

**Intensive Archaeological Survey
And Test Excavations
Ewa Marina Community Project - Phase II**

**Land of Honouliuli, Ewa District
Island of Oahu**

by

Amy E. Dunn
Supervisory Field Archaeologist

and

Alan E. Haun, Ph.D.
Senior Archaeologist

Prepared for

HASEKO (Hawaii), Inc.
c/o Tyrone T. Kusao, Inc.
Planning and Zoning Consultant
1108 Bishop St., Suite 2507
Honolulu, Hawaii 96813

January 1991

PHRI

Paul H. Rosendahl, Ph.D., Inc.

Archaeological • Historical • Cultural Resource Management Studies & Services

305 Mohouli Street • Hilo, Hawaii 96720 • (808) 969-1763 • FAX (808) 961-6998
P.O. Box 12835 • Tamuning, Guam 96911 • (671) 649-3045 • FAX (671) 649-2611



SUMMARY

At the request of Belt Collins & Associates, for their client, HASEKO (Hawaii), Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an intensive survey and test excavations at the Ewa Marina Community Project - Phase II site (*kiawe* forest portion only), situated in Ewa District, Island of Oahu. The survey and excavations were conducted in February through June 1990, in conjunction with survey and excavations for the Phase I portion of the overall project. The work was conducted under the supervision of Supervisory Field Archaeologist Amy E. Dunn, and under the overall direction of Senior Archaeologist Dr. Alan E. Haun. The overall Phases I and II work was designed to satisfy the federal historic preservation review process required under Section 106 of the National Historic Preservation Act of 1966 (as amended), and to provide the basis for preparation of a Mitigation Plan (MP) that would be included within a Memorandum of Agreement (MOA). This report on the Phase II work is intended to satisfy the requirements of an Environmental Impact Statement (EIS).

During the survey, two sites (3208 and 4293) were identified. Site 4293 is a complex consisting of two mounds and two C-shapes. Site 3208 consists of a platform. Two 1.0 m sq test excavation units were placed at Site 4293, within areas suspected to contain cultural deposits. At Site 3208, one 1.0 m sq unit was placed. No significant cultural remains were encountered in the units placed at Site 4293. A thick cultural deposit was encountered in the unit placed at Site 3208.

Sites 3208 and 4293 are assessed as significant solely for information content. No further work is recommended for Site 4293. For Site 3208, further data collection is recommended. After further data collection is completed it is anticipated that no further work would be necessary.

CONTENTS

	Page
INTRODUCTION	1
Background	1
Scope of Work	1
Project Area Description	2
Archaeological Context	5
Previous Archaeological Work	6
Field Methods and Procedures	9
FINDINGS	10
Site and Test Unit Descriptions	10
CONCLUSION	14
REFERENCES CITED	15
APPENDIX A. Historical Documentary Research by Helen Wong Smith, B.A.	A-1

ILLUSTRATIONS

Figure

1 Project Location Map	3
2 Project Area and Site Location Map	11

INTRODUCTION

BACKGROUND

At the request of Belt Collins & Associates, for their client, HASEKO (Hawaii), Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an intensive survey and test excavations at the Ewa Marina Community Project - Phase II site (*kiawe* forest portion only), situated in Ewa District, Island of Oahu. The survey and excavations were conducted in February through June 1990, in conjunction with survey and excavations for the Phase I portion of the overall project (Dunn and Haun 1990). The work was conducted under the supervision of Supervisory Field Archaeologist Amy E. Dunn, and under the overall direction of Senior Archaeologist Dr. Alan E. Haun. The overall Phase I and II work was designed to satisfy the federal historic preservation review process required under Section 106 of the National Historic Preservation Act of 1966 (as amended), and to provide the basis for preparation of a Mitigation Plan (MP) that would be included within a Memorandum of Agreement (MOA). This report on the Phase II work is intended to satisfy the requirements of an Environmental Impact Statement (EIS).

SCOPE OF WORK

The basic objective of the survey and excavations was to collect data sufficient to (a) determine and document as fully as possible the significance of specific archaeological resources, and (b) define as specifically as possible the scope and scale of any subsequent mitigation measures (e.g., data recovery excavations, interpretive development, and/or preservation) that might be necessary or appropriate.

The specific objectives for the overall Phases I and II project area surveys were:

1. Historical Research - (a) locate and summarize readily available documents relating to the project area; (b) integrate the findings of this research into a broader historical picture of Honouliuli and the general SW Oahu area; and (c) to assess the potential for further more detailed historical research that might be appropriate in connection with any subsequent mitigation work that might be required;
2. Intensive Survey and Test Excavations Field Work - to define for each identified archaeological site, so far as possible on the basis of intensive survey and test excavations (a) overall extent (horizontal and vertical) and density of cultural deposits; (b) age, duration, and intensity of site occupation; (c) nature and sequence of site occupation; (d) variety and range of cultural activities carried out during site occupation; (e) variety and range of marine and terrestrial resources available to and exploited by site inhabitants; and (f) with regard to sinkholes, both the presence or absence and the general nature of any paleontological remains;
3. Data Analysis and Reports - Analysis of data recovered during the field work, and preparation of both Interim and Final reports; and

vertical) and density of cultural deposits; (b) age, duration, and intensity of site occupation; (c) nature and sequence of site occupation; (d) variety and range of cultural activities carried out during site occupation; (e) variety and range of marine and terrestrial resources available to and exploited by site inhabitants; and (f) with regard to sinkholes, both the presence or absence and the general nature of any paleontological remains;

The specific tasks for the field work included:

- a. Accurate locational plotting of all identified sites on an appropriate scale topographic map of the project area;
- b. Intensive-level survey recording of surface structural sites and features (including detailed plan mapping, surface profiles, written descriptions, and photographs);
- c. Collection of surface portable remains (artifacts and midden);
- d. Systematic subsurface testing (by coring) of suspected areas (e.g., sand dunes) to determine the presence or absence of subsurface cultural deposits lacking associated surface structural remains;
- e. Intensive-level test excavations at selected surface and subsurface sites and features, including recording (detailed plan mapping and stratigraphic cross-sections, written descriptions, and photographs), and collection of portable artifacts and appropriate samples of ecofactual remains and dating materials (charcoal, volcanic glass);
- f. Test excavations at sinkholes, including a representative sample of sinkholes larger than one meter in diameter, and a representative samples of sinkholes less than one meter found upon examination to have obvious human modifications, side chambers, and/or evidence that they might contain human or fossil bird bone;

4. Mitigation Plan - Based on the results of the intensive survey and test excavations field work and post-field data analyses, an appropriate mitigation plan would be prepared. This plan would include data recovery, site preservation, burial treatment, and archaeological monitoring elements, as appropriate.

The specific tasks were formulated on the basis of: (a) findings and recommendations of previous work in the general area, (b) review comments on several earlier federal and state EIS-related notices and documents, (c) discussions with PHRI archaeologists with extensive experience in the project area and/or adjacent portions of the Barbers Point and West Beach areas; (d) discussions with Staff Archaeologist Joyce Bath of the State Historic Preservation Office; (e) the general scope of work outlined by the U.S. Army Corps of Engineers (COE letter of 5 September 1989 to BC&A); and (f) the request received from BC&A for the proposal for the project.

The survey was to be carried out in accordance with the standards for inventory-level [intensive] survey recommended by the Department of Land and Natural Resources-Historic Preservation Program/State Historic Preservation Office (DLNR-HPP/SHPO). The significance of all archaeological remains identified within the project area was to be assessed in terms of (a) the National Register criteria contained in the Code of Federal Regulations (36 CFR Part 60), (b) the criteria for evaluation of traditional cultural values prepared by the national Advisory Council on Historic Preservation, and (c) PHRI Cultural Resource Management (CRM) value modes. These evaluation criteria are discussed in detail later in the Conclusion section.

PROJECT AREA DESCRIPTION

The Phase II project area is located adjacent to the Phase I project area, which lies along the east-central segment of the Ewa coral plain (Figure 1). The Ewa plain is a Pleistocene elevated coralline reef that forms the leeward coastal lowlands of southwestern Oahu; it extends 5-8 km south of the Waianae mountains and the adjacent Central Plateau. Pearl Harbor lies at the east end of the plain, while West Beach marks the approximate western end.

The topography of the Ewa coral plain is quite regular, rising to a maximum elevation of about 30 m on an average gradient of less than 1/2 percent from the shore to the uplands. Few features interrupt the monotony of the landscape. Only the low eroded bluffs above West Loch in Pearl Harbor and the two volcanic cones of Puukapolei and Puupalailai

stand out in relief. The ash-cinder cone of Puupalailai is of particular interest to any archaeological study of the Ewa coral plain because this is one of only three known sources of volcanic glass on the Island of Oahu (Manhoff and Uyehara 1976:46). Puupalailai lies to the northwest of the project area, at the base of the Waianae range.

Due to the porous structure of the coral plain, overland runoff is much attenuated at the coast. There are few developed surface drainages in the region, with Honouliuli Stream representing the most significant exception. Intermittent streams include Makaiwa and Waimanalo gulches at the western end of the Plain.

Ewa in general is a semiarid region of intense sunshine, warm dry tradewinds, and little rainfall. At the western end of the plain these conditions are most accentuated. Except for some coastal marshlands, the vegetation is typically xeric and, where undisturbed by modern developments, has become dominated by hardy exotics. There is increasing evidence that prehistorically much of the region was more savannah-like, a grassland studded with thickets and small groves of trees.

The relatively harsh conditions characterizing the region today, as in former times, are primarily determined by geology and the location of the coral plain in the leeward shadow of the Waianae and Koolau mountains. Seasonally shifting wind patterns account for the low annual rainfall, which typically ranges from 300-500 mm. Easterly to northeasterly tradewinds of 10-15 knots prevail c. 75-85 percent of the time during an average year. But due to the rain-shadow effect, the retained moisture less frequently reaches the Ewa Plain in the form of significant quantities of rainfall than is true for many other areas of the island. From October through April, the tradewinds decrease in frequency and intensity and are replaced by more variable kona, or leeward, winds. These kona conditions, especially when they originate from the southeast and southwest, bring in the few winter storms which deposit most of the annual precipitation for this area.

The mean annual temperature in the region is 74-75 degrees F, with a seasonal variation of c. 6-8 degrees F; the winter months are noticeably cooler than the summer months. Diurnal variation is considerably greater than annual temperature variation, ranging from 64 degrees to 84 degrees F in the winter, and from 72 degrees to 93 degrees F in summer.

