

FINAL—Archaeological Assessment for Girl Scout Camp Improvements, Paumalū Ahupua‘a, Ko‘olaupua District, Island of O‘ahu, Hawai‘i

TMK: (1) 5-9-006:012 (por.)



Prepared For:

Girl Scouts of Hawai‘i
410 Atkinson Drive, Suite 2E1, Box 3
Honolulu, HI 96814



August 2018

Keala Pono 

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MANAGEMENT SUMMARY

An archaeological inventory survey was conducted for the Paumalū Girl Scout Camp at TMK: (1) 5-9-006:012 (por.) in Paumalū Ahupua‘a, Ko‘olaupua District, on the island of O‘ahu, in anticipation of improvements to the camp. The archaeological work included a pedestrian survey that covered 100% of the project area, as well as test excavations consisting of 13 trenches. Pedestrian survey and subsurface testing yielded no archaeological resources. Four historic buildings were identified, and a historic architecture reconnaissance level survey (RLS) has been prepared for the structures. Stratigraphy consisted of natural deposits, often with an upper road or topsoil layer. Because of the lack of findings, archaeological monitoring is not recommended.

CONTENTS

MANAGEMENT SUMMARY	i
FIGURES	iii
TABLES	iv
INTRODUCTION	1
Project Location and Description	1
Physical Environment.....	5
Climate and Rainfall	5
Geology and Soils.....	9
Vegetation.....	9
Relict Kukui (<i>Aleurites moluccana</i>) and Kī (<i>Cordyline</i> spp.) Groves	11
Recovery of Archaeobotanical Specimens from Paumalū.....	11
Culturally Relevant Hawaiian Concepts for Lands, Forests, Drainages, and Uplands	12
LITERATURE REVIEW.....	19
Historical Resources.....	19
Hawaiian Concepts Regarding Land Divisions and Land Use	19
Historical Maps.....	20
Place Names	32
Mo‘olelo of Paumalū	40
Historic Events and Land Use	43
Māhele Records	43
Post-Māhele History	44
Previous Archaeology.....	48
Kahakai (Coastal) Sites.....	48
Kula (Slope) and Kualapa (Ridge) Sites.....	68
Settlement Patterns	74
Historic Architecture and Buildings	78
Summary of Background Information.....	78
Anticipated Finds and Research Questions	82
METHODS.....	83
RESULTS.....	84
Community Consultation.....	84
Pedestrian Survey	84
Subsurface Testing	84
Summary of Findings	89
CONCLUSION AND RECOMMENDATIONS	94
GLOSSARY	95
REFERENCES	100
APPENDIX: HISTORIC ARCHITECTURE RLS, CAMP PAUMALŪ	108

FIGURES

Figure 1. Moku of Ko‘olauloa and neighboring Waialua with ahupua‘a identified	2
Figure 2. Location of the project area on 7.5 minute 1998 USGS quadrangle maps.	3
Figure 3. Location of the project area on TMK Plat (1) 5-9-06.	4
Figure 4. Location of Camp Paumalū existing conditions.	6
Figure 5. Stream flow records from Paumalū Stream	7
Figure 6. Section of topographic map showing perennial stream flow	8
Figure 7. Map of modeled locations for irrigated agriculture on O‘ah).	8
Figure 8. Major soil classes within and near the vicinity of the project area	10
Figure 9. Google Earth image of relict stands of kukui	13
Figure 10. Kī growing at Makaha Camp in the Paumalū Girl Scout Camp.	14
Figure 11. Palapala‘ā (<i>Sphenomeris chinensis</i>) near Kani Kapila Unit 2.....	14
Figure 12. Map of O‘ahu, part of a larger map of the Hawaiian Islands.....	23
Figure 13. Historic Register Map No. 97, earliest historical map of Paumalū.....	24
Figure 14. Historic Register Map No. 320, Kawaihoa, Pūpūkea, and Paumalū.....	25
Figure 15. Portion of Historic Register Map No. 2374	26
Figure 16. Historic Register Map No. 1560, Figure 16 is southwest of Figure 17.....	27
Figure 17. Historic Register Map No. 1560, Figure 16 is southwest of Figure 17.....	28
Figure 18. Historic Register Map No. 2146	29
Figure 19. Portion of Historic Register Map No. 2252	30
Figure 20. Portion of Waimea map showing topography and place names	31
Figure 21. Plat Map No. 2036, Pūpūkea and Paumalū Ahupua‘a	33
Figure 22. Portion of a topographic map showing trails	34
Figure 23. Google Earth image of upper Paumalū, showing roadway.....	41
Figure 24. Homestead beach lots awarded in Paumalū in 1913–1919.....	49
Figure 25. Location of previous archaeological studies in Paumalū and nearby areas	50
Figure 26. Archaeological sites closest to the project area on USGS quadrangle maps.	65
Figure 27. Mayberry and Haun (1988:16) project area showing Tr-10/T-15 and T-17	69
Figure 28. Cross-section of subsurface channel or irrigation ditch dug into bedrock.....	70
Figure 29. Archaeological study area conducted by Mayberry and Haun (1988:16).....	71
Figure 30. Plan view map of talus slope garden and habitation complex, Site 3826	72
Figure 31. Historic roadway in Paumalū Gulch	74
Figure 32. Current condition of the Health Center at Camp Paumalū.	79
Figure 33. Current condition of the Health Center showing exterior stone masonry.....	79
Figure 34. Current condition of the back exterior wall of Hale Hui Lodge	80
Figure 35. Current condition of the Hale Hui Lodge interior.....	80
Figure 36. Current condition of the Makaha Lodge and canvas tent	81
Figure 37. Current condition of the Makaha Lodge cabins.....	81
Figure 38. Excavation of TR 13 with mini excavator.	83
Figure 39. Location of trenches on aerial imagery.....	85
Figure 40. Wider view of trench locations on 1998 USGS quadrangles.....	86
Figure 41. TR 11 south face profile drawing.	89
Figure 42. TR 11 south face photo.....	89
Figure 43. TR 7 southwest face profile drawing.	90

Figures

Figure 44. TR 7 southwest face photo.....	90
Figure 45. TR 5 northeast face profile drawing.....	91
Figure 46. TR 5 northeast face photo.	91
Figure 47. TR 1 east face profile drawing.....	92
Figure 48. TR 1 east face photo.....	92
Figure 49. TR 2 southeast face profile drawing.	93
Figure 50. TR 2 southeast face photo.....	93

TABLES

Table 1. List of Rare or Endangered Plants Documented Near Paumalū.....	12
Table 2. Listing of Woody Taxa Present in Archaeological Contexts from Paumalū.....	15
Table 3. Hawaiian Terms and Their Descriptions for Landscape Zones.....	18
Table 4. Listing of Historical Maps Referenced Pertaining to O‘ahu and Paumalū.....	22
Table 5. Place Names for Paumalū Ahupua‘a and Neighboring Landmarks	35
Table 6. Māhele Land Claims and Awards for Paumalū Ahupua‘a	45
Table 7. Listing of Previous Archaeological Work for Paumalū and Nearby Areas.....	51
Table 8. Listing of SIHP Sites for Paumalū and Portions of Pūpūkea and Kaunala	54
Table 9. Published ¹⁴ C dates from Paumalū and Pūpūkea Ahupua‘a.....	66
Table 10. Soil Descriptions	87
Table 11. Trench Locations and Dimensions	88

INTRODUCTION

At the request of G70, on behalf of Girl Scouts of Hawai'i (GSH), Keala Pono Archaeological Consulting conducted an archaeological inventory survey (AIS) for improvements and additions to Camp Paumalū, a 135.5 ac. (54.8 ha) property located in Paumalū Ahupua'a, Ko'olauloa District, on the island of O'ahu. The existing camp consists of a lodge, staff cabins, maintenance facility, a pool, camp showers, and five campsites. Improvements will be made to the roads, parking, and landscaping, along with the major infrastructural systems, including those for fire safety and water, and in the future the replacement of existing waste water facilities. The five existing campsites will be upgraded as will be the staff housing by both remodeling structures and the construction of new structures that will replace those that have deteriorated beyond repair. Three new campsites are envisioned and several structures (such as the Craft Hut and Health Center) will be removed or relocated. The main Hale Hui Lodge will be demolished and rebuilt as a new two-story building.

In September 2016, the SHPD advised GSH that an archaeological inventory survey (AIS) would be necessary in support of proposed improvements to Paumalū Girl Scout Camp. The Girl Scouts of Hawaii, a private landowner, is seeking a Grant-in-Aid from the Hawaii State Legislature for this project. No federal permitting or funding is required. The project proponent is the State of Hawaii Department of Land and Natural Resources (DLNR) Division of State Parks (State Parks). The AIS was designed to identify any cultural resources that may occur in the area. This report meets the requirements and standards of state historic preservation law, specifically Chapter 6e of the Hawai'i Revised Statutes, and the State Historic Preservation Division's (SHPD's) *Rules Governing Standards for Archaeological Inventory Surveys and Reports* (§13-276). Due to negative findings, the AIS results are presented as an archaeological assessment per Hawaii Administrative Rules (HAR) §13-275.

The report begins with a description of the project area and a historical overview of land use and archaeology in the area. The next section presents methods used in the fieldwork, followed by the results of the archaeological inventory survey. Project results are summarized and recommendations are made in the final section. Hawaiian words, flora and fauna, and technical terms are defined in a glossary, and an appendix at the end of the document provides information on the camp's historic buildings.

Project Location and Description

In 2013, Group 70 International developed a Master Plan for Camp Paumalū, located in the ahupua'a of Paumalū on the northwest coast (or North Shore) of O'ahu (Figure 1). Paumalū is part of the traditional Hawaiian moku of Ko'olauloa that extends from Ka'a'awa (where it adjoins Ko'olaupoko) to the south, wrapping around the north tip of O'ahu and extending to the west, where the ahupua'a of Waimea lies on the boundary with the moku of Waialua. However, some sources place Waimea Ahupua'a within Waialua Moku (e.g., Sterling and Summers 1978). The Paumalū Camp is at an elevation of between 600–700 ft. (183–213 m) above sea level (asl) and sits on a ridge that separates Paumalū Gulch from a branching tributary to Paumalū Stream called Aimu'u Gulch (Figure 2). The Girl Scout Camp lies approximately 2.2 mi. (3.5 km) from the nearest coastline, which is Sunset Beach.

The project property is recorded as TMK: (1) 5-9-006:012, owned by the Girl Scout Council of the Pacific, Inc. It encompasses 135.5 ac. (54.834 ha), of which approximately 17.528 ac. (7.093 ha) consists of the project area (Figure 3). The boundaries of this 17.528-ac. project area were developed in consultation with SHPD to encompass all areas of planned improvements to the camp.

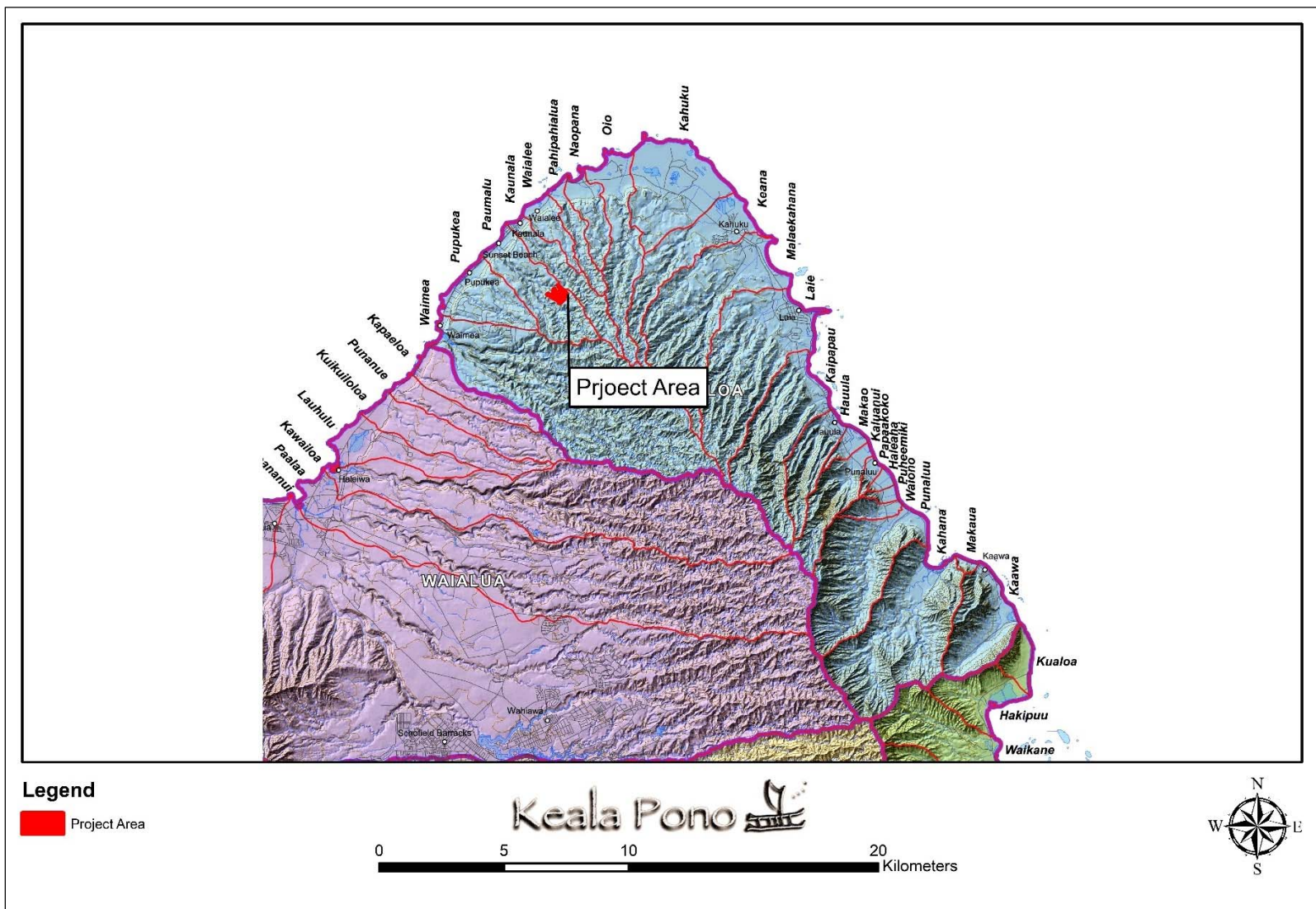
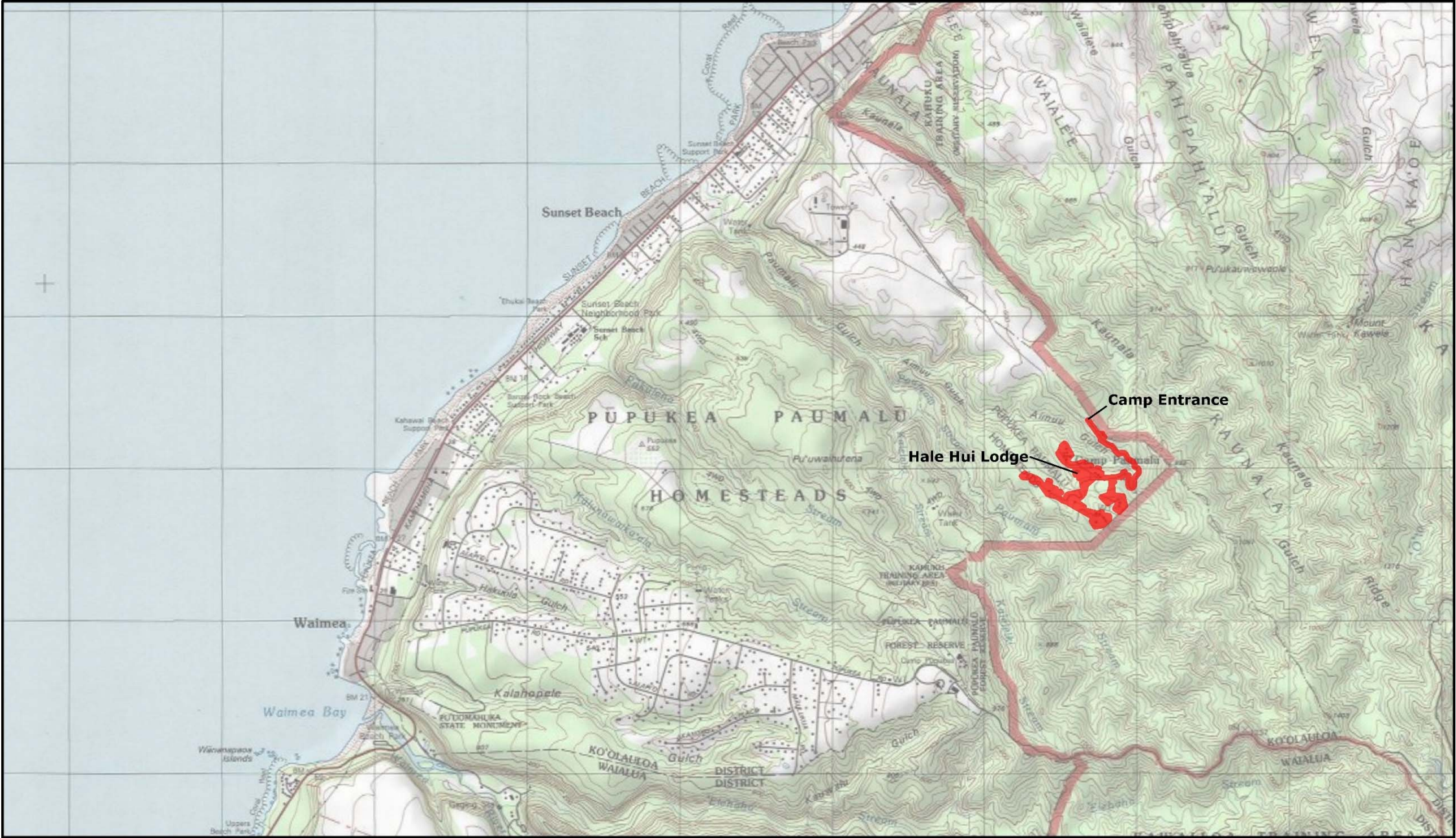


Figure 1. Moku of Ko‘olauloa and neighboring Waialua with ahupua‘a identified, windward, north O‘ahu (Island Breath 2016).



Legend

 Project Area

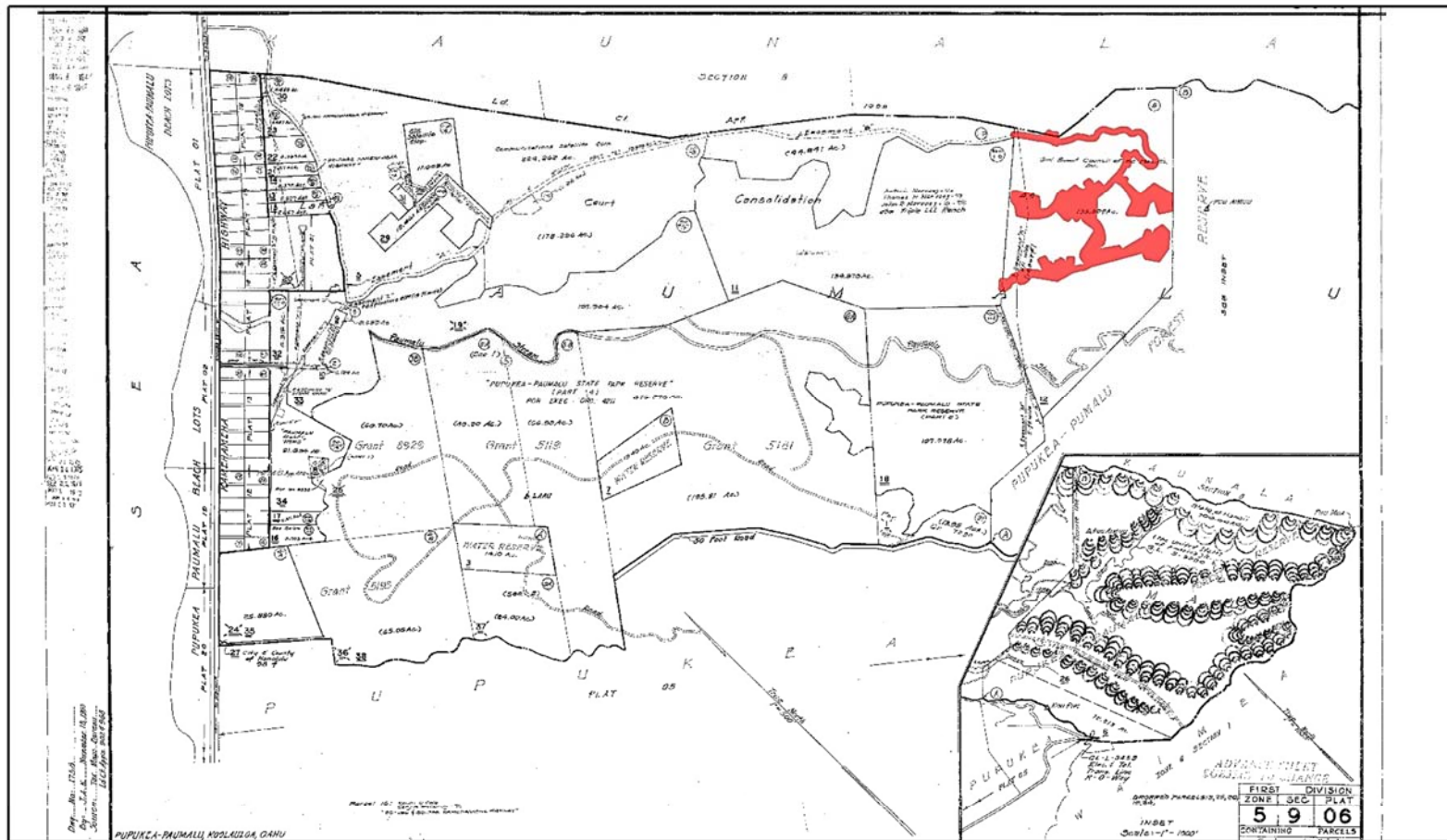
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Layer Credits:USGS Topographical Waimea Quadrangle Map 1998 / Kahuku Quadrangle Map 1998

Figure 2. Location of the project area on 7.5 minute 1998 USGS Kahuku and Waimea quadrangle maps.



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Project Area

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0 0.5 1 2 Kilometers



Figure 3. Location of the project area on TMK Plat (1) 5-9-06 (Honolulu City and County 2014).

Established in 1951, many of the Camp's facilities are in need of renovation, repair, and replacement. The Girl Scouts of Hawaii (GSH) also propose to expand the Camp's facilities with new units and upgraded infrastructure that will increase its utilization and fulfill the organization's goals to provide interactive learning and build leadership (Group 70 International 2013). The improvements proposed by GSH are consistent with the North Shore Sustainable Community Plan (NSSCP) to: 1. enhance the region's recreational and educational potential, 2. preserve and protect its cultural and historic resources, 3. adopt the ahupua'a concept as a framework for land utilization and management, and 4. integrate principles of sustainability into the decision-making process. The current facilities do not meet minimum code and permitting requirements for the Honolulu Fire Department, Environmental Protection Agency, State Department of Health, and Americans with Disabilities Act. Nor are these facilities sufficient to meet the anticipated demand for the Camp's use by the GSH and other members of the community.

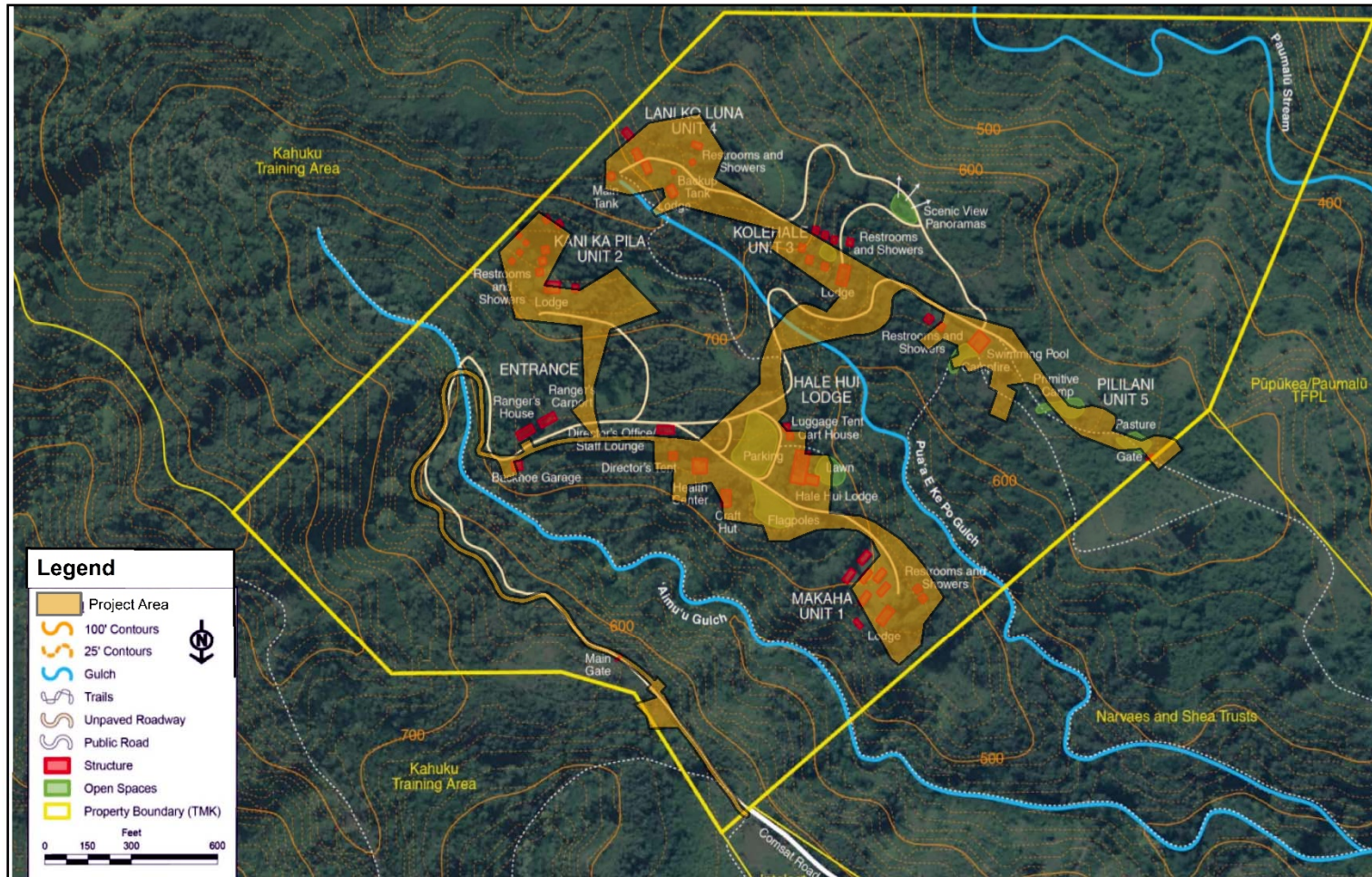
Ground disturbance for the project includes the following: various road improvements, such as widening and clearing/grubbing, to a depth of approximately 2 ft.; upgrade of water system (including water supply and distribution lines, upgrade/additional water tank, and booster pump improvements) to a depth of approximately 3–5 ft.; associated site improvements to any new development or redevelopment to a depth of approximately 3–4 ft.; and excavations for the wastewater system to a depth of roughly 9 ft. for tanks and 5–6 ft. for the disposal system. The new lodge will require excavation to a depth of approximately 2–3 ft. in the location of the existing lodge. The new staff cabins will be located in the vicinity of the existing Staff Lounge, and no ground disturbance will be conducted at the Makaha Cabins or Health Center.

Physical Environment

Paumalū Ahupua'a can be defined by the drainage and catchment of its eponymously named stream and gulch. The topography included within the ahupua'a is varied, including a coastal plain fronting the ocean, a section of talus slopes below the cliffline at the back of the coast, a main, narrow and deep drainage (Paumalū) with several secondary tributaries, (Aimu'u, Kawaipi, Kaleleiki) to the main stream that originate at the mauka boundaries of Paumalū and bring water to the coast. The stream drainages are deeply incised creating a series of narrow canyons. There are also extensive and moderately sloped ridge lands that begin above the cliffline and extend back to the Ko'olau Mountains to an elevation of more than 1,450 ft. (442 m) asl. The drainage of Waimea and its upper branches of Kamanaiki and 'Elehāhā flow to the west on the south side of the Ko'olau Mountains, partly defining the west boundary of Paumalū. The section of Paumalū included within the Girl Scouts project area is characterized by steep slopes above Paumalū Stream and Aimu'u Gulch, along with sections of more gently to steeply sloping ridge lands separating these drainages. The bottom, alluvial zones of the drainages are also included within the project area, although they constitute the smallest topographic unit.

Climate and Rainfall

Located on the windward, or north coast of O'ahu, and extending west from the coast to the Ko'olau Mountains, Paumalū receives 50–100 in. (127–254 cm) of rainfall a year distributed orographically. By some accounts Paumalū Stream is thought to be a non-perennial stream (see Handy et al. 1991). This assessment is based upon historical observations of stream flow where it enters the coastal plain. While the stream does flow to the ocean during periods of heavy rainfall, historically it appears to have been seasonal, not permanent. However, the water flow in the stream apparently extends farther up the drainage. In which case, it may have flowed more regularly to the coast in the past. There are limited, relatively recent (1965–2005) stream gauge data from Paumalū Stream (Figure 5) that suggest it flows at about 85 ft. (26 m) asl from time to time.



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Layer Credits: Courtesy of G70

Figure 4. Location of Camp Paumalū existing conditions (courtesy of G70).

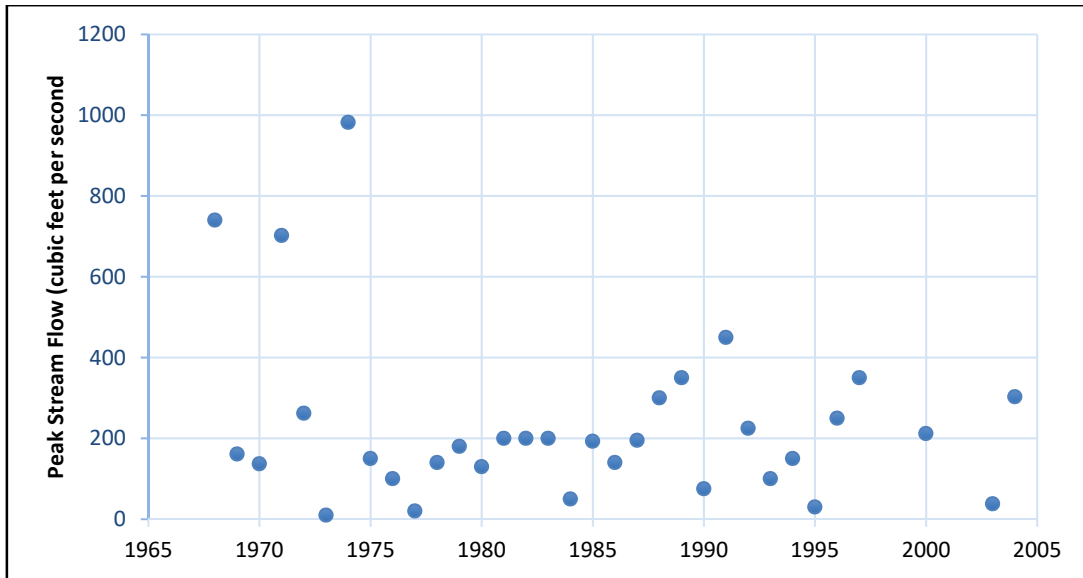


Figure 5. Stream flow records from Paumalū Stream at 85 ft. (26 m) asl between 1965–2005 (USGS 2018).

An early topographic map (United States Army 1943) based on USGS data does show Paumalū Stream, as well as its tributaries, Kaleleiki and Aimu‘u Streams, as perennial between 100 and 300 ft. (30 and 91 m) in elevation (Figure 6). Likewise, the State of Hawai‘i GIS database of streams and drainages depicts all of Paumalū Stream as perennial. Both maps suggest Paumalū Stream is perennial in its mauka section and becomes intermittent or dry downstream near the coast. This suggests any irrigated agriculture would have been located mauka of the coast. When employed in the modeling of the potential for irrigated agriculture (Ladefoged et al. 2007), a section of the upper portion of Paumalū Stream is included in the map of O‘ahu drainages that would have likely supported this form of cultivation (Figure 7). The most recent USGS (1998a) map of the Waimea Quadrangle shows that the unnamed gully near the boundary with Kaunala flowed out and paralleled the coast, joining Paumalū Stream from the east.

Other water resources in Paumalū include a large spring named Waikou located in a small drainage south of Paumalū Gulch (Handy 1940:88) and at least one water hole near the coast (Willis 1892a).

Geology and Soils

The geology of Paumalū (and elsewhere along the northwest coast of O‘ahu) is comprised of three major geological units (Stearns 1938). Along the coast there are limited, narrow areas of unconsolidated marine calcareous deposits, i.e., coastal beach, not more than 100 m (330 ft.) wide. These are characterized by cream-colored and light-tan beach sands made up of worn coral, coralline algae, marine shells, and foraminifers. Immediately inland from the beach is a zone of unconsolidated noncalcareous deposits, chiefly alluvium. This forms a narrow coastal plain in the vicinity of Paumalū of between 300 to 600 m (984–1,969 ft.) wide. This zone contains coarse permeable detritus, only slightly weathered, and angular blocks of basalt talus that forms as aprons at the base of steep slopes. The third geological zone, the northwest flank of the Ko‘olau Mountains is comprised of the Kailua volcanic series. This zone is the largest area of Paumalū with a substrate of dense greenish gray to black massive, nearly impermeable basalt flows. These represent a former

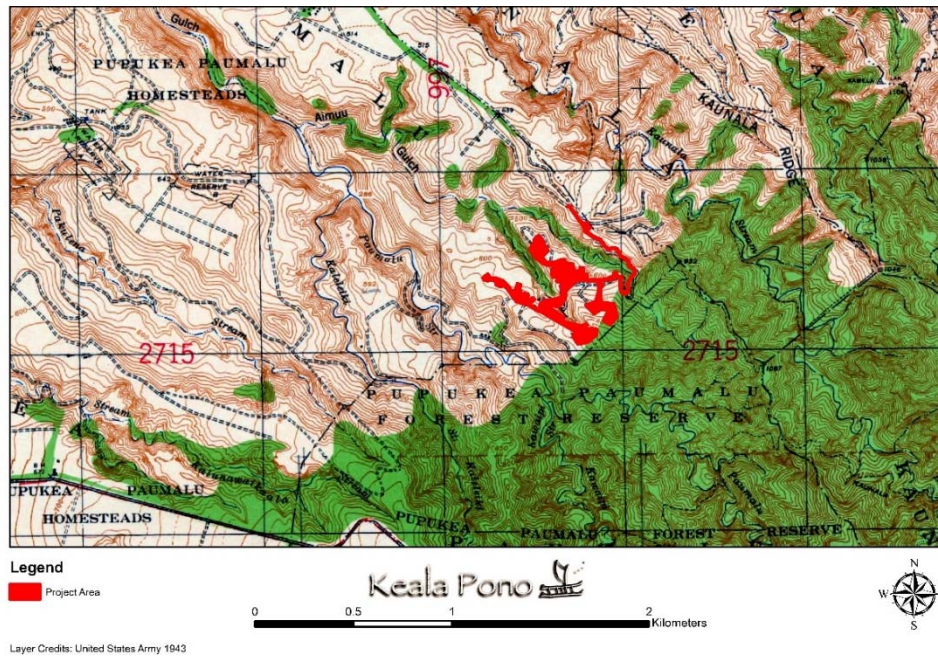


Figure 6. Section of topographic map showing perennial stream flow above 150 ft. (46 m) asl in Paumalū, Kaleleiki, and Aimu‘u drainages (United States Army 1943). Perennial stream flow indicated by blue line; impermanent stream flow by dashed blue line (—...—...). Green shaded areas represent forest or woodland vegetation.

