

## Section 6 Kōloa, Pā'ā Ahupua'a

---

### 6.1 Environmental Setting

#### 6.1.1 Natural Environment

The project area is located just over 2 miles north of the southern coast of Kaua'i in Pā'ā Ahupua'a, Kōloa District (Figure 31 and Figure 32). The project area receives approximately 60 inches of annual rainfall (Giambelluca et al. 1986). The parcel is topographically fairly flat. According to U.S. Department of Agricultural (USDA) soil survey data (Foote et al. 1972) the soils within the project area consist almost entirely of Waikomo very stony silty clay (Ws) (Figure 33). Soils of the Waikomo Series consist of "well-drained, stony and rocky soils on uplands on the island of Kaua'i...developed in material weathered from basic igneous rock, probably with a mixture of ash and alluvium in places" (Foote et al. 1972). The far eastern portion of the project area is composed of Kaena Clay (KaC), which is a deep, poorly-drained soil.

#### 6.1.2 Built Environment

The areas surrounding the project parcel consists primarily of agricultural fields and the large Waitā Reservoir just to the northwest (Figure 34). The Kōloa Mill is located about a quarter mile south of the project area, and Kaluahonu Road runs along the west boundary of the project area. Kōloa town is approximately one mile west, and Po'ipū is 2.25 miles south.

### 6.2 Traditional and Historical Background

#### 6.2.1 Historical Setting: Pre-Contact Kōloa

The project area is located in the *ahupua'a* of Pā'ā in the Kōloa district. Few records exist that document traditional Hawaiian life in Pā'ā. While settlement by westerners with religious and commercial interests make the area a focus of documentation after the first quarter of the nineteenth century, the accounts generated generally focus on the lives and concerns of the westerners themselves, with only anecdotal references to the Hawaiian population. Two nineteenth century documents (Boundary Commission Testimony of 1874 and a Lahainaluna manuscript of 1885), however, did provide two Hawaiians an opportunity to speak for themselves and thus offer insight into life in Kōloa district before the arrival of westerners.

A dispute over the northern boundary of Kōloa Ahupua'a (west of the current project area) in 1874 led to a hearing before Duncan McBryde, the Commissioner of Boundaries for Kaua'i. One native witness, Nao (who describes himself as born in Kōloa but presently living in Ha'ikū), in order to show that Hoaea (the area in dispute) was indeed at the northern boundary of Kōloa, testifies: "At Hoaea tea [sic] leaves were hung up to show that there were battles going on" (Boundary Commission, Kaua'i, vol. 1, 1874:124). That there was a traditional "warning system" --well-known to all natives--suggests that Kōloa, throughout its history, may well have been the scene of some serious conflicts--serious enough and perhaps often enough to warrant devising such a system.

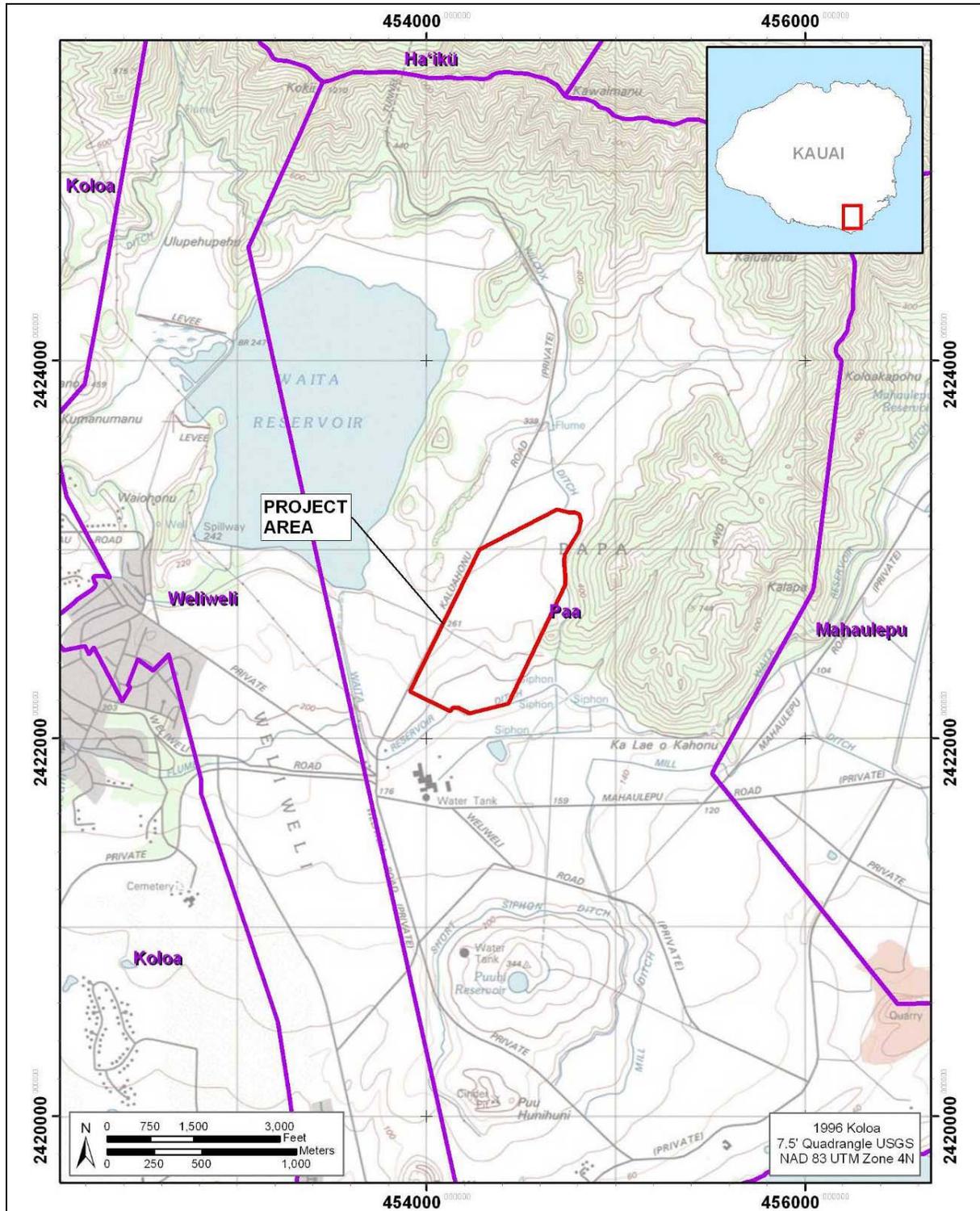


Figure 31. Portion of 1996 U.S.G.S. 7.5-minute topographic Kōloa quadrangle, showing the Kōloa project area

