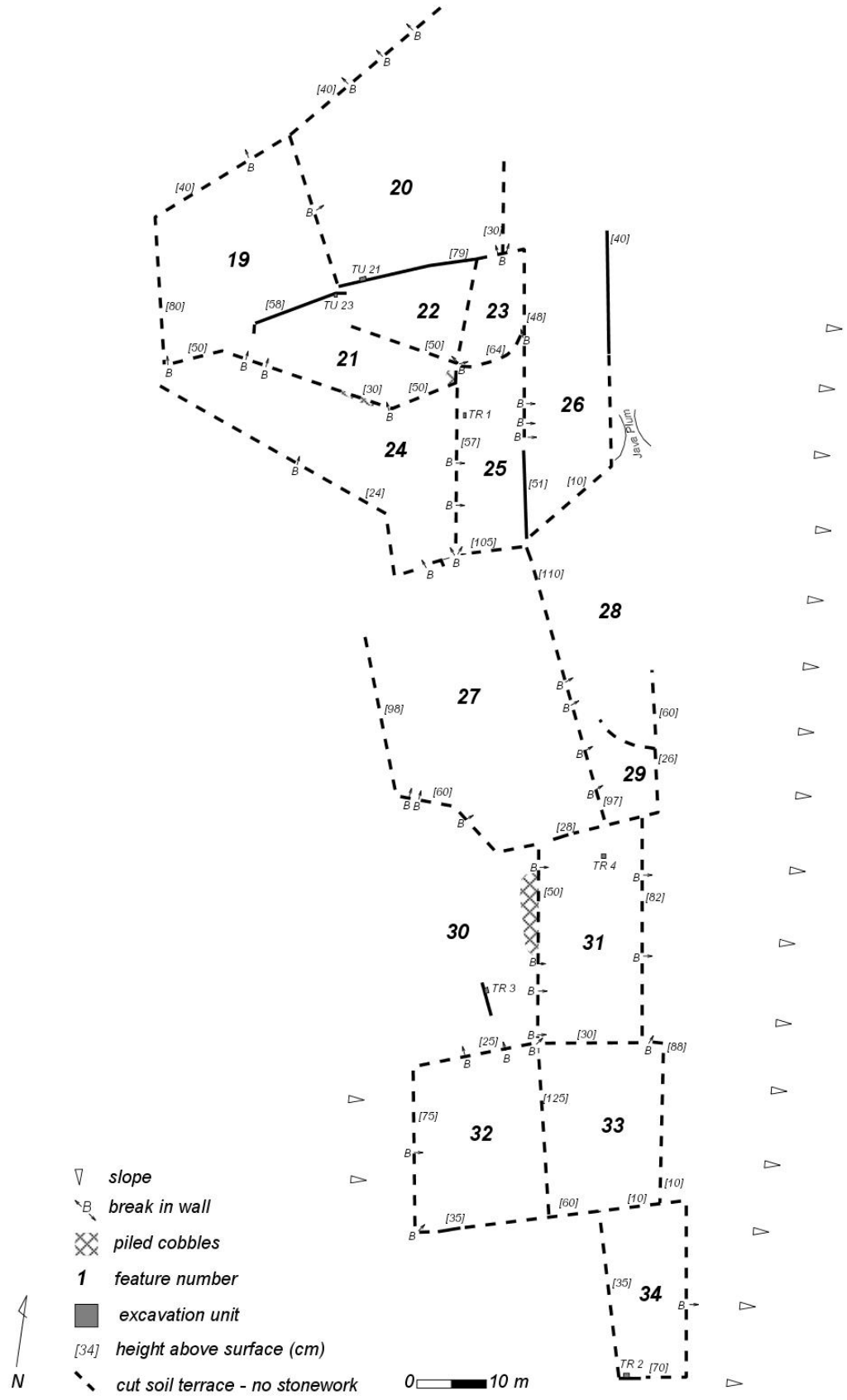

Figure 3.36: Coastal West *lo'i* system, plan view.

Feature C-24 is an irregularly shaped terrace that steps up from C-21 on the south. It measures 45 by 25 m in area and exhibits multiple breaks in every wall for drainage from and into the adjoining terraces. An *L*-shaped stone wall reinforces one of the breaks along the south wall (Figure 3.38). A small portion of the north wall is made up of cobbles and soil piled to 30 cm tall, and the rest of the walls are of cut soil construction.

Figure 3.37: Feature C-20 south wall, facing west, showing the unfinished portion of the wall.

Figure 3.38: Terrace C-24 south wall, showing the *L*-shaped feature that reinforces the drainage breaks within the cut soil construction. The breaks are on either side of the *L*-shaped feature. Orientation is to the southeast.

Feature C-25 is adjacent to C-24 on the east. This terrace is 25 m long and 9 m wide. It is constructed with cut soil except for a portion of the east wall that is composed of stones averaging 15 cm in diameter stacked four courses to a height of 51 cm. Breaks in the northwest and northeast corners allow drainage into terraces C-4 and C-5, and breaks in the center of the east wall drain into C-26. TR 1 was excavated within this terrace. It was offset 2 m from the west wall to identify cultivated soils. None were encountered.