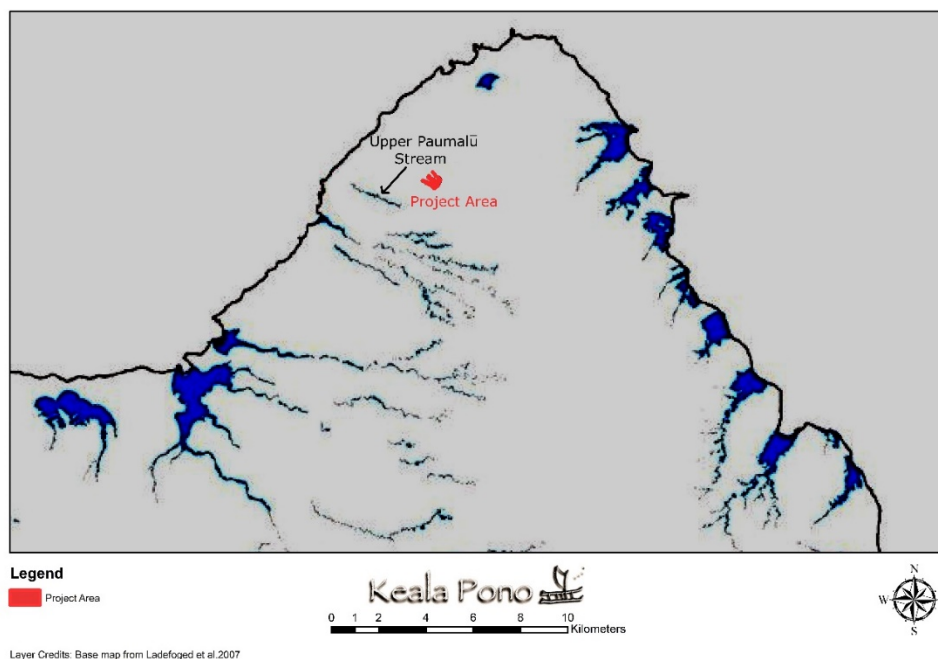


Figure 7. Map of modeled locations for irrigated agriculture on O‘ahu Island, including upper Paumalū Stream based on stream flow, regularity, and extent (base map from Ladefoged et al. 2007).

rift zone between the Wai'anae and Ko'olau volcanic series, often with basalt dikes. The Kailua volcanic series are the result of volcanic activity during the early Pleistocene, approximately 2.1–2.5 mya. The soils of northwest O'ahu reflect the substrate age, as well as erosional history and marine and terrestrial sedimentary deposition. For Paumalu, the coastline and the coastal plain are a result of erosional and depositional processes that track the two geological units to which they were assigned: calcareous marine sands and non-calcareous alluvium and talus. Areas of colluvium and talus are classified among the Kaena series that include sections comprised mostly of clay or stony clay (e.g., KaeC and KanE, see Foote et al. 1972). These were the locations where most of the historical land claims were made and where dryland farming and some of the habitation occurred.

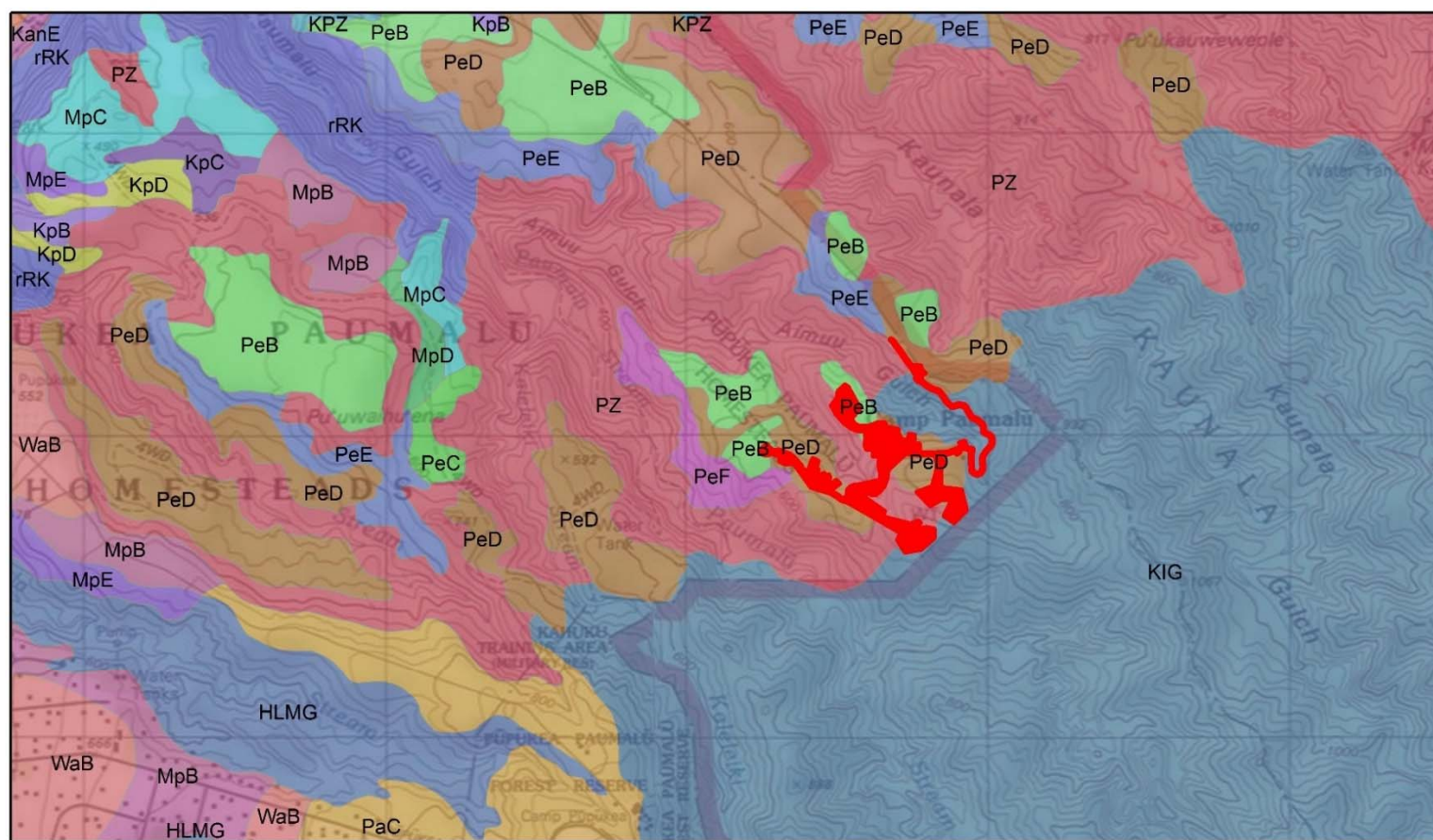
The area where the Girl Scout Camp is located is farther inland and includes slopes, stream and secondary drainages, and ridge lands that contain more varied soils. Much of the slopes and drainages, to about 300 ft. (91 m) in elevation are comprised of rocky badlands (PZ) Paumalu-Badlands soil complex where Paumalu silty clay soils make up 40–80% and slopes range from 10–70%, well drained and of moderate depth (to about 45 in. [114 cm] below surface), with slopes between 10 and 70%. On ridges between 300 and 1,000 ft. (91 and 305 m) in elevation, slopes are more gradual (between 15–25%), but soils remain silty clays, well drained, and of moderate slopes. In the location of the project area they are assigned to either the Paumalu (Pe) or Kapaa (KI) series (Figure 8). While not identified as locations selected for agriculture, the ridge lands could have supported shifting cultivation and management of trees and shrubs utilized for food or industrial purposes (see below under vegetation and historic land claims).

Vegetation

Native vegetation on O'ahu (as it is elsewhere in the Hawaiian Islands) is strongly influenced by rainfall and elevation. On the northwestern side of the island, grass and shrublands receiving less rainfall at lower elevations give way to dryland forest and shrubs, with mesic and wet forests at the uppermost slopes and at the top of the Ko'olau Mountains. Relatively soon after Polynesian colonization, native vegetation at lower elevations and within drainages had been substantially altered. Since the early 19th century (and since Western contact in the late 18th century) vegetation changes have become even more pronounced, often reaching farther inland and upslope and involving a greater number of exotic taxa. Even the uppermost elevation plant community, the mesic and wet montane forest, in the northern Ko'olau Mountains has been substantially modified.

As Mayberry and Haun (1988:2) summarize (from Nagata 1988) there are three vegetation zones present along the northwest coast of O'ahu. These include: 1. a xerophytic zone consisting of shrubs in coastal lowlands, 2. a mixed open forest and shrubs along the slopes and on the lower ridge lands, and 3. a dry shrub and closed forest in the upper elevations of the major drainages, their slopes, and the ridge tops back to the summit of the Ko'olau Mountains.

Plant taxa have been altered in all three zones by historic and recent introductions, much of it through agricultural development, the conversion of the coastal plain to residential housing, military training, and the more recent introduction and release of exotic plants for landscaping. Prior to Western contact and arrival in Hawai'i the coast would likely have supported a variety of Polynesian introductions including niu or coconut palm (*Cocos nucifera*), kamani (*Calophyllum inophyllum*), noni (*Morinda citrifolia*), ipu (*Lagenaria siceraria*), and milo (*Thespesia populnea*). Native plants would have included dwarf naupaka (*Scaevola coriacea*), pōhuehue or morning glory (*Ipomoea pes-caprae*), 'ilima (*Sida fallax*), nehe (*Lipochaeta connata*), 'akoko (*Euphorbia* sp.), and naio (*Myoporum sandwicense*). Along the talus slopes, Polynesian introductions may have included hala (*Pandanus tectorius*), mai'a or banana (*Musa* sp.) and kī or ti (*Cordyline fruticosa*), as well as 'uala (*Ipomoea batatas*). Introduced kukui or candle nut (*Aleurites mollucana*), and 'ōhi'a 'ai or mountain apple (*Syzygium malaccense*) could be found along the slopes or in the upper gulches.



Legend



Layer Credits: USGS Topographical Waimea Point Quadrangle Map 1998 / Kahuku Point Quadrangle Map 1998

Figure 8. Major soil classes within and near the vicinity of the project area, Paumalu Ahupua'a (data from Foote et al. 1972). Soils in the project area are PeB (Paumalu silty clay 3–8% slopes), PeD (Paumalu silty clay 15–25% slopes), and PZ (Paumalu-Badland complex).

Along the upper slopes and ridge lands of the Kahuku Training Area (O‘ahu Army Natural Resource Program 2010) near Paumalū the following taxa have been found at the mid-elevation levels where mesic forest does occur: koa (*Acacia koa*), ‘ōhi‘a lehua (*Metrosideros polymorpha*), alahe‘e (*Psydrax odorata*), olopua (*Nestegis sandwicensis*), lama (*Diospyros* spp.), kaulu (*Pouteria sandwicensis*), pāpala (*Pisonia* spp.), kōpiko (*Psychotria* spp.), halapepe (*Pleomele halapepe*), hame (*Antidesma platyphylum*), ‘ahakea (*Bohea* spp.), and ‘iliahi (*Santalum freycinetianum*). Understory vegetation and shrubs would include: palai nui (*Microlepidia strigosa*), palapala‘ā (*Sphenomeris chinensis*), naupaka kuahiwi (*Scaevola gaudichaudiana*), huehue (*Cocculus ferrandianus*), ‘ū‘lei (*Oslecoeles anthyllidifolia*), pala‘ā (*Stenoloma chinensis*), and maile (*Alyxia stellata*) (O‘ahu Army Natural Resource Program 2010: 115; Nagata 1988).

A large number of endangered plants are thought to occur within Paumalū or neighboring lands (Group 70 International 2013). Several of these have been documented in the Kahuku Training Area (O‘ahu Army Natural Resource Program 2010) (Table 1). Of particular focus has been the documentation and reintroduction of nīōi (*Eugenia koolauensis*) to the Kahuku Training Area. Nīōi is an endemic shrub or tree that is now endangered and found in the Ko‘olau and (more rarely, Wai‘anae Mountains, O‘ahu).

Relict Kukui (*Aleurites moluccana*) and Kī (*Cordyline* spp.) Groves

Across portions of the middle and upper sections of the gulches in Paumalū, there are stands of kukui (*Aleurites moluccana*) that represent relict groves (Figure 9). The picture here displays kukui, the light colored trees, in Aimu‘u Gulch and possibly in Pua‘a E Ke Po Gulch to the east. These may be regarded as having historical and cultural importance inasmuch as kukui trees were introduced to Hawai‘i by Polynesians, and trees were planted throughout the islands. The kukui trees in the gulches may or may not be historic in age, but they are a relict of former areas that would have been purposefully planted and to some extent managed by Hawaiians living in these locales.

Elsewhere in the middle and upper reaches of Paumalū and its neighboring ahupua‘a, there are areas that support the growth of kī. While typically near trails and structures in this area, there are also locations where there are patches of kī currently growing (Figure 10). There are also numerous locations in upper Paumalū where the native or indigenous fern, palapala‘ā (*Sphenomeris chinensis*) can be found in dense concentrations (Figure 11). While its status as native or indigenous means it grows naturally in Hawai‘i, its abundance in some areas may indicate places that were formerly or recently cleared, perhaps for swidden cultivation.

The non-native vegetation found in the project area includes ironwood (*Casuarina equisetifolia*), eucalyptus (*Eucalyptus* sp.), strawberry guava (*Psidium cattleianum*), Christmas berry (*Schinus terebinthifolius*), java plum (*Syzygium a cumini*), Norfolk Island pine (*Araucaria heterophylla*), and a variety of introduced grasses and shrubs.

Recovery of Archaeobotanical Specimens from Paumalū

Recovery of wood charcoal from coastal archaeological contexts (Athens and Magnuson 1998; Murakami 1998) provides additional information on likely vegetation and habitats within or near to Paumalū. Two trench excavations at Sunset Beach in Paumalū encountered buried cultural deposits extending more than 75 cm below the surface (cmbs) and including both features (firepit, postmold) as well as midden deposits. These contained substantial quantities of wood and nutshell charcoal that could be identified to known taxa (Table 2). Seventeen taxa were identified, a number recovered from multiple archaeological contexts. These represent mostly endemic or indigenous shrubs and trees but also included three (possibly four) taxa that were introduced and/or managed. The native and Polynesian introduced taxa include trees such as koa, ‘ōhi‘a lehua, ‘ōhi‘a ‘ai, and kukui most likely found on ridge lands and slopes at higher elevations where rainfall would have been more

Table 1. List of Rare or Endangered Plants Documented Near Paumalū (Group 70 International 2013; O‘ahu Army Natural Resource Program 2010)

Scientific Name	Hawaiian Name	Common Name	Documented Location
<i>Bobea timonioides</i>	‘ahakea	-	Kahuku Training Area
<i>Cyanea koolauensis</i>	haha	Palolo Valley Rollandia	Kahuku Training Area
<i>Dubautia herbstobatae</i>	na‘ena‘e	Keaau Valley Dubautia	Kahuku Training Area
<i>Eugenia koolauensis</i>	nīoī	no common name	Kahuku Training Area, Kaunala, Kaleleiki, Aimu‘u
<i>Euphorbia rockii</i>	‘akoko	Ko‘olau Range Sandmat	Ko‘olau Mountains
<i>Gardenia mannii</i>	nanu	Mann's Gardenia	Kahuku Training Area
<i>Hersperomannia arborescens</i>	-	-	Kahuku Training Area
<i>Hibiscus brackenridgei</i>	ma‘o hau hele	Brackenridge's Rosemallow	Kahuku Training Area
<i>Nesoluma polynesium</i> or <i>Sideroxylon polynesium</i>	keahi	Hawaiian nesoluma	Ko‘olau Mountains
<i>Pteralyxia macrocarpa</i> or <i>Pisonia sandewichensis</i>	kaulu or āulu	-	Ko‘olau Mountains
<i>Polyscias gymnocarpa</i> ; syn. <i>Tetraplasandra gymnocarpa</i>	‘ohe‘ohe	Ko‘olau Range Ohe	Kahuku Training Area, Pūpūkea-Kahuku Trail near Pu‘u Moa

abundant. Among the place names recorded for Paumalū is the mo‘o of Hali‘iloulū, which may reflect the former presence of the loulū palm (*Pritchardia* sp., most likely *P. martii*).

The taxa represented include both shrubs and trees of various sizes, mostly adapted to mesic dry to mesic conditions. Several can be found along the coast but most occur above 100–300 ft. (30–91 m) in elevation. Some may be found up to 4,000 ft. (1,219 m) in elevation. Virtually all of the woody plants have multiple uses, not only as firewood but including tools, weapons, canoe parts, house construction, medicines, and in ritual. The most abundant taxa in terms of specimens recovered are kukui, lama, ‘akoko, and ‘ūlei. Other than kukui, the most common forms in the archaeological collection from Sunset Beach represent shrubs and small trees that likely grew on the talus slopes or the slopes and lower portions of the ridgelines above the coastal plain.

The range of taxa and their environments suggest the coastal dwellers of Paumalū had access to upper elevations along streams, slopes above drainages, and ridge lands up to the crest of the Ko‘olau Mountains. These would have included the Camp Paumalū area.

Most of the taxa are found in mesic environments, but several grow best under wetter conditions. This suggests a mixture or mosaic of open and closed woodlands and forests along with shrub lands, with managed or cultivated woody plants along the coast or the talus slopes and up the drainage of Paumalū Stream. Ridge lands likely supported the main forest trees such as ōhi‘a lehua, kōpiko, lama, and koa. Kukui and ‘ōhi‘a ‘ai likely grew along some portions of these uplands as well.

Culturally Relevant Hawaiian Concepts for Lands, Forests, Drainages, and Uplands

Traditional Hawaiian society conceptualized and integrated natural and cultural domains across the lands of and ocean surrounding the archipelago. This conceptualization is different from the

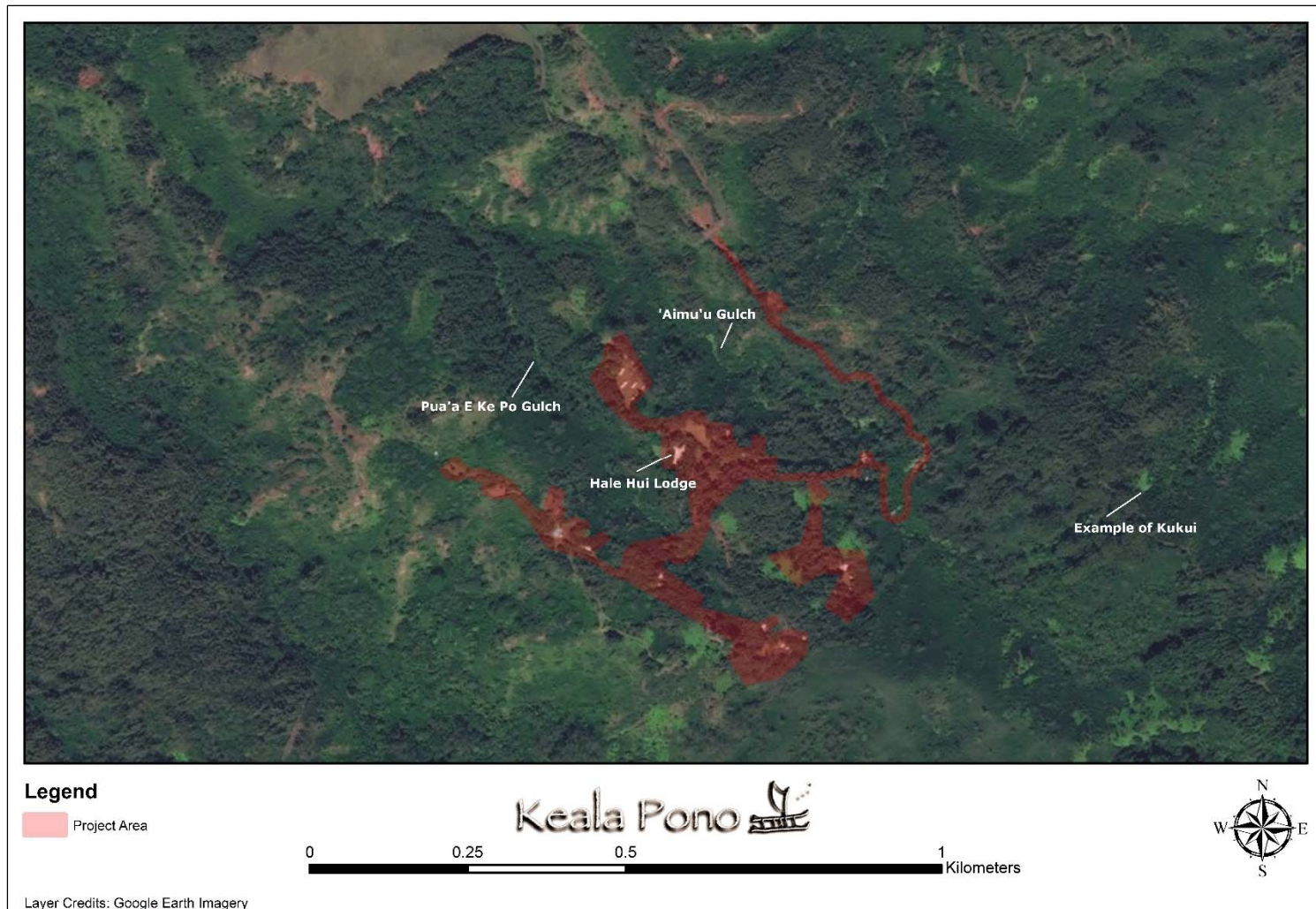


Figure 9. Google Earth image of relict stands of kukui in upper Aimu'u and Pua'a E Ke Po gulches in the vicinity of Camp Paumalū. Kukui is visible as the light-colored tree canopy along the drainages (Digital Globe 2018).



Figure 10. Kī growing at Makaha Camp in the Paumalū Girl Scout Camp. Orientation is to the north.



Figure 11. Palapala'ā (*Sphenomeris chinensis*) near Kani Kapila Unit 2 of Camp Paumalū. Orientation is to the northwest.

Table 2. Listing of Woody Taxa Present in Archaeological Contexts from Paumalū (Murakami 1998)

Scientific Name	Hawaiian Name	Origin	Habit and habitat	Traditional Hawaiian Use	Number of Contexts/Number of Identified Specimens
<i>Acacia koa</i>	koa	Endemic	Tree with two varieties, long lived typically found up to 4,000 ft. elevation, in mesic woodland and forest	Tools, spears, shark hooks, hoes, calabashes, fish lures, house construction, kapa beaters	1/1
<i>Aleurites moluccana</i>	kukui	Polynesian introduction	tree, usually above 300 ft. elevation, in mesic and wet forest	Oil, dye, ink, varnish, preservative, canoe parts, leis, fish bait, firewood, mulch	4/47
<i>Bobea</i> sp.	‘ahakea	Endemic	Tree or shrub, long lived, found 800 to 3,600 ft. elevation, mesic forest	Canoe construction, paddles, house construction for framing, poi boards, medicinal	2/10
<i>Canthium odoratum</i>	alahe‘e	Native	Shrub or small tree, from coast to 3,800 ft. elevation	Digging stick, adze handle, dye, firewood	1/7
<i>Chamaesyce</i> spp.	‘akoko	Endemic	Shrub or small tree, several species and varieties, long-lived, sea level to more than 1,000 ft. elevation, dry and mesic conditions	Medicinal, latex for bird snaring, flowers for bird catching	2/29
<i>Chenopodium oahuense</i>	‘āheahea	Endemic	Shrub, widespread coastal to more than 1,000 ft. elevation, dry adapted	Shark hooks, leaves and shoots consumed after baking, medicinal, ritual	3/8
<i>Cordyline</i> spp.	kī, ti	Polynesian introduction	Shrub, cultivated, windward coasts to wetland forest, 4,000 ft. elevation	Wrap, store and cook food, edible roots, thatch, clothing, skirts, capes, sandals, fishing lure, medicinal, ritual	1/1
<i>Diospyros sandwicensis</i>	lama	Endemic	Shrub to small tree, coastal to 4,000 ft. elevation, dry, mesic and occasionally wet environments	House and temple construction, altar construction tool handles, fish traps, torches, fruit can be consumed, medicinal	4/58
<i>Metrosideros polymorpha</i>	‘ōhi‘a lehua	Endemic	Tree, most common forest taxa with several varieties, can occur at coast up to 4,000 ft. elevation, adapted to dry and wet conditions	Kapa beaters, musical instruments, spears, daggers, clubs, mallets, house and canoe construction, flowers used in leis, medicinal, superior firewood	1/12

Table 2. (continued)

Scientific Name	Hawaiian Name	Origin	Habit and habitat	Traditional Hawaiian Use	Number of Contexts/Number of Identified Specimens
<i>Nestegis sandwicensis</i>	olopua	Endemic	Medium to large sized tree, above 100 ft. elevation, drought tolerant, dry or mesic forests	Spears, digging sticks, adze handles, daggers, house construction, firewood	1/6
<i>Osteomeles anthyllidifolia</i>	ū'lei	Endemic	Shrub to small tree, dry adapted, coastal to more than 4,000 ft. elevation, dry shrub land to mesic forest	Digging stick, fishing spears, kappa beaters, carrying poles, dye, fish nets, fruits consumed, medicinal	2/29
<i>Pandanus tectorius</i>	hala	Indigenous or Polynesian introduction	Small tree, cultivated or managed, coastal, mesic to 2,000 ft. elevation	Plaiting, matting, textiles, thatch, edible fruit, paint, canoe sails and parts, piping cordage, house construction, sandals, medicinal	1/2
<i>Psychotria sp.</i>	kōpiko	Endemic	Small to large tree, usually above 500 ft. elevation, mesic to wet forests	Kapa beater, anvil, firewood	1/2
<i>Rauvolfia sandwicensis</i>	hao	Endemic	Shrub to small tree, above 300 ft. elevation, drought tolerant, ridges and slopes, shrub lands	Hardwood, medicinal, ritual use, firewood	4/19
<i>Senna gaudichaudi</i>	kolomona	Endemic	Shrub, coastal to 3,000 ft. elevation, dry and mesic forest	Not widely used except kindling for firewood	1/3
<i>Sida fallax</i>	‘ilima	Indigenous	Shrub, coastal to more than 4,000 ft. elevation, dry and mesic shrub land or forest	Flooring and matting for houses, aided in cooking, cultivated for lei making, medicinal	2/6
<i>Syzygium malaccense</i>	‘ōhi‘a ‘ai	Polynesian introduction	Medium to large tree, mesic and wet locations, to 1000 ft. elevation,	Edible fruit, house construction, medicinal, tonics, dye, firewood	1/2

Western, natural science view in a number of ways. The oceans and skies were seen as distinct from, but connected to the lands. Lands, their physical properties, and environments were placed into a coherent classification by Hawaiians and this reflected their inter-relatedness. The naming of and cultural attributes associated with lands highlight the attachments to and associations among dimensions Hawaiians placed on the natural world (Maly and Maly 2005:10).

Native Hawaiian historians and other researchers (Kamakau 1976:8–9; Kanahele 2003; Malo 1951; Pogue 1978; Pukui and Elbert 1986) have identified an extensive list of terms and phrases that were applied to the physical environment, particularly to terrestrial landscapes (Table 3). These categories include some with multiple meanings, and some more inclusive than others. Here we present three authorities—Pogue (1978), Malo (1951), and Kamakau (1976)—to show the overlap (and some differences) in their application of Hawaiian terms to different portions of the terrestrial landscape that would include Paumalū and other ahupua‘a that extend to the Ko‘olau Mountains. Some identical terms are applied to distinct zones by the different sources, e.g., wao‘ēiwa. Of the authorities represented in Table 3, Kamakau clearly identifies more categories; Pogue and Malo present quite similar listings. This may reflect, in part, Pogue’s reliance on Malo for his terms and their associated zones. What all of these listings share is the location of native Hawaiian terrestrial zones in relative terms, i.e., one zone is said to be below or above another. Most of the zones are also described in terms of vegetation (e.g., presence or absence, or kinds of) and geophysical aspects (e.g., mountain flanks).

The use of plant-based criteria for designating different ecological zones would have been known to individuals living in northwest O‘ahu. This would have included the role forested zones played, materially, symbolically, and spiritually among Hawaiians. Traditionally, forested lands at upper elevations, above the wao kanaka were dedicated to Kū. These lands were not owned but rather their resources would have been shared by an entire community. Trees such as the ‘ōhi‘a lehua were associated with gods and goddesses. Koa was employed in building canoes. Other trees that were used included ‘ōlapa, lama, and kauila for weaponry and household implements. A number of plants and shrubs, such as hāpu‘u, ‘ōlena, and pōpolo were used for healing. The spread of ‘ōhi‘a ‘ai and kukui provided food, oils, wood for construction, and mulch for gardens. A variety of ferns and vines were used as adornments for hula.

Table 3. Hawaiian Terms and Their Descriptions for Landscape Zones Based on Elevation and Vegetation Appropriate for O‘ahu, Coast to Upper Ko‘olau Mountains (adapted from Maly and May 2005)

Hawaiian Terms	Concepts or Descriptions		
	Pogue (1978:10–11)	Malo (1951:16–17)	Kamakau (1976:8–9)
wao‘ēiwa	wao‘ēiwa where tall trees grow	wao‘ēiwa where monarchs of the forest grow	
wao ma‘ukele, wao kele wao lipo, wao koa	below wao‘ēiwa where tall trees grow; inland regions where koa can grow	below wao‘ēiwa where monarchs of the forest grow	region where trees are tall; inland regions where koa can grow
wao akua	below wao ma‘ukele where fewer trees are found	below wao ma‘ukele where trees of smaller size grow	makai of wao lipo, makai of wao ma‘ukele
wao kanaka, mau	where tree fern (‘ama‘u‘ama‘u) grows and man cultivates	below wao akua where men cultivate the land and fern grows	makai of wao akua, area where people cultivate
‘ama‘u	-	-	makai of wao kanaka, the fern belt
āpa‘a, ‘ilima,	below wao kanaka	below mau where land is hard, baked, or sterile	both terms refer to areas makai of ‘ama‘u, grasslands
‘ilima, wao ‘ilima	below āpa‘a	below āpa‘a	-
pāhe‘e	below ‘ilima	below ‘ilima where land is slippery	makai of āpa‘a and ‘‘ilima, pili grass and ‘ilima growths
kula	below the pāhe‘e where people dwell	below pāhe‘e where there is open country, near to habitations of men	makai of pāhe‘e, open country
kahakai	beach along sea	below kula bordering the ocean	coast
kahaone, kalawa	-	-	sandy beach, curve of the seashore down to the water’s edge
‘ae kai	-	-	water’s edge

LITERATURE REVIEW

This section of the report presents background information as a means to provide a context through which one can examine the cultural and historical significance of the project lands. In the attempt to record and preserve both the tangible (i.e., traditional and historic archaeological sites) and intangible (i.e., mo‘olelo, ‘ōlelo no‘eau) culture, this research assists in the discussion of anticipated finds. Research was conducted at the Hawai‘i State Library and the State Historic Preservation Division (SHPD) library, and using online resources at the University of Hawai‘i at Mānoa libraries, as well as databases such as Ulukau, Kipuka, and Papakilo, AvaKonohiki, and the State of Hawai‘i Department of Accounting and General Services (DAGS) website for historical maps. Historical maps, archaeological reports, Māhele data, and historical reference books were among the materials examined. Among the materials used in for this review are: Hawai‘i [Kingdom] Land Commission (1846–1848a, 1846–1848b, 1846–1852, 1846–1853, 1848, 1855) and Hawai‘i [Territory] Commission of Public Lands (1929).

Sections of this literature review include place names, wind names, mo‘olelo, a review of archaeological studies and cultural sites, historical maps, Māhele data, and early visitor’s accounts and other historic data for the nine ahupua‘a.

Historical Resources

Native traditions describe the formation (literally the birth) of the Hawaiian Islands and the presence of life on and around them, in the context of genealogical accounts... As this Hawaiian genealogical account continues, we find that these same god-beings, or creative forces of nature who gave birth to the islands, were also the parents of the first man (Hāloa), and from this ancestor, all Hawaiian people are descended. It was in this context of kinship, that the ancient Hawaiians addressed their environment. (Maly and Maly 2003)

The history of Paumalū begins with the history of O‘ahu Island:

O‘ahu is also a new name, given in memory of an ancestor of the people of O‘ahu. Lolo-i-mehani, Lalo-waia, and Lalo-oho-aniani were the ancient names of O‘ahu. O‘ahu was the child of Papa and Lua... and because O‘ahu was a good chief and the people lived harmoniously after the time of Wākea *mā*, O‘ahu’s descendants gave the name of their good chief to the island --- O‘ahu-a-Lua. (Kamakau 1991:129)

The following sections review historical resources of Paumalū, including land divisions, historical maps, place names, and mo‘olelo.

Hawaiian Concepts Regarding Land Divisions and Land Use: Moku ‘Āina, Ahupua‘a, and Mo‘o

Despite the colonizing effects of the arrival and then proliferation of Euroamerican individuals and groups in the early 19th century, both Native Hawaiian and Western scholars or authorities recognized the traditional organization of lands (and waters) in Hawai‘i and their representation through a system of palena (or traditional Hawaiian territories, see Beamer and Duarte 2006; 2009). A series of nested terms and concepts were regularly used by Hawaiians to designate and maintain social boundaries and to refer to groups at different scales of inclusion and relatedness (Ladefoged and Graves 2006). These geographic units became the means by which lands were surveyed and property claims identified and assigned locations during the period of the Māhele. The Māhele, of course, presents the historical process by which land tenure was converted to fee simple title and ownership (Alexander 1889). While there was some overlap in the size of these units and changes

in their composition and uncertainty about the meaning of a few, they generally fell into the following categories. At the largest scale was the moku ‘āina (shortened to moku) representing districts that covered large sections of lands. These were managed by ali‘i ‘ai moku and in many cases (and apparently over time) multiple districts (and sometimes entire islands) were ruled by ali‘i.

The ahupua‘a represents the fundamental community scale unit or organization in traditional Hawaiian culture (Alexander [1882] 1891; Gonschor and Beamer 2014; Lyons 1875). Though often described as wedge-shaped sections or strips of land (Lyons 1875) extending from the coast (where they were often broader) to the mountains (where they narrowed), and containing all of the resources that Hawaiians would need to support a community, this reflects an ideal with significant variations (Gonschor and Beamer 2014:68). Additionally, it has been suggested that ahupua‘a were autonomous from one another and largely endogamous, that is most individuals would have married from within the community (e.g., Earle 1978). More recently archaeologists and Native Hawaiian researchers have cast aspects of this model in question (Gonschor and Beamer 2014; Ladefoged and Graves 2006). Ahupua‘a were not always wedge-shaped, nor were they necessarily self-sufficient in resources (or of sufficient size to be so). Coastal lands may have been limited, and there are ahupua‘a that had no coastal access whatsoever (Gonschor and Beamer 2014). There was limited availability of arable land in some ahupua‘a, particularly for irrigated terraces, or lo‘i. There are considerable differences in the areas contained within ahupua‘a, although some of this may be due to resource differentials, with ahupua‘a in leeward, more arid locations having larger territories than those in windward locations. Additionally, larger islands such as Hawai‘i or Maui, typically had ahupua‘a of larger territorial size than are found on O‘ahu. Nonetheless, the assumption of ahupua‘a as self-contained, resource sufficient territories is unlikely to be true in all cases. It would need to be established on a case-by-case basis.

Although not well recognized (but see Beamer and Duarte 2006; Cachola-Abad 2000; Fitzgerald 1987; Gonschor and Beamer 2014); Hawaiian language included at least two terms that refer to lands incorporating more than a single ahupua‘a but less than a moku (or district). “Okana” refers to a “district or sub district usually comprising several ahupua‘a” (Pukui and Elbert 1974:281). “Kalana” refers to a “division of land smaller than a moku” (Pukui and Elbert 1974:121). In either case, these terms refer to multiple ahupua‘a, likely contiguous, located within a given moku, although “okana” was sometimes used to reference single ahupua‘a that may have contained multiple territories and functioned somewhat like a moku (see Gonschor and Beamer 2014:78). These kinds of units—‘okana and kalana—may have formed for management purposes, reflect historical processes of territorial subdivision or territorial re-allocation, or occurred where contiguous communities cooperated across their territorial boundaries.

Below the scale of ahupua‘a was the ‘ili ‘āina (or ‘ili), a subdivision of the territory into named areas where groups of several or more families with ties to one another lived and worked, usually by farming. These lands were considered parts of the ahupua‘a and from which the konohiki received tribute or taxes. There are no named ‘ili recorded for Paumalū, although such areas exist for neighboring ahupua‘a. Rather, Soehren (2008) identified a number of places from Native Testimonies that he identified as mo‘o, land units smaller than ‘ili. Ordinarily in these testimonies the naming of ‘ili lands is recorded as such; and these are lacking in the testimonies. Mo‘o are usually identified with particular families or residents (Lyons 1875). It is possible that in the case of Paumalū that mo‘o were treated as synonymous with ‘ili by its residents, konohiki, or later surveyors or individuals who recorded land boundaries.

Historical Maps

Increasingly important in assessments of cultural resources are historical maps of the Hawaiian Islands (see Table 4 for those pertaining to Paumalū). All maps are models of spatial or geographic

information. As such, they are never “perfect” but are representations of what was known to those who provided information (e.g., Hawaiian kupūna, Native and Western surveyors) to those who drew the maps. The first western maps were produced by early European explorers (Fitzgerald 1987) such as Cook and Vancouver during the late 18th and early 19th century, and these were primarily depictions of the coastlines of the various main islands. Occasionally, properties near the coast were mapped but at a coarse scale of resolution (see Emerson 1833).