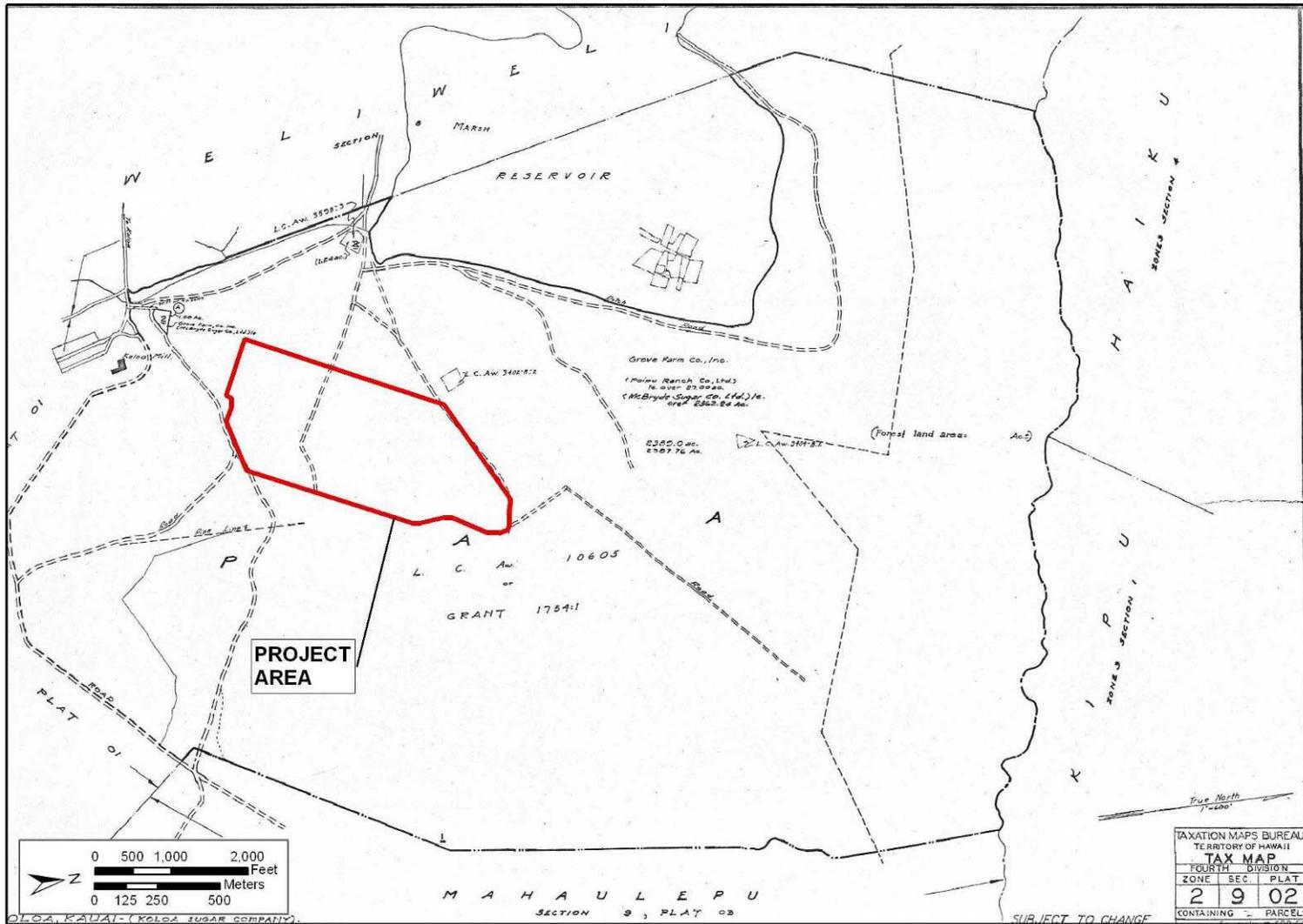


Figure 32. Tax Map (TMK) [4] 2-9-002:001 showing Kōloa project area location





Figure 34. Aerial photograph showing Kōloa project area location in red outline

Additional evidence of a rich history within Kōloa is offered in a Lahainaluna document produced eleven years later. This document appears to be based on an oral historical project. On September 7, 1885 a student from Lahainaluna Schools (HMS 43 #17) interviewed Makea – “a native who is well acquainted with Kōloa” -- and recorded “what she said about the well-known places in the olden times.” More than sixty-four years after the abolition of the *kapu* system and almost as many years of contact with westerners, Makea was able to describe in detail fourteen *heiau* within the Kōloa area; for example:

Maulili was the first *heiau* of south Kōloa. Kapulauki was the first chief of Kōloa, Kiha came next. That is the chief I know of. He was a ruling chief of Kaua'i in the olden days, when the *heiau* was standing there. It had already been built and men had been sacrificed on its altars. This Kiha was called Kiha-of-the-luxuriant-hair. Another name for him was Kakae and another was Ka-pueo-maka-walu (Right-eyed-owl).

This *heiau* was also famous for this reason -- it was the first *heiau* to which Kawelo was carried after he had swooned in Wahiwawa, in the battle where stones were used as missiles.

The location of this *heiau* was not known, but a deaf mute knew and it was he who pointed it out to the chiefs, and that is how it was rediscovered in the olden days.

Kiha lived on the eastern side of the *heiau* and Aikanaka lived on the northeastern side. This chief, Aikanaka, was the one with whom Kawelo fought and he was the owner of this *heiau* at that time.

## 6.2.2 Mythological and Traditional Accounts

Clearly the Kōloa area was particularly important in traditional Hawaiian times. That at least fourteen *heiau* – of varying sizes and functions – have been documented in the Kōloa area (Thrum 1907, Bennett 1931) and the association of legendary-historic figures such as Kawelo and Aikanaka with the *heiau*, suggests a heightened cultural richness of the *ahupua'a*. Nearby Pā'ā Ahupua'a would likely have some similarities.

Further confirmation of a rich traditional life within Kōloa is furnished by the presence of a *hōlua* slide on the slopes of Pu'u o Hewa in the *mauka* reaches of the *ahupua'a* and by the myriad of legends attached to Maulili Pool, a sacred place once located in the present Kōloa Town.

While taro would have been essential to the life of the *ahupua'a*, other resources were available. Bernice Judd, writing in 1935, summarizes most of what was known -- into the first decades of this century -- of the traditional Hawaiian life of Kōloa:

In the old days two large *'auwai* or ditches left the southern end of the Maulili pool to supply the taro patches to the east and west. On the *kuaunas* or embankments the natives grew bananas and sugar cane for convenience in irrigating. Along the coast they had fish ponds and salt pans, ruins of which are still to be seen. Their dry land farming was done on the *kula*, where they raised sweet potatoes, of which both the tubers and the leaves were good to eat. The

Hawaiians planted *pia* (arrowroot) as well as *wauke* (mulberry) in patches in the hills wherever they would grow naturally with but little cultivation. In the uplands they also gathered the leaves of the *hala* for mats and the nuts of the *kukui* for light (Judd 1935:53).

It appears that the relatively good situation for the development of irrigated agriculture focused farming and habitation at elevations including the current project area.

### 6.2.3 Early Historic Period

Early accounts by visitors and settlers in Kōloa focus on these westerners' own religious and commercial concerns and tend to focus on Kōloa town.

On December 31, 1834, Peter Gulick and his family arrived in Kōloa. Apparently the first foreigners to settle in the area, they initiated the process of rapid change that would re-shape the life of Kōloa in the nineteenth century. In 1835, a 30 by 60 ft. grass house was erected as a meeting house and school (probably located at Kōloa Town, only about a mile west of the current project area). Mr. Gulick initiated sugar cane cultivation and collected a cattle herd for the Protestant Mission. In 1837, a 45 by 90 ft. adobe church was built (probably at the same ABCFM site) and the first mission doctor, Thomas Lafon, arrived to assist Mr. Gulick (Damon 1931:179, 187). The Kōloa mission station apparently flourished immediately; Charles Wilkes, a member of the U.S. Exploring Expedition visiting Kōloa in 1840, recorded:

The population in 1840, was one thousand three hundred and forty-eight. There is a church with one hundred and twenty-six members, but no schools. The teachers set apart for this service were employed by the chiefs, who frequently make use of them to keep their accounts, gather in their taxes &c [and for similar tasks]. The population is here again increasing partly by immigration, whence it was difficult to ascertain its ratio (Wilkes 1845:64).