Despite the relatively low precipitation and the normally restricted surface runoff, coastal Ewa is not without accessible

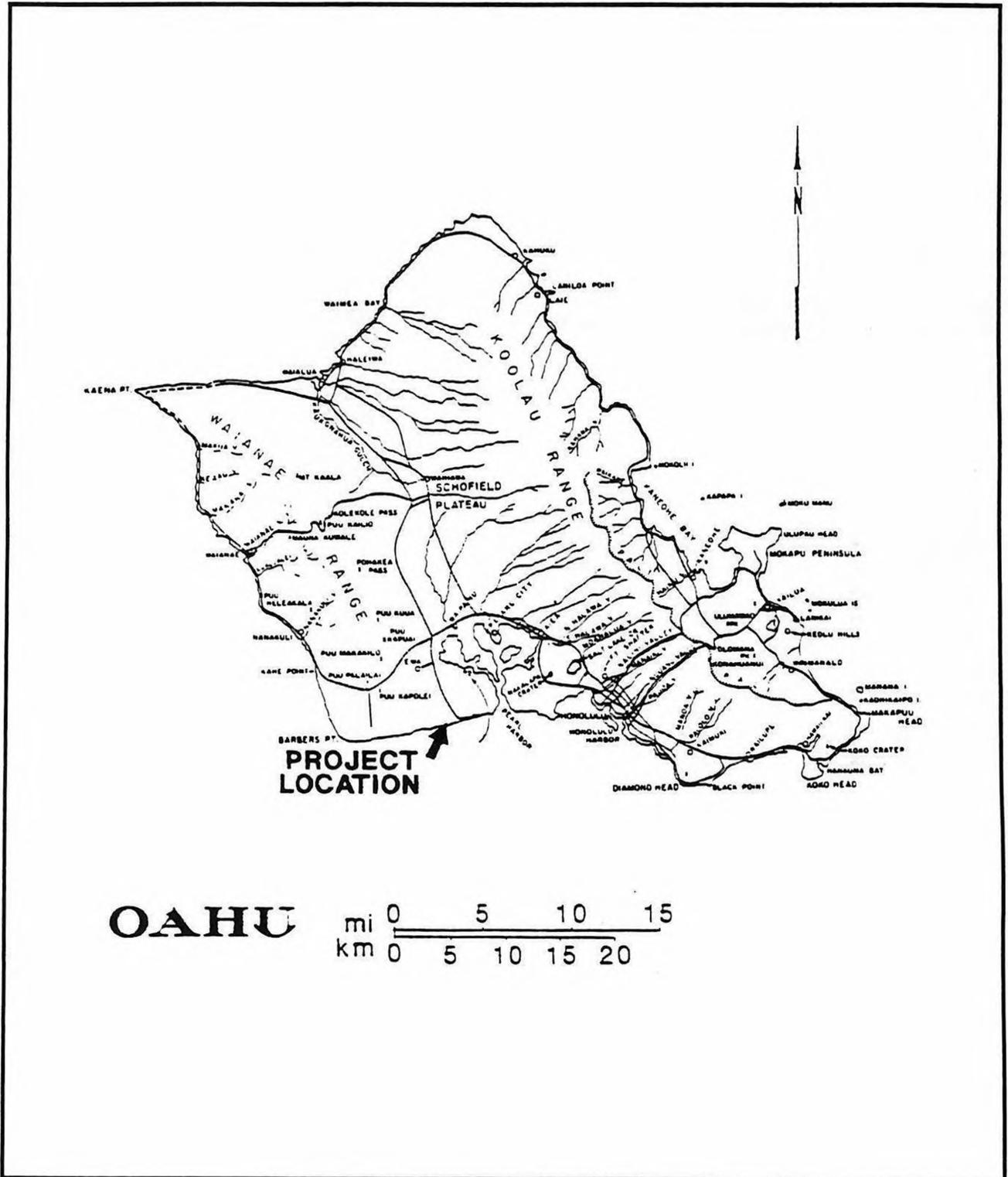


Figure 1. PROJECT LOCATION MAP

**INTENSIVE ARCHAEOLOGICAL SURVEY AND TEST EXCAVATIONS
EWA MARINA COMMUNITY PROJECT - PHASE II**

Land of Honouliuli, Ewa District Island of Oahu

PHRI Project 90-1006 January 1991

fresh water. Prolonged rains during the winter storm season can exceed the capacity of the coral sub-strate to accommodate the increased volume, thus producing extensive sheet-wash flooding at the coast. This was especially evident during the winter of 1981-1982. Groundwater is another important factor in flooding at lower elevations. The water table usually stands 0.3-0.6 m AMSL (above mean sea level). This is only 1.0-3.0 m below ground level through most of the coastal zone; in some areas it appears at the surface as coastal marshlands. Depending upon the combined effect of runoff from the inland zone and the long-term stability of the water table, some of these marshlands may appear only seasonally while others persist year round.

Groundwater in southwestern Oahu is present in two different reservoirs, or aquifers. Basal fresh water is contained in the Waianae Volcanic Series. This is partly overlain by the adjacent coral rock cap containing largely brackish water. Ordinarily, the basal water would flow into the adjacent coral aquifer due to the pressure created by the higher elevation and greater capacity of the catchment that recharges the basal reservoir. But the two are separated by an aquaclude, a dense descending stratum of low permeability formed by terrigenous and marine sediments which act as a barrier to retard the normal flow of fresh water from the basal aquifer. This restricted movement of groundwater between the two reservoirs means that the recharge of the lowland water table must rely primarily on the direct infiltration of the scant rains over the plain, plus the intermittent stream flow and runoff from the adjacent uplands.

Certain aspects of seasonal variation in the region have been discussed in some previous studies. The recent archaeological research in the deep-draft harbor area (Davis and Griffin 1978) suggests that the following elements are important to an understanding of seasonal use of the general region:

- a. **Seasonal Fishery:** The productivity of the Waianae fishery is legendary. It is also generally acknowledged that winter and spring (January to May) are the most productive seasons. The higher productivity of this fishery during this time of the year is apparently correlated with a number of seasonal variations, both oceanographic and biologic. Contributing factors include (a) the prevailing southeasterly surface and near-surface currents and their associated gyals; (b) the synchrony of peak reproductive activity among Hawaiian reef fish with the occurrence of the southeasterly current; (c) the North Pacific Swell and its effect of upwelling cooler nutrient-rich waters from deeper levels into the upper water column; and, (d) the greater aggregation of fish attracted to the increased food levels over the submarine outcrops and escarpments where this upwelling occurs;
- b. **Seasonal Effects on Terrestrial Resources:** There is apparently little in the way of conspicuous seasonal variation in the vegetation, other than perhaps flowering and seed-bearing among several species like the *wiliwili* tree (*Erythrina sandwicensis* Degener), and new leaves resulting from precipitation in November through April. For avifauna, there are the following seasonal cycles. Note that the potential overlap of stages from one period to another is not indicated. Note also that this is only a partial listing since no data are available for many of the species identified to date:
 - (1) For the Hawaiian Goose, breeding adults arrive at nesting sites in lower elevations from October to November and egg laying begins shortly thereafter. Hatching is underway by December and January. The chicks remain in the nest until February or March, by which time the young have fledged and are beginning to fly. Adult birds are also going through their postnuptial molt and are flightless at this time. Finally, from April through September most, if not all, of the geese return to their upland feeding in the interior. A few birds possibly remain at lower elevations;
 - (2) For upland forest birds, May to October finds them resident in the uplands, with only occasional excursions to lower areas. These birds frequent lower elevations from November to April; and
 - (3) For the Petrel (excepting two species), Shearwaters, and Tropic Birds breeding adults begin arriving at nesting sites in April and egg laying continues until August. Hatching begins about June and there may be chicks in the nest through mid-October. Finally, from November to March all the pelagic birds are away at sea. The nesting sites are generally abandoned at this time, with the exception of the White-tailed Tropic Bird which appears to remain in the general vicinity. For Markham's Storm Petrel and the Bonin Island Petrel, eggs are laid in January and February, and chicks begin hatching in March. The young remain in the nest until June. These are also pelagic species and are at sea from July to December.

ARCHAEOLOGICAL CONTEXT

The earliest archaeological evidence for settlement of Oahu and the Hawaiian Islands dates to about AD 300-500 (Kirch and Kelly 1975; Pearson, Kirch, and Pietrusewsky 1971; Schilt 1980). The settlers who came at that time originated from an unspecified island in Eastern Polynesia. Initial settlement is believed to have occurred along the wetter and more fertile windward coasts where "conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia" (Green 1980:1). This exploitation involved a variety of techniques for obtaining fish and shellfish from the sea, gardening, animal husbandry, and utilization of the natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson, Kirch, and Pietrusewsky 1971).

The settlement pattern consisted of a series of widely spaced, permanent home settlements that are thought to have gradually given way to a nearly continuous series of settlements along the windward coasts as the population grew. Leeward settlement is believed to have begun only after windward areas were settled. It is currently unclear whether the earliest leeward coastal settlements were permanent or seasonal/temporary. Inland leeward settlement, at least on a permanent basis, is thought to have occurred only after the development of inland dryland agricultural techniques. Evidence currently available indicates that inland leeward settlement did not occur until 600 to 900 years after initial settlement, or between about AD 1100 and 1400 (Green 1980; Hommon 1976).

Hypothetical reconstructions based on data from archaeology, linguistics, and ethnology suggest that early Hawaiians were organized in a typical Polynesian conical clan pattern in which individual status was based on genealogical ranking (Green 1980:72). Kinship formed a basis for regional and island-wide societal integration; however, the most important social subsistence unit was the localized territorial community-based corporate kin group. Leadership within this group fell to the "highest ranking individual of the locally dominant, socially ranked lineage" (Green 1980:73). This individual acted as the local chief, overseeing the social, political, and economic functioning of the community.

The subsequent development of a uniquely Hawaiian innovation, the *ahupua'a*, resulted in a more complex level of social and political integration (Hommon 1976; Green 1980). The *ahupua'a* is a traditional Hawaiian land division ideally extending from the coast to the mountains, often corresponding with a valley drainage. The chief or manager

(*konohiki*) of an *ahupua'a* extracted rents or tribute from the people (commoners or *maka'ainana*) who worked the land. The chief was a member of a non-localized ruling elite (*ali'i*). Thus, the earlier kinship-based relationship between a chief and his local community no longer existed.

Green's (1980) summary of the prehistory of Makaha Valley and the probable pattern of adaptation by Polynesians to the Hawaiian high-island ecosystem is of direct relevance for understanding the prehistory of the Ewa coral plain area in general and the Marina project area in particular. Makaha prehistory begins with a hypothesized coastal settlement in the late first millennium AD. Although the nature of coastal settlement is unknown because of land modifications and the lack of archaeological investigations on the coast, it is believed to have consisted of habitation structures associated with nearby garden areas (Green 1980:74). Marine exploitation is thought to have played a prominent role in the subsistence economy, and the presence of a small *heiau* has been interpreted as reflecting a lineage-based system of local chiefly leadership.

Some between the 12th and 14th centuries, if not before, cultivation of inland areas began. Dryland field systems marked by stone walls appear to be associated with small field shelters (C-shapes and other enclosure types) that were used on a temporary basis by people tending the fields, but who lived permanently in the coastal settlement (Green 1980). Irrigated terrace systems were in use by the 15th century in the uppermost part of Makaha Valley. Permanent inland settlement is thought to have begun by this time period (Green 1980:76). There is abundant evidence for permanent inland habitation during the 17th century, including rectangular dwellings, religious structures (stepped-stone platforms, shrines, and other specialized architecture). Large-scale construction of irrigation works and the rebuilding and expansion of an inland *heiau* at Makaha indicate that, by the mid-1600s, this area had become an *ahupua'a* unit in the "larger scale, complex rank social systems typical of Hawai'i at the time of contact" (Green 1980:76).