Feature C-26 is a terrace that abuts C-25 on the east. It has only three walls, and is therefore open to the north. This terrace is 12 m wide and at least 38 m long, although the exact length could not be determined due to the absence of the north wall. A portion of the east wall exhibits stonework, consisting of stones averaging 18 cm in diameter stacked five courses to a height of 40 cm. This wall comes to an abrupt end on the north. The other walls are composed of cut soil.

Feature C-27 steps up from C-24 and C-25 on the south. This terrace measures 41 by 25 m in area. It is composed almost entirely of cut soil (Figure 3.39), except for three short segments of stonework: the *L*-shaped feature along the north wall (see Figure 3.38), a stone reinforcement of a break in the northeast corner, and a 28 cm-tall segment along the south wall. The northwest corner is open, and drainage breaks occur in every wall.

Figure 3.39: Terrace C-27 west wall, showing cut soil construction. Orientation is to the southwest.

Feature C-28 is adjacent to C-27 on the east. This terrace is 30 m long and 10 m wide. It is constructed entirely of cut soil and is open on the northeast corner. The west wall is up to 1.1 m tall.

Feature C-29 is a small terrace on the south end of C-28. It is separated from terrace C-28 by a curved wall that creates an opening on the northwest corner. This terrace measures 12.5 by 8 m in area and is constructed of cut soil.

Feature C-30 is a terrace that steps up from C-27 on the south. It is 31 m long and approximately 20 m wide, although the absence of a west wall prevents accurate measurement of the terrace's width. A portion of the east wall is composed of soil and cobbles piled to 50 cm tall, and the remainder or the terrace is of cut soil construction. Drainage breaks interrupt every wall. A 4.8 m-long alignment is situated near the southeast corner of the terrace. The alignment is composed of a single course of stones averaging 40 cm long (Figure 3.40). TR 3 was excavated along the alignment and only charcoal was found.

Figure 3.40: Stone alignment within terrace C-30. Orientation is to the west.

Feature C-31 is adjacent to C-30 on the east. This terrace is 32 m long and 16 m wide. All walls are composed of cut soil construction. Drainage breaks occur in the east and west walls. The tallest wall is on the east, rising to 82 cm in height. TR 4 was excavated within this terrace. It was offset 5 m from the north wall of the terrace to identify cultivated soils. None were found.

Feature C-32 is a terrace that steps up from feature C-31 on the south. It measures 26 by 23 m in area and is composed entirely of cut soil, except for a 3 m-long segment of stonework on the south wall. Drainage breaks occur on the north and west walls and in the northeast and southwest corners.

Feature C-33 is adjacent to terrace C-32 on the east. This terrace measures 22 by 16 m and exhibits cut soil construction. The tallest wall is on the west and it rises 1.25 m in height. A break for drainage is located near the northeast corner.

Feature C-34 forms the southeast corner of the complex, stepping up from feature C-33 on the south. This terrace is 25 m long and 12 m wide. It is constructed of cut soil, except for a 3.5 m-long stone wall segment near the southwest corner. TR 2 was excavated along this segment. A large volcanic glass flake and charcoal were recovered. A break for drainage out of the terrace occurs in the east wall.

Ku‘ele Discussion

Three areas were surveyed in Ku‘ele. The parcel that was surveyed in the Coastal East area was located in the flood zone of Wailau Stream, and no archaeological features

were visible on the surface. In the Coastal Central survey area, habitation platforms, historic features, and an extensive *lo‘i* system were found. Eight terraces and an *‘auwai* were documented, and the *lo‘i* system extends south outside the survey boundaries. The southern portion is described below in the Makea section. A 16-terrace *lo‘i* complex was found in Coastal West. This complex is thought to be unfinished and never cultivated because of sparse stonework, no connection to the *‘auwai* that runs above the complex, and lack of pondfield soils.

Makea

The land division of Makea is on the west side of the valley, inland of Ku‘ele. Roughly 7.5 acres were surveyed in Makea on a series of six adjacent parcels, beginning approximately 200 m from the coast, on the west side of Wailau Stream (see Figure 3.16 *f*). Parcels included in the survey were TMK: 2-5-9-005:052, 054, 061, 063, and portions of TMK: 2-5-9-005:064, and TMK: 2-5-9-006:002. Parcel 052 is 0.069 acre in area and owned by the State. It is the northernmost property in this survey block. Parcel 054 is adjacent on the south. It is 0.76 acre in area and owned by the State. Parcel 061 is south of 054 and is owned by the Wichman ‘Ohana. The boundaries of this parcel were staked in 1975, and three of the original surveyor’s markers remain today. An “x” is etched into a stone in the southwest corner, and yellow pipes embedded in the ground mark the northwest and southeast corners of the property (Minvielle 1975). The pipe that designates the northeast corner could not be found. The parcel is 1.006 acres in area. Parcel 063 is south of 061. It is owned by the State and is 0.22 acre in area. Parcel 002 is a large State-owned property, 8,540 acres in area that lies to the west and south of parcel 063. Roughly 4 acres of this large parcel was surveyed in Makea. Parcel 064 is a 4-acre property owned by the Francis Brown Trust. It lies within parcel 002, and approximately 1.5 acres was surveyed.