Other sources, however, give different population figures for Kōloa during the first half of the nineteenth century. In 1834, according to a report by missionaries on Kaua'i, the inhabitants of the *ahupua'a* numbered 2,166. An article in the *Pacific Commercial Advertiser* of December 21, 1867 estimated that the population in 1838 was about 3,000 (though, by 1867, it had been reduced to a third of that number). James Jackson Jarves, who visited Kōloa and Kaua'i for nine months during the early 1840's, recorded:

Kōloa is now a flourishing village. A number of neat cottages, prettily situated amid shrubbery have sprung up, within two years past. The population of the place, also, has been constantly increasing, by emigration from other parts of the island. It numbers, now, about two thousand people, including many foreigners, among whom are stationed a missionary preacher, and physician, with their families (Jarves 1844:100).

The arrival of "many foreigners" was the cause of, and the native immigration to Kōloa was the result of, the many commercial activities that burgeoned beginning in the 1830s. In 1835, Ladd and Company gained from the king and local chiefs the lease of about one thousand acres at Kōloa for 50 years at \$300 a year and "allowed the use of the waterfall and an adjoining mill site at Maulili pool, not far from the thousand acres, together with the right to build roads, the

privilege of unrestricted buying and selling and freedom from local harbor dues” (Judd 1935:57). Ladd and Company was not the first to mill sugar cane in the area: there was a Chinese-operated granite roller mill in operation at Māhā'ulepū, Kōloa, in 1830; it was, however, the first plantation-organized industry in Hawai'i (Damon 1931:176, 198). Judd notes the following:

The company was permitted to hire natives to work on the plantation provided they paid Kauikeaouli, the king, and Kaikio'ewa, the governor of Kaua'i, a tax for each man employed and paid the men satisfactory wages. The workers were to be exempt from all taxation except the tax paid by their employers (Judd 1935:57).

Judd further described the revolutionary implication of this arrangement: “The significance of Ladd & Co.'s lease lay in the fact that it was the first public admission by the Hawaiian chiefs that their subjects had rights of personal property backed with a guaranty of protection to that property” (Judd 1935:58). Local chiefs, fearful of an usurpation of their power, resisted the company's first efforts to recruit workers, forcing the king's intervention.

The commercial activity initiated by the Ladd and Company plantation had widespread ramifications. Kōloa Town and the landing at the mouth of Waikomo Stream became major commercial centers. The landing – or “roadstead” as it was called – was a busy port during the mid-1800s. “An estimate in 1857 stated that 10,000 barrels of sweet potatoes were grown each year at Kōloa, and that the crop furnished nearly all the potatoes sent to California from Hawai'i. Sugar and molasses were also chief articles of export” (Judd 1935: 326). Whalers also used the Kōloa roadstead during this period (1830-1870) and took on provisions of squashes, salt, salt beef, pigs, and cattle. Hawaiians grew the squashes (pumpkins) on the rocky lands north of the landing, and numerous salt pans were located along the shore near the landing.

Ladd and Company ceased operating in 1845. Then, following a succession of individual and partnered ownerships, a new enterprise, Kōloa Sugar Company, was established in 1880. In 1948, the Kōloa Sugar Company became part of Grove Farm Company.

Another missionary, Dr. James W. Smith, who was stationed at Kōloa for forty-five years, beginning in 1842, mentioned in his journal a visit to “the school at Kukui'ula.” If there was a second school in Kōloa outside the population center of Kōloa Town, Kukui'ula may have warranted the placing of a school there because of a sufficiently large population in the area.

### **6.2.4 Mid-1800s (Land Commission Awards)**

Toward the mid-19th century, the Organic Acts of 1845 and 1846 initiated the process of the Māhele – the division of Hawaiian lands – which introduced private property into Hawaiian society. In 1848 the crown, the Hawaiian government, and the *ali'i* (royalty) received their land titles. Subsequently in the Māhele, Land Commission Awards (LCAs) were given to commoners and others who could prove residency on and use of the parcels they claimed.

The Māhele records of Kōloa give a picture of what had evolved by the middle of the nineteenth century when Kōloa Ahupua'a, totaling 8,620 acres, was awarded to Moses Kekūāiwa (LCA 7714-B), the brother of Alexander Liholiho (Kamehameha IV), Lot Kapuāiwa (Kamehameha V), and Victoria Kamāmalu. The awarding of the *ahupua'a* to Kekūāiwa was an outcome of an event twenty-five years in the past: the crushing - by forces loyal to Kamehameha II - of the 1824 revolt on Kaua'i, when Kaua'i lands were divided up among the chiefs of the

other islands. The next largest award in the *ahupua'a* went to the Protestant Mission (ABCFM) (LCA 387) and consisted of approximately 825 acres. The majority of the mission lands were located in the vicinity of Kōloa Town, where the parsonage was located. Large parcels just *mauka* of Kōloa Town were utilized for sugarcane cultivation and cattle pasture.

Eighty-eight other kuleana awards were given to individuals within Kōloa Ahupua'a. The majority of these Land Commission Awards (LCAs) were located in or around Kōloa Town itself. This concentration of awards around the town area may reflect both the traditional land settlement pattern, a focus on the resources of Maulili Pool and Waikomo Stream (a permanent stream), and a more recent movement of the populace to the plantation and missionary centers.

In Pā'ā Ahupua'a, by contrast, there are only sixteen LCAs. The largest land area was claimed by *ali'i* Iona (Jonah) Piikoi, Kamakee (LCA 10605), and he claims "Paa, with its lihis and its leles, Ahupua'a at Kona, Kaua'i". Other land claims near the project area, in the *'ili* of Pula, include LCA 3402B and LCA 3404B, claimed by Abela Kulae and Kulaakamoā respectively. Abela Kulae claims land including "kula and Pahale also in the ili of Pula. A small part of the kula is planted with potatoes. The principal part is uncultivated" (Foreign Testimony Volume 13: 202). Kulaakamoā claims land that "lies in Paa and in the ili of Pula and consists of one loi ai & two lois not cultivated and house lot all forming one piece." (Foreign Testimony Volume 13: 204). These land claims can be seen on the tax maps for this area (see Figure 32).

Overall, the Māhele documents indicate that, in the vicinity of the current project area, land usage and activity by the mid-nineteenth century included habitation as well as taro, potato, and sugar cultivation. This may reflect the continuation into that century of traditional Hawaiian land use within the project area.

### 6.2.5 Late-1800s to Mid-1900s

The population of Kōloa, based on the house sites, continued to be dispersed across the Kōloa plain. A W.D. Alexander government survey map from 1878 shows the nearby swamp and cultivated lands near the current project area (Figure 35).

Kōloa later became the scene of the confrontation of the traditional social structure with commercially-impelled forces of change. The cane growing activity of Ladd and Company would inevitably affect the lives of the inhabitants of the rest of the *ahupua'a*. Traditional settlement patterns (e.g. permanent and temporary habitation interspersed throughout the irrigated agricultural fields near the coastal zone and traditional farming along streams) would have been distorted by a shift to settlement in Kōloa Town where sugar cane milling activities were located, and a shift to cash crops rather than taro.