While the conditions on the western Ewa coral plain are considerably drier than those existing at Makaha, many of the archaeological remains reported from the lower valley have also been found in the coastal zone of the Ewa region, and may represent associations generally similar to those suggested above for coastal Makaha. At the west end of the Ewa coral plain, Honouliuli gulch and stream provided a much closer physiographic approximation to Makaha, and it is likely that the Makaha pattern was generally duplicated within this area. Recent research provides some evidence in support of this contention (PHRI Project No. 88-440), although

the extensive agricultural-related and other disturbances to the area have undoubtedly destroyed numerous features dating to the 14-17th centuries, while others have likely been deeply buried by extensive sediments washed down from the Waianae Range to the north.

PREVIOUS ARCHAEOLOGICAL WORK

A significant number of archaeological projects have been conducted on the Ewa coral plain, extending from West Loch through Ewa Beach, around Barber's Point, and to the West Beach area near Kahe Point. The most substantial recent projects include those by Lewis (1970), Davis (1980a, 1980b, 1981, 1982), Davis and Griffin (1978), Hammatt and Folk (1981), Barrera (1975), and Sinoto (1976, 1978, 1979).

The earliest reference to archaeological remains in the area (Thrum 1907:46) mentions a *heiau* situated on Kapolei Hill in Ewa. The site was apparently destroyed for its stones, either for use in constructing fences, or crushed for building material (McAllister 1933), and nothing is known concerning its original size or type.

McAllister (1933) listed many sites in Honouliuli; however, most are located at Pearl Harbor or high on the ridges of the Waianae Range. The Barbers Point area and much of the Ewa coral plain are subsumed under his site number 146. Concerning this site area he stated:

Ewa coral plains, throughout which are the remains of many sites. The great extent of old stone walls, particularly near the Puuloa Salt Works, belongs to the ranching period of about 75 years ago. It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation and even today one comes upon bananas and Hawaiian sugarcane still growing in them (McAllister 1933:109).

McAllister also identified a rock shelter located on the same hill (Kapolei) as the *heiau* noted by Thrum, where the pig-god Kamapua'a is said to have resided with his grandmother (McAllister 1933:108). A well-preserved house site and possible *heiau* located on the western part of the Ewa Plain, adjacent to Kalaeloa Boulevard, were examined by Emory (Bishop Museum Site Files [1933]). Both structures had been constructed of stacked limestone slabs and uprights, but had been destroyed during the course of sugarcane cultivation.

In 1959, William Kikuchi removed 12 to 16 incomplete human burials from a limestone sink (Site 50-0a-B6-10) prior to the construction of the Standard Oil refinery (Oahu Sites Folder 01.1 and Site Card in Dept. Anthropology, Bishop Museum).

In 1962, Lloyd Soehren recorded a burial at the Naval Air Station (Bishop Museum Files). The burial, a secondary interment, was found in a sinkhole located near house sites and modified pits.

In 1966, Soehren recorded and excavated a possible fishing shrine that was to be destroyed in the course of constructing a barge harbor (Site 50-0aB6-13; Oahu Sites Folder 01.1 and Site Card in Dept. Anthropology, Bishop Museum). Excavation revealed a pre-construction layer containing large amounts of fish scales. Dog, fish, and shellfish remains, and a one-piece rotating fishhook, were recovered from the architectural fill.

A beach midden site (50-0a-B6-14), located south of the barge harbor in Camp Malakole, was recorded by Roger Green for the Bishop Museum in 1969. Discovered during construction of a pipeline that cut through the site, Green collected surface artifacts including a bone awl, a coral file, a one-piece fishhook point fragment, and a piece of cut bone. The site was subsequently tested by Davis (Davis and Griffin 1978), revealing two components both characterized by charcoal-stained sand, charcoal, fire-cracked rocks, burned coral, and artifacts. The upper layer exhibited pits containing ash and charcoal.

Lewis (1970) has summarized the available historical data for the Ewa coral plain. The data indicates a sparse population at European contact, which was further reduced shortly thereafter. Early travelers made few comments about the region, and many native Hawaiians avoided the area, apparently preferring to use trails further inland. In 1969 and 1970, Lewis also conducted the first extensive archaeological survey and excavations in an area inland of Malakole Road. Lewis summarized his archaeological research, as follows:

For our area we find many kinds of sites - houses and house compounds; cairns mounds, ahus of myriad size and shape; pits that may have had cultural uses; walls of several types. It is obvious that the people at some time adapted themselves to life on this near-barren coral expanse. Though much of the land has been put under cane or concrete, there is yet a large area in which we may expect to find many additional sites to the few we have. Thus

there is hope that we can define something of the past life of the Hawaiians who lived in such a seemingly un-Hawaiian place (Lewis 1970:42).

Lewis considered the area to be so marginal that it would only have been settled after more desirable locations had been occupied, and that one should not ascribe patterns of adaptation, known from other parts of the islands, to west Ewa. The primary food source was thought to be the sea and reef. The possibility of raising fish (mullet) in brackish-water ponds, and limited agriculture associated with pits and mounds is also noted, as is trade as a potential means for obtaining non-marine foods and other resources.

The Department of Anthropology of the Bishop Museum conducted a reconnaissance of c. 900 acres at Barbers Point in 1975 (Barrera 1975). Inland areas were examined to relocate sites recorded by Lewis in 1969 and 1970, and to locate additional sites. Seaward areas were examined to determine the extent and density of surface remains. A total of 24 sites was located, and historic sources were researched. Nine of Lewis's sites were relocated within the survey area, and one could not be found. At least five of Lewis's sites had been destroyed. Twelve new sites were recorded. Site types included limestone sinks, house sites, walls, cairns, enclosures, shelters, a terrace, a midden deposit, a paved area, a burial cave, and many mounds; the latter are typically constructed of coralline limestone boulders and cobbles. A triangular basalt adze was found on the surface within an enclosure.