Archaeological features consist of a large *lo‘i* system on the flat next to Wailau Stream and a barrage terrace system and miscellaneous features on the slope above the south side of the lowland complex (Figure 3.41). A total of 36 features were observed (Figure 3.42). The lowland survey block consists of flat land near Wailau Stream. A large *lo‘i* complex is situated on the flat expanse, with terraces stepping down to the north (Oversize Figure 3). The complex extends north and east outside the survey boundaries, connecting with those terraces described for the Ku‘ele Coastal Central survey area to the north. A number of features occur on the slope to the west of the *lo‘i* complex, including a large historic house paving, a barrage terrace system, enclosures

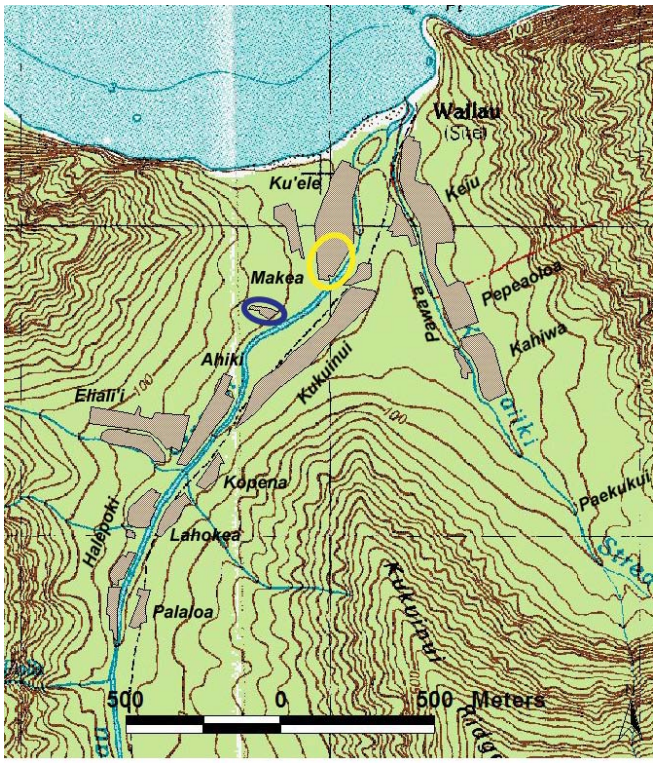

Figure 3.41: Location of the lowland Makea *lo‘i* system, in yellow, and the Makea barrage *lo‘i* system, in blue.