The early success of Ladd and Company (before its bankruptcy in 1845) was an impetus for other entrepreneurial attempts within Kōloa. Silkworm farming, oil extraction from *kukui* nuts, cigar manufacturing, sago raising, and tapioca manufacturing were all attempted with varied success during the middle third of the nineteenth century.

Another major area of commercial enterprise was associated with the whaling industry at Kōloa Landing. Accounts of visitors suggest that the inhabitants of Kōloa took advantage of their nearness to the landing to participate in the booming trade of the port. An article in the *Pacific*

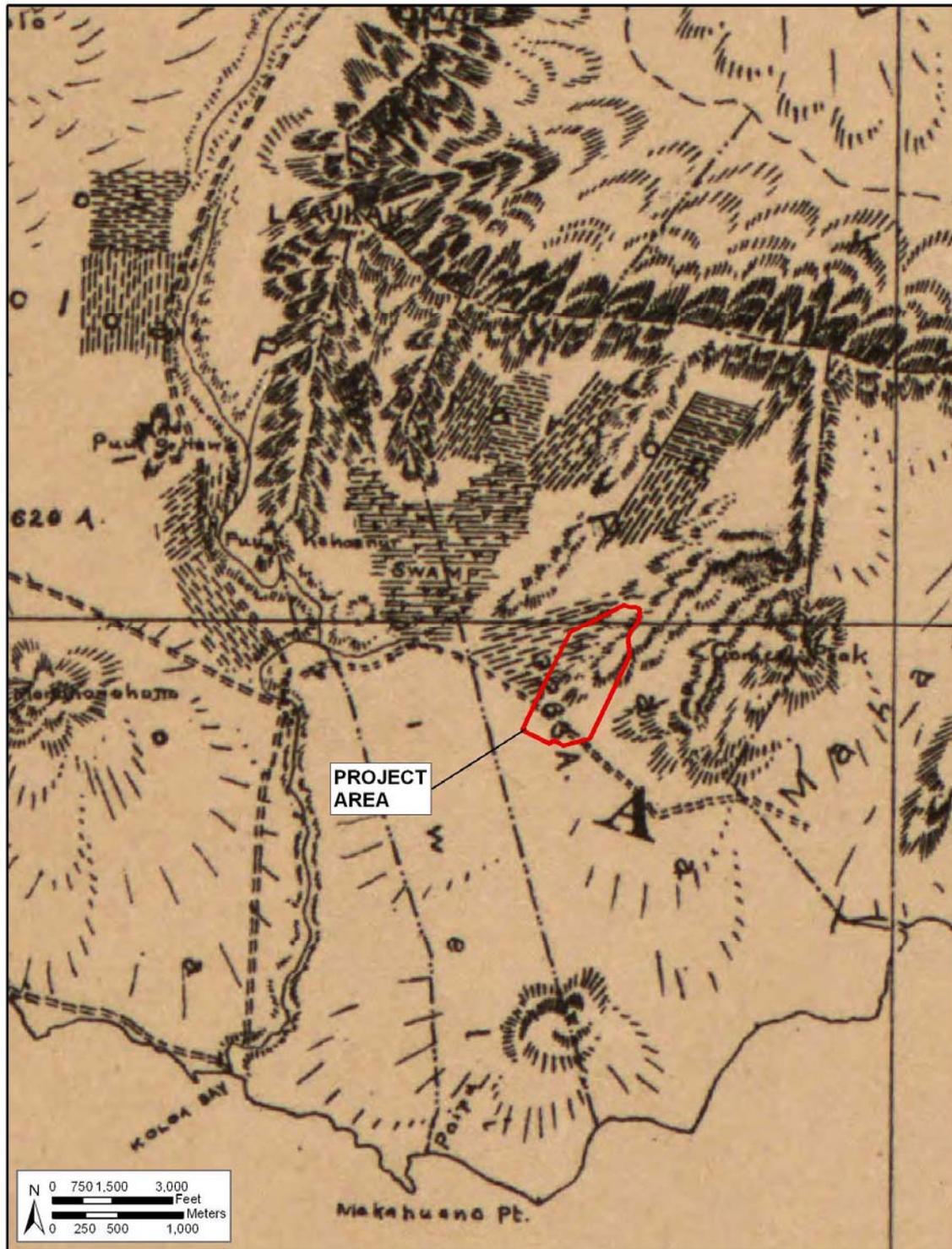


Figure 35. 1878 Government Survey map by W.D. Alexander, showing location of Kōloa project area

*Commercial Advertiser* of Feb. 19, 1857 described the salient characteristics of the port at mid-century and mentions:

From the landing there is a good carriage road to the town, distant about two miles. Large quantities of firewood, bullocks and sweet potatoes are furnished to whalers in this port, and these chattels can nowhere be procured cheaper or better. It is estimated that 10,000 barrels of sweet potatoes are cultivated annually here, which are thought to be the best on the islands. Nearly all the potatoes furnished for the California market are produced here...Sweet potatoes, sugar and molasses constitute the chief trade of the port.

Kōloa became the official port of entry for Kaua'i in the 1850s and participated in the profitable trade with the whaling industry whose peak years ran from the 1830s to the 1860s. It seems likely the demand for firewood, bullocks, sweet potatoes, sugar and molasses at Kōloa Landing was met to at least some small degree by activities in the *mauka* regions of Kōloa.

During the later decades of the nineteenth century the Knudsen family would enter into the Kōloa historical record. As Donald Donohugh (2001:191) notes:

Valdemar Knudsen came to Kaua'i from Norway by way of California in 1852, built a home in Kekaha, which he named 'Wai'awa' (bitter water), and started a cattle ranch there. In 1865 he married Anne Sinclair, daughter of Eliza Sinclair, who owned the island of Ni'ihau and the *ahupua'a* of Makaweli (fearful features). Eliza bought most of the Kōloa *ahupua'a* in 1870 and gave it to Anne that year as a dowry. When Valdemar died, Anne set up a trust and through it leased her land first to Kōloa Plantation, then to Grove Farm, and finally to McBryde. Anne died in 1920, and Knudsen descendants formed trusts in their own names. First Hawaiian Bank manages the activities of all of them. Rather than speaking of several trusts, it is customary to use the generic term Knudsen Trust, as we will here.

Sugarcane cultivation in Kōloa expanded in the 1890s with the forming of McBryde Sugar Company. Benjamin F. Dillingham incorporated "three estates, namely Kōloa Agricultural Co. (no connection with Kōloa Sugar Co.), 'Ele'ele Plantation, and Wahiawa Ranch" (Conde and Best 1973:191). Theo H. Davies was the acting agent until 1901 when Alexander and Baldwin took over agency control.

Expansion of cane fields and plantation rail lines was rapid. By 1903, McBryde had completed rail lines to its Kōloa fields and Kōloa Landing. The manager's report of 1904 notes: "Our permanent railroad had been graded into Kōloa Village...A span has also been run down from the main track to the coral sand beach between Kukuiula and Kōloa landing, so that we are able to load sand as required from fertilizer and other uses..." (Conde and Best 1973:191). By the first decades of the twentieth century, cane fields of the Kōloa Sugar Company and McBryde Sugar Company spanned the landscape of Kōloa.

Kōloa Landing was phased out around 1925 when McBryde Sugar Company and Kōloa Sugar Company began using Port Allen. Soon after, McBryde ceased to use several of the Kōloa fields.

The 1910 USGS map (Figure 36) shows the expansion of Kōloa town and the railroad network for sugarcane in place, but the Kōloa Mill is not yet present.