In Hawai‘i, Native Hawaiians also took a strong interest in mapping during the 19th century. Samuel Kalama was among the best known, particularly for his color-coded map (1838) of all the islands, depicting both moku and a number of ahupua‘a (see Beamer and Duarte 2006, 2009). We illustrate a portion of this map centered on O‘ahu (Figure 12). Its advancements have been noted (Beamer and Duarte 2009; Moffat and Fitzpatrick 1995:24–26), including the clear distinction in geographic scale of the land divisions, and the effort to inventory the Hawaiian names for these territories. This map is clearly the inspiration for a later drawing of O‘ahu, its moku and ahupua‘a in the early 20th century (Donn 1902a, see Figure 15).

With the onset of the Māhele in 1848 and the various land awarded over the next decade, maps were increasingly needed to document boundaries, not only of the land awards but also of territories that comprised ahupua‘a. Typically, the boundaries of land awards were contained within or followed ahupua‘a boundaries. The Survey Division of the Kingdom of Hawaii officially began this process in 1871 (Alexander 1889, 1891) but prior to this, maps of some areas had been completed, including the Crown Lands for Paumalū (Webster 1852a, Figure 13) and Pūpūkea (Webster 1852b).

As the locations of ahupua‘a boundaries were established a number of maps depict these territories on O‘ahu (Figure 14, 15, Figure 18, and Figure 19) for Paumalū and Pūpūkea, either singly or bundled together often with other ahupua‘a (Monsarrat 1876a, 1876b; Donn 1902a, 1902b; Webster 1852a, 1852b). A Commission of Boundaries was established in 1862 to review and establish legal boundaries for ahupua‘a and ‘ili ‘āina (Alexander 1891). This was accomplished by government surveys along with native testimonies. In the case of contested ahupua‘a boundaries, Certificates of Boundaries were awarded by the Commission. A boundary certificate was issued for both Paumalū and Pūpūkea (McCully 1879).

Over time, the historic maps display increasing spatial resolution as well as greater sophistication and awareness of boundaries for ahupua‘a territories. The maps (Figures 16 and 17) prepared by A.B. Loebenstein but completed by Willis (1892a, 1892b) show in fine detail the locations of land awards in coastal Paumalū, along with the boundaries it shares with Pūpūkea and Kaunala. These were prepared along with several others when the Kahuku Plantation was established in the late 19th century. The plantation camp in mauka Paumalū, was a part of the Hawaiian Pineapple Planation. The Kahuku plantation fields did not extend to Paumalū along the coast here.

With the advent of the Māhele and fee simple land awards and later the aggregation of land ownership by Western plantation and ranch owners, ahupua‘a boundaries recede in terms of their significance and continued representation on official maps by the territory of Hawai‘i. This is manifested for Paumalū by the absence of its boundary with Pūpūkea in more recent maps completed after 1900 as shown in Figure 19. However, this map provides a greater number of named places, particularly in upland zones, and shows the topography in greater detail. Figure 20 does illustrate the ahupua‘a boundary, along with greater detail of topography.

Historic maps also show transport pathways such as the Old Government Road as well as the railroad tracks for the O‘ahu Railway and Land Company near the coast in Paumalū. Both features extend beyond the boundaries of Paumalū. Today, Kamehameha Highway has replaced the original

Table 4. Listing of Historical Maps Referenced Pertaining to O‘ahu and Paumalū

Author and Year	Historic Register or Plat Map Number	Title	Mapped Objects
Emerson 1833	445	Oahu	Moku, some ahupua‘a, coastline, some topographic relief
Kalama 1838	-	Island of Oahu	Moku, some ahupua‘a, major streams
Webster 1852a	97	Plan of Paumalu in Koolauloa, Oahu	Paumalū, coastline, neighboring ahupua‘a and boundaries, upper elevation ridgelines
Webster 1852b	98	Plan of Pupukea in Koolauloa Oahu	Pūpūkea, coastline, neighboring ahupua‘a and boundaries, upper elevation ridgelines
Lyons 1875	1380	Oahu Government Survey	Island of O‘ahu, coastline moku, ahupua‘a boundaries, major land awards, place names, some topographic relief
Monsarrat 1876a	320	-	Kawailoa, Pūpūkea, and Paumalū Ahupua‘a boundaries
Willis 1892a	1560, Map 4	Section B of Kahuku Plantation Map, No. 4	Coastal Paumalū, Kaunala, Waiale‘e Ahupua‘a boundaries, land awards, perhaps stone walls, topography, streams and drainages, Old Government Road
Willis 1892b	1560, Map 5	Section B of Kahuku Plantation Map, No. 5	Pūpūkea, Paumalū Ahupua‘a boundary, land awards, stone walls?, topography, streams, drainages, Old Government Road
Beasley 1899	-	Oahu, Hawaiian Islands	Island of O‘ahu, moku, ahupua‘a, topography, embayments, islets
Donn 1902a	2374	Oahu, Hawaiian Islands	O‘ahu moku, ahupua‘a, some ‘ili, streams and drainages, named places, major land awards, islets, embayments
Donn 1902b	2146	North Coast of Oahu	Pūpūkea-Kahuku coastal ahupua‘a boundaries, showing cliffline and major drainages
Wright 1904	2252	Pupukea–Paumalu, Koolauloa, Oahu	Coastline, ahupua‘a boundaries, major topographic features, streams, gulches, place names, LCA and land grants, roads, railway, heiau, named survey stations
Iao 1913	Plat 2036	Pupukea and Paumalu	Produced from Map 2252, showing greater topographic detail, agricultural roadways, new fee simple land holdings
Chaney 1919	2256	Pupukea-Paumalu Beach Lots, Koolauloa, Oahu	Homestead beach lot properties in Pūpūkea and Paumalū, showing boundaries and coastline
United States Army 1943	Waimea Quadrangle	Opana to Waimea Ahupuaa	Topographic detail, streams and drainages, major roadways, railway line, some housing, forest reserve

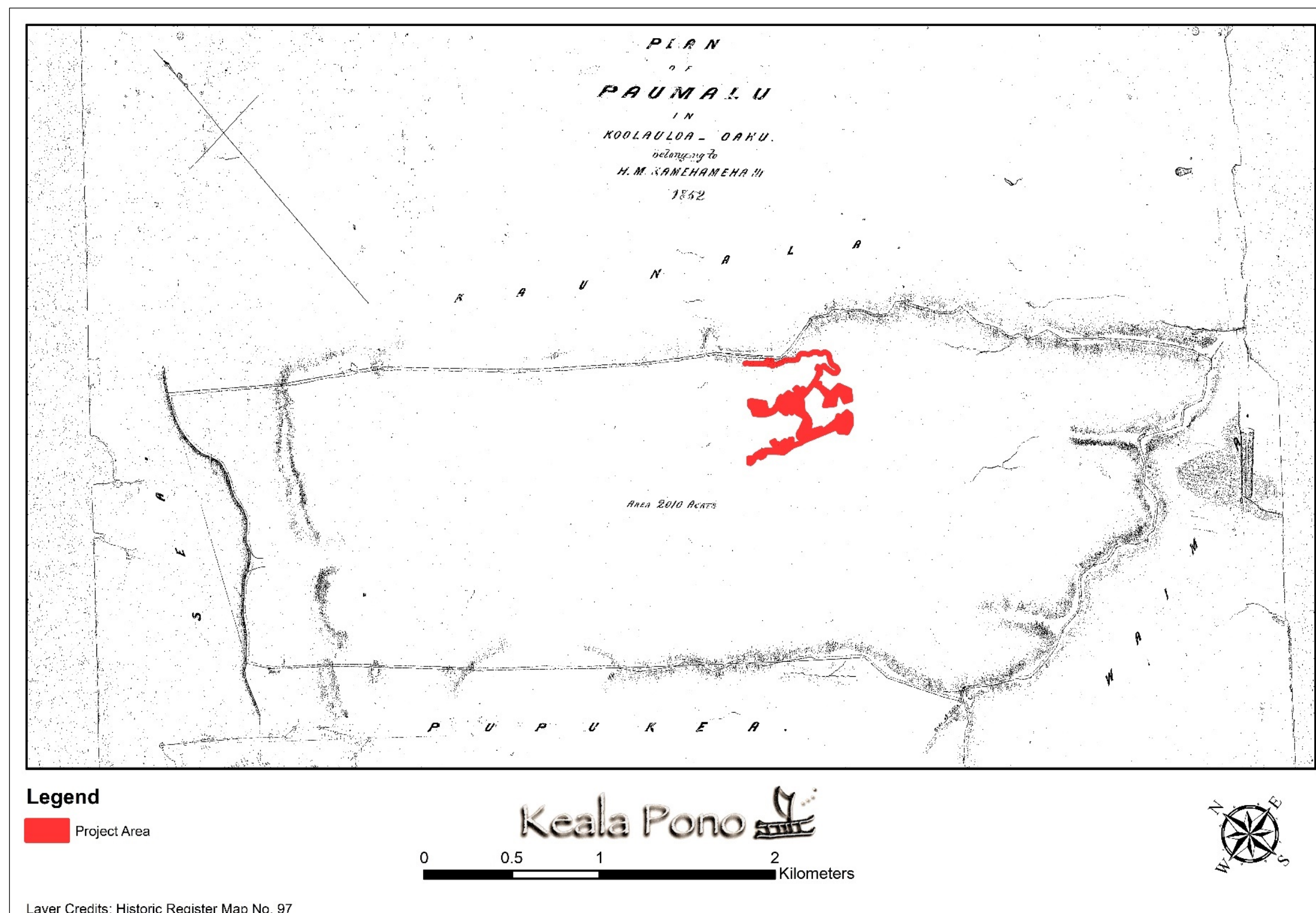


Figure 13. Historic Register Map No. 97, earliest historical map of Paumalū showing Crown Lands of Kamehameha III (Webster 1852a).

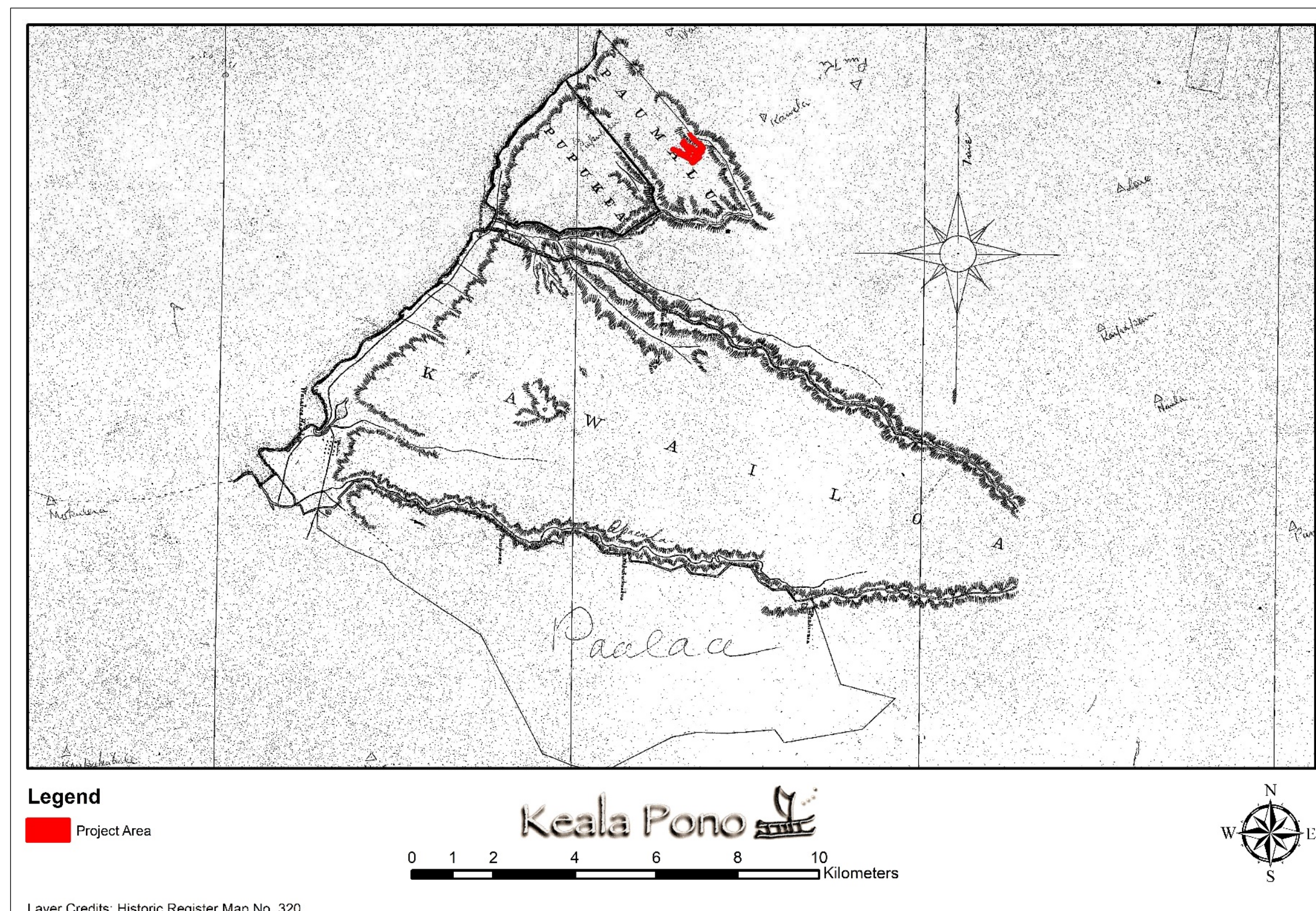


Figure 14. Historic Register Map No. 320, Kawaihoa, Pūpūkea, and Paumalū Ahupua'a boundaries (Monsarrat 1876).

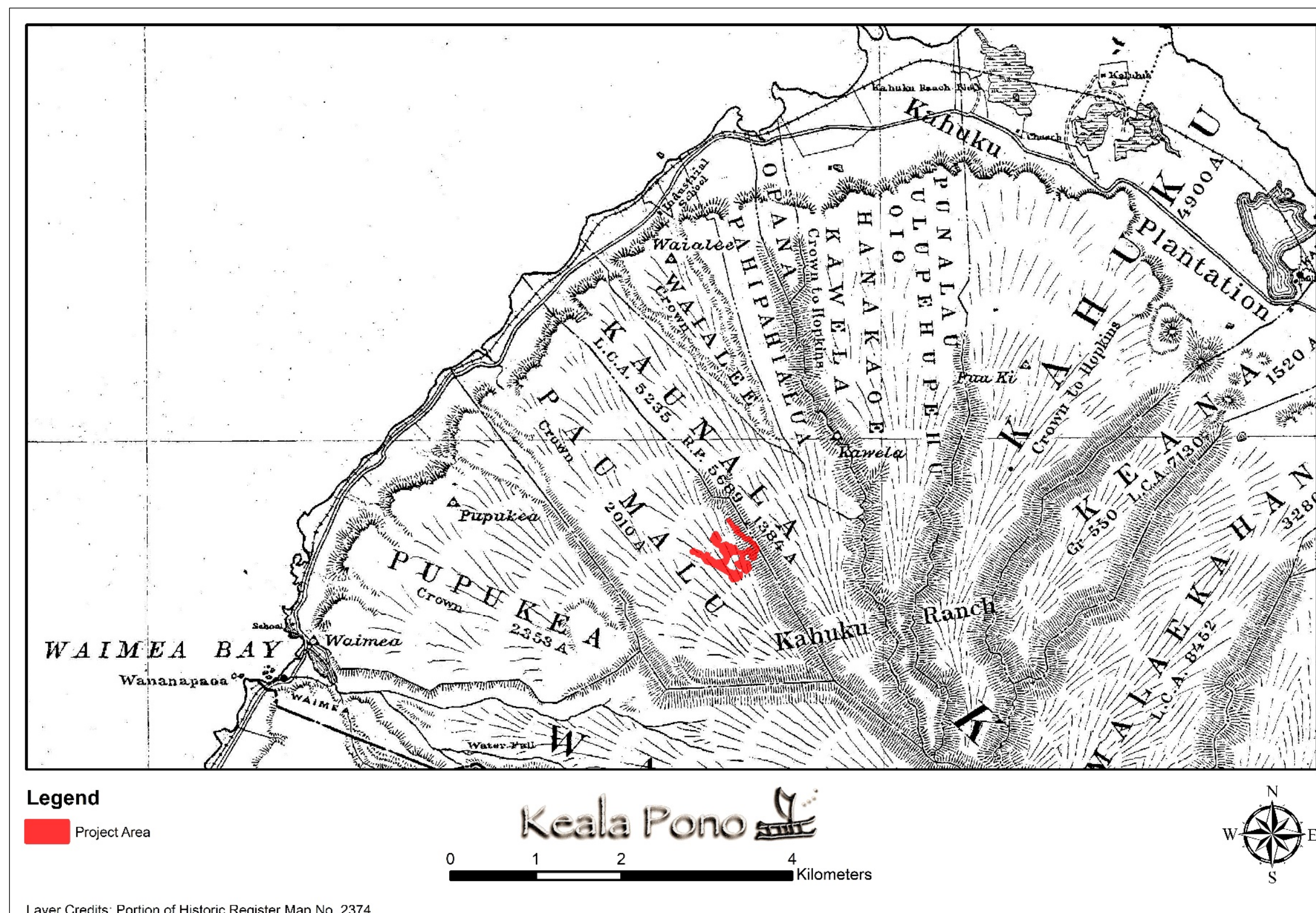


Figure 15. Portion of Historic Register Map No. 2374, O‘ahu showing moku and ahupua‘a near Paumalū (Donn 1902a).

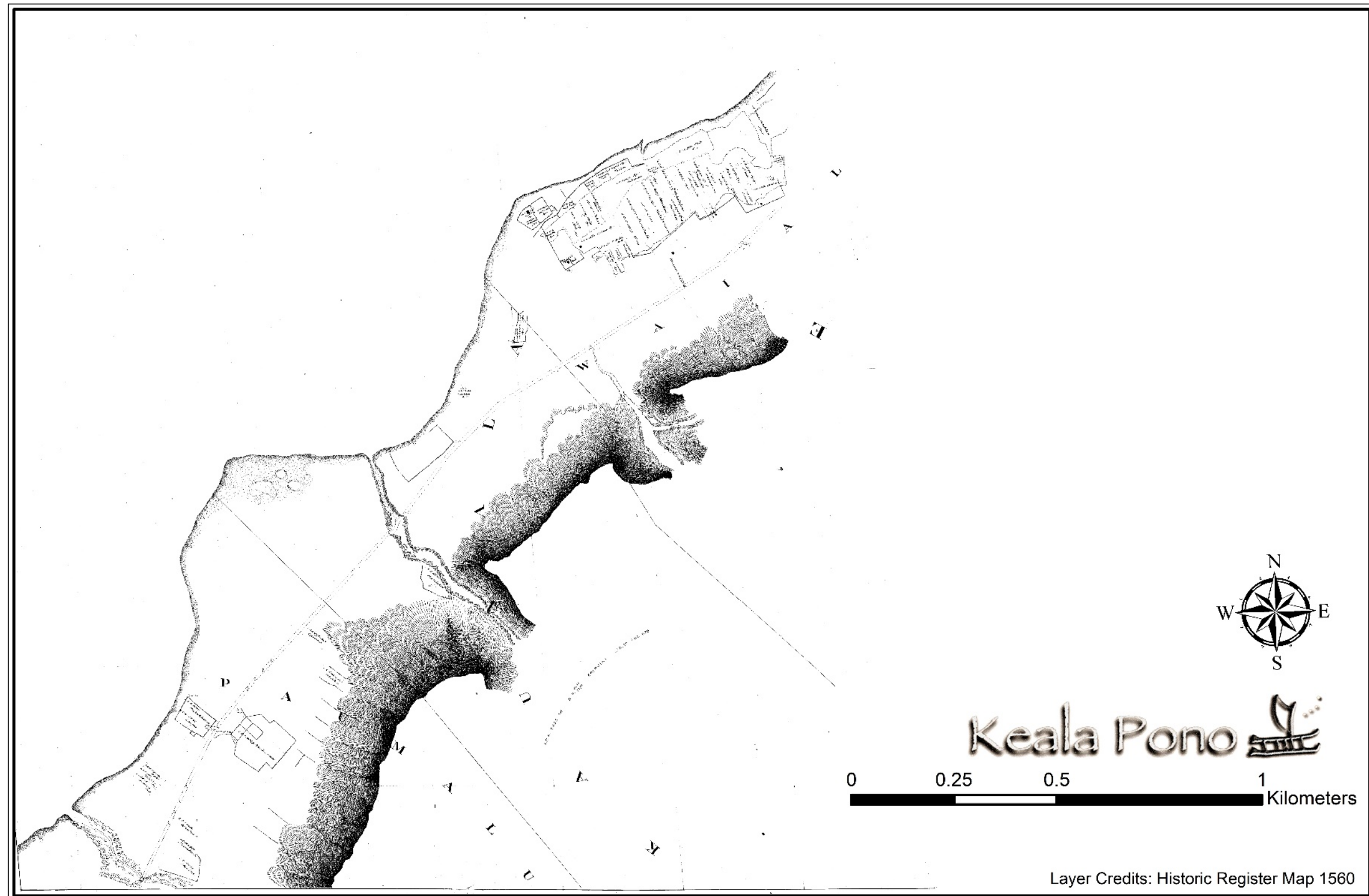
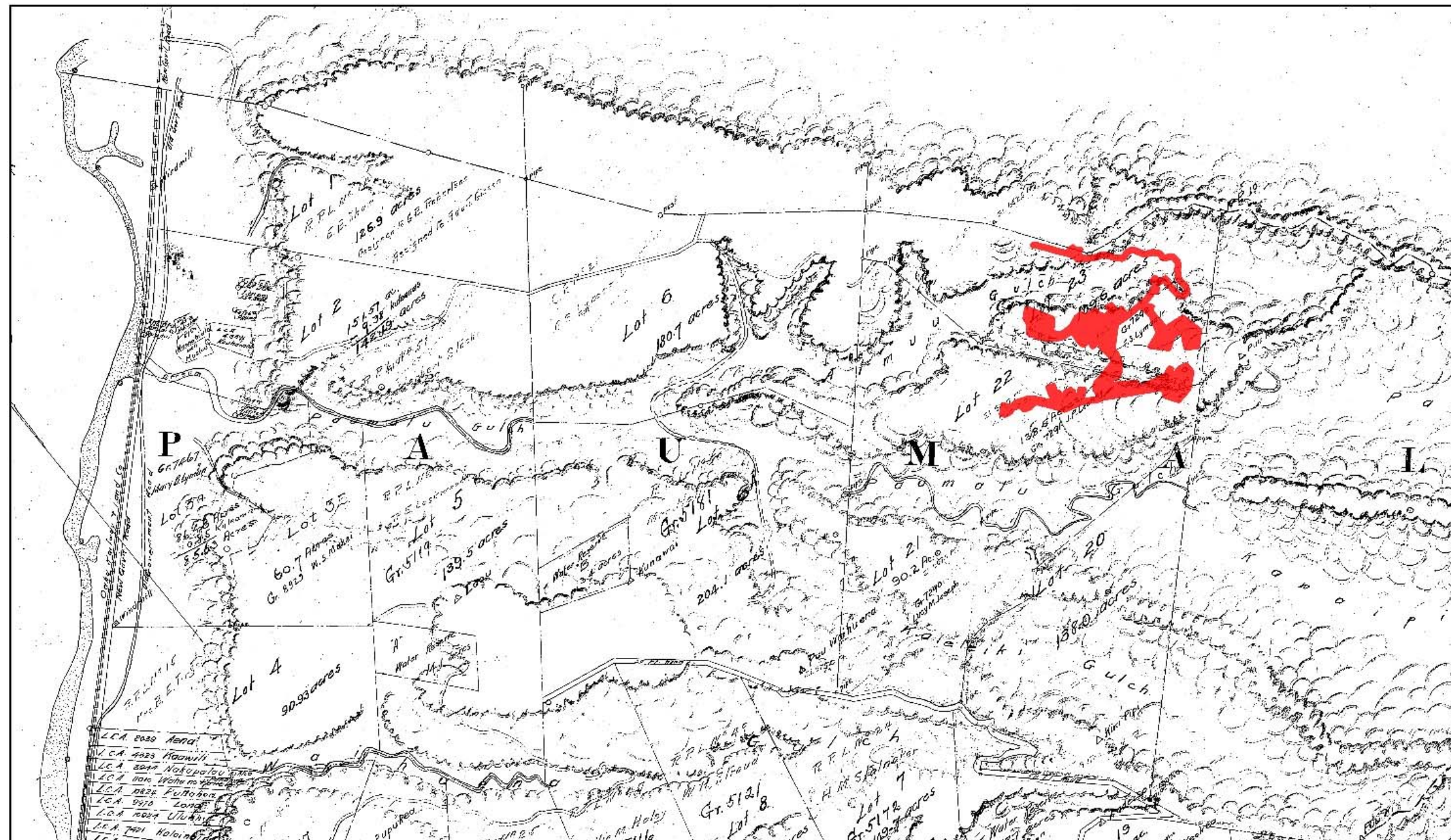


Figure 16. Historic Register Map No. 1560 showing coastal section of Paumalū and Kaunala Ahupua'a including land awards (Willis 1892a). The black area is the cliff edge, grading to gray at the base. Note the walls extending out perpendicular to the cliff, forming land plots or 'āpana. This map provides a rendering of two parcels adjacent to the government road that are visible in Historic Register Map 2374 . Figure 16 is southwest of Figure 17. The project area is off the map to the southeast.



Legend

Project Area

Keala Pono

0 0.5 1 2 Kilometers



Layer Credits: Historic Register Map No. 2252

Figure 19. Portion of Historic Register Map No. 2252, Pūpūkea-Paumalū showing land holdings and topography (Wright 1904).

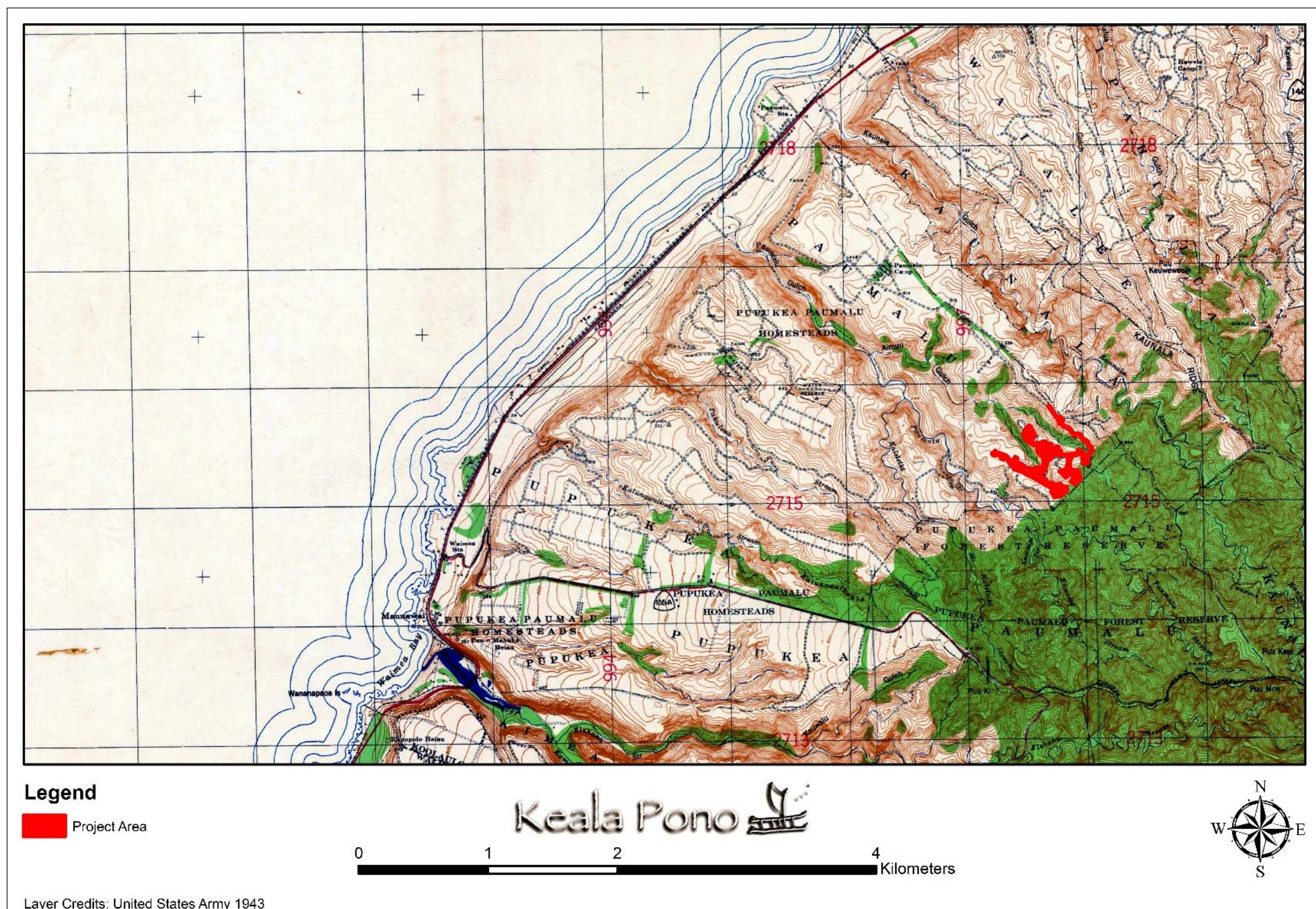


Figure 20. Portion of Waimea map showing topography and place names from Pūpūkea to Kaunala Ahupua'a (United States Army 1943).

Government Road. In many locations the highway was built over the Government Road but in some locations the two follow different paths. In Paumalū, the railway line is abandoned and is no longer visible on the surface (although it may be paved over as a road on the north side of Kamehameha Highway). The location of the Old Government Road was situated more than 800 ft. (244 m) inland from the coast at Paumalū Stream, placing it well south of Kamehameha Highway, located within 200 ft. (61 m) of the coastline. A comparison of the maps by Willis (1892a, 1892b) with those of Donn (1902b) and Wright (1904) suggests that it was just after the turn of the century that the highway was re-located closer to the coast. A plat map by Iao (1913, Figure 21) based on Wright's (1904) early map adds in the Paumalū plantation camp, along with the roads built up the Paumalū Gulch and onto the ridge lands that had been converted to pineapple cultivation.

We also can consider the 1943 United States Army map as a historic resource. It is more than 60 years old and has been superseded by more recent USGS maps. It is useful for documenting history because it is the first map for this area that depicts topography and elevation in fine detail. This map identifies various roads built by the plantations and ranchers along major streams or drainages of the northwest coast of O'ahu, and the extension of these roads into the uplands and to historic plantation camps, such as the Paumalū Camp. This map also depicts a portion of the Kaunala-Paumalū Trail that connected to the Kahuku-Pūpūkea Trail (Figure 22).

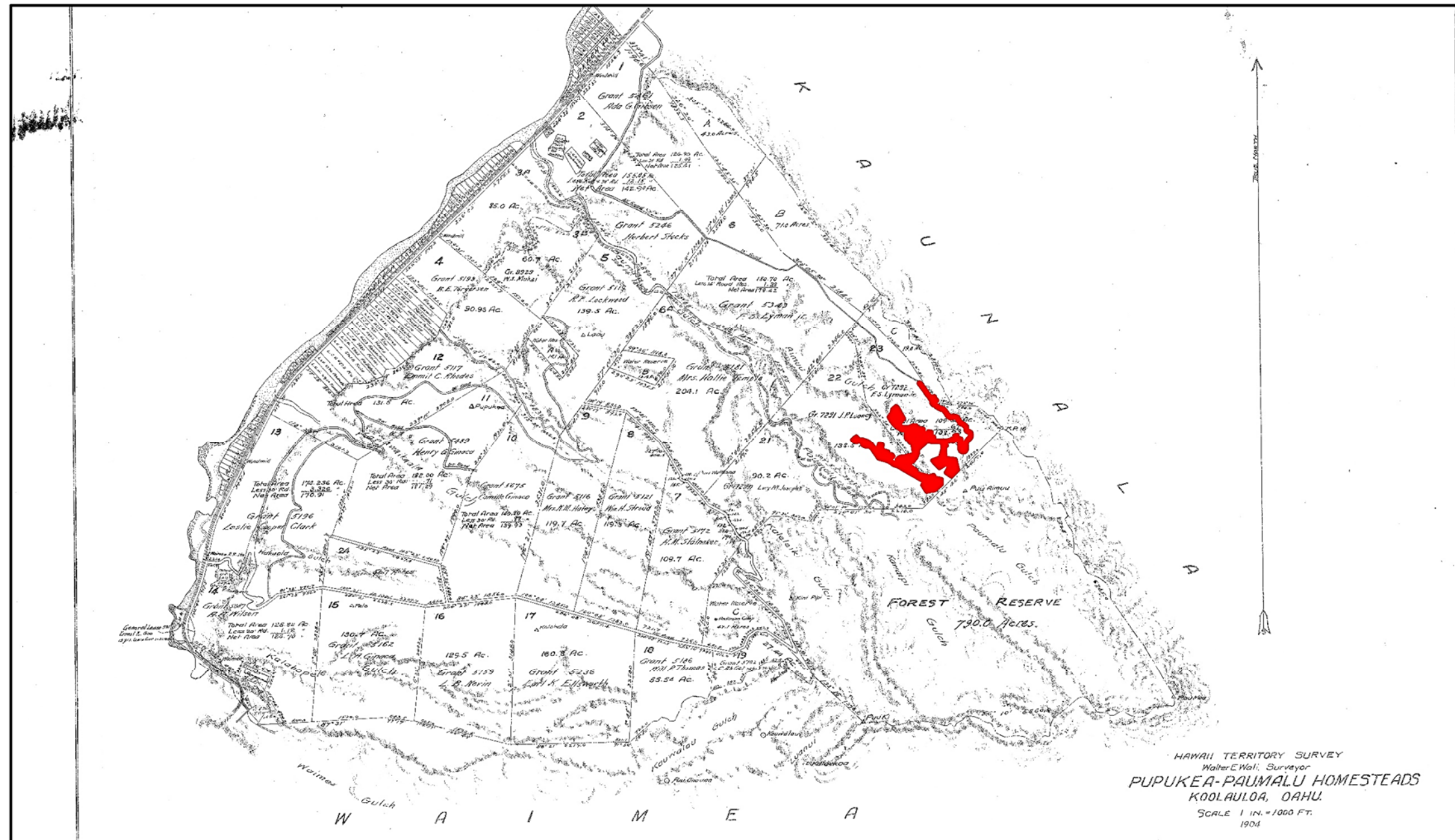
Place Names

Place names for Paumalū Ahupua'a and neighboring locations are presented in Table 5. They include names of ahupua'a (community land divisions), mo'o or 'ili 'āina, wahi pana, and various natural landforms that also served as landmarks, including ridges, streams, gulches, mountain tops, springs, and coastlines. There are nearly 50 names presented here alphabetically and these doubtless do not exhaust the total. Sources consulted for these names include historical and contemporary maps, all land award indices, a portion of the related testimonies, and archaeological and historical reports.

In addition to their literal meanings, which often reflect the setting or events, or individuals associated with them, place names serve as toponyms. That is, named places reinforce mental maps or images that inhabitants hold of their lands. As Thornton (1997:209) notes "Places names are.... [i]nteresting...because they intersect three fundamental domains of cultural analysis: language, thought, and the environment." They can record and preserve aspects of history, not only by their associated archaeological or material remains but also through the events and stories said to be associated with a given place (Basso 1988). Place names inform not only on the structure and content of the physical environment but also how it is perceived, conceptualized, classified, and utilized (Thornton 1997:209). By virtue of their association with physical locations, they serve to promote and prompt mental maps, especially when other place names associated with other locations provide relational, hierarchical, or directional information (Basso 1984). Thus, place names can be a spatial means for remembering or memorializing events, people, or other kinds of things on a landscape. It may be possible to reconstruct or identify aspects of traditional Hawaiian land use and social organization from such names.

The use of named places continued into the historic era in Hawai'i, particularly topographic landmarks that could also serve as survey points. In some cases these are identical in location with traditional named places, but survey stations were often established near to such landmarks to make it possible to relocate them and confirm boundaries and parcel locations.

With relatively few land awards in Paumalū, there is little we can reconstruct about 'ili 'āina names, although several of the testimonies appear to refer to named mo'o lands—or those lands held by an



Legend



Keala Pono

0 0.5 1 2 3 Kilometers



Layer Credits: Plat Map 2036

Figure 21. Plat Map No. 2036, Pūpūkea and Paumalū Ahupua‘a (Iao 1913).