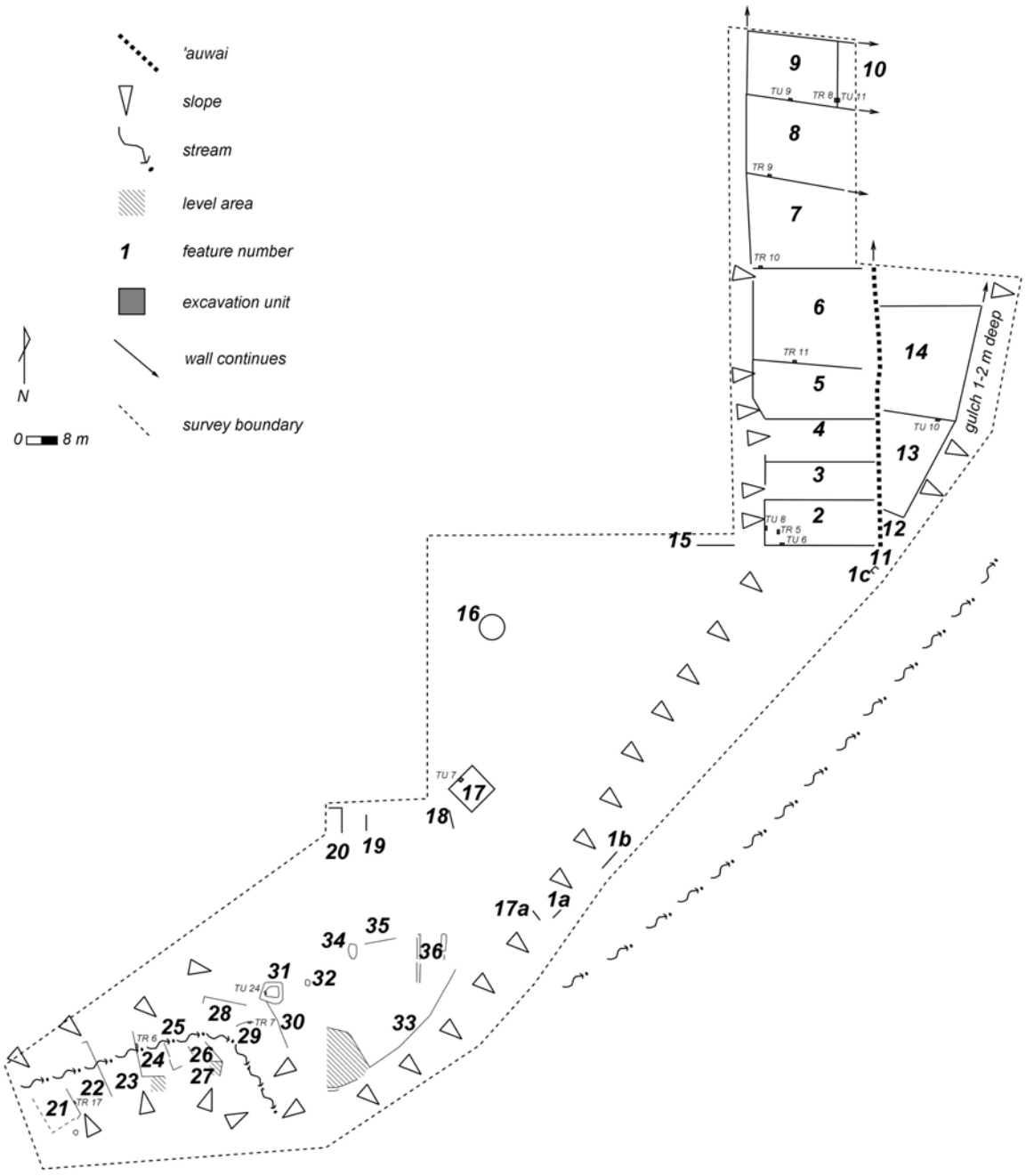

Figure 3.42: Makea survey area, plan view.

alignments, and wall segments. Tangles of *hau* obscure the flat expanse and the lower reaches of the slope, while the rest of the slope is covered in guava with some Maui rose. A single orange tree grows alongside the historic house platform. Ten excavation units were opened in the *loʻi* complex, one unit was excavated at the historic house, one unit was placed within an enclosure, and three units were excavated in the barrage terraces (see Chapter 4).

Lowland *Loʻi*

Features M-1 through M-14 occur on the low-lying flat land on the west side of Wailau Stream. Features M-2 through M-10 and M-12 through M-14 are terraces that step down from south to north. Land within these terraces is flat and relatively free of stones. Feature M-11 is an *ʻauwai* that runs down the center of the complex. Features M-1a, b, and c are water control features that may have been connected to the *ʻauwai* at one time. The features in this complex are in good condition, although severely overgrown with *hau*. Because of this dense vegetation, the complex was not mapped in detail. Instead, wall lengths and orientations were recorded to generate a plan view map of the area (see Figure 3.42).

Figure 3.43: Feature M-1c, facing northwest.

Feature M-1 is a system of related water control features that occur along a ditch that skirts the southeast boundary of the survey area. This ditch is likely a continuation of the *ʻauwai* that runs through the center of the *loʻi* system, although this segment is in poor condition. Feature M-1a is a retaining wall segment located roughly 100 m south of the *loʻi* complex and 10 m west of Wailau Stream. The wall runs at a 40º orientation along the west side of the ditch for 2.8 m. It is composed of stones 10-40 cm in diameter, stacked one to three courses to a height of 40 cm. The ditch is 2 m wide here, with a 70 cm-tall earthen berm on the east side. Feature M-1b is another retaining wall segment located 15 m north of feature M-1a, along the west side of the same ditch. This wall measures 6 m in length and is composed of stones 20-50 cm in diameter, stacked one to four courses to a height of 90 cm. The ditch is 2 m wide here, but the earthen berm begins to flatten out and is only 50 cm high. Feature M-1c is a *U*-shaped water control device along the same ditch as the other features, 90 m north of feature M-1b. The most intact face is 1.9 m long and oriented at 349º (Figure 3.43). It is composed of stones 40 cm in diameter and smaller stacked two courses to a height of 35 cm. Two perpendicular walls extend from the ends of this wall, but they are heavily eroded. The M-1 components are generally in poor condition, suffering from erosion.

Feature M-2 is part of the large agricultural complex, the southernmost of the terraces. It is 29 m in length and 13.5 m in width. Its walls are typically 90 cm high, composed of stones 20-30 cm in diameter stacked four to six courses (Figure 3.44). The long axis of the terrace runs exactly east-west. The ground surface south of the terrace is level with the top of the wall. Three excavation units were opened in this feature. Another terrace might occur to the south of this one, but its walls are too fragmentary to clearly discern.

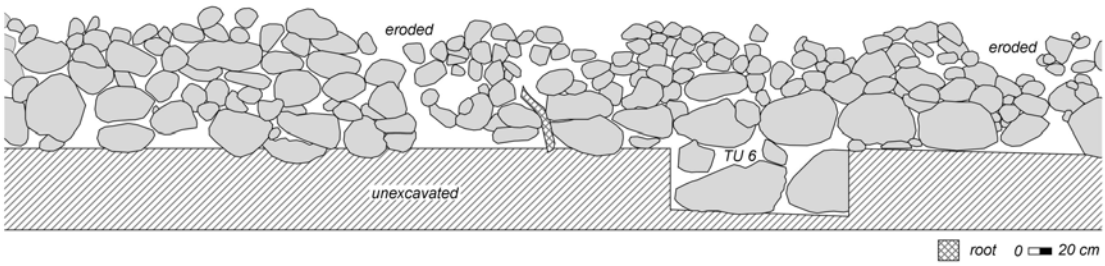

Figure 3.44: Feature M-2, portion of the south wall, south face profile at the west end of the wall.