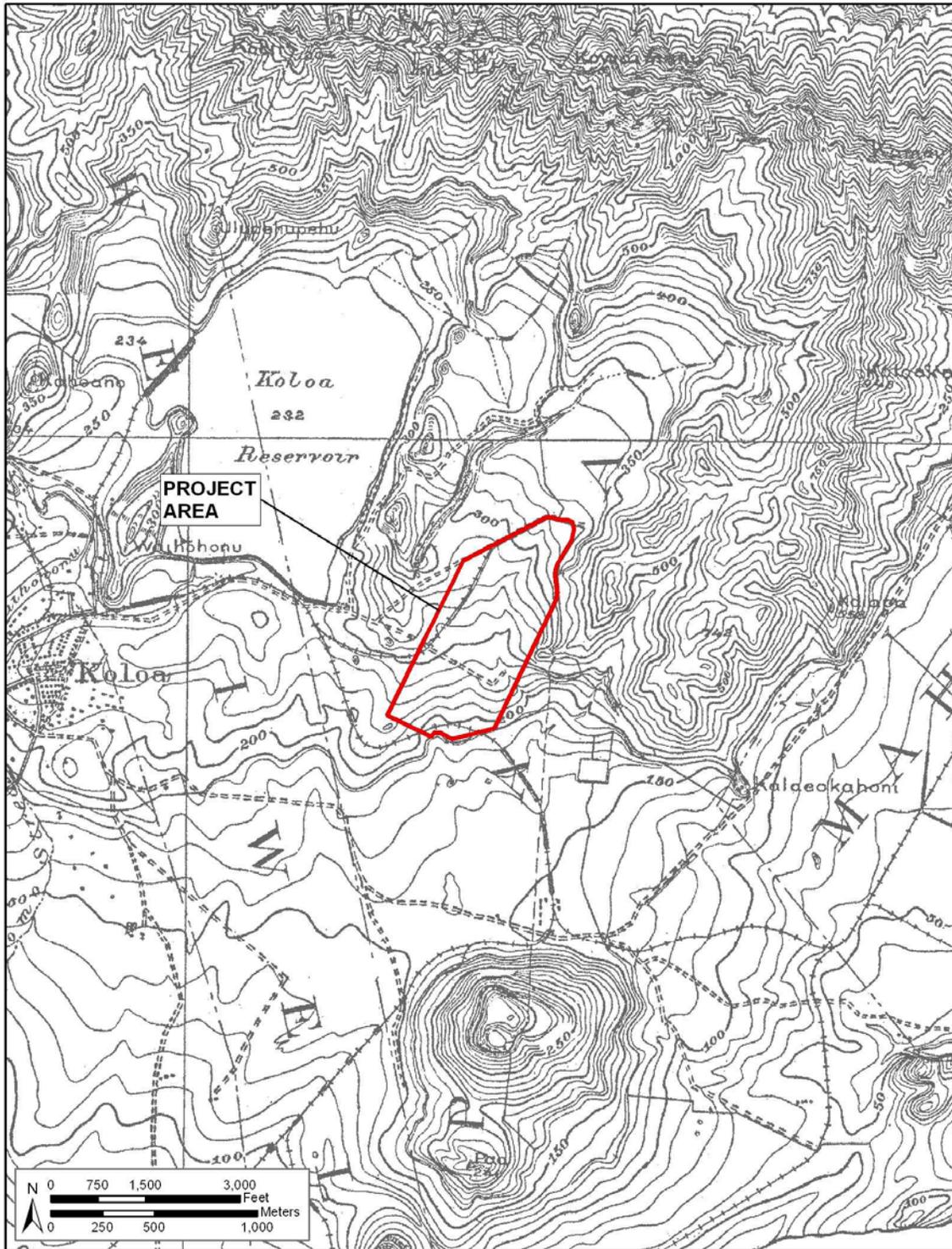


Figure 36. 1910 U.S.G.S. Topographic Map, Kōloa Quadrangle, showing the location of the project area

### 6.2.6 Modern Land Use

Following the merger of the plantation lands of the Kōloa Sugar Company and Grove Farm Company in 1948, the combined lands under cultivation required new sources of irrigation water. In 1965, Grove Farm built a tunnel to bring the waters from Ku'ia directly into the Waitā (Kōloa) Reservoir. Grove Farm leased these cane lands to McBryde Sugar Company when it terminated sugar operations in 1974 (Wilcox 1996).

By the late 1960's, the main town of Kōloa experienced a type of reverse migration back to the shoreline (Figure 37). Although the town had established a Civic Center in 1977, the pace of tourist-driven development at the shoreline had been drawing construction and service jobs away from the town center. In 1962, the Wai'ohai Resort opened, with the Sheraton Kaua'i Resort following in 1965. The Kīahuna Plantation Resort opened in 1967, followed by the construction of various condominiums throughout the 70's and 80's. Finally, the Hyatt Regency Resort, with its' expansive golf course, opened in 1991.

By this time, the tourist industry had successfully attached the name "Po'ipū Beach" to the entire coastline beginning just west of the subject parcel at Kōloa Landing, and continuing east to Makahū'ena Ledge. With the development of the Po'ipū Bay Resort Golf Course and the Hyatt Regency Kaua'i Resort Hotel, the Po'ipū Beach name became synonymous with all two miles of coastline fronting the Wai'ohai, Kiahuna, and Sheraton developments; ending at Po'ipū Beach Park (Donohugh 2001).

By 1985, annual "Plantation Days" festivals were held in the open field adjacent to the former site of the 1841 sugar mill in Kōloa town. The Kōloa Mill in Pā'ā was finally closed in 1996, and remains a landmark of countryside as one makes the drive to Po'ipū. Future plans within the Kōloa district will place more demands on beachfront properties along the Lāwa'i and Po'ipū coastline. Over 1,000 acres of former McBryde Sugar Company lands are slated for hotel and condominium development surrounding both coastal resort areas (Donohugh 2001). Future development plans for the upland areas involve both large tracts of lands, as well as regional redevelopment within Kōloa town itself.