Table 5. Place Names for Paumalū Ahupua‘a and Neighboring Landmarks

Place Name	Description	Location	Notes	Source
Aimuu or Aimoo	awāwa	Paumalū Ahupua‘a	Stream rises at about 670 ft. elev., enters Paumalū gulch at about 220 ft. PE: eat second generation taro	Wright 1904; United States Army 1943
Alanui	government road	Paumalū Ahupua‘a	Mentioned in LCA testimonies. Likely in the same location at Old Government Road	Wright 1904
Ehukai	kahakai	Paumalū, Pūpūkea Ahupua‘a	-	USGS 1998b
Elehaha	awāwa	Waimea Ahupua‘a	Stream rises at about 700 ft. elevation, joins ‘Elehāhā Stream at about 318 ft. Serves to define boundary in Ko‘olau Mountains between Paumalū and Waimea	Soehren 2008; Wright 1904
Elehaha	kahawai	Waimea Ahupua‘a	-	-
Haliiloulu	mo‘o	Paumalū Ahupua‘a	Claim no. 3808 by Laipo: ‘O ko‘u hale kekahi kuleana o‘u, aia ma Haliiloulu.” Claim no. 4387 by Kahuewaa was not awarded. PEM: a covering of loulou	Soehren 2008
Kahikilani	wahi pana	Paumalū Ahupua‘a	“...near Pau-malū (Sunset Beach)...named for a surfer whose wife gave him lehua leis every day; once he returned from surfing with ‘ilima leis given by another woman; the wife called on her aumakua (family god) and the husband was turned to stone.” Also referred to as the “Washington Stone”. PEM: the arrival [of] chief	Soehren 2008
Kahuewaa	kai lawai‘a	Paumalū Ahupua‘a	-	Soehren 2008
Kalaekoa	survey station	Pūpūkea, Waimea Ahupua‘a	-	Iao 1913; Wright 1904
Kaleakoa	boundary point, pu‘u	Pūpūkea, Waimea Ahupua‘a	Boundary Survey course 9 of the Pūpūkea/Waimea boundary runs “to top of hill Kalaekoa.” Elev. 976 ft.	Soehren 2008
Kaleleiki	awāwa	Paumalū Ahupua‘a	Claim no. 3777 by Apaa is for “he uka laau kekahi o Kaleleiki kona inoa”	Soehren 2008; Wright 1904
Kaleleiki	kahawai	Paumalū Ahupua‘a	-	United States Army 1943
Kaleleiki	kualapa	Paumalū Ahupua‘a	Rises to about 800 ft. asl, joined by Kaleleiki Stream at 270 ft. asl, and by Aimu‘u Gulch at 220 ft. asl, then flows to ocean	Soehren 2008; United States Army 1943

Table 5. (continued)

Place Name	Description	Location	Notes	Source
Kelieleele	mo‘o	Paumalū Ahupua‘a	Claim no. 3777 by Apaa is “ma Kelieleele 1 ili uala.” Claim no. 3725 by Moa for “8 ili uala, he uka laau, he koa, he ulu, he ōhi‘a, he ohe a me na mea like, aia no ma Kelieleele keia mau kuleana.” Perhaps ke-lī-‘ele‘ele. PEM: the edible seaweed (<i>Enteromorpha prolifera</i>)	Soehren 2008
Kaliku	kai lawai‘a	Paumalū Ahupua‘a	-	-
Kanawaikaala	kahawai	Pūpūkea Ahupua‘a	-	United States Army 1943
Kanawaikaala	awāwa	Pūpūkea Ahupua‘a	-	United States Army 1943
Kaunala	ahupua‘a	Kaunala Ahupua‘a	Lit: PEM: [boat] landing	Webster 1852; Monsarrat 1876
Kaunala	ala hele	Kaunala, Paumalū Ahupua‘a	Extends from Kahuku-Pūpūkea Trail in the Ko‘olau Mountains across the ridgeline separating Kaunala and Paumalū Ahupua‘a	United States Army 1943
Kauai, Kawai	kahawai	Paumalū Ahupua‘a,	Upper branch of Paumalū Stream	United States Army 1943
Kawai	awāwa	Paumalū Ahupua‘a	Upper branch of Paumalū Stream	Wright 1904
Kauwalau	awāwa	Waimea Ahupua‘a	-	-
Kini Pipi	survey station	Paumalū Ahupua‘a	-	Wright 1904; Iao 1913
Kukaela	mo‘o	Paumalū Ahupua‘a	Claim no. 3777 by Apaa is for “aina kula ma Kukaela 1 ili ‘uala.” PE: eggs deposited by flies, as in meat	Soehren 2008
Kunawai	survey station	Paumalū Ahupua‘a	-	Wright 1904
Laau	survey station	Paumalū Ahupua‘a	-	Iao 1913
Laipo	kai lawai‘a	Paumalū Ahupua‘a	Same name as LCA claimant, associated with Kukaela	-
Luanui	awāwa, kahawai	Waimea Ahupua‘a	Uppermost gulch bordering Paumalū Ahupua‘a to the south	Iao 1913
Makanilua	mo‘o	Paumalū Ahupua‘a	Claim no. 3777 by Apaa: “Aia ma Makanilua o ku‘u hale”	Soehren 2008
Malu	survey station	Paumalū, Kaulana Ahupua‘a	Near boundary between two ahupua‘a	Wright 1904; United States Army 1943

Table 5. (continued)

Place Name	Description	Location	Notes	Source
Moe hala	mo‘o	Paumalū Ahupua‘a	Claim no. 3776 by Opunui is “ma ka ili ma Moe hala 1 ili hala” PEM: bed of hala	Soehren 2002–2010
Old Government Road	roadway	Paumalū Ahupua‘a	May overlay the Ala Nui Trail, road	Donn 1904a; Iao 1913
Palaau	mo‘o	Paumalū Ahupua‘a	Claim no. 3880 by Pukaloheau is for “2 ili ‘uala a me ka uka laau ma Palaau, o ko‘u hale kekahi aia no ma Palaau.” PEM: wooden fence or enclosure	Soehren 2008
Papalaekoa	pu‘u	-	-	-
Pakulena	kahawai	Pūpūkea Ahupua‘a	On historic maps this is identified as Weihuena Gulch	United States Army 1943; USGS 1998
Paumalū	kahawai	Paumalū Ahupua‘a	Rises to about 800 ft. asl, joined by Kaleleiki Stream at 270 ft. asl, and by Aimuu Gulch at 220 ft. asl, then flows to ocean	Soehren 2008
Paumalū	ahupua‘a	Paumalū Ahupua‘a	Returned by Lunalilo, retained by Crown at the Māhele	Soehren 2008
Paumalū	awāwa, kahawai	Paumalū Ahupua‘a	Conjoins Aimu‘u Gulch and Kaleleiki Stream. The gulch and stream appear to be the mauka boundary between Paumalū and Pūpūkea	Soehren 2008; Wright 1904
Paumalū Camp	historic settlement	Paumalū Ahupua‘a	-	United States Army 1943
Paumalū Station	historic settlement	Paumalū Ahupua‘a	-	United States Army 1943
Pohakunui	mo‘o	Paumalū Ahupua‘a	Claim no. 4369 by Kaahamoa is for “6 mo‘o uala ma Pohakunui. He uka laau kekahi, he ulu, he noni, he koa, a me na mea like, aia ma Pohakunui.” PEM: large stone	Soehren 2008
Puaa e kepo	awāwa, kahawai	Paumalū Ahupua‘a	Branch gulch to Aimu‘u Gulch in upper Paumalū	Group 70 International 2013
Pulai	bench mark	Paumalū, Waimea Ahupua‘a	At 1,237 ft. asl near boundary between two ahupua‘a	United States Army 1943

Table 5. (continued)

Place Name	Description	Location	Notes	Source
Pūpūkea	ahupua‘a	Pūpūkea Ahupua‘a	Returned by Kamāmalu at the Māhele, retained by the Gov. Indices list 19 kuleana. Claims no. 4261 by Kauila, no. 4337 by Nalimaku, no. 7442 by Kaawa were not awarded. “...the kahuna class were given the lands of Waimea, Pupukea, Waiahole, and Hakipuu in perpetuity...until the days of Ka-hahana.” (Kamakau)	Soehren 2008
Pūpūkea	survey station	Pūpūkea Ahupua‘a	-	United States Army 1943
Pūpūkea-Kahuku Trail	ala hele	Kahuku to Pūpūkea Ahupua‘a	Trails that extended from coastal Kahuku across the crest of the Ko‘olau Mountains to Pūpūkea Ahupua‘a	United States Army 1943
Puu Aimuu	pu‘u	Paumalū Ahupua‘a	Claim no. 3650 by Naonohiula: “Aia ma Aimoo 4 ili uala.” The name may be a corruption of Aimuu (q.v.).	Soehren 2008
Puu Aimuu	survey station	Paumalū Ahupua‘a	-	Soehren 2008; Iao 1913
Puu Kauī	pu‘u	Kaunala Ahupua‘a	-	United States Army 1943
Puu Ki	pu‘u	Paumalū, Pūpūkea Ahupua‘a	Boundary point, PEM: ti plant hill	Soehren 2008; United States Army 1943
Puu Ki	survey station	Paumalū, Pūpūkea Ahupua‘a	-	Iao, 1913; Wright 1904
Puu Moa	pu‘u	Paumalū, Kaunala, Waimea Ahupua‘a	Boundary point, 1,400 ft. asl The mauka corner of Paumalū is near Pu‘u Moa. PEM: hill of the chicken	Iao 1913; Soehren 2008; United States Army 1943
Puu Moa	survey station	Paumalū, Kaunala, Waimea Ahupua‘a	-	Wright 1904
Puu Weihuena	survey station	Pūpūkea Ahupua‘a	-	Iao 1913; Soehren 2008; Wright 1904
Puu Weihuena	boundary point, pu‘u	Paumalū, Pūpūkea Ahupua‘a	Perhaps once on the Paumalū/Pūpūkea boundary, which was not surveyed. PEM: flowing water hill.	Soehren 2008; USGS 1998
Sunset Beach	kahakai	Paumalū Ahupua‘a	-	USGS 1998b
Waihuena	awāwa, kahawai	Pūpūkea Ahupua‘a	alt to Pakulena	Iao 1913; Wright 1904

Table 5. (continued)

Place Name	Description	Location	Notes	Source
Waikoi	awāwa	Paumalū Ahupua‘a	“Inland, on the southern slope above Paumalu Stream, is a spring called Waikou;” there is a small gulch to the south of Paumalū Gulch with this name	Iao 1913; Sterling and Summers 1978
Waialua	moku	Paumalū, Waimea Ahupua‘a	-	USGS 1998
Waimea	ahupua‘a	Waimea Ahupua‘a	-	Soehren 2008
Waimea	kahawai	Waimea Ahupua‘a	-	United States Army 1943
Washington Stone	stone, wahi pana	Paumalū Ahupua‘a	Recent, alternate name for Kahikilani rock	Sterling and Summers 1978

extended family for their residence and at least a portion of their cultivated lands. These include the following mo‘o, (spelling follows the original literature, without diacriticals): Haliiloulu, Kelielele, Kukaala, Moehala, Palaau, and Pohakunui. The names of three fisheries are included here and these were associated with named initials. They reflect the importance of access to and conservation of marine resources for Paumalū. The major spring that served the coastal community in a small gulch, Waikoi, is named (Iao 1913) . This gulch also served as the boundary between Paumalū and Pūpūkea.

More often represented in the Paumalū place names are natural features. Most of these are located away from the coastline and many of them center near to the Paumalū Stream catchment (along with its tributaries). Both streams (waterways) and the gulches (drainages) often share the same name. The emphasis on naming streams, gulches, and hills or mountain tops reflects the importance of water and forest resources that could be found or originated in the uplands. Woodland and forest resources would have included trees, particularly their woods but also nuts, bark, roots, leaves and flowers. It is possible that named uplands also included managed trees, such as kukui or ‘ōhi‘a ‘ai, and possible locations for swidden or shifting fields for gardening.

Along with named upland locations there are at least two named trails that border or extend through Paumalū—the Kahuku-Pūpūkea Trail and the Kaunala-Paumalū Trail (Figure 23). The Kaunala-Paumalū Trail is located just to the east of the GSH Paumalū Camp on the ridge line separating these two ahupua‘a. These trails would have provided access from coastal locations to the Ko‘olau Mountains and in the case of the Kahuku-Pūpūkea Trail it provided a terrestrial, interior access route to link dispersed communities and their residents.

The listing of places for Paumalū and portions of its neighboring communities is likely partial and incomplete. It nonetheless illustrates the interconnectedness from the ocean to the beaches and then to higher elevations along drainages, slopes, ridges and mountaintops. Named upland locations were thus part of a conceptual system and tradition whose local members would have employed these names to commemorate, memorialize, and represent locations of cultural and historic significance.

Mo‘olelo of Paumalū

Paumalū and its environs are well known for their coasts and surrounding ocean and fisheries. It is not surprising, then that mo‘olelo mentioning Paumalū make references to these characteristics.

For Paumalū, an account of how it came by its name was provided by Henry Kaina (and can be found in McAllister 1933:145):

How Paumalu Got Its Name

At one time there lived on the island of O‘ahu a woman who was noted for ability to catch squid, of which the chiefs of high rank were fond. If there was anyone who could catch a lot of squid that person was in great demand.

One day a great luau was to be given by a chief, and he wanted some squid. He sent some of his men in search of someone who could catch squid. They brought the woman to him. He told her he wanted squid from a certain reef and asked her if she could catch some for him. She said she could catch all he wanted.

She went down to the beach at the place designated by the chief but before she entered the water an old man met her. He told her the rules of the place: she was supposed to catch only a certain number and had when she had caught them to go home or something would be sure to happen to her. She called for her daughter who had followed and told her to come with her into the water. Another thing the old man had said was for her to go home

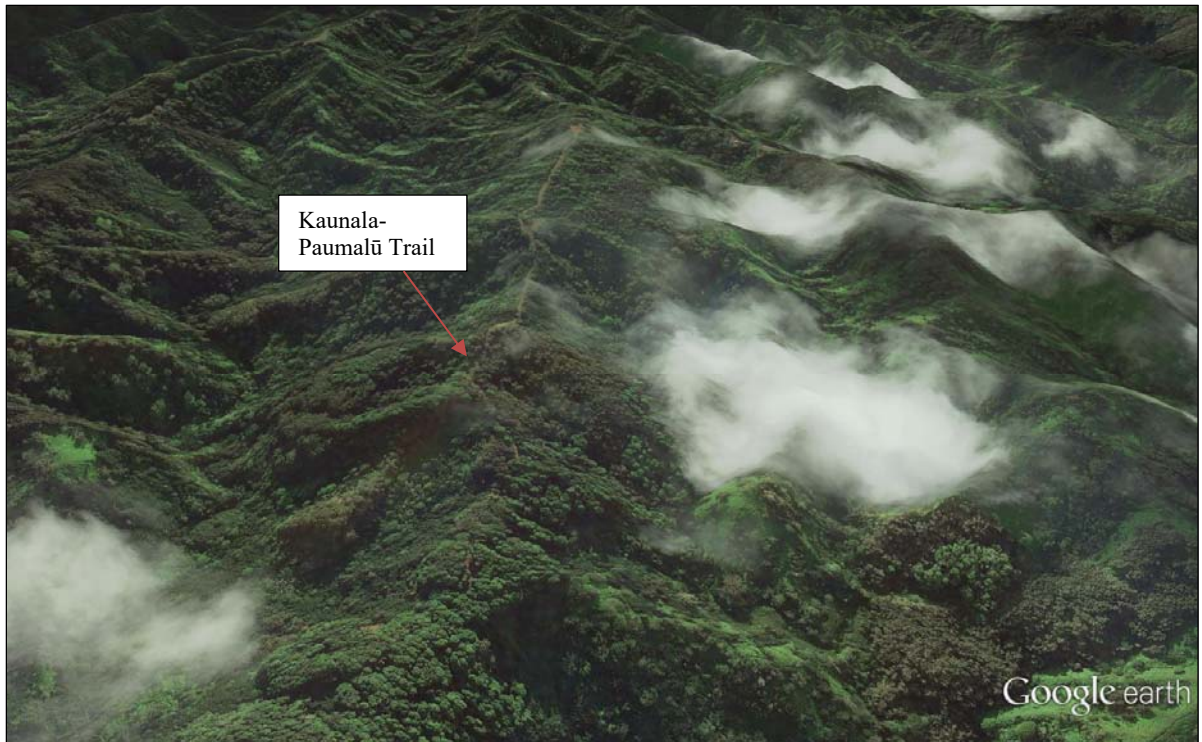


Figure 23. Google Earth image of upper Paumalū, showing roadway matching the location of the Kaunala-Paumalū Trail, dated January 16, 2013 (Google Earth 2018).

when she said would not stop for anything. The lady caught all she had been allowed by the old man, but she kept on fishing until she had more than she could handle. She sent her daughter to the shore with half of the load and told her she was going home, but instead she remained, for she saw a huge squid she wanted to get. Just then a large shark came and bit off her legs. She yelled for help. Her daughter came to her rescue but too late. She died from the loss of blood and the shock.

When the people examined her later they found one deep gash on her right arm made by one of the shark's teeth. They then knew that it was done by a shark who guarded that particular reef. After that incident they named the place Paumalu, which mean, "taken by surprise"

A second mo'olelo refers to the large named stone on the coastline of Paumalū, sometimes known as Washington Stone but whose Hawaiian name is Kahikilani (reprinted in Sterling and Summers 1978:146).

Long ago there lived on Kauai a chief who was very fond of surfing. He had won every surfing contest on his own home island and now came to Oahu to try his skill. As the surf at Waikiki was not to his liking, he went on to the Koolau side of the island. There he found just what he wanted.

While he was surfing he noticed some birds circling about him. One old bird in particular would fly a short distance away and then return to circle about him as if urging him to follow. He did so, and the bird led him into a cave where he met a beautiful girl who had fallen in love with him as she watched him surfing and had sent her pets, the sea-birds, to

lead him to her. She asked him to become her husband and he accepted her proposal. Each morning before he left her for his favorite sport she made him two lehua wreaths to wear, one for his head and one for his neck.

For a long time they lived thus happily until one day as he came ashore from surfing, another girl greeted him and threw about his neck several strands of the golden ilima. The old seabird flew home and reported to his mistress what he had seen. When she saw her lover returning with the ilima wreaths about his neck in addition to the lehua strands which she had braided for him, she was very angry and called upon her ancestral gods (aumakua) to punish him. As he ascended the hill he felt his body becoming heavy and, as he turned to look once more at his beloved surfing beach, there he remained transfixed in stone and is so to this day.

A more detailed version of this mo‘olelo is thus (reprinted in Sterling and Summers 1978:146–147):

Long, long before Washington was born, a youth, Kahikilani, came from Kauai. He came with kahunas and carried a surfboard. Up and down the coast he went trying the waves. At last he came to Paumalu.

Now there are waves, but the waves on this beach come in from the sea in a way that puzzles all riders of surf. They do not come sweeping in straight, long swells. Some distance out, there is a lull and a change. Not many men can ride these waves. And long ago, they tempted the stranger who came from Kauai. Many times he tried to ride the swell. Day after day he tried and failed. But at last, he conquered. The people cheered. “Hm, I can ride still harder waves,” he said. “Tell me, where is your hardest surf?”

“Bird Island, Bird Island,” the people called. “No man alive can ride the waves of Bird Island.” So off they went. Around his head, Kahikilani noticed some birds. They circled and circled and sang and sang, and at last winged away up to the pass. They sang their song. Kahikilani was coming, a great strong man, handsome of face, light of skin, tall and broad and proud as a god.

Kaiulani, the adopted daughter of the lizard god, sat in her cave. She was weaving sweet-smelling lehua leis. She looked out from her cliff as she heard the song, and fell in love. To the singing birds she gave her leis and bade them go.

Around and around his head they sang. “Why,” asked the youth, “Do these birds carry leis?” “Because” the wise kahuna said “a beautiful girl sends a message of love.” He tossed his head, “I do not care for beautiful girls. I desire only to ride the waves.” So he went to Bird Island and conquered the surf.

Then he lay in the sun on the beach to rest. He thought of the splendid things in the world - the challenging waves, the shining sand, the sun-lit sky, his own great strength. And round and round flew the singing birds, bearing their leis, singing their song. They sang of love and of Kaiulani, the lovely girl who lived in the cave. She was lithe and fair, and her skin was soft as a newborn babe. Her hair made a cloud of silken black that veiled the beauty of her rounded form. Her voice was soft as the lapping of waves on a sandy shore. She had seen Kahikilani as he passed on the trail; she sent him the leis, laden with love.

At last he succumbed to their wooing song and followed the fragrant message of love. For a while the two in the cave were content. But not for long. Thoughts of the surf disturbed his sleep. He ached for the waves with their white-foamed crests. He could hear the murmur of Paumalu.

Before he left, he made two vows, He would soon return, and while he was gone, his lips would not kiss another girl. But he broke his pledge. A beautiful maid who came to the beach adored his strength. She came to him with ilima leis and kissed him shyly as he bent his head. Kahikilani, king of surf, forgot the love he had left in the cave. But alas he forgot also the singing birds. They flew back to the cave and carried the word of his faithless love.

Kaiulani was weaving lehua leis. She listened. She rose. She went straight as a crow to Paumalu. From the neck of her lover, she snatched the ilima. She gave him a fragrant lehua lei, and she said, "This, our love is over." She turned away.

The man bowed his head in burning shame. Then he rose to follow his sorrowing love. But he found that a curious thing had occurred. His legs would not walk along the beach. He could only walk back to the hills. He climbed the cliff, halfway up, to watch his sadly departing love. She rounded the bend. He turned to stone.

The legend of Kahikilani and Kaiulani attests to Paumalū's reputation for large ocean waves that required considerable skill to ride. They also required some time and commitment before they could be mastered (Finney and Houston 1996). It is said that the image of Kahikilani can still be seen wearing a petrified lehua lei around his neck on a ridge above Paumalū Bay, less than a mile from Kamehameha Highway. Someone renamed the image "the George Washington Stone."

Paumalū and the north coast of O'ahu are noted for their marine resources. These include fish, shellfish, invertebrates, and limu (Titcomb et al. 1979:327). While access to the ocean would have been limited by winter storms and high surf conditions, during the summer it would have been easily accessed. This is reflected in the named fisheries associated with Paumalū. At least three were known: Kaliku, Kahuewa'a, and Laipo, associated in most cases with named individuals or locations. Kamehameha III, in addition to acquiring title to all of Paumalū and Pūpūkea was also able to place a kapu on certain fish, in this case, the alalaua or *Priacanthus alalaua*.

Historic Events and Land Use

The historic period in Hawai'i began in 1778 with the arrival of foreigners and their written records. In 1848, the Great Māhele was an important event that has provided us with a wealth of information on land use. This information is discussed in detail below. The post-Māhele history of Paumalū is reviewed as well.

Māhele Records

Traditionally in Hawai'i, land title was held by the ali'i nui (paramount chief) and land use rights were assigned to a series of ali'i (chiefs) and konohiki (lesser chiefs), who in turn provided parcels of lands to families belonging to the maka'āinana. Konohiki managed the ahupua'a lands, while maka'āinana were expected to improve and work their assigned lands, usually identified by an 'ili name, and to provide a portion of agricultural output to the konohiki and/or other chiefs.

Changes in the traditional Hawaiian land tenure system began with the appointment of the Board of Commissioners to Quiet Land Titles by Kamehameha III in 1845. The Great Māhele or land division took place during the first few months of 1848 when the king and his senior chiefs chose their interests in the lands of the Kingdom. This division of land was recorded in the Māhele Book. The King retained substantial land holdings as Crown Lands, while approximately the same amount of land was designated as Government Lands. Konohiki Awards were made as lesser chiefs presented their claims before the Land Commission.

In the fall of 1850 legislation was passed allowing citizens to present claims before the Land Commission for parcels that they were cultivating within the Crown, Government, or Konohiki lands. By 1855 the Land Commission had made visits to all of the islands and had received testimony for about 12,000 land claims. Ultimately, about 10,000 kuleana land claims were awarded to maka‘āinana totaling only about 30,000 acres.

The ahupua‘a of Paumalū, as part of the Ko‘olauloa Moku, had restrictions placed upon it from ancient times. These restrictions were honored during the Māhele in 1848. The Crown (Kamehameha III) chose to reserve all of Paumalū Ahupua‘a as his private royal holding. Despite its designation as Crown Land, 12 individuals made claims for land parcels in Paumalū (Table 6). Ten of these were eventually awarded, totaling less than 10 acres out of the more than 2,000 acres that comprised the ahupua‘a of Paumalū. None of these land awards include the area now owned by the Girl Scouts of Hawaii; it would have been a portion of the Crown Land claimed by Kamehameha III. There are claimants from other nearby ahupua‘a, Kaunala and Waiale‘e, who also mention access to plant resources in Paumalū. For instance, Keluhui, from Waiale‘e Ahupua‘a claimed the following resources and plants from Paumalū: noni, wauke, mai‘a, ‘ulu, and koa. Another claimant, Kimo, also from Waiale‘e, claimed ‘uala, wauke, and ipu. Claimant Kuana from Waiale‘e, LCA 2820 claimed resources from Kaunala and from Paumalū: ‘uala, mai‘a, wauke, ‘ulu, and ipu. Opunui, who was awarded land in Paumalū had a separate claim, LCA 3780 in Waiono that included lo‘i and kula lands.

Reading the Foreign Testimonies, one might reach the conclusion that there was little other than ‘uala (sweet potatoes) and mai‘a (bananas) grown on the lands claimed during the Māhele. Most of the maka‘āinana claims identify the land as kula used primarily for the cultivation of sweet potatoes, and occasionally bananas, and on which their houses were built. The Native Register testimonies, however, document a more diverse array of plants including Polynesian introductions: noni, ‘ulu, hala, ‘awa, and what appears to be kalo malo‘o. Other native and introduced tree resources were claimed such as kukui, ‘ōhi‘a ‘ai, ‘ōhi‘a lehua, and koa.

All of the land claims were for parcels near the ocean or set back at the base of the talus slope below the cliffline (see Figures 16 and 17). In several cases two separate parcels were awarded, one near the coast where houses were likely located and the second farther inland towards the cliff where kula gardens were placed. There were two surface water sources— Paumalū Stream and the seep located on the coastal plain—identified on the map shown in Figure 16 and this does not include the spring in Waikou Gulch. The kula lands were located for the most part on the talus slope and adjacent to the cliffline and these appear to be permanent fields as indicated by the rock walls (see Figure 16). Otherwise garden areas were situated just inland of the Government Road. A number of walled sections, likely kula fields, went unclaimed or awarded during the Māhele. Both maps depict the Government Road likely in the same location as the Ala Nui mentioned and identified as adjacent to several parcel claims. The Government Road is located at least 700–1,300 ft. (213–396 m) from the coast along Paumalū, which would have placed it relatively near the base of the talus slope (see Figure 17).

Post-Māhele History

By the time of the Māhele an Englishman named Robert Moffitt was named konohiki of Paumalū and is likely the person referred to or named by various claimants in their testimonies. Moffitt was a close confidante of Kamehameha IV and Kamehameha V. By the mid-19th century Moffitt had established sheep and cattle operations in Paumalū, likely centered on the uplands above the cliffline and within Paumalū Gulch.

Table 6. Māhele Land Claims and Awards for Paumalū Ahupua‘a*

Award No.	Claimant	No. of Pcs. Claimed	No. Awarded	Land Use	Awarded	LCA	Testimony	R.P.	Area (acres)	Notes
2829	Keoho	1	-	kula land	no	yes	FT:	-	-	Keoho died in 1848; land not awarded
3713	Manunui	1	1	kula land planted with 2 ‘ili ‘uala, mai‘a , and house on parcel	yes?	yes	MD-NR-R2-V4-I01555	-	-	-
3725	Moa	1	1	8 ‘ili ‘uala, ‘ulu, ōhi‘a, koa, ‘ohe, pūhala, ‘oke uka lā‘au	no	yes	FT:V-11-S-04; MD-NR-R2-V4-I01559	-	-	Said to be abandoned land; awarded to konohiki, located at Keliele‘ele
3745	Wailua	1	1	House on parcel 1 niu, 1 hala, kou?	no	yes	MD-NR-R2-V4-I01564	-	-	Not shown on maps; probably denied but see LCA 4011
3776	Opunui	2	2	5 ‘ili ‘uala, he uka lā‘au kekahi, noni, ‘ulu, koa, mo‘o kalo, and house on parcel	yes	yes	FT: V-11-8-04; MD-NR-R2-V4-I01568	None	0.72	Willis 1892a, house on coast ‘āpana with alanui on makai, konohiki and Kalaiku on sides; kula ‘āpana on north edge of ahupua‘a talus slope with konohiki on either side; located at Kaleleiki
3777	Apaa	2	2	kula planted with 1 ‘ili ‘uala Laipo, 2 ‘ili ‘uala Opunui, 1 ilu ‘uala Moa, 1 ‘ili ‘uala Kapuake, 2 ‘ili ‘uala Kalaiku, and hale on second parcel. “mo‘o ‘uala na lele aku i kehahi kanaka”	yes	yes	FT: V-11-8-04; MD-NR-R2-V4-I01569 & I01569	None	0.90	Willis 1892a, 1892b, coastal ‘āpana shown on map with house lot, alanui to makai; konohiki and Kalaiku on either side; kula ‘āpana lot next to Paumalū Stream by talus slope with konohiki on one side

Table 6. (continued)

Award No.	Claimant	No. of Pcs. Claimed	No. Awarded	Land Use	Awarded	LCA	Testimony	R.P.	Area (acres)	Notes
3808	Laipo	1	1	kula planted with 9 mo'o 'uala, mai'a , 'ulu, he uka lā'au, koa, 'ōhi'a, and hale on parcel	yes	yes	FT: V-11-8-04; MD-NR-R2-V4-I01576	None	0.75	Willis 1892a, water hole on mauka side of property, along with alanui; Pukaloheau and Holoakea parcels on either side and konohiki on mauka and makai
3880	Pukaloheau	1	1	kula planted with 2 'ili 'uala, he uka lā'au, and a hale	yes	yes	MD-NR-R2-V4-I01587	None	0.55	Willis 1892a, water source and alanui on mauka side of parcel and Laipo on the south side, and konohiki on north side. Located at Pala'au
3950	Naonohiuli or Naonohiula	1	1	kula planted with 4 'ili 'uala, he uka lā'au kekahi 'ulu, koa, 'ōhi'a, and hale on parcel	yes	yes	MD-NR-R2-V4-01599	None	1.00	Willis 1892a; died before award granted, title to wife, Keheeiki.; located at Aimo'o
4011	Haalou	1	1	kula planted with 2 'ili 'uala, he uka kekali, he lā'au, 'ulu, mai'a , koa, 'ōhi'a, and hale on parcel	yes	yes	MD-NR-R2-V4-I01612	None	1.12	Willis 1892a; died before award grant, title to Wailua; 'āpana north of Paumalū Stream on talus slope. Naonohiuli 'āpana north and Holoakea and alanui makai.
4013	Holoakea	1	1	cultivated kula land planted with 2 'ili 'uala, wauke, 'ulu, mai'a , 'ōhi'a	yes	yes	FT: V-11-S-04; MD-NR-R2-V4-I01612	None	0.93	Willis 1892a; Located at Kukaela

Table 6. (continued)

Award No.	Claimant	No. of Pcs. Claimed	No. Awarded	Land Use	Awarded	LCA	Testimony	R.P.	Area (acres)	Notes
4369	Kaahamoa	1	1	kula planted with 6 mo‘o ‘uala, he uka lā‘au kekahi, ‘ulu, noni, koa; hale on parcel	yes	yes	FT: V-11-S-04; MD-NR-R3-V4-I00008:	None	2.60	Willis 1892a; surface water on property, water hole and alanui on makai, konohiki on north and south sides; abuts talus slope with kula parcels mauka; interior of parcel subdivided into smaller plots or terraces.
4381	Kalaiku, Kalaiki	2	2	kula planted with 5 ‘ili ‘uala, he uka laau, noni, ‘ulu, koa, kukui, mo‘o kalo, mai‘a , and hale on parcel	yes	yes	FT: V-11-S-04; MD-NR-R3-V4-I00011	8337	0.67	Willis 1892a; Yucha and Hammatt 2015:13–14; coastal ‘āpana with alanui mauka and Apaa and Opunui parcels on either side; kula ‘āpana near north ahupua‘a boundary on talus slope with konohiki on three sides
-	Kamehameha III	-	-	-	yes	no	-	-	2,010.0	Crown Land

* No ‘Apana numbers were found for these Award numbers.

The former Ala Nui was converted to a Government Road before 1892 (see Figures 16 and 17; compare to Figure 14) and placed in the same location. Kamehameha Highway was later built but in Paumalū it was placed much closer to the coastline.

In 1889, the Oahu Railway & Land Company (OR&L) was organized by Benjamin Dillingham. Designed to link areas to the west and north of Honolulu, portions of it were completed in 1890 (to Pearl City), 1895 (Waiʻanae), and 1898 (Waialua Plantation), and in 1899 it reached Kahuku (Kuykendall 1967:100). Thus, the portion of the OR&L through Paumalū was one of the last to be constructed. The Oʻahu Railway & Land Company went out of business on December 31, 1941 and the railway line through the Koʻolauloa District was later discontinued (Conde and Best 1973:299). One cause of the railway’s closure was the damage to the rail line from the 1946 tsunami.

The Kahuku Sugar Company was established in 1890 by James Castle and Alexander Young at the same time the railway reached this portion of Oʻahu. A plantation mill became Kahuku’s first “modern” community. The railway and plantation provided the major economic and transport facilities in northwest Oʻahu. Sugarcane fields from the Kahuku Sugar Company extended as far south and west as Kaunala.

The Pūpūkea and Paumalū Homestead Lots were created by legislation in the early 1900s. In 1905, nine claims to homestead lots were awarded in Paumalū (Figure 24) and were subsequently put into pineapple cultivation. A plantation camp was established on the ridgetop above the coast. By 1951 and with the decline of the railway and pineapple in Paumalū, Camp Paumalū was donated to the Council, courtesy of the Hawaiian Pineapple Company.

Paumalū and surrounding areas in north Oʻahu were employed to conduct defense exercises during World War II. This area saw defensive structures constructed, cannons housed, and a landing strip for fighter planes built.

Previous Archaeology

There are more than 30 previous studies from Paumalū and nearby locations in Pūpūkea and Waimea Ahupuaʻa (Figure 25 and Table 7). These range from monitoring to surveys or reconnaissance to data recovery projects. There are four significant archaeological studies for Paumalū (Athens and Magnusen 1998; Mayberry and Haun 1988; Kennedy and Denham 1992; Yucha and Hammatt 2015) described in greater detail below. Nearly 80 sites (Table 8) have now been reported for Paumalū and neighboring portions of Pūpūkea and Waimea. State Inventory of Historic Places (SIHP) Site numbers are prefixed by 50-80-01; the sites in the vicinity of the project area are shown in Figure 26. Nine ¹⁴C dates are now reported for both Pūpūkea and Paumalū that span a range between ca. AD 1400–post 1950 (Table 9).

McAllister (1933:151–152) reports a single site from Paumalū—the Washington Stone or Kahikilani Stone (50-80-01-256). Although not located in Paumalū, Site 255 in Pūpūkea is described as “...a conspicuous group of large stones of lava...” that were once a family of Pele followers who she turned to stone to immortalize (McAllister, 1933:151). Both sites are located along or near to the coast. McAllister’s failure to identify other archaeological sites was likely due to their subsurface burial in the coastal sands or their location farther inland on the talus slope.