Feature M-3 steps down from feature M-2 on the north. This terrace is 29 by 12.4 m in area, with its long axis directly east-west. Walls are composed of stones stacked three courses to a height of 50 cm. There is a possible opening for water flow in the south wall at the southwest corner. The ground surface of feature M-2 is level with the top of the south wall of this terrace.

Feature M-4 is adjacent to feature M-3 on the north. This terrace is 29 by 10.5 m in area and oriented directly east-west. Walls are composed of stones stacked four courses to a height of 62 cm. The ground surface of feature M-3 is level with the top of the south wall of this terrace.

Feature M-5 is a terrace that abuts feature M-4 on the north. It is 31 m long and 17 m wide. Walls are typically constructed with stones stacked four courses to 65 cm tall. The ground surface of feature M-4 is level with the top of the south wall of this terrace.

Feature M-6 steps down from feature M-5 on the north. This terrace is 35 by 21.8 m in area. Its south wall is oriented at 95º, while its north wall runs directly east-west. Walls are typically composed of stones stacked four courses to a height of 32 cm. The ground surface of feature M-5 is level with the top of the south wall. Segments of the north wall are in poor condition, heavily eroded. TR 11 was excavated at the south wall.

Feature M-7 is adjacent to feature M-6 on the north. This terrace is 22.9 m in width, and its north wall extends east out of the survey boundary at a 102º orientation. This wall is in excellent condition, composed of stones stacked seven courses to a height of 98 cm. The ground surface of feature M-6 is level with the top of the south wall of this terrace. TR 10 was excavated at the base of the south wall.

Feature M-8 steps down from feature M-7 on the north. This terrace is 21.8 m wide, and its north wall extends east and west out of the survey boundary at a 90º orientation. The north wall is constructed with stones stacked three courses to a height of 40 cm, but is eroding and in poor condition. The south wall is more intact although severely overgrown with *hau* (Figure 3.45). The ground surface of feature M-7 is level with the top of the south wall of this terrace. TR 9 was excavated along the south wall.

Feature M-9 is a terrace that abuts feature M-8 on the north. It is 16.8 m wide and its north wall extends east and west out of the survey area at a 90º orientation. This wall is in poor condition, consisting of a single course of stones, 20-30 cm in diameter, scattered here and there where the wall once stood. The ground surface of feature M-8 is level with the top of the south wall. TU 9 was excavated along the south wall, and it revealed that the majority of this wall is intact, but buried. TR 8 was placed along the east wall.

Feature M-10 is adjacent to feature M-9 on the east. This terrace is 16.8 m wide, and its north and south walls extend east outside the survey boundary. The west wall is composed of stones typically 20 cm in diameter, stacked three to four courses to a height

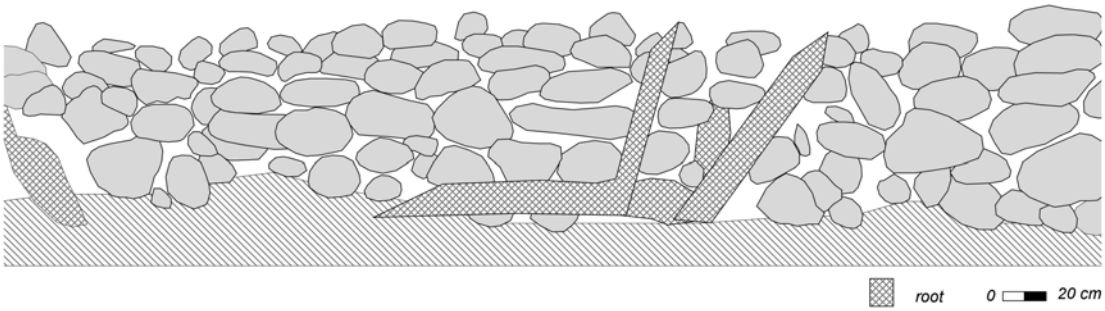

Figure 3.45: Feature M-8, portion of the north wall, south face profile near the center of the wall.

of 45 cm. This terrace is higher than terrace M-9 to the west. TU 11 was placed along the west wall of the terrace.

Feature M-11 is the *ʻauwai* that runs down the long axis of the complex. Its total length is unknown, as it extends north out of the survey area. It probably also extends south to feature M-1, although south of terrace M-2, the ditch is not well defined, and the only sections that are stone-lined are at features M-1a, b, and c. The section of *ʻauwai* between features M-2 and M-6 is also heavily eroded but is stone-lined in most places. At terrace M-3, the ditch is 1 m wide and 60 cm deep, and at terrace M-5, it is 80 cm wide and 40 cm deep.

Feature M-12 is a small triangular terrace next to feature M-2 on the east. The *ʻauwai* borders this terrace on the west, and a 1-2 m-deep gulch forms the eastern boundary. This terrace only exhibits a north wall, 3.2 m long, and the topography within it is uneven.

Feature M-13 abuts feature M-12 on the north. This terrace is 19 m long and 18 m wide on the west and 29 m wide on the east. The north face is composed of stones 30-40 cm in diameter stacked three courses to a height of 60 cm. It runs at a 99º orientation. The east face exhibits a retaining wall along the gulch. This wall is constructed with 30 cm-diameter stones stacked up to three courses, extending north for more than 50 m, and then continuing outside the survey boundary. TU 13 was placed along the north wall.