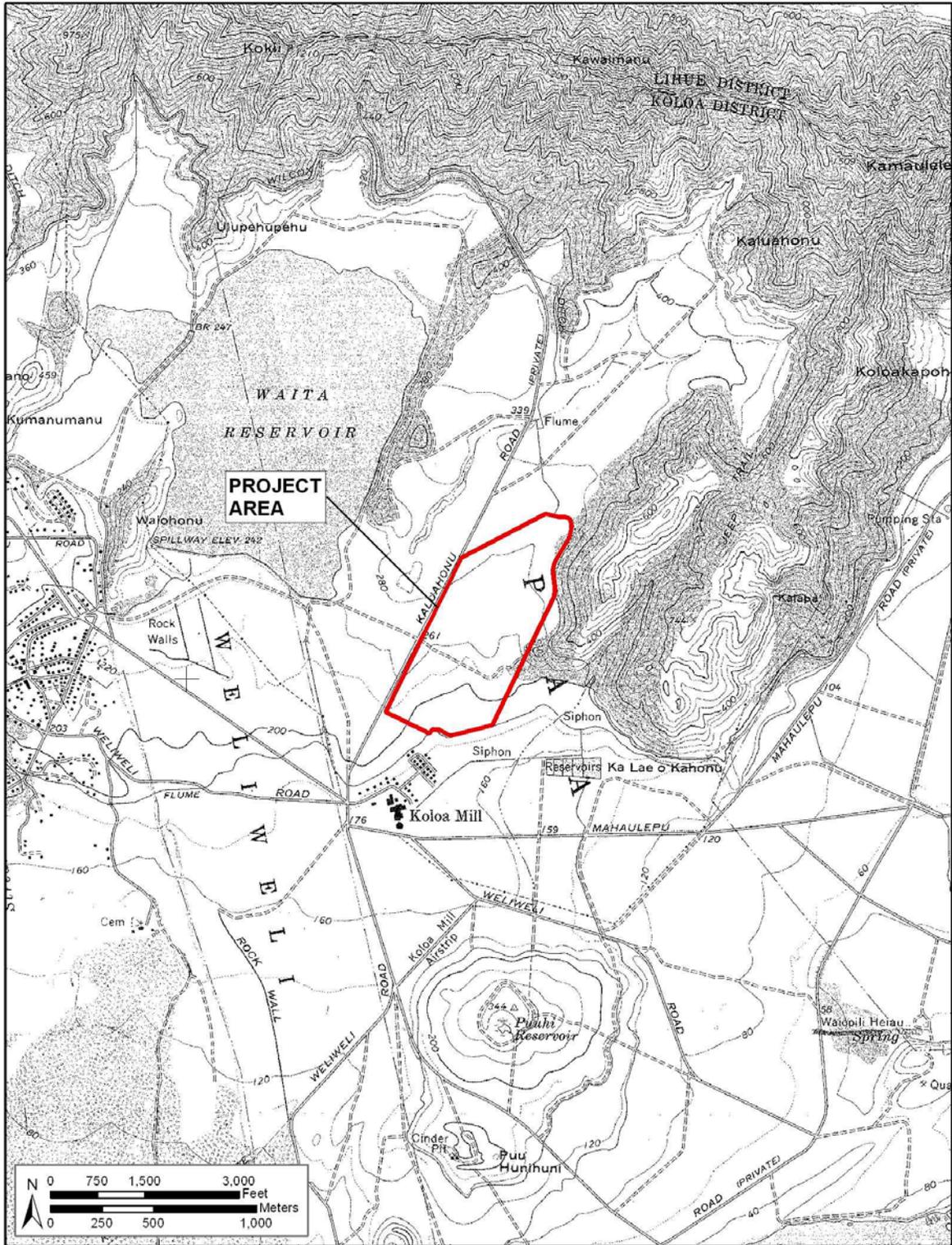


Figure 37. 1963 U.S.G.S. Topographic Map, Kōloa Quadrangle, showing the location of the project area and the Kōloa Mill

## 6.3 Previous Archaeological Research

### 6.3.1 Early Archaeological Studies

Thomas Thrum was the first to discuss sites in the Kōloa area in his list of the *heiau* of Kaua'i (Thrum 1907). He discussed six *heiau* in the district of Kōloa, which once extended from Hanapēpē to Māhā'ulepū. The *heiau* were Hanakalauae, Kanehaule (inland Kōloa Ahupua'a), Kihouna (Kōloa Ahupua'a), Kaneiolouma (Kōloa Ahupua'a), Weliweli (Weliweli Ahupua'a), and Waiopili (Māhā'ulepū Ahupua'a). The two *heiau* on the Kōloa coast, Kaneiolouma and Kihouna, were described as: "Near the Po'ipū beach, at Kōloa, are two walled *heiaus* but a short distance apart." (Thrum 1907:36-37:68).

The earliest systematic archaeological survey on the Island of Kaua'i was conducted by Wendell Bennett in the late 1920s. Bennett examined and recorded 202 sites on the island. According to his site location map (Bennett 1931:98), Sites 74 to 81, 85-86, and 91-92 are within or in the vicinity of Kōloa Ahupua'a.

Selected Archaeological Sites Located by Bennett (1931:117-122) near Pā'ā:

- Site 76. Salt pans, east of Waikomo stream along the shore.
- Site 77. Ponds, just inland from the shore road at the east side of the Weliweli, Kōloa.
- Site 78. Taro terraces and house sites, just east of Site 77 and adjoining it.
- Site 79. Walled inclosure [*sic*] and house sites, just northeast of Site 78, Kōloa.
- Site 80. Kihouna heiau, at Kihouna point, Poipu, Kōloa.
- Site 81. Kaneiolouma heiau, on the shore a short distance east of Site 80.
- Site 82. Dune burials in sand dunes along the shore at Paa, Koloa, east of Makahuena Point..reported as an old battlefield but the number of children's and women's skulls would indicate that it was just a common burial ground.
- Site 83. Weliweli heiau, on the shore in weliweli section, koloa
- Site 84. Petroglyphs at Keonelo Beach
- Site 85. Walls, inclosures[*sic*], house sites, in the cactus-covered country around the Kōloa reservoir and extending to the sea.
- Site 86. House site, in the area described in Site 85.
- Site 87. Waiopili heiau, in Mahulepu section
- Site 88. House sites, at Mahaulepu, Koloa
- Site 89. House sites, at Mahaulepu
- Site 91. Holua slide, on the hill named Puu o Hewa just above Kōloa off the main road.
- Site 92. Kanehaule heiau, at Kaunuieie, Kōloa.

Especially of note are Sites 85 and 86, which are near the current project area (Figure 38). The presence of these enclosures and house sites are not surprising given the pattern of Land Commission Awards discussed above, where a few *kuleana* claims indicate houses and *kula* or *lo'i* plots. The description of these sites seems to correlate well with the archaeological findings *makai* of the current project area (summarized below).