Kahakai (Coastal) Sites

At least nine sites in Paumalū and neighboring Pūpūkea represent discoveries and documentation of human remains and burials located in sand dune deposits along or near to the coast. These discoveries

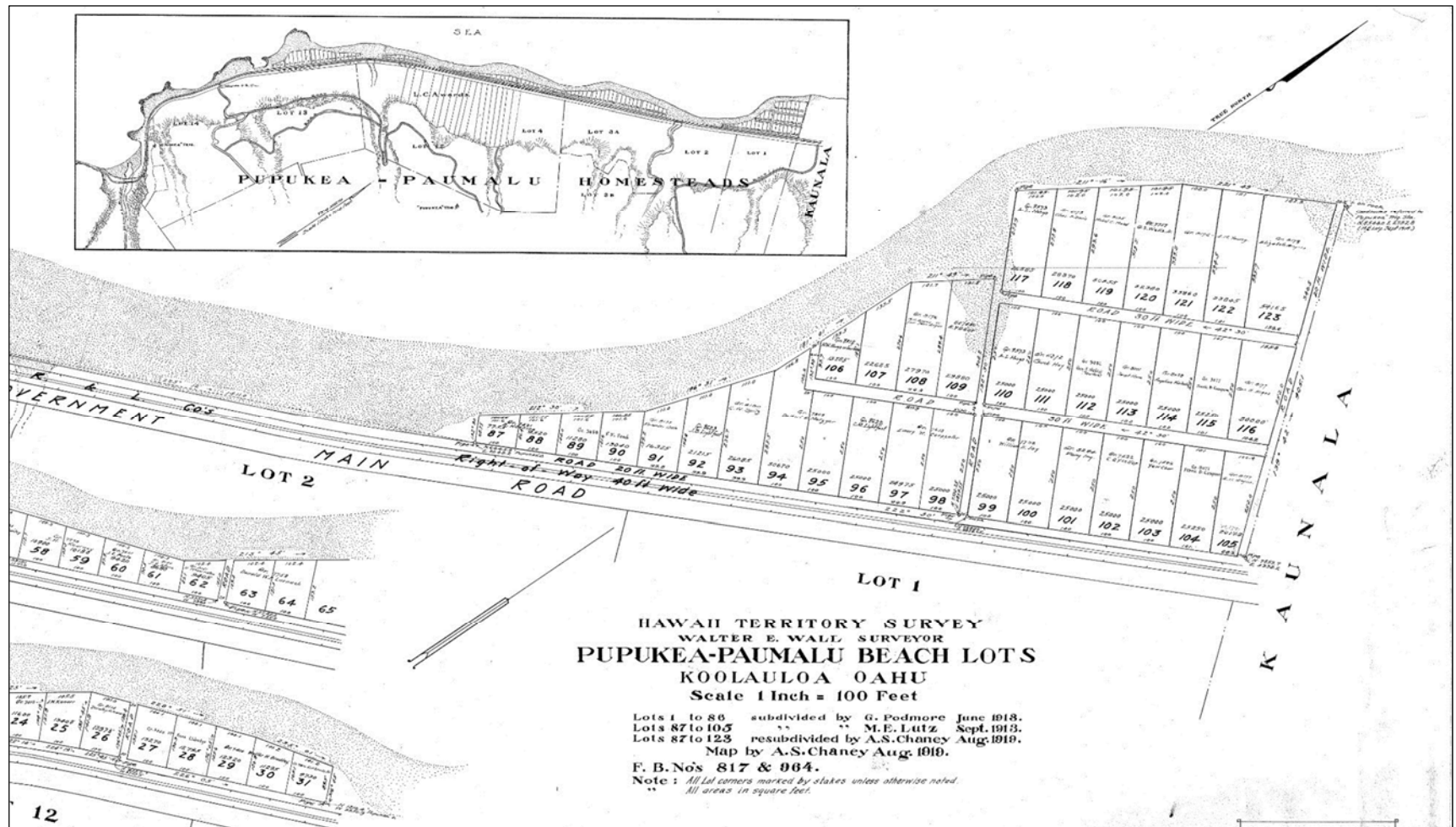
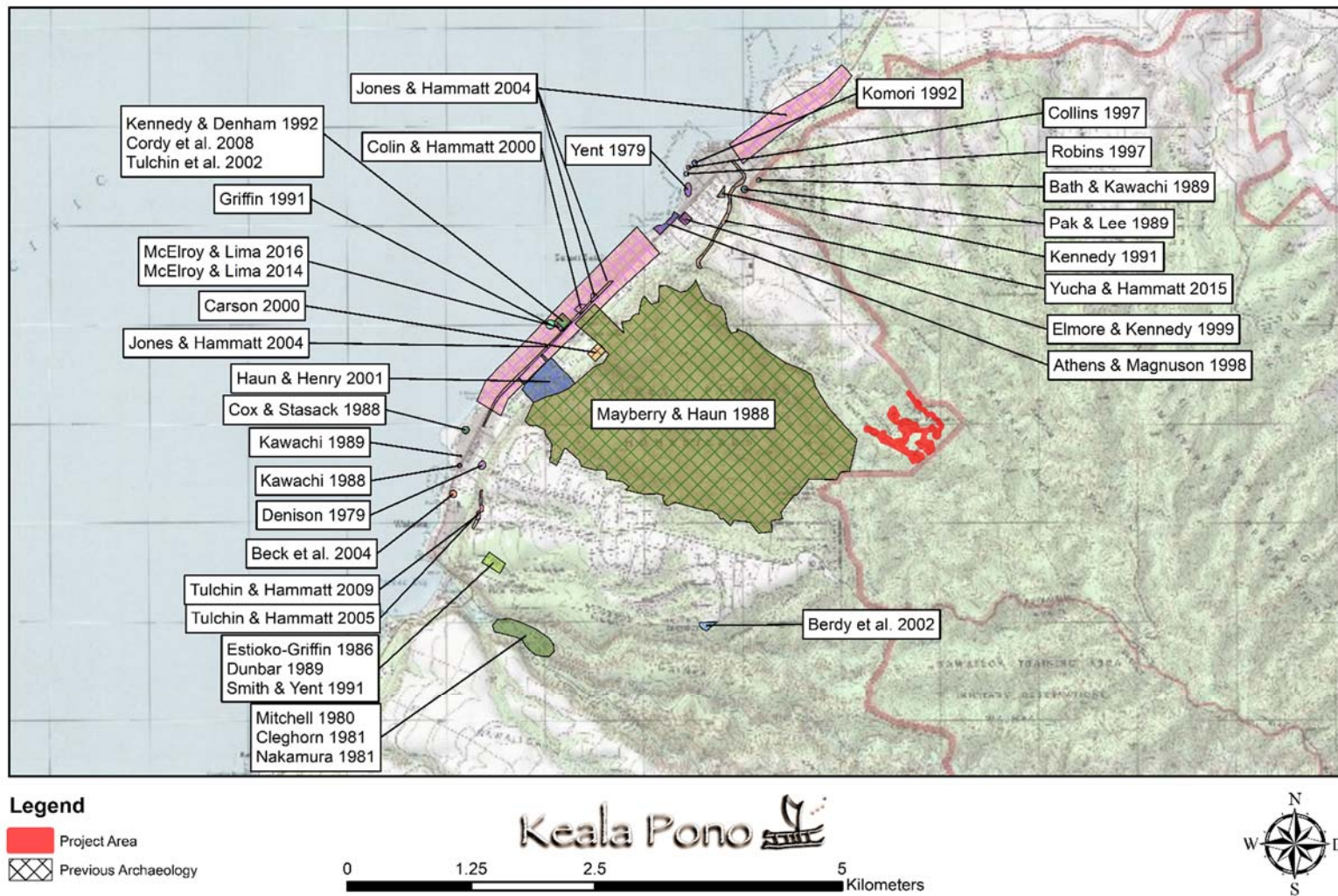


Figure 24. Homestead beach lots awarded in Paumalū in 1913–1919 (Chaney 1919). The project area is located inland of the Lot 1 area of homestead plots.



Layer Credits:USGS Topographical Waimea Quadrangle Map 1998 / Kahuku Quadrangle Map 1998

Figure 25. Location of previous archaeological studies in Paumalū and nearby areas on 7.5 minute 1998 USGS Kahuku and Waimea quadrangle maps.

Table 7. Listing of Previous Archaeological Work for Paumalū and Nearby Areas

Author and Year	Location	Work Completed	Findings
McAllister 1933	Island-Wide	Survey	Described a petroglyph site and told how Paumalū got its name; noted a basalt outcrop with legendary significance, Site 256, Washington Stone or Kahikilani Rock, also Pele Follower Stones, Site 255.
Yent 1979	Pūpūkea, Paumalū Ahupua‘a, TMK 5-9-001:057	Reburial Report	Documented a human burial, Site 4519.
Denison 1979	Pūpūkea Beach Park, Pūpūkea	Archaeological Reconnaissance Report	Recorded a historic enclosure, Site 3364.
Mitchell 1980	Waimea Ahupua‘a	Interpretive Plan	Recorded 12 sites Waimea Valley.
Nakamura 1981	Waimea Ahupua‘a	Interpretation of Historical Evidence	Offered a general discussion of sites in Waimea Valley.
Cleghorn, 1981	Waimea Ahupua‘a	Interpretation of Historical Evidence	Offered a general discussion of site in Waimea Valley.
Estioko-Griffin 1986	Pūpūkea and Paumalū Ahupua‘a	Brief Historical Overview	Provided a historical overview of Pu‘u-o-Mahuka Heiau, Site 249.
Cox & Stasack 1988	Sunset Beach, Pūpūkea and Paumalū Ahupua‘a	Petroglyph Study	Documented petroglyphs carved in sandstone reef, Site 2353.
Kawachi 1988	Keiki Road, Pūpūkea Ahupua‘a, TMK 5-9-003:029	Report on Inadvertent Discovery	Field inspection of burial, Site 3955.
Mayberry & Haun 1988	Development Project Area, Pūpūkea-Paumalū Ahupua‘a	Archaeological Reconnaissance Survey and Limited Subsurface Testing	Identified 60 pre-contact and historic sites within the 1,130-acre Pūpūkea-Paumalū project area.
Bath & Kawachi 1989	Burial Cave, Sunset Beach, Paumalū-Pūpūkea	Report on Burial Cave	Documented a burial cave, Site 4098.
Dunbar 1989	Pūpūkea Ahupua‘a	National Register Nomination Form	Site 249, nomination of Pu‘u-o-Mahuka Heiau to National Register; historical context and significance study of heiau.
Kawachi 1989	Keiki Road, Pūpūkea Ahupua‘a, TMK 5-9-003:046	Report on Inadvertent Discovery	Field inspection of burial, Site 4150.
Pak & Lee 1989	Burial Cave, Sunset Beach, Paumalū-Pūpūkea	Report on Human Burial	Documented Site 4193, a human burial.
Griffin 1991	‘Ehukai Beach, Pūpūkea Ahupua‘a, TMK 5-9-020:022 & 023	Report on Inadvertent Discovery	Recorded a burial along coast eroding out, Site 4452.
Kennedy 1991	Paumalū Ahupua‘a, TMK 5-9-006:023	Archaeological Inventory Survey	No surface artifacts, nor were any cultural materials found in 9 test units, other than historic or modern materials.

Table 7. (continued)

Author and Year	Location	Work Completed	Findings
Smith & Yent 1991	Pūpūkea Ahupua‘a	Archaeological Mapping and Test Excavations	Documented Pu‘u-o-Mahuka Heiau, Site 249.
Kennedy & Denham 1992	‘Ehukai Beach Park	Archaeological Monitoring Report	Documented Site 4452, a previously recorded human burial, as well as scattered human remains, a firepit, and several artifacts.
Komori 1992	Burial at Sunset Beach	Report on Inadvertent Discovery	Recorded a human burial, Site 5531.
Collins 1997	Sunset Point, O‘ahu, TMK 5-9-001:038	Inadvertent Burial Discovery Report	Recorded a human burial, Site 5533.
Robins 1997	Sunset Point, O‘ahu, TMK 5-9-001:038	Burial Removal Report	Recorded a human burial, no site number assigned.
Athens & Magnuson 1998	Sunset Beach Park, Paumalū Ahupua‘a	Archaeological Inventory Survey	Documented a cultural layer; historic and pre-contact artifacts collected from Trench 1 and 2 & pre-contact cultural layer from Trench 3. Substantial marine shell and wood charcoal collected, Sites numbered 5585 and 5586.
Elmore & Kennedy 1999	Sunset Beach Support Park, Paumalū Ahupua‘a, TMK: 5-9-015:010 & 011	Archaeological Monitoring Report	No new sites were identified.
Carson 2000	Mauka of Sunset Beach Elementary, TMK 5-9-005:083	Archaeological Survey	Documented 5 sites: 5830 a terrace with enclosure; 5831 a complex of walls, mound and terraces; and three terraces 5832 to 5834.
Colin & Hammatt 2000	Kenai Road, Pūpūkea Ahupua‘a, TMK 5-9-019:051	Letter Report on Inadvertent Burial Discovery	Recorded a human burial, Site 5532.
Haun & Henry 2001	Sunset Beach Agricultural Subdivision Sites, TMK 5-9-005:066	Archaeological Inventory Survey Report	Documented 14 sites: 5951–5964, including two burial caves, nine agricultural terraces or alignments, two water storage devices, and a concrete foundation.
Berdy et al. 2002	Pūpūkea and Waimea Ahupua‘a, TMK 5-9-023:001, 5-9-024:001, 6-1-002:022	Archaeological Inventory Survey Report	No new sites were identified.
Tulchin et al. 2002	‘Ehukai Beach Park Bath House, Pūpūkea Ahupua‘a, TMK: 5-9-020:022 & 023	Archaeological Monitoring Report	Documented additional features of site 4452, including two firepits and one cultural layer or deposit of midden.
Beck et al. 2004	North Shore Center, Pūpūkea, TMK 5-7-011:017	Archaeological Assessment	No new sites were identified.

Table 7. (continued)

Author and Year	Location	Work Completed	Findings
Jones & Hammatt 2004	Kamehameha Highway, from Pūpūkea to Waiale‘e; TMK 5-8-001, 5-8-003:006, 5-9-001:004, 5-9-007:016	Archaeological Monitoring Report	Recorded Site 6519 and 6520 two burials and a firepit or earth oven.
Tulchin & Hammatt 2005	Portion of Pūpūkea Road, Pūpūkea Ahupua‘a	Archaeological Field Inspection and Literature Review	Identified historic roadbeds, two burial caves, a storage cave, and four temporary shelters.
Cordy et al. 2008	‘Ehukai Beach Park, Pūpūkea Ahupua‘a, District of Ko‘olaupua, O‘ahu. TMK: 5-9-020, 5-9-022, 5-9-023	Archaeological Monitoring Report	No new or previously discovered sites were reported.
Tulchin & Hammatt 2009	Rockfall Mitigation Project, Pūpūkea Road, Pūpūkea Ahupua‘a, District of Ko‘olaupua, O‘ahu. TMK 5-9-1 1 por. and 5-9-1 8 por.].	Archaeological Inventory Survey	Identified 5 sites including sections of the historic Pūpūkea roadbed, 2 modified rock overhangs, 5 burial caves and temporary habitation shelter, a cluster of 6 rock overhangs and lava tube.
McElroy & Lima 2014	Pūpūkea Ahupua‘a, TMK 5-9-020:029	Burial Site Component of an Archaeological Data Recovery Plan and Preservation Plan	Recorded Site 7678, a human burial.
Yucha & Hammatt 2015	Kaunala and Paumalū, TMK 5-8-005:001, 002, 088 and 5-9-006:005	Archaeological Monitoring Report	Documented Sites 7719, 7720, and 7721, portions of a historic road, habitation cave, and storage cave.
McElroy & Lima 2016	Pūpūkea Ahupua‘a, TMK 5-9-020: 029	Archaeological Monitoring Report	Documented Sites 7678, a human burial; and 7679 cultural layer.

can be grouped into three locations. The first of these is located on the southwest end of ‘Ehukai (or Pūpūkea) Beach Park, where three burials (Sites 3955, 4150, and 4285) were exposed during construction work to the west of ‘Ehukai Beach in Pūpūkea (Kawachi 1988, 1989; Jones and Hammatt 2004). All of these remains were re-interred or left in place.

The second location, along the main stretch of Sunset Beach at ‘Ehukai Beach Park, straddling both Pūpūkea and Paumalū, includes a series of burials and other subsurface deposits and features that have been found, including an inadvertently discovered human burial (Site 5532) disturbed during construction (Colin and Hammatt 2000). The remains of two additional burials and a firepit or earth oven (Sites 6519, 6520) were found during monitoring for a water main (Jones and Hammatt 2004:29–34). A firepit from Site 6520 was radiocarbon dated to cal. AD 1500–1950 (Jones and Hammatt 2004:43–44). Another human burial (Site 7678) and a subsurface cultural layer (Site 7679) were identified at the west end of ‘Ehukai Beach (McElroy and Lima 2014, 2016).

Previously, a burial (Site 4452) was encountered during trenching work associated with construction at ‘Ehukai Beach Park (Griffin 1991). This burial was also found in association with a cultural layer and was left in place. While an archaeological inventory survey (Kennedy 1991) in this same area did not locate any historic properties, a later archaeological monitoring project identified a human

Table 8. Listing of State Inventory of Historic Places (SIHP) Sites for Paumalū and Portions of Pūpūkea and Kaunala* (Compiled from Mayberry and Haun 1988; Yucha and Hammatt 2015)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
249	-	Hawaiian Pre-Contact	Waimea	Heiau, Pu'u-o-Makua	Heiau, ritual, ceremonial	Mitchell 1980; Estioko-Griffin 1986; Dunbar 1989; Smith & Yent 1991
255	-	Hawaiian Pre-Contact	Pūpūkea	Natural outcrop of basalt	Pele Follower Stones, legendary significance	McAllister 1933:151; Jones & Hammatt 2004
256	-	Hawaiian Pre-Contact	Paumalū	Basalt boulder	Washington Stone, Kahikilani, legendary significance	McAllister 1933:152
2353	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Petroglyphs carved into sandstone reef	Sunset Beach petroglyphs	Cox & Stasack 1988; Jones & Hammatt 2004
3364	-	Historic	Pūpūkea	Drylaid masonry enclosure	Animal pen?	Denison 1979; Jones & Hammatt 2004
3820	T-01	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Coastal, rock mound built with waterworn basalt, .5 m tall, 13 x 2 m, waterworn coral	Given location near the coast, most likely a ko'a	Mayberry & Haun 1988; Jones & Hammatt 2004
3821	T-02	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal, rock alignment built with waterworn basalt, fine-grained basalt cobbles	Work area, possibly for lithic manufacture or maintenance	Mayberry & Haun 1988; Jones & Hammatt 2004
3822	T-03	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Talus slope, bedrock with basalt boulder alignment 42 m in length	Modified outcrop	Mayberry & Haun 1988; Jones & Hammatt 2004
3823	T-04	Euro-American, Late 19 th , Early 20 th Century	Paumalū	Coastal, large, U-shaped earthen berm, pilings, and lumber	Railway siding	Mayberry & Haun 1988; Jones and Hammatt 2004

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3824	T-05	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Talus slope, 1 retaining wall, built of stacked basalt cobbles and boulders, 15 m in length, with 1 upright	Agricultural terrace(s)	Mayberry & Haun 1988
3825	T-07	Hawaiian Pre-Contact to Historic	Pūpūkea & Paumalū	Coastal, on or near ahupua'a and LCA boundaries, mound of basalt boulders forming a cairn	Boundary marker	Mayberry & Haun 1988
3826	T-13	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Talus slope, complex of large 2 enclosures, one with smaller enclosure in the interior, and 3 low terraces, and 5 boulders with petroglyphs, and low masonry platform with earth fill. All of walls built of basalt cobbles and boulders	Habitation and agricultural complex	Mayberry & Haun 1988
3827	T-14	Hawaiian Pre-Contact to Historic	Paumalū	Coastal, pit, partially stone lined, dug into bedrock, 2 m diameter, with pipes extending to concrete foundation	Water source, well	Mayberry & Haun 1988; Jones & Hammatt 2004
3828	T-15	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Coastal plain, ditch, 220 m length, excavated into bedrock, 80 cm deep, 65 cm wide; note, this is unlikely to be historic; rather the ditch is similar to traditional Hawaiian 'auwai in terms of dimensions	Irrigation ditch	Mayberry & Haun 1988; Jones & Hammatt 2004
3829	T-16	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Talus slope, rock mound, 10 m length parallel to slope, adjacent to drainage channel	Water diversion	Mayberry & Haun 1988

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3830	T-17	Hawaiian & Euro-American, Late 19 th Century	Pūpūkea & Paumalū	Coastal plain, depression 180 m in length, oriented parallel to T-15; note this matches the location of the Old Government Road; the Road, in turn, is likely on or near the location of the Ala Nui	Road bed, irrigation ditch	Mayberry & Haun 1988; Jones and Hammatt 2004
3831	T-18	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Coastal cliffline, rock shelter and wall with cultural materials, volcanic glass	Habitation and volcanic glass source	Mayberry & Haun 1988
3832	T-19	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Coastal cliffline, 2 rock shelters with cultural remains, charcoal	Habitation and agricultural complex	Mayberry & Haun 1988
3833	T-20	American, Mid-20 th Century	Pūpūkea	Coastal cliffline, concrete structure, with openings facing coast	World War II bunker	Mayberry & Haun 1988
3834	T-21	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Pākūlena- Kālunawaika'ala Tableland, 1 retaining wall, built of rough basalt, at head of drainage	Agricultural terraces	Mayberry & Haun 1988
3835	T-22	American, Mid-20 th Century	Paumalū	Coastal cliff edge, 4 features, concrete structures, foundations	World War II facility, bunkers, gun turrets	Mayberry & Haun 1988
3836	T-23	American, Late 19 th -Early 20 th Century,	Pūpūkea	Paumalū-Pākūlena Tableland, 9 features, concrete slabs, basin, chimney, and depression, wooden platform, earthen terrace, linear alignment of waterworn basalt rock	Ranching and/or agricultural facility	Mayberry & Haun 1988
3837	T-25	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū-Pākūlena Tableland, 2 features, retaining wall, built of waterworn basalt cobbles and boulders	Historic roadbed	Mayberry & Haun 1988
3838	T-30	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Pākūlena Gulch, rock shelter with retaining wall and wall	Habitation	Mayberry & Haun 1988

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3839 & 5831	T-31	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Talus slope, at least 6 walls and terraces	Agricultural terraces	Mayberry & Haun 1988
3840	T-32	Hawaiian & Euro-American, Late 19 th Century	Pūpūkea	Pākūlena Gulch, 3 features, all masonry walls built of basalt cobbles and small boulders	Historic roadbed	Mayberry & Haun 1988
3841	T-33	Hawaiian & Euro-American, Late 19 th Century	Pūpūkea	Pākūlena Gulch, 4 features, all masonry walls built of waterworn cobbles and some basalt boulders	Historic roadbed	Mayberry & Haun 1988
3842	T-34	Hawaiian Pre-Contact to Early Historic	Pūpūkea & Paumalū	Coastal cliffline, cave, with parts of wooden canoe, human remains	Burial, ritual	Mayberry & Haun 1988
3843	T-35	Hawaiian & Euro-American, Late 19 th Century	Pūpūkea	Kālunawaika'ala Gulch, retaining wall built of waterworn cobbles within gulch	Historic roadbed	Mayberry & Haun 1988
3844	T-37	Hawaiian & Euro-American, Late 19 th Century	Pūpūkea	Kālunawaika'ala Gulch, 3 walls and retaining walls built from basalt cobbles and boulders, and 1 paving constructed of waterworn cobbles	Historic roadbed	Mayberry & Haun 1988
3845	T-38	American, Late 19 th -Early 20 th Century,	Pūpūkea	Pākūlena- Kālunawaika'ala Tableland, concrete and wood structure with tin roof	Historic pumphouse	Mayberry & Haun 1988
3846	T-40	American, Mid-20 th Century	Pūpūkea	Pākūlena- Kālunawaika'ala Tableland, 3 concrete, wood structures	Historic World War II facility	Mayberry & Haun 1988
3847	T-42	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Kālunawaika'ala Gulch, low (1 m) dry laid masonry wall (14 m) built of waterworn cobbles across stream bed	Dam	Mayberry & Haun 1988

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3848	T-43	Euro-American, Mid-20 th Century	Pūpūkea	Pākūlena- Kālunawaika'ala Tableland, 3 concrete structure with openings facing the ocean	Historic World War II bunker	Mayberry & Haun 1988
3849	T-45	Euro-American, Mid-20 th Century	Pūpūkea	Pākūlena- Kālunawaika'ala Tableland, 2 trenches with tin roofing, ironwood posts	Historic World War II facility	Mayberry & Haun 1988
3850	T-46	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū-Pākūlena Tableland, 1 retaining wall built of waterworn basalt rocks	Historic roadbed	Mayberry & Haun 1988
3850	T-47	Euro-American, Late 19 th , Early 20 th Century	Paumalū	Paumalū-Pākūlena Tableland, scatter of bottle glass (1 dated to 1888), ceramics, metal	Historic plantation agriculture	Mayberry & Haun 1988
3852	T-48	Hawaiian Pre-Contact to Early Historic	Paumalū	Paumalū-Pākūlena Tableland, two low rock mounds with stacked waterworn cobbles and boulders	Agricultural terraces, perhaps plantation	Mayberry & Haun 1988
3853	T-49	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū-Kaleleiki Tableland, 2 retaining walls of drylaid waterworn basalt cobbles and boulders	Historic roadbed	Mayberry & Haun 1988
3854	T-50	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū Gulch, 3 features, of which Fea. A has 5 segments of drylaid walls of waterworn basalt cobbles and boulders, Fea. B is a wall paralleling Segment 1 of Fea. A, and Fea. C is a ditch or channel	Historic roadbed	Mayberry & Haun 1988
3855	T-52	Hawaiian & Euro-American, Late Pre-Contact to Historic	Paumalū	Paumalū Gulch, low enclosure and attached wall built of rough waterworn cobbles and boulders	Animal enclosure	Mayberry & Haun 1988

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3856	T-53	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū Gulch, 1 retaining wall built of waterworn basalt rocks	Historic roadbed	Mayberry & Haun 1988
3857	T-54	Hawaiian Pre-Contact to Early Historic	Paumalū	Paumalū Gulch, rock shelter, with faunal remains, charcoal	Habitation	Mayberry & Haun 1988
3858	T-55	Hawaiian Pre-Contact to Early Historic	Paumalū	Paumalū Gulch, 1 wall and exposed bedrock 20 m in length, core-filled with rough waterworn basalt, filled with basalt rubble	Agricultural terraces	Mayberry & Haun 1988
3859	T-56	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū Gulch, 1 wall built of rough waterworn basalt cobbles and boulders 220 m in length	Historic roadbed	Mayberry & Haun 1988
3860	T-57	Hawaiian Pre-Contact to Early Historic	Paumalū	Paumalū Gulch, large, low enclosure and exposed bedrock, core-filled walls built of rough waterworn basalt rocks, 1 m high, 3 m wide	Animal pen	Mayberry & Haun 1988
3861	T-58	Hawaiian & Euro-American, late 19 th Century	Paumalū	Paumalū Gulch, 1 wall, 2 retaining walls, 16 m long, built of waterworn basalt	Historic roadbed	Mayberry & Haun 1988
3862	T-59	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Paumalū Gulch, 1 retaining wall, 30 m long, built of waterworn basalt cobbles and boulders	Historic roadbed	Mayberry & Haun 1988
3863	T-62	Hawaiian Pre-Contact to Early Historic	Paumalū	Paumalū-Pākūlena Tableland, low rock mound, parallel to secondary drainage, 20 m long built of waterworn basalt rocks	Agricultural terraces	Mayberry & Haun 1988

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3864	T-64	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, rock shelter and associated rock wall, with both modern and pre-contact cultural material	Habitation	Mayberry & Haun 1988
3865	T-65	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, rock shelter, with wall, no cultural material	Habitation	Mayberry & Haun 1988
3866	T-66	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, rock shelter, with 2 chambers, modern and pre-contact (basalt flakes) cultural remains	Habitation	Mayberry & Haun 1988
3867	T-67	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, rock shelter, with human remains	Burial, ritual	Mayberry & Haun 1988
3868 & 5830	T-69	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Talus slope, enclosure, 16 by 12 m, and terrace, built of waterworn basalt rocks, 2 m wide wall, with coral	Heiau, ceremonial and ritual	Mayberry & Haun 1988
3869 & 5832	T-70	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, 4 rock shelters, associated rock walls, 2 petroglyph panels, all with human remains	Burial, ritual	Mayberry & Haun 1988
3879	T-71	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, rock shelter, 2 associated rock walls	Habitation	Mayberry & Haun 1988
3871	T-72	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, rock shelter, with charcoal, 1 human bone	Habitation and possible burial	Mayberry & Haun 1988
3872	T-73	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, 2 rock shelters, both with charcoal, marine shell, possible hearth	Habitation	Mayberry & Haun 1988
3873	T-74	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Talus slope, wall built of waterworn rocks, 60 m length, 1 m high	Boundary marker?	Mayberry & Haun 1988

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
3955	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Human remains	Burial, ritual	Kawachi 1988; Jones and Hammatt 2004
3971	T-75	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Pākūlena Gulch, 1 rock shelter, 2 walls, no visible cultural remains	Habitation	Mayberry & Haun 1988
3972	T-76	Euro-American, 20 th Century	Paumalū	Paumalū-Kaleleiki Tableland, complex with 3 features and number of cultural remains (fuel drum, small vehicle, aluminum boxes	Historic ranching and agricultural facility	Mayberry & Haun 1988
3973	T-77	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Pākūlena Gulch, 1 rock shelter, 1 wall,	Possible burial, habitation	Mayberry & Haun 1988
3974	T-78	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Pākūlena Gulch, 1 cave, with entry ledge, cultural remains (volcanic glass, marine shell, kukui nut, fish and bird bone	Habitation and volcanic glass source	Mayberry & Haun 1988
3975	T-79	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Pākūlena Gulch, 1 cave, cultural remains, coral cobbles, vesicular basalt	Possible ritual or burial	Mayberry & Haun 1988
3976	T-80	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, 1 cave, with human remains	Burial, ritual	Mayberry & Haun 1988
4098	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal cliffline, 1 cave, with human remains	Burial, ritual	Bath & Kawachi 1989
4150	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Coastal sand dune, human remains, hearth	Burial, ritual	Kawachi 1989; Jones & Hammatt 2004
4159	-	Hawaiian Pre-Contact and Early Historic	Pūpūkea, Paumalū	Coastal sand dune, human remains	Burial, ritual	Yent 1979
4193	-	Hawaiian Pre-Contact to Early Historic	Kaunala	Coastal cliffline, 1 cave, human remains, 2 basalt adzes	Burial, ritual	Pak & Lee 1989

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
4285	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Human remains	Burial, ritual	Jones & Hammatt 2004:18
4452	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Human remains, 2 firepits, cultural layer or deposit	Burial, ritual, and habitation	Griffin 1991; Tulchin et al. 2002:13
4519	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Human remains	Burial, ritual	Yent 1979; Tulchin et al. 2002:14; Jones & Hammatt 2004
5531	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Human remains	Burial, ritual	Komori 1992; Tulchin et al. 2002:14; Jones & Hammatt 2004
5532	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Human remains	Burial, ritual	Colin & Hammatt 2000; Tulchin et al. 2002:16
5533	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Human remains	Burial, ritual	Collins 1997; Tulchin et al. 2002:14; Jones & Hammatt 2004
5585	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Traditional Hawaiian and Euroamerican artifacts, shell, bone, charcoal, invertebrates	Cultural or midden deposit	Athens & Magnusen 1998:33
5586	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Marine shell, bone, charcoal, invertebrates,	Cultural or midden deposit	Athens & Magnusen 1998:33
5830	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Terrace with enclosure	Habitation	Carson 2000
5831	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Complex with walls, mound, and terraces	Habitation	Carson 2000
5951	-	-	Pūpūkea	-	-	Haun & Henry 2001
5952	-	-	Pūpūkea	Drylaid masonry alignment or wall	Agricultural terraces	Haun & Henry 2001
5953	-	-	Pūpūkea	-	-	Haun & Henry 2001

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
5954	-	-	Pūpūkea	-	-	Haun & Henry 2001
5955	-	-	Pūpūkea	Terrace, drylaid masonry retaining walls	Agricultural terraces	Haun & Henry 2001
5956	-	-	Pūpūkea	Terrace, drylaid masonry retaining walls	Agricultural terraces	Haun & Henry 2001
5957	-	-	Pūpūkea	-	-	Haun & Henry 2001
5958	-	-	Pūpūkea	-	-	Haun & Henry 2001
5959	-	-	Pūpūkea	Terrace and partial enclosure, drylaid masonry alignment, wall, retaining wall	Agricultural terraces	Haun & Henry 2001
5960	-	-	Pūpūkea	Terrace and partial enclosure, drylaid masonry alignment, wall, retaining wall	Agricultural terraces	Haun & Henry 2001
5961	-	-	Pūpūkea	Terrace and partial enclosure, drylaid masonry alignment, wall, retaining wall	Agricultural terraces	Haun & Henry 2001
5962	-	-	Pūpūkea	Terrace and partial enclosure, drylaid masonry alignment, wall, retaining wall	Agricultural terraces	Haun & Henry 2001
5963	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Human remains	Burial, ritual	Haun & Henry 2001
5964	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Human remains	Burial, ritual	Haun & Henry 2001
6519	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Human remains, 2 features	Burial, ritual	Jones & Hammatt 2004:29
6520	-	Hawaiian Pre-Contact to Early Historic	Paumalū	Subsurface pit feature	Firepit or earth oven	Jones & Hammatt 2004:34

Table 8. (continued)

Hawai'i Site No. 50-80-01-	Temporary Site No.	Estimated Cultural Tradition & Period	Ahupua'a	Formal Description	Functional Assignment	Reference
7719	-	Hawaiian & Euro-American, Late 19 th Century	Paumalū	Drylaid masonry retaining wall, graded surface	Roadbed	Yucha & Hammatt 2015
7720	-	Hawaiian Historic	Paumalū	Cave with mortared basalt wall	Storage	Yucha & Hammatt 2015
7721	-	Mid-20 th Century, Possible Earlier Components	Paumalū	Cave with 20 metal stoves and other equipment	Storage	Yucha & Hammatt 2015
7678	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Human burial	Burial, ritual	McElroy & Lima 2014
7679	-	Hawaiian Pre-Contact to Early Historic	Pūpūkea	Cultural layer with several firepits; historic material	Cultural deposit	McElroy & Lima 2016

* Note that some data such as site age and function could not be located for every site.

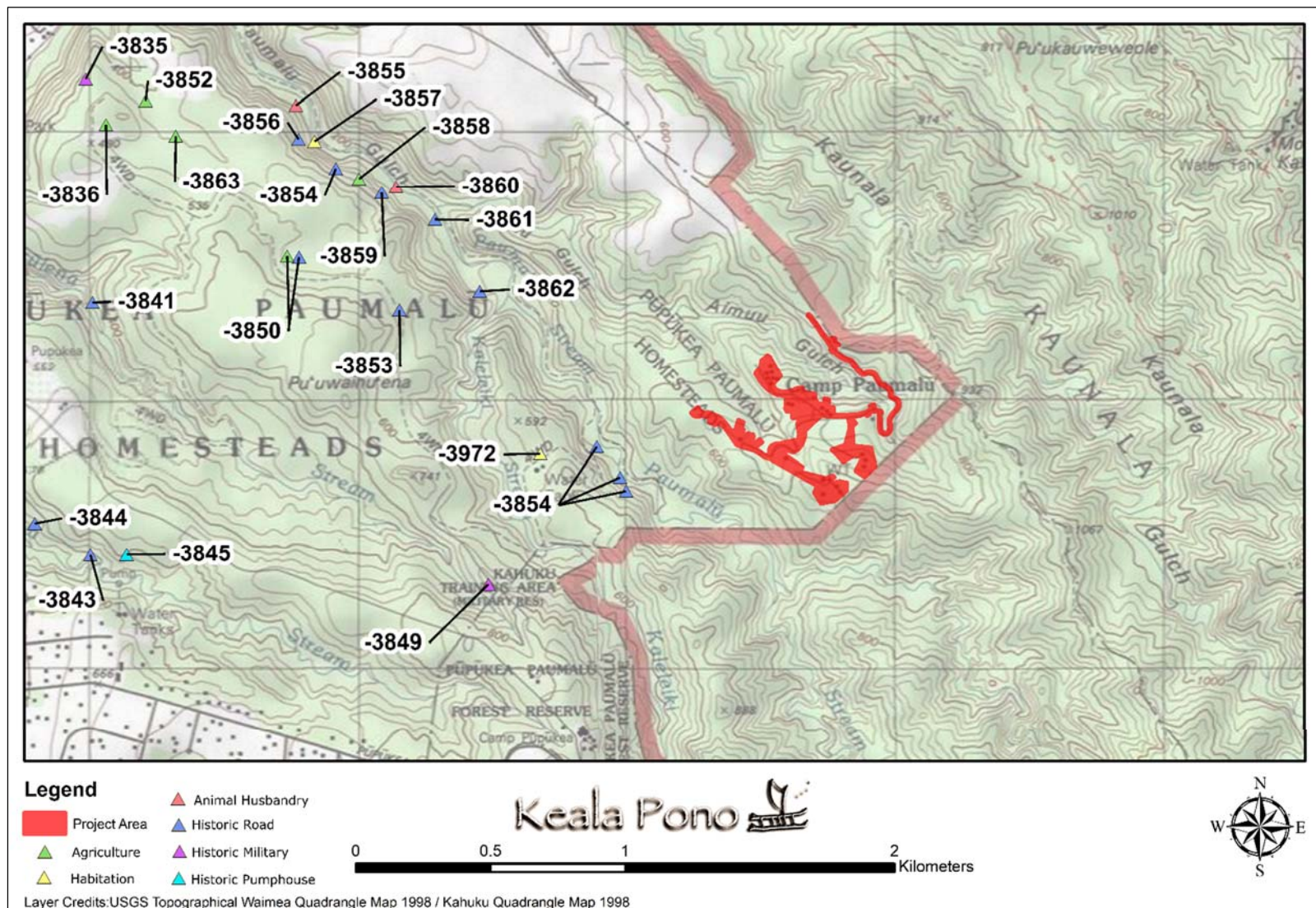


Figure 26. Archaeological sites closest to the project area on 7.5 minute 1998 USGS Kahuku and Waimea quadrangle maps.