Feature M-14 is a terrace that is adjacent to feature M-13 on the north. Its north wall is in poor condition, composed of stones 10-30 cm in diameter once stacked three courses but now mostly fallen. The maximum height of the wall is 30 cm, and it runs at an orientation of 92º for 26.8 m to meet the retaining wall at the gulch on the east. More terraces occur to the north, but these are outside the survey boundary.

Features on the Slope

Features M-15 through M-36 are located on a hillside south and west of the *loʻi* system (see Figure 3.42). Features consist of an historic house platform, various terraces, enclosures, and alignments, and a 9-terrace barrage *loʻi* system. The slope is steep where the barrage terraces are and is gentler where the other features occur. A secondary drainage runs down the slope through the barrage terraces. The area is overgrown with *hau*, guava, and Maui rose.

Feature M-15 is a stone alignment that runs up the slope, beginning 8 m west of the southwest corner of terrace M-2. It runs for 10 m at 259º and then turns into a mounded cobble berm that continues upslope (west). The stone alignment portion is composed of stones 30-50 cm in diameter with cobbles piled on the north side of the

stones to form the feature. The height of the alignment is 30 cm and the width is 50 cm. This feature is in poor condition and appears to have eroded significantly.

Figure 3.46: Feature M-16, facing northwest.

Feature M-16 is an ovoid stone alignment located 75 m west of the southwest corner of terrace M-2. It is composed of stones approximately 30 cm in diameter embedded into the ground in a rough oval shape (Figure 3.46 and Figure 3.47). The feature is 7 m long and 5 m wide. A small upright occurs on the west side, and a pair of small pyramidal uprights mark the northeast corner of the feature. The feature is in good condition although poorly defined. Its function is unknown.

Feature M-17 is an historic house platform, the northwest corner of which lies 33.75 m south of feature M-16. The platform is rectangular, measuring 9.7 by 7.1 m (Figure 3.48). It is made up of one to two courses of stacked stones averaging 40 cm in diameter. The east side is more defined than the west. Stones are aligned into two step-like features on the east side, and this is where the stacking occurs. The remainder of the platform is composed of a single course of embedded stones. A 10 cm-deep pit occurs on the south side of the structure, and a rusty metal pot was found embedded in the southwest corner. Historic artifacts were scattered throughout the area. These included English/American ceramic sherds, fragments of mold-blown glass bottles, and a piece of slate (see Chapter 5). TU 7 was placed on the northwest side of the feature at a concentration of surface artifacts. An abundance of ceramics, glass, and metal, along with a small stone adze, were recovered from the unit. The feature is in good condition although the west side is poorly defined and overgrown with *hau* (Figure 3.49). Stone steps lead up the slope toward the platform on the southeast (feature M-17a). These are located 5 m southwest of feature M-1a. They consist of seven stones wedged into the slope in a slightly curving alignment. The steps are in fair to poor condition, and appear to have been affected by erosion.

Figure 3.47: Feature M-16 plan view drawing.