Barrera (1975) concluded that prehistoric occupation of the Barbers Point area was demonstrated by the presence of midden and artifacts. Fishing was considered to be the primary prehistoric use of the area, and was evidenced by fish bones and scales, fishhooks, and sinkers. No indications of agricultural activities were present, but Barrera suggested that some of the mounds may have been used for cultivation of ti (*Cordyline terminalis* [L.] Kunth) and sweet potato (*Ipomoea batatas* [L.] Lam.), and recommended further survey and excavations to document this possibility. The settlement pattern was described as "dispersed clusters of residences, surrounded by a relatively open and little-inhabited area" (Barrera 1975:18). The Barbers Point locality was considered a potentially important locale for archaeological research because it represents "the prehistoric Hawaiian adaptation to a unique set of ecological circumstances (raised reef, low rainfall, and immediate proximity to deep ocean)" (Barrera 1975:18).

Sinoto (1976) provided a list of sites and features recorded for Barbers Point in four survey areas designated A through D. A total of 97 sites was identified, including 17 previously recorded by Lewis (1970) and 36 reported by Barrera (1975).

All sites were assigned Bishop Museum site numbers (50-0a-B6-22 through 137; B6-58 through 137 added by A. Sinoto). The most common features recorded were unmodified limestone sinks (80 total), walled sinks (17), rectangular enclosures (18), C-shape enclosures (12), wall segments (14), and *ahu* (15+). Other infrequent sites/features included cairns, complexes of walls and enclosures, an L-shape wall, a ramp associated with a sink, a filled sink, railroad tracks, a cyst, a trail, platforms (2), and culturally modified caves (3). Sinoto (1976) undertook excavation at a total of 27 sites. An important result of the excavations was the discovery, within limestone sinks, of six fossil bird bones; the bones were deemed potentially important for paleontological research.

In 1977 an archaeological and paleontological salvage project was conducted by the Department of Anthropology, Bishop Museum, to mitigate the impacts of constructing the deep-draft harbor at Barbers Point (Sinoto 1978). Five archaeological and 13 paleontological sites were excavated. The excavations at the five archaeological sites produced portable artifacts (25), and midden, soil, and land snail samples (Sinoto 1978). In general, the excavations evidence a high degree of disturbance at project area sites. Sinoto noted only a single component, or cultural stratum, among all of the excavated sites. Basaltic glass from one site (Site B6-70) was hydration-rind dated to the 17th century (AD 1612-1650). Artifacts consisted of single specimens of the following artifact categories: adze, adze chip, basalt flake, basalt hammerstone, coral abrader, coral file, fishhook fragment (Type S-IA/B-HT 4; after Emory, Bonk, and Sinoto 1959), modified bird bone, and polished hematite. A total of ten pieces of basaltic glass and three unmodified basalt flakes were also recovered from the excavations. Midden materials consisted primarily of mollusca, echinodermata, and Crustacea, species which commonly inhabit nearby shallow waters, the reef, and the surge zone. Tuna (*Scombridae* sp.) was the only fish remains identified, and bird bones were scarce. Mammal bones were primarily rodent, with minor amounts of human bone.

Several trends in prehistoric utilization of the area, as evidenced by the archaeological remains, were discussed by Sinoto (1978). Construction of surface architectural features incorporated natural features such as outcrops surrounding low lying areas. Habitation-related structures were oriented in a manner that offered protection from the prevailing winds (i.e., highest walls along the northeast side of habitation areas). Sinkholes, when sufficiently large, evidenced habitation, and were often modified and incorporated into clusters of surface structures. The prehistoric utilization of the area was interpreted as short term, temporary, or seasonal and/or specialized. This interpretation was based on consistently thin cultural stratigraphic units, the absence of

internal features such as fireplaces, and low artifact and midden densities. The stratigraphic consistency and range of dates from Sites B6-58 and B6-70 suggested that regional sites represent a "coeval occupation." The artifacts, midden, and the presence of *ahu* were interpreted as evidence for fishing-oriented activities.

In 1978, Davis and Griffin (1978) discussed previous research in the Barbers Point area. They recognized the tentative nature of some of the earlier hypotheses advanced by Lewis (1970) and Sinoto (1976), particularly the hypotheses suggesting permanent occupation of the area and the comments re. plant cultivation. Davis and Griffin, on the contrary, suggested another plausible interpretation of the existing data. Their suggestion was that these sites simply represented use and revisitation over an extended period of time. Furthermore, contrary to Lewis' earlier assertion, Davis and Griffin suggested that techniques for cultivating atoll environments could have been readily applied to the more or less equivalent environmental context at Barbers Point. Intensive labor practices, involving mulching and tapping the subterranean brackish water lens, for example, would have permitted small-scale food production within this area.

Sinoto (1979) conducted survey and test excavations in an 80-acre parcel adjacent to the area which he had previously surveyed in 1976. No new architectural types were present, but Sinoto (1979:32) did note variation in the "intensity in the exploitation of the two areas." Sinoto's research focused on continued evaluation of paleontological significance. In addition to locating over 500 testable limestone sinks using a systematic quadrant sampling design, 24 sinks were actually evaluated. Sixteen percent of the excavated sinks were found to contain extinct avifaunal remains, and Sinoto (1979:34) outlined four categories of significance or potential significance for the avifaunal remains which he had inventoried:

1. Species of birds that are totally extinct in the Hawaiian Islands, with no historic record of extinction;
2. Species of birds that still exist today in the Hawaiian Islands but that occupy a totally different type of habitat from that of Barbers Point;
3. Species of birds that are extinct on Oahu Island; and
4. Species of birds that are totally extinct in the Hawaiian Islands today, with a historic record of extinction.