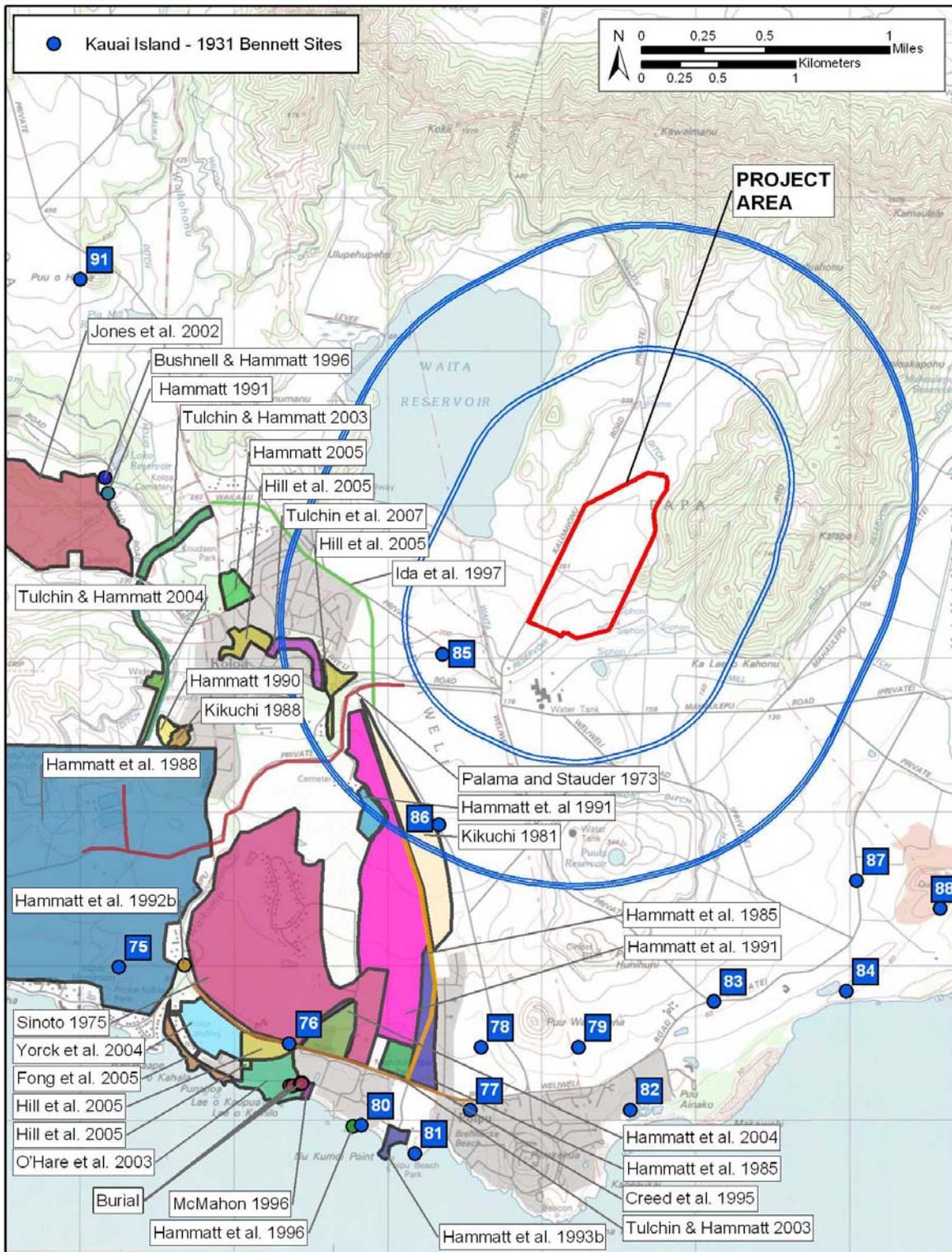


Figure 38. Previous archaeological studies in the vicinity of the Pā'ā project area

### 6.3.2 More Recent Archaeological Studies in the Vicinity of the Pā'ā Project Area

Table 6 summarizes the more recent previous archaeological studies conducted in the vicinity of the project area. The majority of these studies focus on Kōloa town and vicinity, to the west of the project area, and are primarily within Kōloa Ahupua'a. Archaeological studies within Pā'ā Ahupua'a have focused almost exclusively on the *makai* portion, with the development of the Keonelo Bay and Po'ipū town. Given that this shoreline development is over two miles from the project area, such coastal finds are of little concern for the current study. The archaeological work done in Kōloa is of higher interest since it is at a similar elevation and environmental context. Figure 38 illustrates areas of previous archaeological studies in Kōloa in relation to the current project area. Descriptions of individual project areas of interest follow.

Table 6. Previous Archaeological Studies near the Kōloa project area

Reference	Location	Study Type	Findings
Palama & Stauder 1973*	Cane Haul Road-Kōloa Mill	Reconnaissance Survey	18 sites identified. Of note was an extensive 'auwai system located along both side of Waikomo Stream.
Sinoto 1975	Knudsen Trust Lands	Reconnaissance Survey	Re-identification of Bennett's Sites 78, 79, 85, & 86.
Kikuchi 1981*	Weliweli Tract	Reconnaissance Survey	Findings included the railroad causeway, which "historically connected the Kōloa Sugar Mill to Kōloa Landing" (Kikuchi 1981:2), 'auwai, walls, terraces, alignments, and habitation sites.
Kikuchi 1988	Pa'anau Sugar Camp	Reconnaissance Survey	Remnants of an early (1910-1950) plantation camp observed : cement foundations, ditches, and portable historic artifacts
Hammatt et al. 1988	Kukui'ula Bay Planned Community	Inventory Survey	Fifty-eight archaeological sites were recorded; many associated with the Kōloa Field System. Two to three heiau were found, possibly including the remains of Kamaloula Heiau.
Hammatt 1990	Pa'anau Housing Project	Inventory Survey	No historic properties observed.
Hammatt, et al. 1991*	Po'ipulani Golf Course	Inventory Survey	75 sites identified including: traditional 'auwai and associated <i>kula</i> and <i>lo'i</i> features consistent with the Kōloa Field System.
Bushnell and Hammatt 1996	'Ōma'ō Bridge, 'Ōma'ō Homestead	Inventory Survey	Only bridge and railroad remnants
Ida et al.	Po'ipū Bypass	Inventory Survey	No historic properties observed.

Reference	Location	Study Type	Findings
1997*	Road		
Jones et al. 2002	260-Acre Parcel on Po'ele'ele Stream, 'Ōma'ō, Kōloa	Inventory Survey	Two historic sites found, primarily agricultural features
Tulchin & Hammatt 2003	Northern Leg of the Western Bypass Road	Inventory Survey	No historic properties observed.
Tulchin & Hammatt 2004	Western Bypass Road project	Inventory Survey	One irrigation ditch observed
Tulchin & Hammatt 2005	2.8-Acre Knudsen Trust Parcel	Inventory Survey	Three historic properties, comprised of six component features, were identified within the project area. State Inventory of Historic Properties (SIHP) No. 50-30-10-3923 Features A-C (series of stone walls), 50-30-10-3924 (platform), and 50-30-10-3925 Features A and B (agricultural planting areas).
Hill et al. 2005*	8.633-Acre Parcel of Knudsen Trust Lands in Kōloa	Inventory Survey	Two previously-noted habitation sites relocated, tested and recorded. A third site, related to the construction of the railroad berm, was recorded.
Tulchin et al. 2007*	10-Acre Knudsen Trust Parcel	Inventory Survey	Found one site, a historic wall

\*Indicates archaeological studies within one mile of the project area

Stephen Palama and Catherine Stauder (1973) conducted a reconnaissance survey along the route of the then-proposed main cane haul road to the Kōloa mill site. The proposed new section of road extended from Weliweli Road, southwestward across Po'ipū Road, connecting to an existing cane haul road. A total of 18 sites were recorded along the road corridor. An extensive 'auwai system was observed east of Po'ipū Road. The following comments on this system and the sites in general are relevant to understanding the archaeological significance of the area as a whole, and the historic processes at work:

Our reconnaissance revealed that the most significant archaeological feature located within the study area is the extensive 'auwai system. Remnants of this irrigation system were observed on both sides of the Waikomo Stream...[This] network of watering canals proved to be the key to the success of the prehistoric Hawaiian Culture in turning these marginal lands into flourishing wet and dry agricultural fields. From information gathered from local informants and preliminary historical investigation of this area it is evident that the early commercial growers of sugar cane utilized the existing 'auwai system. Gradually as more and more fields came under sugar cane production these replaced the wet and dry fields of an earlier day. Today the archaeological sites remaining stand as

islands as these marginal cane lands were taken out of production and turned into pasture (Palama & Strauder:4).

Hallett Hammatt, Richard Bordner, and Myra Tomonari Tuggle (Hammatt et al. 1978) as part of Archaeological Research Center of Hawaii (ARCH), reported on a general survey of 460 acres for the then-proposed Kīahuna Golf Village, located on the east side of Waikomo Stream and Po'ipū Road. The Kīahuna survey recorded 583 archaeological sites including 175 stone enclosures and 108 stone house platforms, some of which appeared as clusters of family compounds. The water channels (*'auwai*), ponded fields, terraced plots, and mounded fields all indicated extensive wet and dry land agriculture (Hammatt et al. 1978:5). The water source for this highly integrated agricultural system, called the Kīahuna Complex, was Waikomo Stream, which was tapped upstream. Additional sites included 10 occupation caves and a *heiau*.