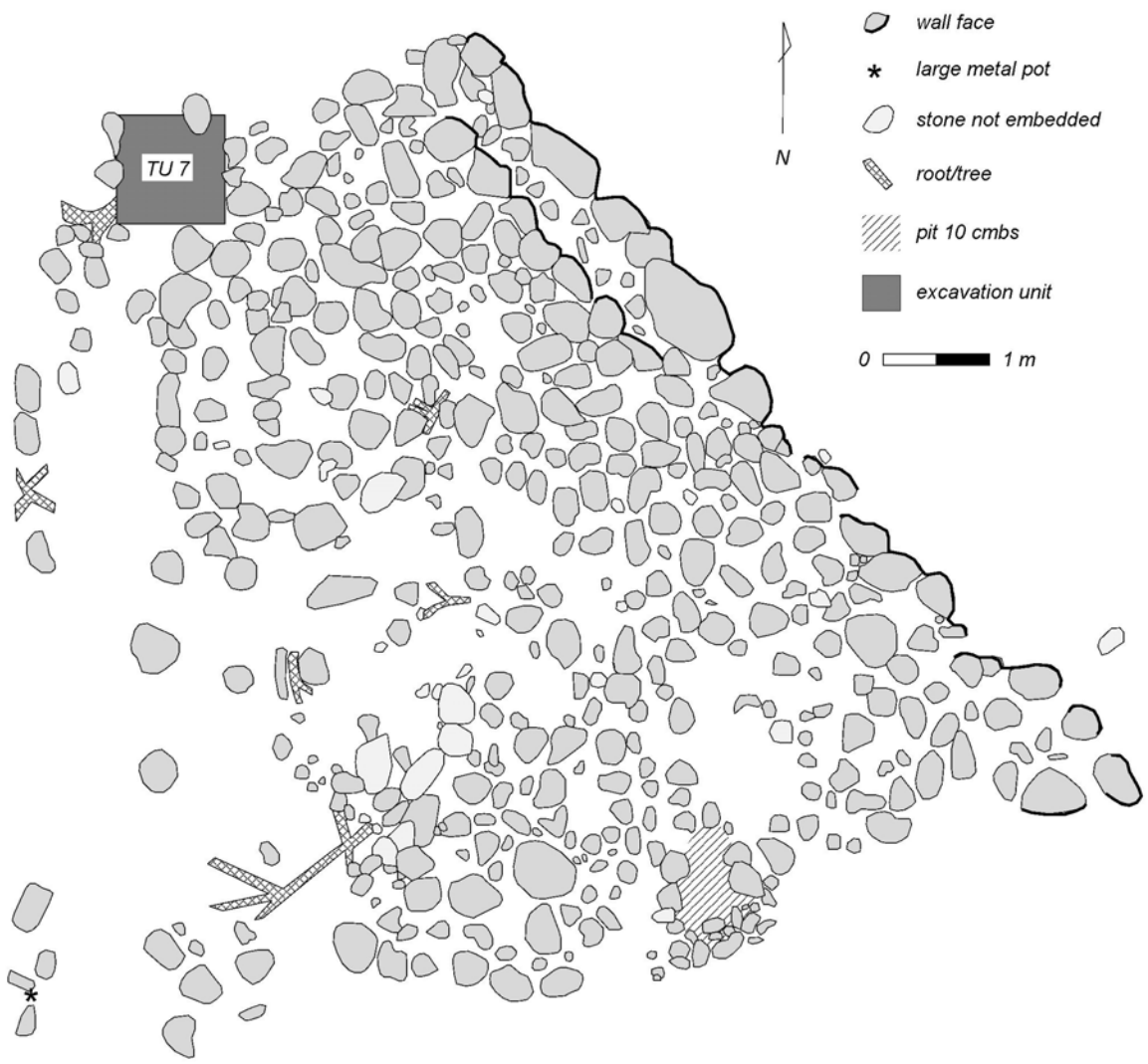

Figure 3.48: Feature M-17 plan view drawing.

Feature M-18 is located 12 m west of the west side of feature M-17. This is an eroded terrace 5.5 m long and roughly 30 cm high. It is composed of a single alignment of stones averaging 40 cm in diameter. The land on the west is relatively flat and is level with the top of the alignment. This feature is in poor condition and heavily overgrown.

Feature M-19 is a terrace located 10.2 m west of feature M-18. It is

Figure 3.49: Feature M-17, facing west.

composed of stones 30-60 cm in diameter in a single alignment 4.25 m long and 21 cm high (Figure 3.50). The north side has two displaced stones that have eroded down the gentle slope. The ground surface on the west is relatively flat and is level with the top of the alignment. This feature is in good condition.

Feature M-20 is a terrace located 5.9 m west of feature M-19. It is composed of two single stone alignments that form an *L*-shaped terrace 6.5 by 3.5 m in area. The terrace walls are composed of small to large stones embedded in alignment, with a height of 23 cm. The ground surface on top of the terrace is relatively flat and is level with the top of the alignment. This feature is in good condition. Additional terraces are likely to occur to the west, but this area was not examined, as it was outside the survey boundaries.

Features M-21 through M-29 are part of the barrage terrace system. Terraces step down the slope, crossing a secondary drainage that runs down to Wailau Stream. Land on both sides of the drainage is steeply sloping.

Figure 3.50: Feature M-19 plan view drawing.

Feature M-21 is the uppermost terrace. It measures 10 by 9 m in area. The west wall of the terrace is a 50 cm-tall cut earthen berm. The east wall is composed of 20 cm-diameter stones stacked three courses to a height of 50 cm. The north side of the terrace is eroded.

Feature M-22 steps down from M-21 on the east. This terrace is 19 m long and 11 m wide. The east wall is constructed with 20-40 cm-diameter stones stacked three courses to 65 cm tall. TR 17 was excavated along the west wall, which this terrace shares with terrace M-21.

Feature M-23 steps down from M-22 on the east. This terrace measures 16 by 13 m in area. The east wall is composed of stones averaging 30 cm in diameter, stacked six courses to 1 m tall. A square area near the southern slope has been leveled.

Feature M-24 is a terrace that steps down from M-23 on the east. It is 14 m long and 10 m wide. The south wall is made up of 30 cm-diameter stones stacked four courses to 55 cm tall. The east wall is constructed with stones averaging 30 cm in diameter, stacked three courses to 50 cm tall. TR 6 was excavated at the base of the west wall, which this terrace shares with feature M-23.

Feature M-25 steps down from M-24 on the east. This terrace measures 8 by 6 m in area. The east wall is only 3 m long, and is composed of 30 cm-diameter stones and smaller, stacked two courses to 40 cm tall. The north side is eroded.

Feature M-26 is a terrace that steps down from M-25 on the east. It is 6 m long and 5.5 m wide. The east wall is composed of stones 35 cm in diameter and smaller, stacked three courses to 60 cm tall. The north side is eroded.