In the mid-1980s, resort, commercial, residential community, and public recreation developments were proposed for a 640-acre parcel situated at the far west end of the Ewa coral plain. Known as West Beach, the area was subjected to intensive inventory survey and test excavation work, which resulted in identifying 181 component features at 48 separate sites (Davis and Haun 1986). Sites included habitation complexes with and without architectural features, gardening areas, and both primary and secondary human burials. Typical features included trash dumps, large cairns and isolated examples, and numerous modified sinkholes, some containing cultural refuse.

Dating results confirmed that most of the occupation likely dated to the latter centuries of the prehistoric sequence. However, samples from some rockshelters and cultural deposits identified near an old buried marshland suggested initial use/occupation as early as the period of initial Polynesian settlement of Oahu, and possibly during the period of initial Polynesian settlement of the Hawaiian Islands overall. The West Beach project thus yielded the first clear evidence of early occupation within the leeward zone of Oahu.

Recommendations for additional data collection work and data recovery excavations for the West Beach project area were formalized in the fall of 1986 in a Data Recovery Plan (Davis, Haun, and Rosendahl 1986). The field work portion of this work was completed before the end of 1987, and laboratory and other analyses were undertaken during the subsequent three years. Overall, the findings of the data recovery excavations at West Beach provide a picture of the overall spatial patterning of settlement on the west end of the Ewa coastal plain. It appears that the western Ewa plain had a long initial settlement period and that initial settlement was based on a high degree of marine-oriented task specialization. Marine task specialization continued into later settlements, but it seems that in later settlements terrestrially oriented activities increased. This shift in activities suggests a concomitant shift from a very dispersed temporary occupation to a loosely nucleated one involving extended periods of residence. This nucleation apparently depended upon a functionally (task) integrated household where membership was both kin- and task-based.

Concurrently with implementation of the West Beach Project, PHRI undertook additional inventory survey work above Pearl Harbor's West Loch (Dicks, Haun, and Rosendahl 1987). The City and County of Honolulu proposed residential community and golf course developments on c. 216 acres located within the lower and upper valley segments of Honouliuli Gulch. Although agriculture and other

disturbances to the project area were extensive, a total of seven sites were identified. These sites included both historic and prehistoric habitation and burial sites situated on Hoaeae Point and on the slopes and uplands surrounding the Honouliuli Stream floodplain. Included among the recorded features were the remnants of a once extensive agricultural system which combined aquiculture in fishponds situated on the shores of West Loch, irrigated pondfield cropping of the floodplain, and dryland cultivation of the surrounding slopes and uplands.

Additional data collection was recommended for six of the seven West Loch Estates and Golf Course project area sites. This work was undertaken in 1988 and 1989, but has not yet been fully reported on. Generally, the findings support initial testing results, wherein (a) permanent occupation was indicated for most of the habitation features, (b) upper valley occupation may have occurred as early as the mid-6th to mid-9th centuries, and (c) subsequent occupations appear to have been most intensive between the 1300s and 1600s, and between the late 1700 to early 1800s.

FIELD METHODS AND PROCEDURES

The surface survey was conducted by way of a series of pedestrian sweeps. Distance between sweeping crew members

was maintained at 10-20 m, depending on ground visibility. All sites encountered were described on standard PHRI site survey record forms and were photographed using 35mm black-and-white film. Detailed site recording included written descriptions, measurements, and scaled plan maps. Each site, or the primary feature within each site complex, was marked with an aluminum tag bearing the site number, date, the letters "PHRI", and the PHRI project number. Flagging tape on which were written the site number and feature letter was wrapped around a rock and placed on all the features as an aid to future site reidentification. All newly identified sites were assigned temporary field numbers prefixed with "T-", beginning with "T-1". The sites were later assigned permanent State Inventory of Historic Places site numbers.

Three excavation units were placed in the project area. The locations of the units were plotted on site maps. The units were dug using arbitrary levels within layers, and all fill was processed through 1/8-in mesh screens to facilitate recovery of portable artifacts and midden. If necessary, portions of structural features were dismantled as part of the test excavation units, and selected cross sections were recorded. All detailed soil sample descriptions were done using standard procedures and terminology as set forth in the Soil Survey Manual (Soil Survey Staff 1962).

FINDINGS

During the Phase II area survey, two sites (3208 and 4293) were identified (Figure 2). Site 4293 is a complex consisting of two mounds and two C-shapes. Site 4293 consists of a platform. Two 1.0 m sq test excavation units were placed at Site 4293, within areas suspected to contain cultural deposits. One unit was placed within Feature A (mound) and another was placed within Feature C (C-shape). No cultural deposits were encountered in the excavations. At

Site 3208, one 1.0 m sq unit was placed. The unit displayed 35 cm of cobbles stacked above a 10 cm thick cultural deposit of historic midden. Site 3208 is interpreted as a prehistoric temporary habitation site, and Site 4293 is interpreted as a historic/prehistoric habitation and agricultural site. Both sites are described in detail below; also described below are the test units excavated at the sites.

SITE AND TEST UNIT DESCRIPTIONS

SITE NO.: State: 3208 Other: 3208B PHRI: T-84

SITE TYPE: Platform

TOPOGRAPHY: Generally flat

VEGETATION: Thick ground vegetation, dense *koa-haole*, large fallen *kiawe*, sword grass, and purple flowering vines.