William Kikuchi (1981) conducted a reconnaissance survey of Weliweli Tract (TMK 2-8-22-06) in the *ahupua'a* of Weliweli, abutting the *ahupua'a* of Kōloa. The survey included the railroad causeway, which "historically connected the Kōloa Sugar Mill to Kōloa Landing" (Kikuchi 1981:2), *'auwai*, walls, terraces, alignments, and habitation sites. Kikuchi states that "the sites...were probably an extension of the vast, prehistoric habitation and agricultural sites of the adjacent Kīahuna (see Hammatt, Bordner & Tomonari-Tuggle, 1978) property" (1981:17)

Hammatt et al. (1991) conducted an archaeological inventory survey of the proposed Poipulani Golf Course and Residential Development. The project area consisted of 160 acres in eastern Kōloa along the boundary of Kōloa and Weliweli Ahupua'a. A total of 75 archaeological sites were documented throughout the project area. It was noted that despite historic modification of the landscape by commercial sugar cultivation and cattle ranching, "significant remnants of a once continuous prehistoric habitation/agricultural complex remain on the property" (Hammatt et al. 1991:i). The habitation and agricultural complex contained features typical of the Kōloa Field System, including platforms, c-shapes, walls, enclosures, *'auwai*, terraces, and mounds. 8 potential burial sites, including two lava tubes possibly containing human burials, were also located.

Gerald Ida, Victoria Creed and Hallett H. Hammatt (1997) conducted a reconnaissance survey on a 1.2 mile corridor of a proposed bypass road within the *ahupua'a* of Kōloa and Weliweli (TMK 2-8-02:3, 2-8-03:1, 2-8-04:1, 2-8-05:2) that had previously been bulldozed. This road extended from an existing bypass road at the coast to north of Kōloa town. This survey did not reveal any archaeological sites, and further study was not recommended.

Tulchin and Hammatt (2005) conducted an archaeological inventory survey of an approximately 2.8-Acre Knudsen Trust parcel located adjacent to Hapa Rd., approximately 0.6 mi (1 km) southeast of Kōloa Town. Three historic properties, comprised of six component features, were identified within the project area: State Inventory of Historic Properties (SIHP) No. 50-30-10-3923 Features A-C (series of stone walls), 50-30-10-3924 (platform), and 50-30-10-3925 Features A and B (agricultural planting areas).

Hill et al. (2005) conducted an archaeological inventory survey of an approximately 8-Acre Knudsen Trust parcel located adjacent to Hapa and Weliweli Roads. One historic property was identified during the inventory survey, SIHP No. 50-30-10-3926, a previously identified plantation-era elevated metal irrigation flume, which was constructed in 1902 by the Kōloa Sugar Company.

Tulchin et al. (2007) conducted an archaeological inventory survey of an approximately 10-Acre Knudsen Trust parcel. They located one site, a historic wall.

### 6.3.3 Background Summary and Predictive Model

From previous archaeological studies and historic accounts it appears that habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. As an extensive irrigated complex, the Kōloa Field System was used to divert the waters of the Waikomo Stream for taro, native sugar, and fish. As the Judd (1935) account asserts, it is likely that low inland areas were used for less intensive cultivation of patches of sweet potato, *pia*, (arrowroot) and *wauke* (paper mulberry) and the gathering of *hala*, (pandanus fiber) *kukui* nuts (oils having medicinal applications) and other resources. The coastal portion of the *ahupua'a* would be a focus for permanent habitation, collection of marine resources, ceremonial activities, and burials. The archaeology of the region also seems to bear out the accuracy of Judd's account.

Initial occupation at Kōloa probably was characterized by temporary and/or recurrent occupation. From A.D. 600-1400, settlements in the Kōloa area were still limited to the coast. By A.D. 1040, lava tubes were used for burial and temporary habitation in the inland areas of Kōloa (Hammatt et al. 1999:7).

In the early historic era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges and other items are noted in many ship journals. The documents of the Great Māhele show that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims – for both *lo'i* (wetland) and *kula* (dryland) suggest that while traditional farming of taro for subsistence was still taking place, in *kula* lands – sugar cane production for sale to the nearby sugar mill, had begun to dominate the landscape. Of the LCAs within Kōloa, several claim a *kula* planted with cane or a cane field or sugar cane garden. Several also identify cane lands as boundaries for the LCAs. Clearly, *kula* lands were being converted into sugar lands at an increasing rate. Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane and only the most rocky areas, unsuitable for cultivation, survived the dramatic changes in the landscape brought about during the early 20th century.

Historic documentation indicated the current project area was within about a mile of the eastern extent of the ancient, heavily modified landscape known as the Kōloa Field System. Testimony to the Land Commission associated with land claims for parcels adjacent to the project area indicated land use in the vicinity included *lo'i* (wetland taro cultivation), *kula* (sugar cultivation and pasture) lands as well as house lots. Remnants of this traditional agriculture and habitation, including agricultural planting areas, walls, *'auwai*, and house platforms, could be present within the project area. However, the likelihood of surface sites remaining within the project area is fairly low, due to being impacted by historic and modern agriculture.

## 6.4 Assessment

### 6.4.1 Historic Properties within the Kōloa project area

There are no known archaeological sites in the proposed Kōloa location. However, this is complicated by the fact that no archaeological studies have been done within the project area. The aerial map (see Figure 34) shows that the surrounding area has largely been converted to agricultural fields (most likely sugar cane), and this activity has likely impacted any archaeological remains that may have existed within the project area.

### 6.4.2 Historic Properties within one mile of the Kōloa project area

Six archaeological studies have been conducted within one mile of the Kōloa location (see Table 6). None of the archaeological studies are within 0.5 miles of the project area. The three *mauka* studies – Ida et al. (1997), Hill et al. (2005) and Tulchin et al. (2007) – found a total of only two sites, a plantation-era elevated metal irrigation flume and a historic wall. The three studies slightly *makai* of the project area – Palama and Stauder (1973), Kikuchi (1981) and Hammatt et al. (1991) – found extensive *'auwai* systems, walls, terraces, alignments, mounds, potential burial sites and habitation sites. Hammatt et al. (1991) notes that the extensive Kīahuna complex has survived despite historic modification of the landscape by commercial sugar cultivation and cattle ranching, and Kikuchi (1981) recorded fairly well intact portions of the Kōloa Field System.

Despite the fairly extensive finds of some archaeological studies within one mile of the project area, the current project area is unlikely to have similar intact remains. The *mauka* studies discussed above have considerably fewer archaeological finds than the more *makai* studies, and the project area is further *mauka* than any of the six nearby studies. Following the pattern of the three higher upland studies, there may be sparse archaeological remains related to historic agriculture, but it is unlikely that any pre-contact surface or sub-surface sites are still present.

### 6.4.3 Summary

The project area contains no known historic properties and, although no archaeological inventory survey has been done within the parcel, there is low probability of finding sites within the project area. While there are some archaeological sites within one mile of the project area, the density of sites that have survived the sugarcane industry appears to decrease upslope in the near vicinity of the project area. Given the distance and location of the known sites within the vicinity, our assessment does not indicate that any historic properties would be impacted by development of the parcel, and therefore no mitigation measures for known historic properties are currently deemed necessary. There is some likelihood of historic features (such as those related to agriculture) being present in the project area, and a possibility – albeit rather low – that pre-sugarcane industry house sites or agricultural plots have survived on the property.