Table 9. Published ^{14}C dates from Paumalū and Pūpūkea Ahupua‘a

Laboratory No.	Ahupua‘a	Site No. (50-80-01-)	Provenience	Material	^{14}C Age BP	Conventional ^{14}C Age BP	Calibrated Date Range AD (2 sigma)	Reference
BA-47160	Pūpūkea	4452	Unit 1, firepit, Ly IIIa, 25–35 cmbs	Charcoal, taxa not identified	630 ± 90	710 ± 90	1160–1410	Kennedy & Denham 1992
BA-168708	Pūpūkea	4452	Feature 1, firepit, Ly IIb, 25–48 cmbs	Charcoal, taxa not identified	400 ± 40	410 ± 40	1410–1570	Tulchin et al. 2002:36
BA-168707	Pūpūkea	4452	Feature 3, firepit, Ly IIa, 0–30 cmbs	Charcoal, taxa not identified	150 ± 60	160 ± 60	1650–1960	Tulchin et al. 2002:36
BA-247661	Pūpūkea	7038	Feature G, Unit 1	Charcoal, taxa not identified	310 ± 40	360 ± 40	1440–1640	Tulchin & Hammatt 2009:71–72
Beta-394957	Pūpūkea	7679	Feature 5, firepit, 22–40 cmbs	Charcoal, kukui nutshell		200 ± 30	1650–1665 1730–1810 1925–Post 1950	McElroy & Lima 2016:68
BA-156931	Pūpūkea	5957	Feature A, Unit 3, Ly I, 20–60 cmbs	Charcoal, taxa not identified		150 ± 60	1650–1950	Haun & Henry 2001:39
BA-156932	Pūpūkea	5955	Unit 1, cultural deposit, Ly II, below 36 cmbs	Charcoal, taxa not identified		180 ± 60	1640–1950	Haun & Henry 2001:41
Wk-5798	Paumalū	5585	Trench 1, firepit or burn feature, Ly IV, 97–115 cmbs	Charcoal, hao		310 ± 45	1513–1652	Athens & Magnusen 1998
BA-181542	Paumalū	6520	Phase II Station, 7+85, firepit, Fea Z, Ly II, 45–110 cmbs	Charcoal, taxa not identified		180 ± 90	1500–1955	Jones & Hammatt 2004:43

burial, scattered human remains, and a firepit, all grouped with Site 4452 (Kennedy and Denham 1992). Charcoal from the firepit was radiocarbon dated to cal. AD 1153–1421 (Kennedy and Denham 1992:24). Artifacts collected include a possible kukui nut candle, files and abraders, a broken adze, basalt flakes, and an iron ball. Subsequent monitoring revealed four additional firepits, again all of which were included with Site 4452 (Tulchin et al. 2002). Two radiocarbon dates were obtained, cal. AD 1410–1530 and 1650–1960 (Tulchin et al. 2002:29). Another monitoring project at ‘Ehukai Beach Park yielded no findings (Cordy et al. 2008).

The third coastal cluster of sites is located in the Paumalū section of Sunset Beach. Along the northeastern boundary of Paumalū Yent (1979) reported the discovery of the remains of two adult individuals found eroding out of a sand dune on a beachfront parcel (Site 4519). These were associated with a cultural layer observed in the dune exposure and were reburied farther inland on the same parcel. Later, both Komori (1992) and Collins (1997) identified human remains eroding out of beach sands (Sites 5531 and 5532) and in one instance associated with cultural deposits. Robins (1997) reports the recovery of a burial from this same area; no site number was assigned.

In 1998, an archaeological inventory survey and subsurface testing project was conducted along the Paumalū section of Sunset Beach Park (Athens and Magnuson 1998). A series of auger-based test units were placed along the beach over a distance of nearly 300 m to test for the presence of buried archaeological remains. Based on the auger results three test trenches were excavated: two on the southern end (at Site 5585) and one on the northern end (at Site 5586) of the beach. Trench 1 (Site 5585) revealed a series of buried midden and charcoal deposits, along with a burn feature or firepit. The firepit was radiocarbon dated to cal AD 1530–1610. Historic and traditional Hawaiian artifacts were also found in Trench 1, possibly associated with the historic LCA 3777. An extensive midden of marine shell and invertebrates was also recovered from Trench 1, estimated to include more than 3,300 minimum number of individuals (MNI). The excavation of Trench 3, Site 5586, identified a buried firepit associated with a cultural layer as well as a post mold that from the next layer down extended to 90 cmbs. Both Sites 5585 and 5586 produced a number of wood charcoal fragments with more than 17 identified taxa that are native or Polynesian introductions to Hawai‘i (see Table 2).

A number of archaeological features or complexes were found during a survey of a 60 ac. parcel near the Pūpūkea and Paumalū boundary on the coastal plain inland from Kamehameha Highway (Mayberry and Haun 1988; Figure 27). This parcel was part of a much larger area that included more than 1,200 ac. in the uplands. These sites complement those documented by Haun and Henry (2001) on a 27 ac. coastal parcel located farther west in Pūpūkea between Pākūlena and Kālunawaika‘ala Streams. Site 3827 (T-14 in Figure 27), located near the Pūpūkea-Paumalū Ahupua‘a boundary makai of the GSH camp project area is a subsurface rock-lined pit, that likely served as a well. Although this feature has metal piping extending to the surface, it is probably associated with traditional Hawaiian forms that are reported elsewhere. Its topographic setting within the coastal plain is similar to that of the spring located farther north and identified on a historic map of Paumalū (see Figure 16). A similar subsurface pit (Site 5951) was also identified by Haun and Henry (2001:15–16) in the same coastal setting, although it had been reinforced with concrete.

Mayberry and Haun (1998:20–22, 28–29), identified two sites along the Paumalū-Pūpūkea coast as irrigation ditches (T-15: Site 3828, T-17: Site 3830 in Figure 27). Both features extend more than 100 m paralleling the coastline, and in the case of Site 3828 a trench was excavated through it (Figures 27 and 28). This excavation revealed a channel about 55–60 cm wide cut into the sandstone bedrock as much as 85 cm from the original surface (see Figure 28). While Mayberry and Haun (1998:20) believe this ditch was associated with historic agricultural development, the size and construction of the ditch are consistent with pre-contact ‘auwai found elsewhere in Hawai‘i (Graves et al. 2012, 2013). If true, this represents a form of irrigation or water transport technology in a

section of northwest O‘ahu where it has not been previously documented. It is possible that a section of this ditch is also represented on the 1892 historic map (Willis 1892b) showing the Paumalū-Pūpūkea boundary (see Figure 17). If so, this irrigation ditch would have crossed the ahupua‘a boundary. The second “ditch” (Site 3830) identified by Mayberry and Haun is in the general vicinity of the Old Government Road and Ala Nui Trail and more likely represents the main transport route through the coastal section of Paumalū and Pūpūkea Ahupua‘a.

Both Mayberry and Haun (1988) and Haun and Henry (2001) identify drylaid masonry walls in the coastal plain that they believe are associated with habitation and/or agricultural activities. These features are in approximately the same location in this coastal setting where LCA awards were made to claimants in Pūpūkea and Paumalū. In addition, a possible shrine or ko‘a was identified based on an associated coral offering that is located almost directly on top of the Pūpūkea-Paumalū boundary.

Coastal archaeological sites in Paumalū and Pūpūkea thus include both burial and habitation contexts, with at least three locations that have produced multiple burials. Firepits and cultural layers or deposits have been noted in association with many of the burial discoveries, suggesting these individuals are associated with the related habitation sites on or near the coast. In Paumalū, there are at least three archaeological areas of habitation along the coast and at least two more have been identified in Pūpūkea. The large number and wide range of plant and marine fauna recovered from excavations by Athens and Magnuson (1998) indicate that habitation was likely permanent. The presence of an Ala Nui or coastal trail, an ‘auwai or irrigation ditch that crossed the ahupua‘a boundary as well as a shrine or ko‘a located on the boundary suggest the residents of the two ahupua‘a were integrated ritually and economically.

Kula (Slope) and Kualapa (Ridge) Sites

Most of the surface archaeology in Paumalū and Pūpūkea is located somewhat inland from the coast and includes pre-contact or traditional Hawaiian sites and complexes as well as an array of historic features and structures that date from the mid-19th to the mid-20th centuries. Many of the post-contact features share construction design with traditional Hawaiian architecture but are associated with roads, animal pens, or agricultural features.

At the top of the talus slopes where it intersects the volcanic cliffline, a number of archaeological caves and rock shelters have been identified. Bath and Kawachi (1989) documented human remains in a small cave (Site 4098) located on the east side of Kaunala Gulch and south of the COMSAT road that extends from Kamehameha Highway to the ridge lands above in Paumalū. Pak and Lee (1989) found a second burial cave (Site 4193) on the west side of Kaunala Gulch.

The survey by Haun and Henry (2001), west of Pākūlena Gulch in Pūpūkea, included an area along the talus slope and the base of the cliffline. Most of the archaeological features (see Table 8) found in this area consisted of drylaid masonry walls or retaining walls, of which four (Sites 5959, 5960, 5961, 5962) formed three complexes. Within each of these complexes there were intact walls positioned perpendicular to the cliff face and extended downslope 20–50 m and separated by more than 50 m. Three of these walls had terrace retaining walls abutted to them. These three complexes are thought to be traditional Hawaiian garden areas mainly consisting of late pre-contact to early historic agricultural features (Haun and Henry 2001:35). Two burial caves (Sites 5963 and 5964) are located at the base of the cliffline above two of the agricultural plots. The human remains were interpreted to be probable pre-contact Native Hawaiian burials. Carson’s survey (2000) of the coastal cliff area near the mouth of Pākūlena Gulch produced similar findings: three rock shelters were identified associated with both habitations and burials. The talus slopes adjacent to the cliff included a series of enclosures, terraces, walls and mounds most of which were likely used for agricultural

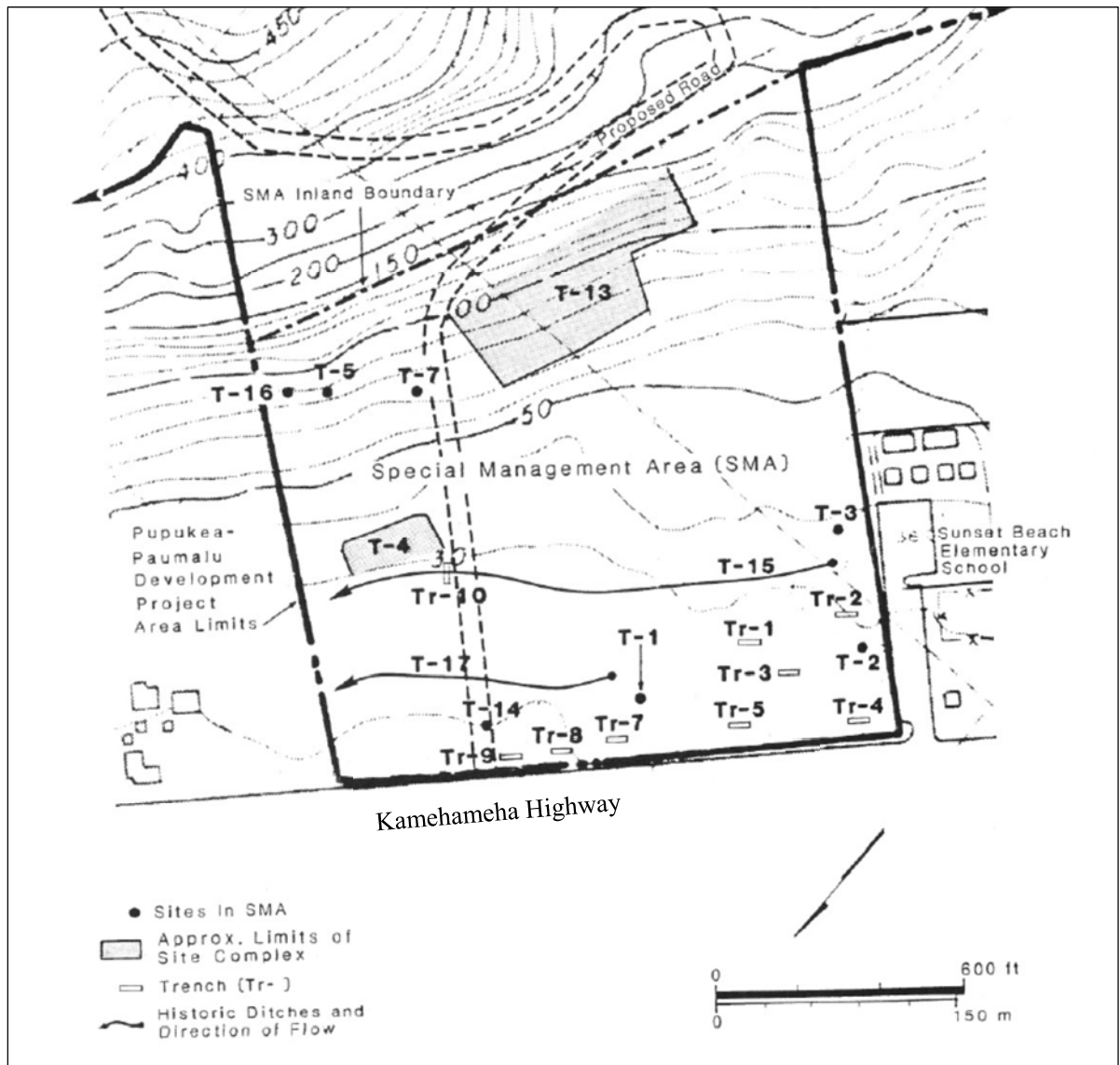


Figure 27. Mayberry and Haun (1988:16) project area showing Tr-10/T-15 and T-17 along the boundary of Paumalū and Pūpūkea Ahupua'a and south of Kamehameha Highway. Based on its location, T-17 may represent the Old Government Road; T-10 was excavated and it represents an irrigation ditch that flowed to the east into Paumalū. T-14 is a traditional rock-lined well. T-1 may be a ko'a or shrine located on the ahupua'a boundary.

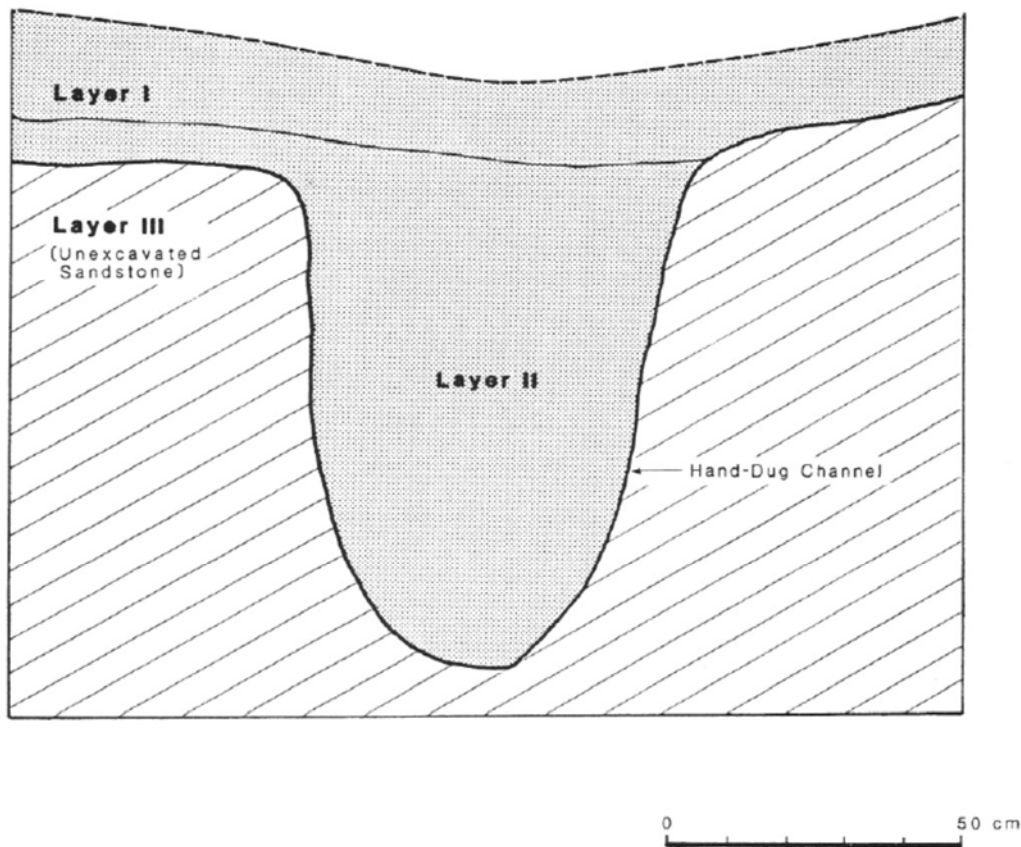


Figure 28. Cross-section of subsurface channel or irrigation ditch dug into bedrock, Site 3828, Paumalū-Pūpūkea coastal plain (Mayberry and Haun 1988:21).

purposes. Cultural materials suggest these features and complexes originated in the pre-contact period and were in use through the mid-19th century.

In addition to the coastal parcel, Mayberry and Haun (1988) surveyed an area of more than 1,200 ac. in the uplands above the coastal plain between Paumalū and Kālunawaika‘ala Streams, spanning Paumalū and Pūpūkea Ahupua‘a. More than 50 sites (Figure 29, see Table 8) were located on the talus slopes, at the bottom of the cliffline, along the drainages and slopes of Paumalū, Pākūlena, and Kālunawaika‘ala Streams, and onto the ridge lands and ridgetops between the streams and which extend inland.

Consistent with historic land award information and previous surveys (Carson 2000; Haun and Henry 2001) in Pūpūkea, Mayberry and Haun (1988) found substantial evidence for gardening, habitation, and burials along the talus slope and the lower cliffline in the project area. Site 3826 (Figure 30), along with nearby Sites 3831, 3832, 3834, and 3976 provides an excellent example of what such a complex may have included. Site 3826 is primarily interpreted as a walled agricultural complex with a large .5 ha dryland field, along with several smaller terraces and a series of boulders along the cliff face with petroglyphs. Sites 3831 and 3832 are rock shelters located adjacent to Site 3826 that functioned as a habitation area and as a local source of volcanic glass. Sites 3834 and 3976 are burial caves located in the cliff. A variety of cultural materials were observed on the surfaces of

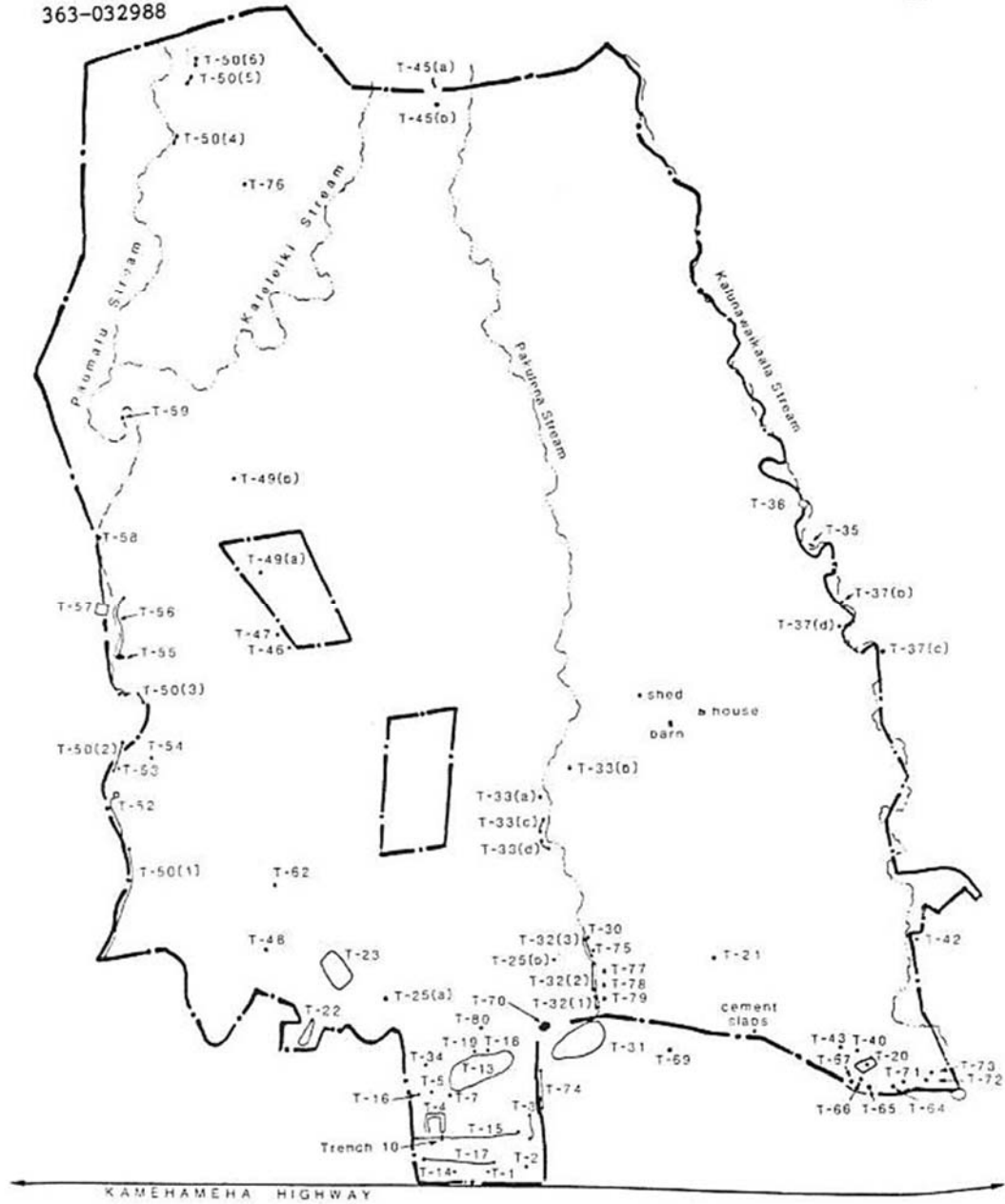


Figure 29. Archaeological study area including portions of western Paumalū and eastern Pūpūkea conducted by Mayberry and Haun (1988:16).

the rock shelters and caves including charcoal, a basalt flake, a polished basalt pebble, coral, pig mandibles, koa wood fragments of a canoe, and volcanic glass flakes.

There is one other comparable site complex near the mouth of Pākūlena Gulch, located on a talus slope and cliffline on either side of the gulch. Sites 3839 and 5831 represent a series of agricultural terraces and walls similar in size to Site 3826, along with burial caves and a habitation rock shelter (Sites 3869, 5832, 3973, 3974, 3975).

Elsewhere along the cliffline there is a complex of habitation rock shelters and burial caves at the mouth of Kālunawaika‘ala Gulch comprising Sites 3864, 3865, 3866, 3870, 3871, and 3872. No survey was done along the talus slope in this area but a bounded series of agricultural enclosures and terraces would be expected there.

Mayberry and Haun (1988:47, 49) identify a large walled enclosure, 12 by 16 m, with walls 2 m thick, along the middle of the talus slope between Pākūlena and Kālunawaika‘ala Gulches in Pūpūkea. Its size, nearly 200 m², and construction of this structure along with the presence of coral suggest it likely functioned as a heiau. Given its position on the slope, it has a considerable view of the coastal plain and ocean to the north.

The remaining features identified by Mayberry and Haun (1988) fall into three groups: 1. a series of historic roadbeds and their retaining walls within or on the slopes of the three gulches; 2. a series of features and foundations associated with livestock or plantation agriculture, and 3. three World War II concrete defensive structures located at the top of the cliffline to the east of Kālunawaika‘ala Gulch.

The three sets of roadbeds are represented by discrete sections but relatively well preserved walls or retaining walls along with leveled portions of the roadways, and occur along the bottom of Paumalū (Sites 3853 [T-49a-b], 3854 [50a-c], 3856 [T-53], 3859 [T-56], 3861 [T-58], 3862 [T-59]); Pākūlena (Sites 3840 [T-32], 3841 [T-33a-d], 3849 [T-45]); and Kālunawaika‘ala (Site 3844 [T-37a-d]) Gulches. These features are characterized by the use of drylaid masonry stacked walls, occasionally core-filled, with the extensive use of waterworn basalt cobbles in their construction. They are located adjacent to or within the stream channels, or are placed against the lower slopes of the gulches. There are more than 20 segments of these three roadbeds still preserved; some segments are more than 100 m in length. In some cases, they correspond to roads depicted on historic maps (Figure 31). It is possible that these roadbeds were built over existing trails that connected the coast to the upland regions, the Ko‘olau Mountains, and mauka Pūpūkea to Kahuku Trail.

There are three structures (Sites 3833, 3835, and 3848) associated with World War II military activities. These sites include three bunkers built of concrete, and in the case of Site 3835 the remains of two gun turrets. There is one site (3836) on the ridge land between Paumalū and Pākūlena Gulches associated with the former pineapple plantation. It is a habitation complex that includes a concrete chimney, basin, and foundation slabs, wooden platforms, and is associated with an alignment of waterworn basalt cobbles that may have served to mark a roadway. A second site was given a temporary site number (T-28) but no state site number and is located on the tablelands adjacent to one of the water reservoirs built before 1920 and consists of a historic dump. A third historic site located in upper Kālunawaika‘ala Gulch is a wood and concrete structure associated with a former pump house that served the plantation. One other site identified as historic is an earthen U-shaped berm (T-4) near the coast, thought to be associated with the railway line.

The previous archaeological investigations conducted within Paumalū and adjoining portions of Pūpūkea Ahupua‘a, although limited in scope for the most part to surface surveys, indicate that pre-

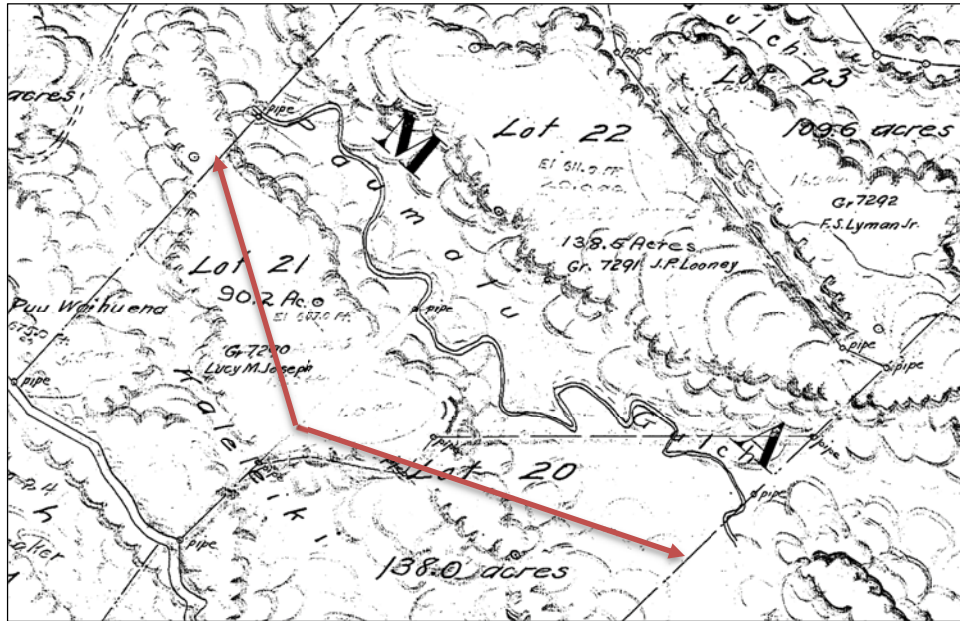


Figure 31. Historic roadway in Paumalū Gulch (Wright 1904).

contact Hawaiians in the region incorporated the coastal plains, kula lands along the talus slope, and the cliffclines into their land use. They likely planted crops in terraces and walled enclosures that were located along the coast and across all of the talus slopes fronting the uplands. Many of their houses were located near the coast, adjacent to the Ala Nui Trail, near fresh water, and based on the limited excavations, they procured a variety of marine resources along the coast. The powerful winter waves may have restricted the use of Sunset Beach during the winter, but calm summer water and the importance of seafood in the diet assured the utilization, even if seasonal, of the beach. Two ritual structures—a heiau and ko’a shrine attest to the performance of religious activities likely related to farming and fishing. Hawaiians in the region appear to have buried their dead in beach sand deposits near the shoreline and in caves along the cliffline. It is probable that families tended to bury their dead in ancestral locations.

Settlement Patterns

This reconstruction of settlement patterns integrates various sources of information to provide descriptions of the locations of habitation, food production efforts, water and other terrestrial resources, transportation routes, and rituals.

Paumalū and Pūpūkea Ahupua’a, with their proximity to the population center of Waimea supported a series of Hawaiian households and settlements prior to European contact in the late 18th century. Because most of the Māhele land awards (the claims and various testimonies) occurred more than a century after substantial Native Hawaiian population loss, it is difficult to reconstruct population size. However these documents, historic maps, and archaeological documentation provide the basis for reconstructing much of the late pre-contact to early historic settlement pattern in Paumalū and its neighboring ahupua’a.

Although only 10 land claims were awarded in Paumalū, they indicate a strong pattern towards coastal habitation, as was likely true for much of O’ahu. All of the claimants included documentation

of parcels with housing that abutted either side of the Ala Nui Trail. The trail extended across the coastal plain of Paumalū, between 200 and 1,200 ft. (61–366 m) inland from the coast. Maps of the LCA parcels for Paumalū from 1892 (Willis 1892a, 1892b), along with contemporary maps for Pūpūkea, and from Kaunala to Kahuku all confirm this concentration of habitation along the coast. There is also a pattern in Paumalū and other ahupua‘a of side-by-side parcels often with the longest sides perpendicular to the coastline or clustered around surface water sources such as ponds or springs. For Paumalū there are no land awards made west of Paumalū Stream, although there were likely residents living along the coast in that section of the community as well. Other evidence for coastal habitation comes from the archaeological survey, monitoring, and excavations conducted along the Paumalū and Pūpūkea coastal sand dunes. Athens and Magnuson (1998) have identified at least two locations where habitation is indicated; these would roughly correspond to the two clusters of LCA parcels along the coast.

While most of the land awards in Paumalū were relatively small in size averaging about 0.85 ac. (.34 ha), there is one larger award of 2.60 ac. (1.05 ha) that is more than three times the size of the others. The occurrence of this property adjacent to the coastal spring and near the coastal trail (later the Government Road), and extending inland more than 400 ft. (122 m) suggests it might have been the home for a local konohiki.

There is archaeological (although no historical) evidence for coastal habitation on the west side of Paumalū Stream extending across the ahupua‘a boundary with Pūpūkea. Again, there are numerous firepits documented for the coastal sands and there are at least three terraced and walled habitation and/or agricultural complexes (Mayberry and Haun 1988) just inland from the Ala Nui Trail, extending onto the talus slope below the cliffline. The presence of coastal water sources would have potentially been a limiting factor in the spatial distribution of residential locations. For Paumalū there is one coastal spring or water hole (i.e., well) identified on a historic map, plus a named spring in Waikoi Gulch (Soehren 2008). It is possible that water flowed in Paumalū Stream down to the coast on a more regular basis. If the identification of a coastal irrigation ditch is correct, it would have distributed water from Pūpūkea to Paumalū based on the reconstruction by Mayberry and Haun (1988).

The concentration of burials in at least three locations along the Pūpūkea to Paumalū section of the beach also suggests the presence of local residents who would have favored such locations for the burial of their deceased family members.

Based on the land award testimonies it is clear that a number of residents lived and cultivated crops and other plants on the talus slopes across Paumalū and Pūpūkea. One of the Paumalū maps (Willis 1892a) shows what appears to be drylaid masonry walls extending downslope from the base of the cliffs, sectioning off kula lands for cultivation. Remnants of such walls are documented archaeologically in an area where the two ahupua‘a boundaries meet (Mayberry and Haun 1988). A second study by Haun and Henry (2001) identified a series of intact masonry walls extending downslope from the bottom of the cliff in a pattern identical to that depicted on the historic Paumalū map. A number of rock shelters and caves are documented along the base of the cliffline and in the cliff face that were used for habitation, probably temporary, as well as storage, burial and ritual, and lithic procurement. Whether these represent other residents or the movement of members of coastal households on a seasonal or periodic basis (or both) is unclear. This suggests there was a pattern of dryland gardening and habitation cross the entire region where talus slopes had developed at the base of the cliffs, rising up from about 20 ft. (6 m) to 100–200 ft. (30–61 m) in elevation.

While more recent studies (Handy and Handy 1972:463) viewed Paumalū and portions of the northwest coast of O‘ahu as relatively marginal for farming, Māhele testimonies provide a different perspective. In addition to ‘uala, which was the primary cultigen in this area, residents identify mai‘a,

kō, and ‘ulu, along with noni, wauke, and hala. Woodland and forest resources were claimed, including koa, ‘ōhi‘a lehua, ‘ōhi‘a ‘ai, and kukui; all have been recovered from excavations or noted within caves or rock shelters used by Hawaiians. Although not mentioned in the testimonies kī grows abundantly in the uplands of Paumalū and was recovered from excavations along the coast. There is also a prominent landmark in Paumalū named Pu‘u Kī. Kalo is also mentioned in a few testimonies; most likely it was the dryland variety. Thus, there were diverse food and plant resources from a variety of environments available to Paumalū residents.

Traditional Hawaiian livestock included pua‘a (pig), moa (chicken), and ‘īlio (dog). Pig mandibles were observed in one of the burial caves. Two named places, Pua‘a E Ke Po and Pu‘u Moa, in Paumalū include the names of two of these domesticated animals. Dog bone was recovered from a coastal location (Athens and Magnuson 1998:31). Two dryland masonry enclosures are located within Paumalū Gulch and these are thought to represent animal pens.

Paumalū and its neighboring communities are known for their traditional fisheries. There are two named fisheries among the place names and a kapu fish, the alalaua, for Paumalū. More than 30 taxa of marine shellfish were identified in the coastal excavations by Athens and Magnuson (1998:28–29). They reflect the littoral and marine environments along the north coast. The most abundant taxon by weight represented among the marine resources was an invertebrate, wana (sea urchin). Fish bone also occurred in these excavations and was observed on the surface of one of the kula rock shelters.

While the coast of Paumalū offered one means for Hawaiians to travel by canoe there are also several named trails in the vicinity as well. The Ala Nui runs directly through the coastal plain of Paumalū, linking it to adjacent ahupua‘a and beyond. There is a trail along the ridgeline ahupua‘a boundary between Kaunala and Paumalū, leading into the Ko‘olau Mountains. There was an even longer trail linking Pūpūkea to Kahuku that crossed over the northwest to southeasterly oriented ridgelines of the Ko‘olau Mountains. There may have been a trail within Paumalū Gulch where the later, historic roadbed was constructed.

These trails not only were for human transport but likely enabled Hawaiians to access forest resources at higher elevations, including koa and ‘īliahi (sandalwood). Trails in the gulches would have provided access to stream water at higher elevations, and possibly wet kalo, but also to kukui and other managed trees within the drainages.

The traditional Hawaiian organization of settlement combined dispersed households and extended families with named territorial units at various scales. The nature, number, and size of these units varied across the archipelago and within individual islands, and probably over time as well. The development of communities organized into ahupua‘a territories was, with few exceptions, a universal, unifying feature of Hawaiian culture. Paumalū was no exception to this. However, there are several ways in which the residents of Paumalū organized themselves that bears further discussion.

First, at the scale of extended households or kindreds, community members from Paumalū apparently did not use ‘ili ‘āina to organize their territorial and economic relations within the larger ahupua‘a. There is no mention of ‘ili ‘āina in any of the claimants’ testimonies for land awards, as was the case in other areas of O‘ahu and on other larger, main Hawaiian islands. Named ‘ili ‘āina represented land parcels that had been “improved” and incorporated agricultural or aquacultural recourses. Such land parcels are commonplace in many land award testimonies. They were used to locate individual claims spatially relative to other individuals from the same or adjacent ‘ili ‘āina. However, in Paumalū according to Soehren (2008) land claims refer to named places that appear to have served as mo‘o, usually considered to be smaller sets of lands occupied or claimed by fewer

families or individuals. Many of the Paumalū claims are made for one or more mo‘o where there were gardens or cultivated plant resources, or in some cases, managed trees and larger shrubs.

The history of specific ahupua‘a development has been of interest to archaeologists and researchers for some time. Typically, that interest refers to the timing of the onset of the ahupua‘a system of land management and organization in Hawai‘i associated with the integration of mauka and makai lands into single named units that corresponded with individual communities. Such systems are said to appear as early as AD 1300–1400 based on radiocarbon dates from inland archaeological contexts (Hommon 1986). In many accounts, ahupua‘a are treated as “typically” economically autonomous and relatively endogamous, with a sufficiently sized population for the formation of new families or household units with time (Earle 1978).

Implicit in this and other reconstructions of ahupua‘a development is that earlier, larger territorial units preceded later, smaller units. Several efforts to reconstruct the formation of multiple ahupua‘a within delimited portions of an island have now been offered (Ladefoged et al. 2006; Ferriola 2015; Graves et al. 2016). Possible application to Paumalū and its neighboring ahupua‘a would create a larger, single territory, joining Waimea, Pūpūkea, Paumalū, and Kaunala based on the configuration of ahupua‘a boundaries. According to this scenario Pūpūkea and Paumalū would have been the last to divide.