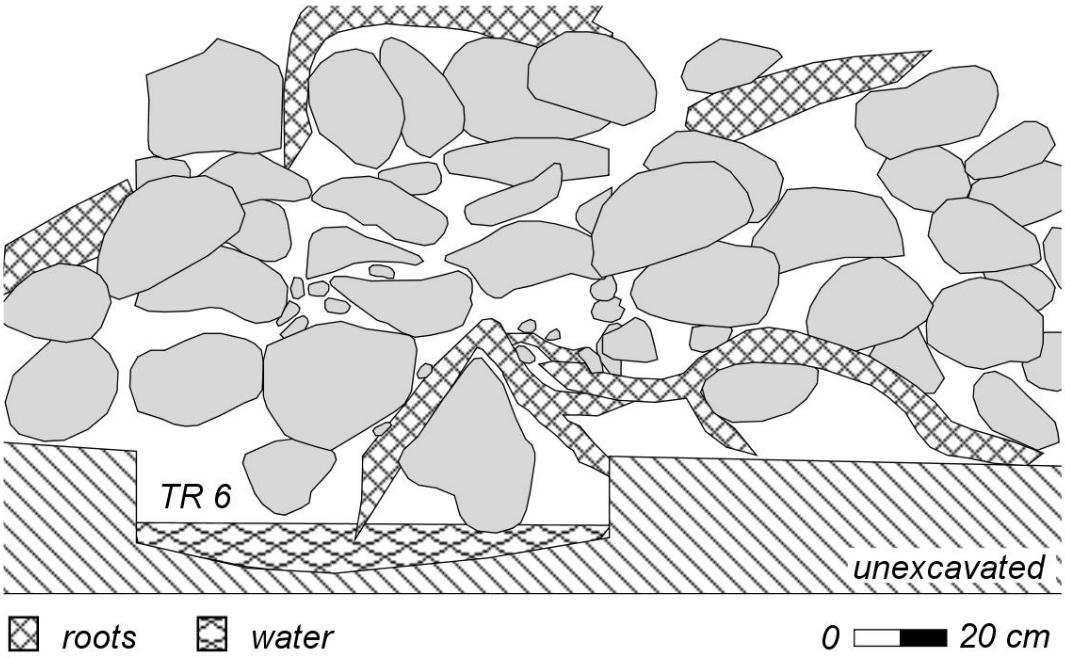

Figure 3.51: Feature M-24 portion of the west wall, west face profile near the north end of the wall.

Feature M-27 is adjacent to terrace M-26 on the south. This terrace is a 4 by 4 m leveled square. The east wall is constructed with stones 40 cm in diameter and smaller, stacked three courses to 60 cm tall.

Feature M-28 is a terrace northeast of M-26. It follows the curve in the stream, and is thus oriented roughly perpendicular to the terraces above. It measures 13 by 4 m in area. The north wall is primarily a single course alignment of stones that stands 30 cm tall.

Feature M-29 is a terrace that steps down from M-28 on the south. It is 5.5 m long and roughly 3 m wide and is composed of a single wall that curves slightly. This wall is constructed with stones 15 cm in diameter and smaller, stacked four courses to 40 cm tall. Stones in this wall are slightly smaller than those used in the construction of the other features. TR 7 was placed at the base of the wall.

Feature M-30 is an alignment that extends from the southwest corner of feature M-31, an enclosure. The alignment is 16 m long and is composed of a single course of stones that stands 30 to 40 cm tall.

Feature M-31 is an enclosure on the east side of terrace M-28. The enclosure is 6 by 5.5 m in area and is composed of two to four courses of various sized rocks, ranging from small stones to small boulders. Wall height varies from 30 cm on the west side of the enclosure to 110 cm on the south. TU 24 was placed within the enclosure, but little cultural material was found.

Feature M-32 is a stone mound located 7 m east of the M-31 enclosure. The mound is roughly circular in plan and is made up of 15 cm-diameter stones and smaller. The mound measures 1.8 m in diameter and is likely a clearing pile.

Feature M-33 is made up of a double alignment and low wall that border the cliffline on the southeast side of the survey area. The double alignment is on the west side of the wall and was probably connected to the wall before it eroded. The alignments are 3

Figure 3.52: Feature M-31 enclosure, facing northwest.

m long and 9 m long and are composed of a single course of 15 cm-diameter stones with some instances of low piling to 20 cm tall. The wall is composed of three segments that were likely part of a single feature at one time. The segments measure 8 m, 12 m, and 39 m long. The longest segment follows the contour of the slope and is composed of a single course of 30 cm-diameter stones. The 12 m-long segment exhibits some stacking, typically two to three courses stacked to 45 cm tall. The short wall segment is made up of two 25 cm-tall stone piles.

Feature M-34 is an enclosure located 13 m east of the M-32 stone mound. The enclosure measures 5 by 3 m in area. Portions are composed of a single stone alignment, while other parts exhibit two courses of stones stacked to a maximum height of 60 cm.

Feature M-35 is a stone wall just east of feature M-34. The wall is 11 m long and is composed of stones averaging 20 cm in diameter with cobbles piled on the north side to a maximum height of 35 cm.

Feature M-36 is composed of two parallel walls located 5 m southeast of feature M-35. Both walls are oriented directly north-south. The wall on the west measures 14 m long, while the one on the east is 7 m long. Both are of bi-faced core filled construction and stand 50 to 60 cm tall.

Makea Discussion

In Makea, a large *lo‘i* system was found on the flat land near Wailau Stream, and various features occur on a slope above it. Terraces of the large system extend north out of the survey boundaries, connecting with the terraces of the Coastal Central survey block in Ku‘ele to form a single large complex. Walls, alignments, enclosures, an historic house platform, and a small barrage terrace system are situated on the slope above the large *lo‘i* complex.