At the same time, there are indications of shared resources across these ahupua‘a. The two major documented traditional trails (Kahuku-Pūpūkea and Kaunala-Paumalū) are located along boundaries to which individuals from more than one ahupua‘a would have had access. Similarly, the Ala Nui Trail that ran along the coastal plain of northwest O‘ahu would have potentially linked individuals from various ahupua‘a in terms of transportation. The irrigation ditch identified by Mayberry and Haun (1988) along the coastal section of their project area would have extended across the ahupua‘a boundary between Paumalū and Pūpūkea, with water likely diverted from Pākūlena Stream to the coastal ditch.

In terms of ritual and ceremonial practices, Hawaiians living along the northern Ko‘olau section of O‘ahu shared common burial practices both in the extensive sand dune deposits that formed along the shoreline and also at the base of the Ko‘olau cliffline, at the top of the talus slope where numerous caves and rock shelters can be found. Both locations were used for habitation, suggesting a settlement pattern in which local residents were buried near their homes or on lands they cultivated or had improved. Two heiau structures are suggested for the Pūpūkea and Paumalū coastal areas; one that probably served as a ko‘a was located on the ahupua‘a boundary, and a second, larger heiau is located on the talus slope of Pūpūkea, not far from the boundary with Paumalū, suggesting it may have served the populations of these two ahupua‘a before they split apart. The largest nearby heiau is that of Pu‘u-o-Mahuka, (Site 50-80-01-249) located on the north side of Waimea Stream near the boundary with Pūpūkea. It may have served the population of Ko‘olauloa on the northwest side of the island.

Thus there is an organization to traditional settlement in Paumalū that linked coastal and terrestrial resources, as far inland as the crest of the Ko‘olau Mountain. Distinctive sets of resources were fished, procured, managed, and cultivated in these different zones, with households claiming one or more mo‘o for their exclusive use. The settlement organization extended beyond the boundary of Paumalū, linking it with adjacent ahupua‘a through transport routes, shared water sources and forested zones, and at those times of the year when rituals were engaged at local heiau or when interment of family members occurred on their traditional lands.

Historic Architecture and Buildings

There are at least four facilities that were constructed more than 50 years ago and thus could potentially have historic significance. These include the 1. Health Center, 2. Staff Lounge, 3. Hale Hui Lodge, and 4. Unit 1 Makaha cabins (see Appendix).

The Health Center was formerly a residence of the camp when it served as housing for the Kahuku Plantation and thus pre-dates the Girl Scouts use of the land (Group 70 International 2013). The structure is a masonry and single wood frame house with a pitched roof (Figures 32 and 33). It included three small rooms and a bathroom with a sink, toilet, and warm-water shower. It is probably not in compliance with county safety requirements in terms of the cesspool that serves the structure.

The Staff Lounge is one of the original structures at the camp. As described by the GSH Master Plan (Group 70 International 2013) “The building is a wood frame on posts, and is accessed by stairs. Lap siding provides enclosure. Original windows are jalousie, and some have been replaced by vinyl sliders. Other openings are screened. It is a double-pitch, wood frame roof with corrugated metal roofing. A sink is located outside the entry. There is no interior finish at the ceiling, and the underside of the metal roofing is exposed.” The building, its facilities, and finishes are all in poor to fair condition, and would require considerable repairs for its continued use.

Hale Hui Lodge (Figure 34) is a single-framed wooden house with a steeply pitched roof on one large section of the structure. There is a large, enclosed (on three sides) work area with a large masonry fireplace and chimney (Figure 35) in the center of the work area at the back of the structure. This facility includes a kitchen and adjacent restroom structure, the latter of which houses several restrooms, two with warm-water showers.

The Makaha (Gateway) complex is located closest to the main camp area and consists of a unit lodge, six cabins, and a canvas tent on a wooden platform (Figures 36 and 37). The Lodge is a three-sided wooden structure with a covered area for fire-based cooking. It is built on a series of wooden piers and its roof is made from corrugated iron. The structure is in poor condition and of limited value, with evidence of termite damage. The cabins are simple slab-on-grade wood framed structures.

Summary of Background Information

The ahupua‘a of Paumalū and its neighboring communities of Pūpūkea and Kaunala present a consistent archaeological and historical pattern of traditional Hawaiian coastal habitation along with gardening on the talus slopes, burial in the coastal sands or in caves at the base of the cliffline, and the management of forest resources with perhaps some shifting cultivation in the uplands. Water likely flowed in the upper reaches of the main drainages such as Paumalū, and there were springs or water seeps on the coast. There is archaeological evidence of an irrigation ditch along the coast that would have crossed the ahupua‘a boundary between Pūpūkea and Paumalū. Trails linked coastal and upland areas as well as the ahupua‘a along the northwest and northeast coast of O‘ahu.

Historic maps and land claims provide more detail about land tenure and use, but are limited to the post-European contact period after the native population had declined during an interval during which land ownership was converted to fee simple title. Prior to this, places like Paumalū would have supported larger numbers of residents whose households might have varied in terms of their access to marine, coastal, and upland resources. The Native Hawaiian residents of Paumalū would



Figure 32. Current condition of the Health Center at Camp Paumalū. Orientation is to the east.



Figure 33. Current condition of the Health Center at Camp Paumalū showing exterior stone masonry. Orientation is to the west.



Figure 34. Current condition of the back exterior wall of Hale Hui Lodge showing the chimney. Orientation is to the south.



Figure 35. Current condition of the Hale Hui Lodge interior, showing the fireplace and ceiling construction features. Orientation is to the east.



Figure 36. Current condition of the Makaha Lodge and canvas tent. Orientation is to the east.



Figure 37. Current condition of the Makaha Lodge cabins. Orientation is to the north.

have possessed a shared history with their neighbors, may have joined together for certain ritual occasions, and they likely communicated with each other and visited their kin in other communities via the well-established trail network.

After Western contact and conversion to fee simple title, much of Paumalū was claimed as Crown Land; there were 10 smaller land claims awarded in the ahupua‘a concentrated along the coast and to the east of Paumalū Stream. The Ala Nui Trail was converted to a roadway, and many of the lands passed out of Native Hawaiian ownership and became part of the Kahuku Plantation. Much of the Crown Land in Paumalū was also sold to private individuals, and some of it was also acquired by the Plantation; the uppermost areas became part of the Forest Reserve in the northern Ko‘olau Mountains.

Anticipated Finds and Research Questions

No archaeological resources are known to occur within the current project boundaries or on any part of TMK: (1) 5-9-006:012. Previous archaeological studies have identified a variety of sites in the coastal and upland regions of Pūpūkea and Paumalū. Upland sites include pre-contact or traditional Hawaiian sites and complexes as well as an array of historic features and structures that date from the mid-19th to the mid-20th centuries. Closest to the Camp Paumalū property are historic ranching, agriculture, and water control features. Elsewhere in the uplands are traditional sites such as trails, rockshelters, and human burials as well as historic military features.

Research questions will broadly address the identification of the above archaeological resources and may become more narrowly focused based on the kinds of resources that are found. Initial research questions are as follows:

1. Is there any evidence of pre-contact use of the project area and what is the nature of that use?
2. Are there vestiges of historic use of the project area, such as military or ranching remnants?
3. Are there any traditional or historic trail systems that run through the project area?
4. If cultural resources are found, how do they relate to the settlement pattern of the wider region?

Once these basic questions are answered, additional research questions may be developed in consultation with SHPD, tailored to the specific kinds of archaeological resources that were identified.

METHODS

Pedestrian survey was conducted on July 15, 2016 by Windy McElroy, PhD, Lisa Hinano Rey, BA, and Danielle Shemesh, BA. Subsurface testing and additional pedestrian survey took place on October 25 and 26, 2016 by Windy McElroy, PhD, Dietrix Duhaylonsod, BA, Robin Keli'i, BA, Jeffrey Lapinad, and Kevin Sprenger, for a total of 12 person-days completed for the project. McElroy served as Principal Investigator, overseeing all aspects of the project.

For the pedestrian survey, the ground surface was visually inspected for surface archaeological remains, with transects walked for the entire area. Archaeologists were spaced approximately 10 m apart. Of the 7.093 ha (17.528 ac.) survey area, 100% was covered on foot. Vegetation was variable, consisting of grass and large trees in many areas, which did not affect visibility of the ground surface. There were areas that were heavily overgrown with palapala'ā, and this did affect visibility of the ground (see Figure 11). Archaeologists were spaced closer together in these places, approximately 5 m apart.

Test trenches were excavated in 13 locations throughout the project area. The excavation strategy was approved by SHPD beforehand via email on July 21, 2016. Test trench placement targeted areas where deep excavations are likely to occur during construction. A mini excavator was used for excavation of the trenches (Figure 38). Vertical provenience was measured from the surface, and trenches were excavated to sterile deposits. Profiles were drawn and photographed, and sediments were described using Munsell soil color charts (Munsell 2010), a sediment texture flowchart (Thien 1979), and the U.S. Department of Agriculture soil manual (USDA 2017). Trench locations were recorded with a 3 m-accurate Garmin GPSmap 62st, and all trenches were backfilled after excavation.

The scale in all field photographs is marked in 10 cm increments. The north arrow on all maps points to magnetic north. Throughout this report rock sizes follow the conventions outlined in *Field Book for Describing and Sampling Soils*: Gravel <7 cm; Cobble 7–25 cm; Stone 25–60 cm; Boulder >60 cm (Schoeneberger et al. 2002:2–35). No materials were collected and no laboratory analyses were conducted.



Figure 38. Excavation of TR 13 with mini excavator. Orientation is to the northwest.

RESULTS

Pedestrian survey and subsurface testing were conducted in the 7.093 ha (17.528 ac.) project area. No archaeological resources were found. Excavation of 13 test trenches did not yield any evidence of subsurface archaeological deposits or features. Four historic structures occur within the project area; a reconnaissance level survey (RLS) has been conducted for the buildings (see Appendix).

Community Consultation

A cultural impact assessment (CIA) was conducted for this project (Graves et al. 2016). Three interviews with community members were completed by Keala Pono Ethnographer Dietrix Duhaylonsod, BA. Interviewees were selected because they met one or more of the following criteria: 1) was referred by Keala Pono Archaeological Consulting, the Girl Scouts of Hawai'i, or G70; 2) had/has ties to the project area or vicinity; 3) is a known Hawaiian cultural resource person; 4) is a known Hawaiian traditional practitioner; or 5) was referred by other cultural resource professionals. The interviewees were Butch Helemano, Kawika Kahiapo, and Bob Leinau. They were contacted by email and in person.

Ethnographic interviews identified several cultural resources located in Paumalū Ahupua'a. They include trails, rock alignments, possible agricultural areas, possible human burials, pōhaku with special meaning, and petroglyphs at Sunset Beach (makai of the project area). Plants such as hala, loulou, maile, 'ohe, mai'a, 'ulu and 'iliahi were also mentioned and may still be gathered by cultural practitioners today.

The interviewees shared several concerns and recommendations for the improvements to the Girl Scout Camp. The following recommendations were made: have good intentions and aloha; restore life to the land; care for the land and the ancestors; protect the things of old and the trees; bring in cultural experts; map out cultural resources and keep new construction away from them; keep mauka to makai access open; contain erosion; keep the community informed of project plans; and talk to more kūpuna. These as well as any other concerns and recommendations brought forward by the community should be considered during all phases of the Camp Paumalū improvements.

Pedestrian Survey

The surface survey included 100% of the 7.093 ha (17.528 ac.) project area. No surface archaeological remains were observed within any part of the project area. There are several buildings within the property, and four structures are known to be more than 50 years old. These include the 1. Health Center, 2. Staff Lounge, 3. Hale Hui Lodge, and 4. Unit 1 Makaha cabins (See Historic Architecture and Buildings section). An RLS has been conducted for the four structures (McElroy 2016) and they will not be discussed further here. The RLS has been added as an appendix to this document.

Subsurface Testing

A subsurface testing plan was approved by SHPD before trenching began. The 13 trenches (TR) were excavated within the project area to determine the presence or absence of subsurface archaeological deposits or material (Figures 39–40 and Table 10). No archaeological resources were found. Trench locations and dimensions are listed in Table 11.

Stratigraphy was similar throughout, with slight variations. Five variations in stratigraphy were noted (see Table 2), and each is illustrated with a profile drawing and photo:

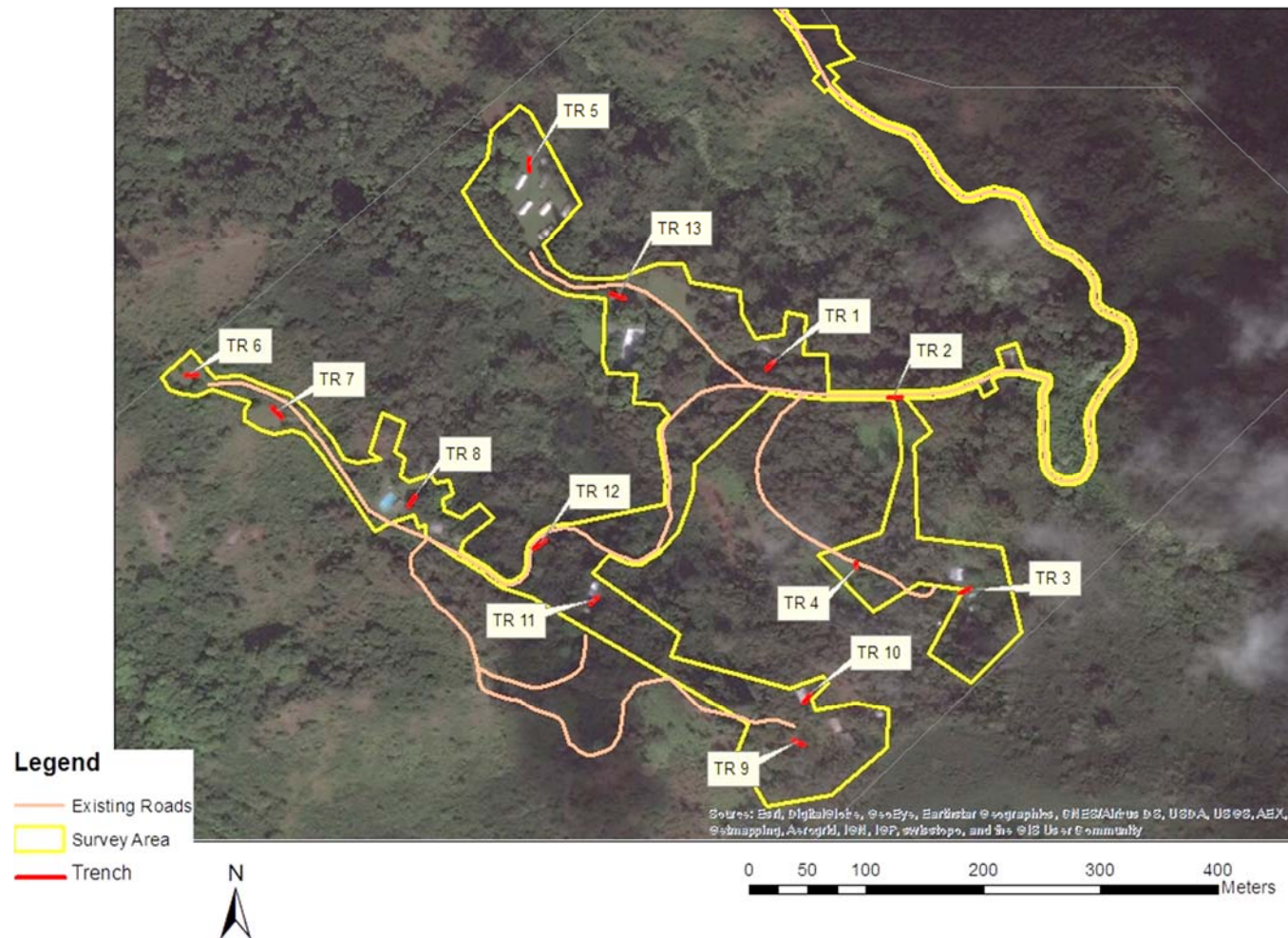


Figure 39. Location of trenches on aerial imagery.

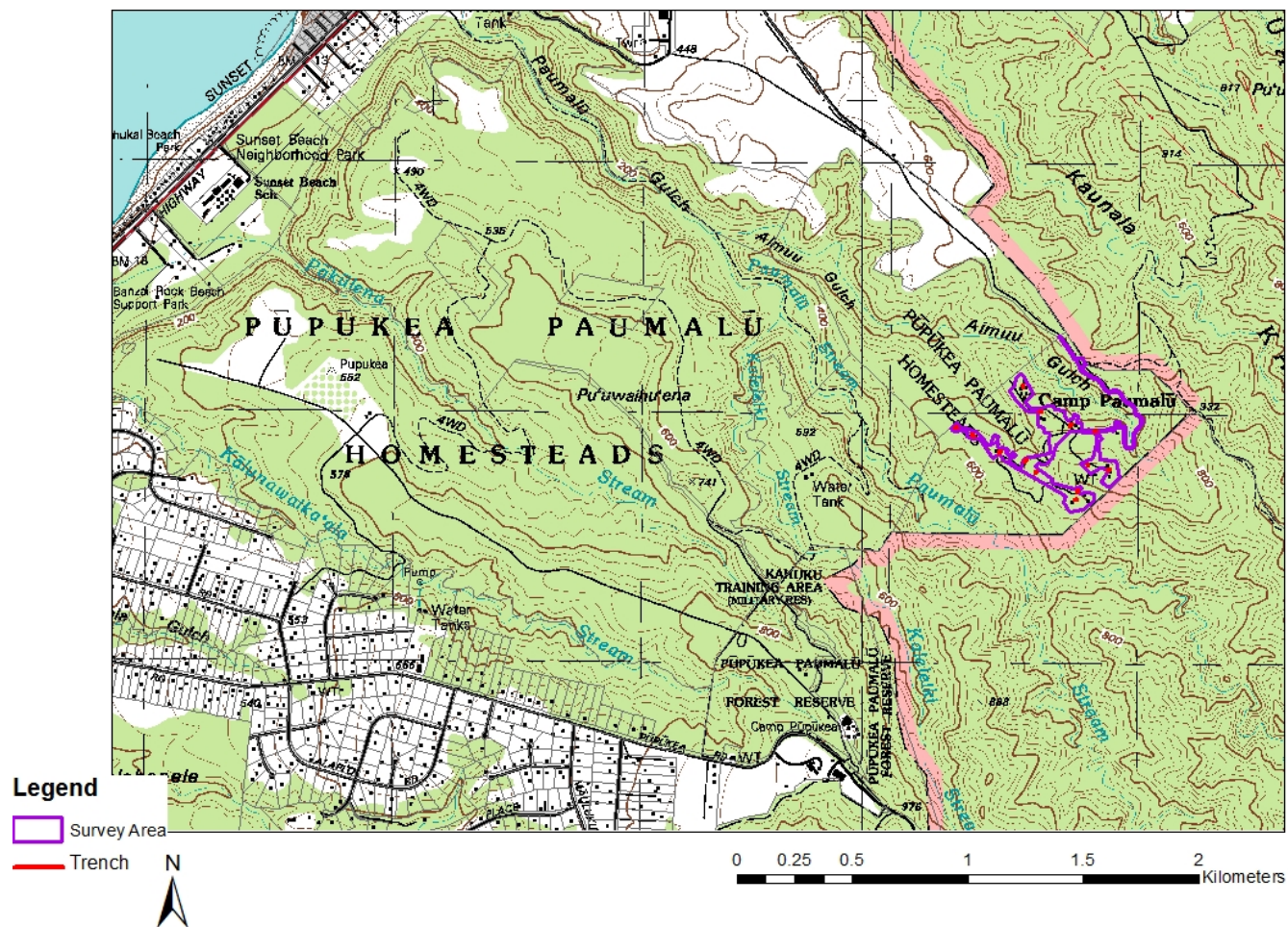


Table 10. Soil Descriptions

Trench	Layer	Depth (cmbs)	Color	Description	Interpretation
TR 1	I	0–120	7.5YR 3/4	Clay loam, dry; 3% roots; pvc pipe at 40 cmbs; smooth, clear boundary.	Natural Colluvium
	II	120–135+	7.5YR 3/1 mottled	Saprolitic rock; base of excavation.	Weathering Bedrock
TR 2	I	0–15	10YR 2/1	Detritus, dry; 60% basalt gravel; sparse modern debris; smooth, very abrupt boundary.	Road Surface
	II	15–105	5YR 3/3	Clay loam, dry; smooth, clear boundary.	Natural Colluvium
	III	105–115+	5YR 4/6	Clay loam, dry; 50% saprolitic rock; base of excavation.	Weathering Bedrock
TR 3	I	0–40	7.5YR 3/3	Silt loam, moist; 20% roots; smooth, clear boundary.	Natural Colluvium
	II	40–130+	5YR 3/4	Clay loam, dry; 2% roots; base of excavation.	Natural Colluvium
TR 4	I	0–140+	5YR 3/4	Clay loam, moist; base of excavation.	Natural Colluvium
TR 5	I	0–35	7.5YR 3/2	Clay loam, dry; 10% roots; smooth, clear boundary.	Natural Top Soil
	II	35–140	5YR 3/4	Clay loam, dry; 1% roots; smooth, clear boundary.	Natural Colluvium
	III	140–160+	5YR 3/1 mottled	Clay, dry; base of excavation.	Natural Colluvium
TR 6	I	0–35	7.5YR 3/2	Clay loam, dry; 40% roots; smooth, clear boundary.	Natural Top Soil
	II	35–145+	5YR 4/3	Clay loam, dry; 3% roots; base of excavation.	Natural Colluvium
TR 7	I	0–22	7.5YR 3/3	Clay loam, dry; 15% roots; smooth, clear boundary.	Natural Top Soil
	II	22–160+	2.5YR 3/6	Clay loam, dry; 20% saprolitic rock; base of excavation.	Weathering Bedrock
TR 8	I	0–30	7.5YR 3/3	Clay loam, dry; 25% roots; metal pipe at 2 cmbs; smooth, clear boundary.	Natural Top Soil
	II	30–125+	2.5YR 3/6	Clay loam, dry; 2% roots; base of excavation.	Natural Colluvium
TR 9	I	0–22	7.5YR 3/4	Clay loam, dry; 20% roots; metal pipe at 12 cmbs; smooth, clear boundary.	Natural Top Soil
	II	22–40	5YR 3/4	Clay loam, dry; 2% roots; smooth, clear boundary.	Natural Colluvium
	III	40–115+	5YR 4/4	Clay, dry; 20% saprolitic rock; base of excavation.	Weathering Bedrock

Table 10. (continued)

TR 10	I	0–22	7.5YR 3/4	Clay loam, dry; 20% roots; metal pipe at 12 cmbs; smooth, clear boundary.	Natural Top Soil
	II	22–85	5YR 3/4	Clay loam, dry; 2% roots; smooth, clear boundary.	Natural Colluvium
	III	85–115+	10YR 3/2	Clay, dry; base of excavation.	Natural Colluvium
TR 11	I	0–25	7.5YR 3/3	Clay loam, moist; 20% roots; smooth, clear boundary.	Natural Top Soil
	II	25–59	5YR 3/3	Clay loam, dry; 3% roots; smooth, clear boundary.	Natural Colluvium
	III	59–100+	7.5YR 4/6 mottled	Clay, dry; 20% saprolitic rock; base of excavation.	Weathering Bedrock
TR 12	I	0–13	10YR 2/2	Clay loam, dry; 2% roots; 40% basalt gravel; smooth, very abrupt boundary.	Road Surface
	II	13–115+	5YR 3/3	Clay loam, dry; base of excavation.	Natural Colluvium
TR 13	I	0–25	7.5YR 3/3	Clay loam, dry; 30% roots; smooth, abrupt boundary.	Natural Top Soil
	II	25–116+	5YR 3/3	Clay loam, dry; 2% roots, 20% saprolitic rock; base of excavation.	Weathering Bedrock

Table 11. Trench Locations and Dimensions

Trench	Location	Length (m)	Width (m)	Depth (cmbs)
TR 1	South of Health Center	6.2	.60	135
TR 2	Road Between Caretaker's House and Health Center	8.1	.60	115
TR 3	Southeast of Kani Ka Pila Lodge	5.9	.60	130
TR 4	South Side of the Road leading to Kani Ka Pila	4.2	.60	140
TR 5	South of Makaha Lodge	7.4	.60	160
TR 6	Northwest End of Piilani	7.9	.60	145
TR 7	Piilani, in Clearing, Southeast of Time Capsule	8.2	.60	160
TR 8	Northeast of Pool	7.1	.60	125
TR 9	Lani Ko Luna, Open Area at End of Road	5.8	.60	115
TR 10	Southeast of Lani Ko Luna Picnic Structure	4.7	.60	115
TR 11	South of Kolehale Lodge	6.5	.60	100
TR 12	Road Leading to Pool	6.5	.60	115
TR 13	Northwest of Paumalu Lodge	7.1	.60	116

1. Topsoil at the surface with a layer of soil formed on colluvium below, and weathering bedrock at the base of the trench (Figures 41 and 42). This was found in TR 9 and 11.
2. Topsoil at the surface, with weathering bedrock directly below it (Figures 43 and 44). This was observed at TR 7 and 13.
3. Topsoil at the surface with one or two layers of soil formed on colluvium below (Figures 45 and 46). This was found in TR 5, 6, 8, and 10.
4. No topsoil, and either two layers of soil formed on colluvium (TR 3 and 4) or an upper layer of soil formed on colluvium underlain by weathering bedrock (TR 1) (Figures 47 and 48).
5. A gravel road as the uppermost layer, with soil formed on colluvium below (TR 12) or soil formed on colluvium underlain by weathering bedrock below (TR 2) (Figures 49 and 50).

Summary of Findings

Pedestrian survey of 7.093 ha (17.528 ac.) at Girls Scout Camp Paumalū yielded no archaeological resources. Four historic buildings were identified, and a historic architecture RLS has been prepared for the structures. Subsurface testing, consisting of 13 trenches, did not identify any subsurface cultural deposits or features. Stratigraphy consisted of natural deposits, sometimes with an upper road or natural topsoil layer.

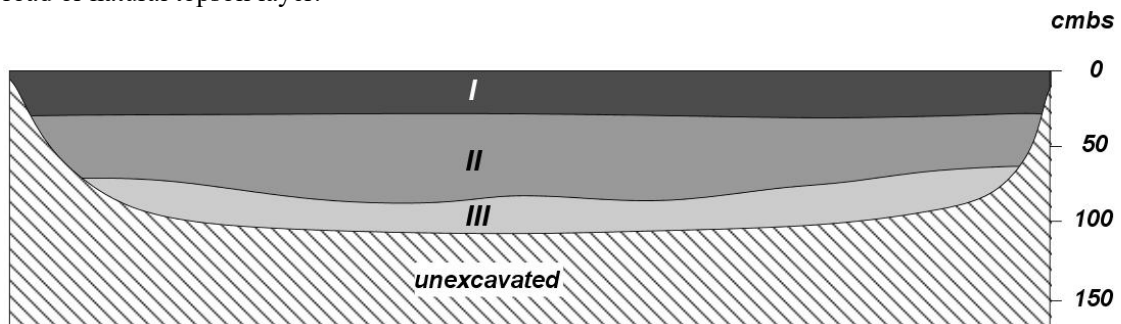


Figure 41. TR 11 south face profile drawing.



Figure 42. TR 11 south face photo.

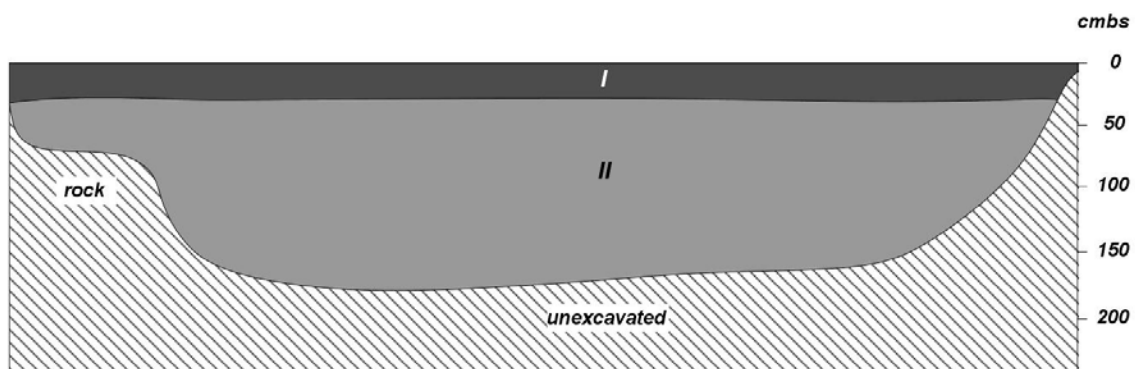


Figure 43. TR 7 southwest face profile drawing.



Figure 44. TR 7 southwest face photo.

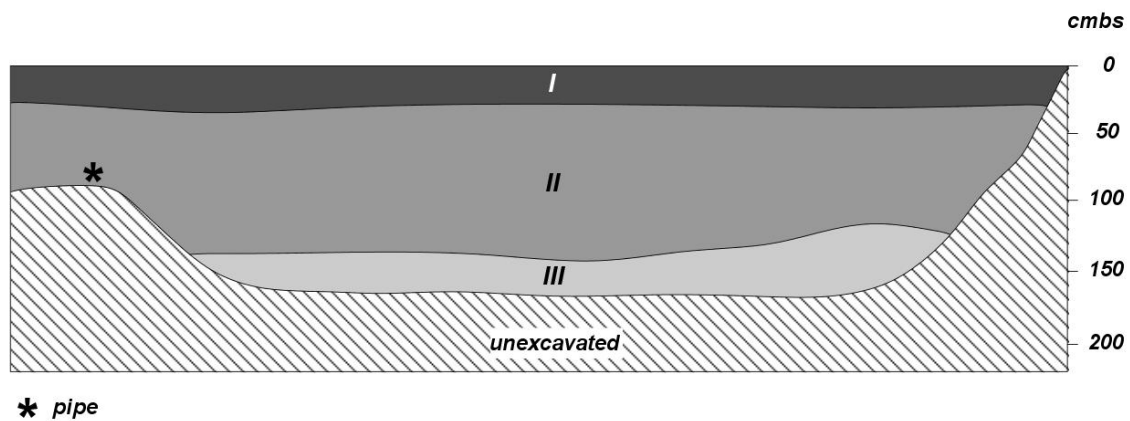
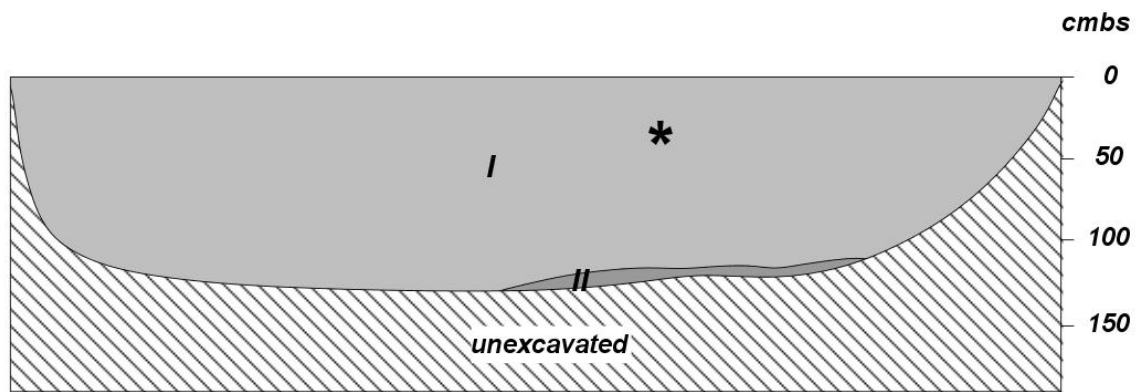


Figure 45. TR 5 northeast face profile drawing.



Figure 46. TR 5 northeast face photo.



* pipe

Figure 47. TR 1 east face profile drawing.



Figure 48. TR 1 east face photo.

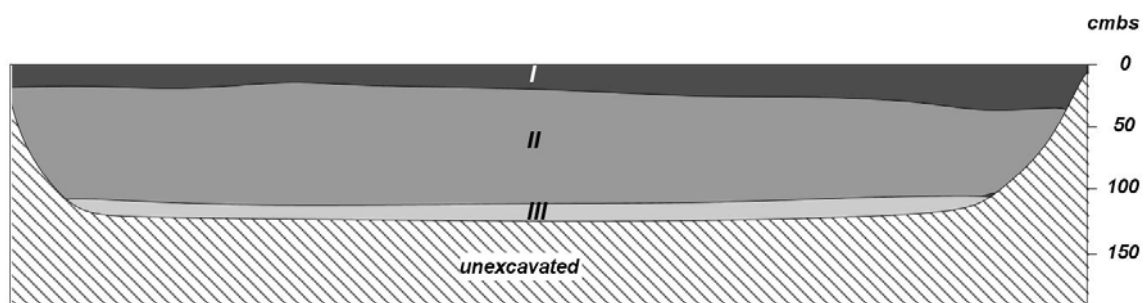


Figure 49. TR 2 southeast face profile drawing.



Figure 50. TR 2 southeast face photo.

CONCLUSION AND RECOMMENDATIONS

An archaeological inventory survey was conducted for the Paumalū Girl Scout Camp at TMK: (1) 5-9-006:012 (por.) in Paumalū Ahupua‘a, Ko‘olaupua District, on the island of O‘ahu, in anticipation of improvements to the camp. The Girl Scouts of Hawai‘i is planning improvements to the camp, so that facilities will meet minimum code and permitting requirements for the Honolulu Fire Department, Environmental Protection Agency, State Department of Health, and Americans with Disabilities Act. The archaeological work included pedestrian survey that covered 100% of the 7.093 ha (17.528 ac.) project area, as well as test excavations consisting of 13 trenches. Due to negative findings, the AIS results are presented as an archaeological assessment per HAR §13–275.

No surface archaeological remains were found during pedestrian survey of the parcels. Likewise, subsurface testing did not yield any evidence of subsurface archaeological features or deposits. Stratigraphy consisted of natural deposits, often with an upper road or topsoil layer. The only findings were four historic buildings; an RLS has been prepared for the structures.

Given the lack of findings, archaeological monitoring is not recommended. However, even though human remains were not found during the survey, it is still possible that they may be unearthed during construction. Should human burial remains be discovered during construction activities, work in the vicinity of the remains should cease and the SHPD should be contacted.

GLOSSARY

‘ahakea	The native tree, <i>Bobea</i> sp., the wood of which was used for canoe gunwales, house doors, and door frames, and bark used medicinally in traditional Hawai‘i.
ahupua‘a	Traditional Hawaiian land division usually extending from the uplands to the sea.
‘āina	Land.
‘akoko	Endemic shrubs and trees of <i>Euphorbia</i> spp., the sap of which was made into a paint for canoes in traditional Hawai‘i.
akua	God, goddess, spirit, ghost, devil, image.
ala hele	Pathway, trail, road.
alahe‘e	The native shrub or small tree <i>Canthium odoratum</i> , used medicinally and to make digging sticks in ancient Hawai‘i.
alalaua	The fish <i>Priacanthus alalaua</i> , usually found at depths of 100 m or greater.
ali‘i	Chief, chiefess, monarch.
ali‘i nui	High chief.
‘āpana	Piece, slice, section, part, land segment, lot, district.
‘aumakua	Family or personal gods. The plural form of the word is ‘aumākua.
‘auwai	Ditch, often for irrigated agriculture.
‘awa	The shrub <i>Piper methysticum</i> , or kava, the root of which was used as a ceremonial drink throughout the Pacific.
awāwa	Valley, gulch, ravine.
Christmas berry	The ornamental tree <i>Schinus terebinthifolius</i> known for its bright red berry-like fruits.
eucalyptus	Forest trees of the genus <i>Eucalyptus</i> , more than 90 species of which have been introduced to Hawai‘i.
haha	<i>Cyanea koolauensis</i> , a rare plant in the bellflower family.
hala, pū hala	The indigenous pandanus tree, or <i>Pandanus odoratissimus</i> , which had many uses in traditional Hawai‘i. Leaves were used in mats, house thatch, and basketry; flowers were used for their perfume; keys were utilized in lei and as brushes; roots and leaf buds were used medicinally; and wood was fashioned into bowls and other items.
halapepe	The native tree <i>Pleomele auwahiensis</i> .
hale	House.
hame	The native tree, <i>Antidesma pulvinatum</i> , whose fruit was used traditionally in dyes.
hao	The native tree <i>Rauvolfia sandwicensis</i> .
hāpu‘u	<i>Cibotium splendens</i> , a fern endemic to Hawai‘i; a forest fern to 5 m high.
heiau	Place of worship and ritual in traditional Hawai‘i.
huehue	The native climbing plant <i>Cocculus ferrandianus</i> , the stems of which were once used for fish traps and twine.

‘ili, ‘ili‘āina	Land area; a land section, next in importance to ahupua‘a and usually a subdivision of an ahupua‘a.
‘ili kūpono	An ‘ili within an ahupua‘a that was nearly independent. Tribute was paid to the ruling chief rather than the chief of the ahupua‘a, and when an ahupua‘a changed hands, the ‘ili kūpono were not transferred to the new ruler.
‘iliahi	<i>Santalum</i> spp., refers to all types of Hawaiian sandalwood.
‘ili‘ili	Waterworn cobbles often used in floor paving.
‘ilio	Dog.
ipu	General name for a vessel or container. Also the bottle gourd <i>Lagenaria siceraria</i> or <i>L. vulgaris</i> , which was used traditionally for containers, hula instruments, and for medicine.
ironwood	<i>Casuarina equisetifolia</i> , a large tree introduced to Hawai‘i in the historic era.
Java plum	Introduced tree or shrub of the genus <i>Eugenia</i> or <i>Syzygium</i> , common in dry to mesic forests.
kahakai	Beach, seashore, coast.
kahawai	Stream, creek, river; valley, ravine, gulch, whether wet or dry.
Kahiki	A far away land, sometimes refers to Tahiti.
kahuna	An expert in any profession, often referring to a priest, sorcerer, or magician.
kai lawai‘a	Fishery.
kalana	A division of land smaller in size than a moku, or district.
kalo	The Polynesian-introduced <i>Colocasia esculenta</i> , or taro, the staple of the traditional Hawaiian diet.
kama‘āina	Native-born.
kamani	The Polynesian-introduced tree, <i>Calophyllum inophyllum</i> , that had many uses in ancient Hawai‘i. Nuts were fashioned into whistles, nut oil was used as a polish for wooden containers and as a fuel for lamps. Flowers were used for scenting kapa, fruit husks were made into a brownish mauve dye, and wood was manufactured into bowls.
kapa	Tapa cloth.
kapu	Taboo, prohibited, forbidden.
kauila	The name for two types of buckthorn trees native to Hawai‘i (<i>Alphitonia ponderosa</i> and <i>Colubrina oppositifolia</i>). Produced a hard wood prized for spear and a variety of other tool making.
keahi	The native tree <i>Nesoluma polynesianum</i> .
kī	The plant <i>Cordyline</i> spp., whose leaves were traditionally used in house thatching, raincoats, sandals, whistles, and as a wrapping for food.
kō	The Polynesian introduced <i>Saccharum officinarum</i> , or sugarcane, a large grass traditionally used as a sweetener and for black dye.
ko‘a	Fishing shrine.

koa	<i>Acacia koa</i> , the largest of the native forest trees, prized for its wood, traditionally fashioned into canoes, surfboards, and calabashes.
konohiki	The overseer of an ahupua‘a ranked below a chief; land or fishing rights under control of the konohiki; such rights are sometimes called konohiki rights.
kōpiko	The native shrub-tree, <i>Psychotria</i> sp., four species of which are known to Moloka‘i. Its wood was previously used as firewood and to make kapa logs.
kou	The flowering tree, <i>Cordia subcordata</i> , either native to Hawai‘i or introduced by Polynesians.
Kū	The Hawaiian god of war.
kualapa	Ridge.
kukui	The candlenut tree, or <i>Aleurites moluccana</i> , the nuts of which were eaten as a relish and used for lamp fuel in traditional times.
kula	Plain, field, open country, pasture, land with no water rights.
kuleana	Right, title, property, portion, responsibility, jurisdiction, authority, interest, claim, ownership.
kupuna	Grandparent, ancestor; kūpuna is the plural form.
lama	The native tree, <i>Diospyros sandwicensis</i> , that had many uses in traditional Hawai‘i. Fruit was eaten, wood was fashioned into fish traps and sacred structures within heiau. Lama wood was also crushed and used for medicinal purposes.
lele	A detached part or lot of land belonging to one ‘ili, but located in another ‘ili.
limu	Refers to all sea plants, such as algae and edible seaweed.
lo‘i, lo‘i kalo	An irrigated terrace or set of terraces for the cultivation of taro.
loulou	The fan palm (<i>Pritchardia</i> spp.), endemic to Hawai‘i.
Māhele	The 1848 division of land.
mai‘a	The banana, or <i>Musa</i> sp., whose fruit was eaten and leaves used traditionally as a wrapping for cooking food in earth ovens.
maile	<i>Alyxia olivaeformis</i> , a fragrant native shrub used for twining.
maka‘āinana	Common people, or populace; translates to “people that attend the land.”
makai	Toward the sea.
māla	Garden, plantation, patch, cultivated field.
ma‘o hau hele	<i>Hibiscus brackenridgei</i> , the native yellow hibiscus.
mauka	Inland, upland, toward the mountain.
melaleuca	Trees such as paperbarks, honey-myrtles or tea-trees.
mele	Song, chant, or poem.
midden	A heap or stratum of refuse normally found on the site of an ancient settlement. In Hawai‘i, the term generally refers to food remains, whether or not they appear as a heap or stratum.
milo	The tree <i>Thespesia populnea</i> , used traditionally for dye, medicine, oil, gum and for making calabashes.

moa	Chicken.
moku	District, island.
mo‘o	Narrow strip of land, smaller than an ‘ili.
mo‘olelo	A story, myth, history, tradition, legend, or record.
na‘ena‘e	Plants of the daisy family (<i>Dubautia</i>).
naio	<i>Myoporum sandwicense</i> , the bastard sandalwood native to Hawai‘i.
nānū	The native gardenia.
naupaka	The native shrub <i>Scaevola</i> sp., varieties of which are found both in the uplands and by the sea.
nehe	The native shrub <i>Lipochaeta</i> spp. that has yellow flowers.
nioi	The tree <i>Eugenia</i> sp. Only at Mauna Loa on Moloka‘i was the wood said to be poisonous.
niu	The Polynesian-introduced tree <i>Cocos nucifera</i> , or coconut.
Norfolk Island Pine	The introduced tree <i>Araucaria heterophylla</i> .
‘ohe	Bamboo of all kinds.
‘ohe‘ohe	Tall native trees such as <i>Tetraplasandra kawaiensis</i> .
‘ōhi‘a	Two kinds of forest trees. See also o‘ōhi‘a‘ai and ‘‘ōhi‘a lehua.
‘ōhi‘a ‘ai	The mountain apple tree, <i>Syzygium malaccensis</i> , a forest tree that grows to 50 ft high.
‘ōhi‘a lehua	The native tree <i>Metrosideros polymorpha</i> , the wood of which was utilized for carving images, as temple posts and palisades, for canoe spreaders and gunwales, and in musical instruments.
‘okana	Subdivision or district, usually consisting of several ahupua‘a.
‘ōlapa	The native tree <i>Cheirodendron trigynum</i> , the leaves of which were used in lei, and fruit, leaves, and bark made into dye.
‘ōlelo no‘eau	Proverb, wise saying, traditional saying.
‘ōlena	The turmeric plant, <i>Curcuma domestica</i> , traditionally used as medicine and for spices and dyes.
oli	Chant.
olopua	<i>Osmanthus sandwicensis</i> , a large native tree, the wood of which was used traditionally for adze handles, spears, and digging sticks.
pala‘ā, palapala‘ā	The lace fern (<i>Sphenomeris chinensis</i>) that grows wild. Traditionally, brown dye was made from its fronds.
palai	The lacy native fern <i>Microlepia setosa</i> .
palena	Boundary, border, limit, juncture, separation.
pāpala	Refers to all native shrubs in the <i>Charpentiera</i> genus.
pōhaku	Rock, stone.

pōhuehue	The beach morning glory, <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> , used medicinally. Vines are also used to drive fish into nets.
poi	A staple of traditional Hawai‘i, made of cooked and pounded taro mixed with water to form a paste.
pōpolo	The herb black nightshade (<i>Solanum nigrum</i>), traditionally used for medicine and in ceremony.
post-contact	After A.D. 1778 and the first written records of the Hawaiian Islands made by Captain James Cook and his crew.
pre-contact	Prior to A.D. 1778 and the first written records of the Hawaiian Islands made by Captain James Cook and his crew.
pua‘a	Pig.
pu‘u	Hill, mound, peak.
strawberry guava	The invasive tree <i>Psidium cattleianum</i> , originating in Brazil and brought to Hawai‘i in 1825. Fruit are edible and are used in juice, and the tree is used as an ornamental and for firewood.
sugarcane	The Polynesian-introduced <i>Saccharum officinarum</i> , or kō, a large grass traditionally used as a sweetener and for black dye.
‘uala	The sweet potato, or <i>Ipomoea batatas</i> , a Polynesian introduction.
‘ūlei	The native shrub <i>Osteomeles anthyllidifolia</i> , the berries of which were eaten, sewn into lei, and used to make lavender dye, and its hard wood used to produce a variety of implements.
‘ulu	The Polynesian-introduced tree <i>Artocarpus altilis</i> , or breadfruit.
wahi pana	Sacred places or legendary places that may or may not be kapu, or taboo.
wana	Sea urchin, such as <i>Diadema paucispinum</i> and <i>Echinothrix diadema</i> ; some were considered ‘aumākua in traditional Hawai‘i.
wao	A general term for inland areas, usually forested and uninhabited.
wao kanaka	An inland region where people may live or occasionally frequent, usually below the wao akua.
wao‘eiwa	Inland region.
wauke	The paper mulberry, or <i>Broussonetia papyrifera</i> , which was made into tapa cloth in traditional Hawai‘i.

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**APPENDIX: HISTORIC ARCHITECTURE RECONNAISSANCE-LEVEL SURVEY, CAMP
PAUMALŪ**



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – **Reconnaissance Level**

FOR SHPD USE ONLY:

Site # [Click here to enter text.](#)

TMK # [Click here to enter text.](#)

I. GENERAL INFORMATION

Common / Present Name: Camp Paumalū Hale Hui Lodge

Historic Name: Camp Paumalū Hale Hui Lodge

Property Owner: Girl Scouts of Hawai'i

Address: 58-370 Kamehameha Highway

City/ Town/ Location: Paumalū

County: Honolulu

TMK [(X)-X-X-XXX:XXX]: (1) 5-9-006:012

Subdivision/Neighborhood: Sunset

Latitude: -158.018

Longitude: 21.655

Parcel Number: None

Historic District: None

Original Use: Girl Scout Camp Main Lodge

Current Use: Girl Scout Camp Main Lodge

Architect/ Builder (if known): Unknown

Date of Construction (if known): ca. 1950s

II. Photograph of Resource



Prepared By: Windy Keala McElroy, PhD
Address: PO Box 1645, Kaneohe, HI 96744
Telephone Number: 808-381-2361

Consulting Firm: Keala Pono Archaeological Consulting
Email: wkm@keala-pono.com

Date: 11/9/16

III. CONDITION ASSESSMENT



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Category (select all that apply):

- ☒ Building(s)
☐ Residential ☐ Commercial ☐ Educational ☒ Public/Civic ☐ Religious
☐ Structure(s)
☐ Object(s)
☐ Site(s)/Landscape(s)
☐ Archaeology or potential for archaeology (Please provide a description of the potential for archaeology within VI. Description of Resource Features below.)

Condition:

- ☐ Excellent
☒ Good
☒ Fair

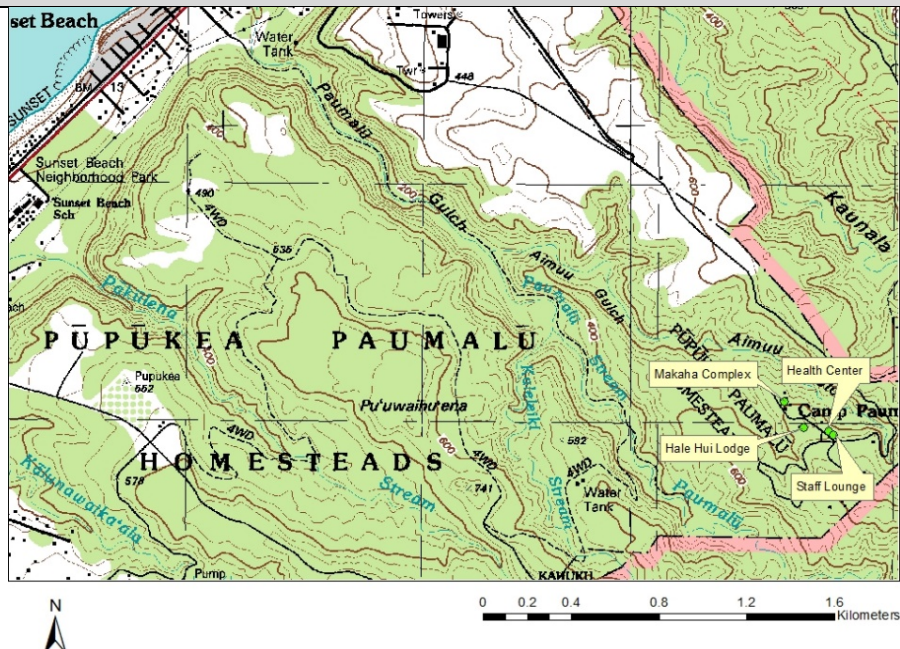
Eligibility (select all that apply):

- ☐ National Register of Historic Places
☐ State Register of Historic Places
☒ Not Eligible
☐ Eligible
☐ Listed
☐ Contributing to Historic District:
Name of District: [Click here to enter text.](#)
☐ Unknown

Criteria of Significance (select all that apply)

- ☐ A: Associated with Events
☐ B: Associated with Significant Person(s)
☐ C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)
☐ D: Have yielded or may be likely to yield information important to history or prehistory.

IV. MAP





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V. DESCRIPTION

Materials (please check those materials that are visible):

Height

☒ Stories: 1

☐ Below Ground

☐ N/A

☐ Other: [Click here to enter text.](#)

Exterior Walls (siding):

☐ Aluminum Siding

☐ Asbestos

☐ Brick

☐ Ceramic

☐ Concrete

☐ Horizontal Wood Siding

☐ Log

☐ Metal

☐ Shingles-Asphalt

☐ Shingles-Wood

☐ Stone

☐ Stucco

☒ Vertical Wood Siding

☐ Engineered Siding

☒ Plywood

☐ OSB

☐ Fiberboard

☐ Fiber Cement

☐ Vinyl Siding

☐ Other:

Roof:

☐ Asphalt, shingle

☐ Asphalt, roll

☐ Metal

☒ Other: Undetermined

☐ Slate

☐ Built Up

☐ Ceramic Tile

☐ Wood Shingle

☐ None

Foundation:

☐ Brick

☐ Concrete Block

☐ Other:

☒ Concrete Slab

☐ Poured Concrete

☐ Stone

☐ Raised/Pile

Structural Support:

☐ Baled Hay

☐ Concrete Block

☐ Concrete Framed

☐ Concrete Poured

☐ Other: [Click here to enter text.](#)

☒ Frame-wood

☐ Frame-metal/steel

☐ Brick-load bearing

☐ Stone-load bearing

☐ Puddled Clay

☐ Rammed Earth

☐ Sod

Windows:

☒ Double Hung Sash

☐ Single Hung Sash

☐ Casement

☐ Fixed

☐ Other:

☐ Jalousie

☐ Glass Block

☐ None/Unknown

☐ Ribbon

☐ Stained Glass

☐ Replacement

☐ Aluminum

☐ Vinyl

Lanai(s)

☐ Arcade

☐ Balcony

☐ Porte-Cochere

☒ Other: Concrete slab work area in back of structure, enclosed on three sides

☐ Recessed

☐ Stoop

☐ Portico

☐ Wrap-around

☐ Verandah

☐ None

Chimney

☐ Brick

☐ Concrete

☐ Stuccoed Masonry

☒ Stone

☐ Stove Pipe

☐ Siding



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HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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☐ None

☐ Other: [Click here to enter text.](#)

X. Continuation Sheet

Please use this sheet those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

Hale Hui Lodge is a single-framed wooden house with a steeply pitched roof on one large section of the structure. There is a large, enclosed (on three sides) work area with a large masonry fireplace and chimney in the center of the work area at the back of the structure. This facility includes a kitchen and adjacent restroom structure, the latter of which houses several restrooms, two with warm-water showers. There is evidence of cracking of the concrete foundation and rot of the wooden walls.

The Girl Scouts Master Plan describes Hale Hui Lodge as follows:

Hale Hui Lodge construction plans date to 1953 and is one of the original purpose built structures for the Girl Scouts at Camp Paumalū. The lodge consists of a multi-purpose structure for dining and large gatherings and includes a kitchen and adjacent restroom structure. The lodge is in fair to good condition.

The multi-purpose hall is a wooden heavy timber structure and concrete slab construction of approximately 4,000 gsf. A large, covered (open-air on 2 sides) area that contains tables and chairs to seat up to 170 has a central concrete block with stone face fireplace. The structure is in fair condition. The wood columns are showing signs of deterioration and rusting at the base connection; repair and repainting is needed throughout.

Fronting the multi-purpose hall is an outside terrace paved with concrete paving blocks. Shade is provided by a painted steel post and I-beam trellis. The concrete paving blocks have displaced settlement creating a tripping hazard. Blocks should be reset. The trellis has signs of rust; removal of rust and painting is needed.

The kitchen includes two commercial ranges and ovens, commercial dishwasher, refrigeration, utensils and table service....The bathrooms, built in two phases, are adjacent to the kitchen and lodge. The original bathrooms contain two staff bathrooms and a shared restroom... In 1999, a second structure was built to provide ADA-accessible toiletrooms....The original bathrooms are in poor to fair condition. The fixtures and finishes have reached the end of useful life. (Group 70 International 2013)

The structure is not recommended as eligible for the National or State Register of Historic places because it lacks integrity of workmanship and feeling. The structure has fallen into disrepair, and the restroom building is a modern addition. The structure is not visually unique or appealing and does not exhibit historic character. The fireplace is an interesting and intact feature of the building, yet this feature alone does not make the structure eligible for the National or State Register of Historic Places under any of the significance criteria.

Reference: Group 70 International. 2013 Camp Paumalū Master Plan. Prepared for Girl Scouts of Hawai'i, by Group 70 International, Honolulu.



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Rear of Hale Hui Lodge. Orientation is to the south.



Interior fireplace. Orientation is to the east.



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Restroom addition and lawn. Orientation is to the south.



Wood rot near door at front of building. Orientation is to the east.



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Roof damage at rear of building. Orientation is to the southeast.



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HISTORIC RESOURCE INVENTORY FORM – **Reconnaissance Level**

FOR SHPD USE ONLY:

Site # [Click here to enter text.](#)

TMK # [Click here to enter text.](#)

I. GENERAL INFORMATION

Common / Present Name: Camp Paumalū Health Center

Historic Name: Unknown

Property Owner: Girl Scouts of Hawai'i

Address: 58-370 Kamehameha Highway

City/ Town/ Location: Paumalū

County: Honolulu

TMK [(X)-X-X-XXX:XXX]: (1) 5-9-006:012

Subdivision/Neighborhood: Sunset

Latitude: -158.017

Longitude: 21.655

Parcel Number: None

Historic District: None

Original Use: Housing for Kahuku Plantation

Current Use: Girl Scout Camp Health Center

Architect/ Builder (if known): Unknown

Date of Construction (if known): pre-1950s

II. Photograph of Resource

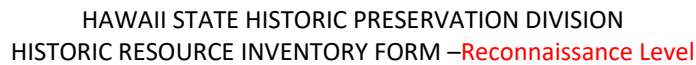


Prepared By: Windy Keala McElroy, PhD
Address: PO Box 1645, Kaneohe, HI 96744
Telephone Number: 808-381-2361

Consulting Firm: Keala Pono Archaeological Consulting
Email: wkm@keala-pono.com

Date: 11/9/16

III. CONDITION ASSESSMENT



TMK # Click here to enter text.



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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V. DESCRIPTION

Materials (please check those materials that are visible):

Height

☒ Stories: 1

☐ Below Ground

☐ N/A

☐ Other: [Click here to enter text.](#)

Exterior Walls (siding):

☐ Aluminum Siding

☐ Asbestos

☐ Brick

☐ Ceramic

☐ Concrete

☐ Horizontal Wood Siding

☐ Log

☐ Metal

☐ Shingles-Asphalt

☐ Shingles-Wood

☒ Stone

☐ Stucco

☐ Vertical Wood Siding

☐ Engineered Siding

☒ Plywood

☐ OSB

☐ Fiberboard

☐ Fiber Cement

☐ Vinyl Siding

☐ Other:

[Click here to enter text.](#)

Roof:

☐ Asphalt, shingle

☒ Asphalt, roll

☐ Metal

☐ Other:

☐ Slate

☐ Built Up

☐ Ceramic Tile

☐ Wood Shingle

☐ None

Foundation:

☐ Brick

☐ Concrete Block

☐ Other: [Click here to enter text.](#)

☒ Concrete Slab

☐ Poured Concrete

☐ Stone

☐ Raised/Pile

Structural Support:

☐ Baled Hay

☐ Concrete Block

☐ Concrete Framed

☐ Concrete Poured

☐ Other: [Click here to enter text.](#)

☒ Frame-wood

☐ Frame-metal/steel

☐ Brick-load bearing

☒ Stone-load bearing

☐ Puddled Clay

☐ Rammed Earth

☐ Sod

Windows:

☐ Double Hung Sash

☐ Single Hung Sash

☐ Casement

☐ Fixed

☐ Other: [Click here to enter text.](#)

☒ Jalousie

☐ Glass Block

☐ None/Unknown

☐ Ribbon

☐ Stained Glass

☐ Replacement

☐ Aluminum

☐ Vinyl

Lanai(s)

☐ Arcade

☐ Balcony

☐ Porte-Cochere

☐ Other: [Click here to enter text.](#)

☐ Recessed

☐ Stoop

☐ Portico

☐ Wrap-around

☐ Verandah

☒ None

Chimney

☐ Brick

☐ Concrete

☒ None

☐ Stuccoed Masonry

☐ Stone

☐ Other: [Click here to enter text.](#)

☐ Stove Pipe

☐ Siding



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

FOR SHPD USE ONLY:

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X. Continuation Sheet

Please use this sheet those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

The structure is a brown one-story building with two entrance doors on the southwest. It is built on a concrete slab, with three of the four sides made of plywood with some wooden latticework. The rear (northeast) side and two rear corners are constructed of stone set in mortar. There are screened jalousie windows on all sides. The roof is mostly wood with a rolled asphalt covering; one section of plastic sheeting replaces the wood. The stonework is in fair condition, with a few stones fallen from the walls. The wooden walls exhibit some evidence of deterioration. The ceiling beams are partially rotted, particularly where they are exposed outside the roof. Portions of the roof and most of the window frames are also rotted, and the metal hardware of the building is heavily rusted. The concrete foundation exhibits several cracks.

The Girl Scouts Master Plan describes the Health Center as follows:

The layout of the building is similar to a small residence with three small rooms for living/sleeping, a small kitchen area and a bathroom. It is a slab on grade wood frame structure, with one end of the building constructed from local stone. Wood framed openings are screened. Windows are aluminum framed jalousies. The double pitched roof is wood frame with tongue and groove decking and rolled asphalt covering.

The building is in poor condition. The roof flashing needs to be replaced. The wood framing has termite damage and deterioration. Settlement has caused a large crack in the concrete slab, and the floor and walls are visibly sloped. Girl Scouts has closed the building due to concerns over the structural stability of the structure. Removal of the structure is recommended. (Group 70 International 2013)

The structure is not recommended as eligible for the National or State Register of Historic places because it lacks integrity of materials, workmanship, and feeling. The wooden walls have clearly been replaced since the original construction, and the roof has been recently modified with plastic sheeting. The stonework on the northeast side of the structure may be original, but it has fallen into disrepair. The building is not visually unique or appealing and does not exhibit historic character. It is structurally unstable.

Reference: Group 70 International. 2013 Camp Paumalū Master Plan. Prepared for Girl Scouts of Hawai'i, by Group 70 International, Honolulu.



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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Northwest side of Health Center. Orientation is to the west.



Wood rot and metal siding rust. Orientation is to the west.



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HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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Rotted window frame with boards missing. Orientation is to the east.



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HISTORIC RESOURCE INVENTORY FORM –**Reconnaissance Level**

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Stones falling and missing from north corner of the building. Orientation is to the west.



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – **Reconnaissance Level**

FOR SHPD USE ONLY:

Site # [Click here to enter text.](#)

TMK # [Click here to enter text.](#)

I. GENERAL INFORMATION

Common / Present Name: Camp Paumalū Makaha Cabins

Historic Name: Unknown

Property Owner: Girl Scouts of Hawai'i

Address: 58-370 Kamehameha Highway

City/ Town/ Location: Paumalū

County: Honolulu

TMK [(X)-X-X-XXX:XXX]: (1) 5-9-006:012

Subdivision/Neighborhood: Sunset

Latitude: -158.019

Longitude: 21.656

Parcel Number: None

Historic District: None

Original Use: Unknown

Current Use: Girl Scout Camp Cabins

Architect/ Builder (if known): Unknown

Date of Construction (if known): ca. 1950s

II. Photograph of Resource



Prepared By: Windy Keala McElroy, PhD
Address: PO Box 1645, Kaneohe, HI 96744
Telephone Number: 808-381-2361

Consulting Firm: Keala Pono Archaeological Consulting
Email: wkm@keala-pono.com
Date: 11/9/16

III. CONDITION ASSESSMENT



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

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TMK # [Click here to enter text.](#)

Category (select all that apply):

- ☒ Building(s)
☐ Residential ☐ Commercial ☐ Educational ☒ Public/Civic ☐ Religious
☐ Structure(s)
☐ Object(s)
☐ Site(s)/Landscape(s)
☐ Archaeology or potential for archaeology (Please provide a description of the potential for archaeology within VI. Description of Resource Features below.)

Condition:

- ☐ Excellent
☒ Good
☒ Fair

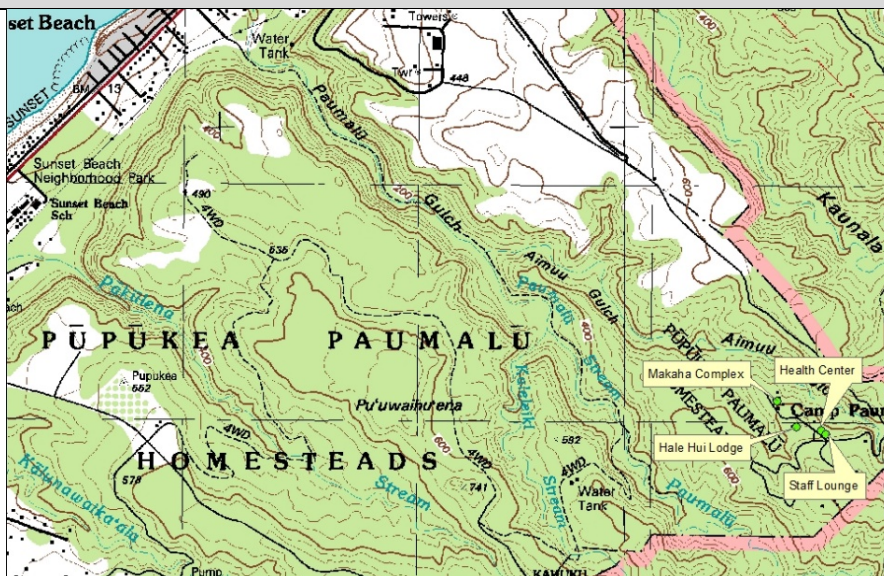
Eligibility (select all that apply):

- ☐ National Register of Historic Places
☐ State Register of Historic Places
☒ Not Eligible
☐ Eligible
☐ Listed
☐ Contributing to Historic District:
Name of District: [Click here to enter text.](#)
☐ Unknown

Criteria of Significance (select all that apply)

- ☐ A: Associated with Events
☐ B: Associated with Significant Person(s)
☐ C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)
☐ D: Have yielded or may be likely to yield information important to history or prehistory.

IV. MAP





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HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

FOR SHPD USE ONLY:

Site # [Click here to enter text.](#)

TMK # [Click here to enter text.](#)

V. DESCRIPTION

Materials (please check those materials that are visible):

Height

☒ Stories: 1

☐ Below Ground

☐ N/A

☐ Other: [Click here to enter text.](#)

Exterior Walls (siding):

☐ Aluminum Siding

☐ Asbestos

☐ Brick

☐ Ceramic

☒ Concrete

☐ Horizontal Wood Siding

☐ Log

☐ Metal

☐ Shingles-Asphalt

☐ Shingles-Wood

☐ Stone

☐ Stucco

☒ Vertical Wood Siding

☐ Engineered Siding

☐ Plywood

☐ OSB

☐ Fiberboard

☐ Fiber Cement

☐ Vinyl Siding

☐ Other:

Roof:

☐ Asphalt, shingle

☐ Asphalt, roll

☒ Metal

☐ Other:

☐ Slate

☐ Built Up

☐ Ceramic Tile

☐ Wood Shingle

☐ None

Foundation:

☐ Brick

☐ Concrete Block

☒ Other: Wood

☐ Concrete Slab

☐ Poured Concrete

☐ Stone

☐ Raised/Pile

Structural Support:

☐ Baled Hay

☐ Concrete Block

☐ Concrete Framed

☐ Concrete Poured

☐ Other: [Click here to enter text.](#)

☒ Frame-wood

☐ Frame-metal/steel

☐ Brick-load bearing

☐ Stone-load bearing

☐ Puddled Clay

☐ Rammed Earth

☐ Sod

Windows:

☐ Double Hung Sash

☐ Single Hung Sash

☐ Casement

☐ Fixed

☒ Other: Screen Only

☐ Jalousie

☐ Glass Block

☐ None/Unknown

☐ Ribbon

☐ Stained Glass

☐ Replacement

☐ Aluminum

☐ Vinyl

Lanai(s)

☐ Arcade

☐ Balcony

☐ Porte-Cochere

☐ Other:

☐ Recessed

☐ Stoop

☐ Portico

☐ Wrap-around

☐ Verandah

☒ None

Chimney

☐ Brick

☐ Concrete

☒ None

☐ Stuccoed Masonry

☐ Stone

☐ Other: [Click here to enter text.](#)

☐ Stove Pipe

☐ Siding



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Site # [Click here to enter text.](#)

TMK # [Click here to enter text.](#)

X. Continuation Sheet

Please use this sheet those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

There are six Makaha Cabins that are very similar in construction. They are brown one-story buildings with wooden door entrances on the northwest. The windows are made of screen with no glass, and many of the window sills are damaged. All six cabins show signs of wood rot, as well as rust damage on their roofs.

The Girl Scouts Master Plan describes Makaha Cabins as follows:

Unit 1 Makaha (Gateway) accommodates 53 people, and is closest to the main camp area....There are six cabins that sleep eight. They are simple slab-on-grade wood framed structures. A portion of the up-slope walls are concrete block. The walls are board and batten wood siding with screened openings. The wood framed roof with truss members at +/-6ft on center is sheathed with a corrugated iron roofing. The head height is less than 7 feet and creates a head bumping hazard. The cabins are in poor to fair condition. Replacement is recommended due to the low head height and limited remaining useful life. The downslope cabin slab has visible cracks reportedly caused by a nearby mango tree.... (Group 70 International 2013)

The structures are not recommended as eligible for the National or State Register of Historic places because they lack integrity of workmanship and feeling. The structures have fallen into disrepair, with visible damage on the walls, windows, and roofs. The buildings are not visually unique or appealing and do not exhibit historic character. The low roofs are hazardous, as noted above.

Reference: Group 70 International. 2013 Camp Paumalū Master Plan. Prepared for Girl Scouts of Hawai'i, by Group 70 International, Honolulu.



Makaha Cabins. Orientation is to the east.



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Makaha Cabins, damaged wood. Orientation is to the south.



Makaha Cabins, rusted roof. Orientation is to the north.



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HISTORIC RESOURCE INVENTORY FORM – **Reconnaissance Level**

FOR SHPD USE ONLY:

Site # [Click here to enter text.](#)

TMK # [Click here to enter text.](#)

I. GENERAL INFORMATION

Common / Present Name: Camp Paumalū Staff Lounge

Historic Name: Unknown

Property Owner: Girl Scouts of Hawai'i

Address: 58-370 Kamehameha Highway

City/ Town/ Location: Paumalū

County: Honolulu

TMK [(X)-X-X-XXX:XXX]: (1) 5-9-006:012

Subdivision/Neighborhood: Sunset

Latitude: -158.017

Longitude: 21.655

Parcel Number: None

Historic District: None

Original Use: Girl Scout Camp Staff Lounge

Current Use: Girl Scout Camp Staff Lounge

Architect/ Builder (if known): Unknown

Date of Construction (if known): ca. 1952

II. Photograph of Resource

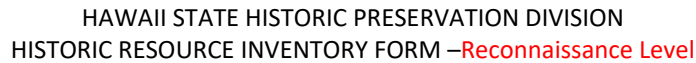


Prepared By: Windy Keala McElroy, PhD
Address: PO Box 1645, Kaneohe, HI 96744
Telephone Number: 808-381-2361

Consulting Firm: Keala Pono Archaeological Consulting
Email: wkm@keala-pono.com

Date: 11/9/16

III. CONDITION ASSESSMENT



TMK # Click here to enter text.



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V. DESCRIPTION

Materials (please check those materials that are visible):

Height

☒ Stories: 1

☐ Below Ground

☐ N/A

☐ Other: [Click here to enter text.](#)

Exterior Walls (siding):

☐ Aluminum Siding

☐ Asbestos

☐ Brick

☐ Ceramic

☐ Concrete

☒ Horizontal Wood Siding

☐ Log

☐ Metal

☐ Shingles-Asphalt

☐ Shingles-Wood

☐ Stone

☐ Stucco

☐ Vertical Wood Siding

☐ Engineered Siding

☒ Plywood

☐ OSB

☐ Fiberboard

☐ Fiber Cement

☐ Vinyl Siding

☐ Other:

[Click here to enter text.](#)

Roof:

☐ Asphalt, shingle

☐ Asphalt, roll

☒ Metal

☐ Other:

☐ Slate

☐ Built Up

☐ Ceramic Tile

☐ Wood Shingle

☐ None

Foundation:

☐ Brick

☐ Concrete Block

☐ Other:

☐ Concrete Slab

☐ Poured Concrete

☐ Stone

☒ Raised/Pile

Structural Support:

☐ Baled Hay

☐ Concrete Block

☐ Concrete Framed

☐ Concrete Poured

☐ Other: [Click here to enter text.](#)

☒ Frame-wood

☐ Frame-metal/steel

☐ Brick-load bearing

☐ Stone-load bearing

☐ Puddled Clay

☐ Rammed Earth

☐ Sod

Windows:

☐ Double Hung Sash

☐ Single Hung Sash

☐ Casement

☐ Fixed

☒ Other: Sliding Glass

☒ Jalousie

☐ Glass Block

☐ None/Unknown

☐ Ribbon

☐ Stained Glass

☐ Replacement

☐ Aluminum

☐ Vinyl

Lanai(s)

☐ Arcade

☐ Balcony

☐ Porte-Cochere

☐ Other: [Click here to enter text.](#)

☐ Recessed

☐ Stoop

☐ Portico

☐ Wrap-around

☐ Verandah

☒ None

Chimney

☐ Brick

☐ Concrete

☒ None

☐ Stuccoed Masonry

☐ Stone

☐ Other: [Click here to enter text.](#)

☐ Stove Pipe

☐ Siding



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X. Continuation Sheet

Please use this sheet those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

The Staff Lounge is a brown one-story building raised on wooden posts, with stairs leading to the wooden entrance door. There is also a wooden back door. Walls are wooden and exhibit many damaged areas where the wood is rotted and holes have formed. Most windows are screened jalousies, although some have been replaced with vinyl sliders. The roof is corrugated metal, with several areas exhibiting rust and holes. Some of the holes have been covered with additional corrugated metal.

The Girl Scouts Master Plan describes the Staff Lounge as follows:

The building is a wood frame on posts, and is accessed by stairs. Lap siding provides enclosure. Original windows are jalousie, and some have been replaced by vinyl sliders. Other openings are screened. It is a double-pitch, wood frame roof with corrugated metal roofing. A sink is located outside the entry. There is no interior finish at the ceiling, and the underside of the metal roofing is exposed. The building is in poor to fair condition. Lighting is rusted and needs replacement. All interior finishes have reached the end of useful life and need to be replaced. It appears that additional wood supports have been added to support the floor framing. (Group 70 International 2013)

The structure is not recommended as eligible for the National or State Register of Historic places because it lacks integrity of workmanship and feeling. The structure has fallen into disrepair, and there are several modern additions, such as repairs to the roof, and the vinyl sliding windows. The building is not visually unique or appealing and does not exhibit historic character.

Reference: Group 70 International. 2013 Camp Paumalū Master Plan. Prepared for Girl Scouts of Hawai'i, by Group 70 International, Honolulu.



Damage to roof on southeast side of building. Orientation is to the northeast.



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Wood rot on stair railing. Orientation is to the northeast.



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Damage to roof above back door. Orientation is to the southwest.



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Wood rot near back door. Orientation is to the southwest.