CONDITION: Poor

INTEGRITY: Altered (tree disturbance)

PROBABLE AGE: Prehistoric

FUNCTIONAL INTERPRETATION: Temporary habitation

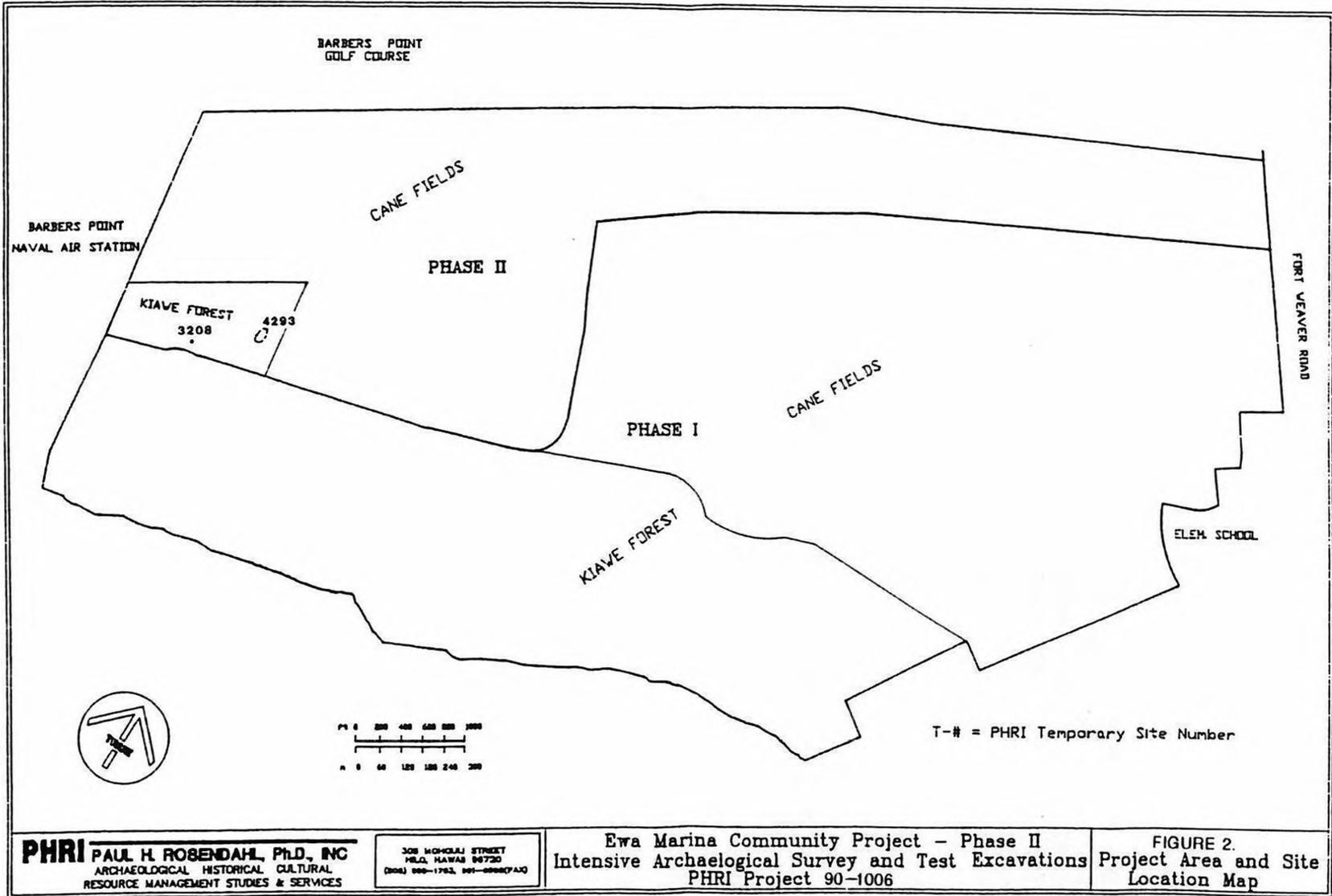
DIMENSIONS: 2.80 m by 2.70 m by 0.32 m (approx.)

DESCRIPTION: This platform is badly disturbed; a large *kiawe* tree has fallen on its east side. The platform is oriented c. east-southeast to west-northwest; the platform walls consist of small and large subangular limestone cobbles and a few boulders stacked one to two courses high. The interior of the platform is flat and contains depressions. The perimeter of this feature is clear. Cobbles from the wall are scattered on the ground.

This site was previously identified by Davis (1979) (as Feature B of Site 3208).

A 1.0 m by 1.0 m test unit (TU-1) was excavated in the center of the platform. A datum was set c. 0.3 m south of the northwest corner of the unit, on the platform surface. The unit displayed the following stratigraphy:

Layer	Description
I	0-35 cmbd; mound of limestone cobbles and boulders; lower boundary is abrupt and irregular in profile;
II	35-45 cmbd; dark brown (10YR 3/3 dry); gravelly silt loam and loose organic material intermixed; consistency is loose and noncoherent when dry, nonsticky when wet, and nonplastic; lower boundary is abrupt and wavy in profile;
III	45-55 cmbd; brown (10YR 4/3 dry); stony silt loam and loose organic material intermixed; consistency is slightly hard when dry, nonsticky when wet, and slightly plastic; lower boundary is abrupt and smooth in profile;
IV	55-65 cmbd; light yellow brown (10YR 6/4 dry); silty clay loam with rare loose organic material intermixed; consistency is soft and weakly coherent when dry, nonsticky when wet, and slightly plastic; lower boundary is abrupt and smooth in profile;



PHRI PAUL H. ROSENDAHL, Ph.D., INC
 ARCHAEOLOGICAL HISTORICAL CULTURAL
 RESOURCE MANAGEMENT STUDIES & SERVICES

308 WICHUKAI STREET
 HILA, HAWAII 96720
 (808) 955-1763, 951-8888(FAX)

Ewa Marina Community Project - Phase II
 Intensive Archaeological Survey and Test Excavations
 PHRI Project 90-1006

FIGURE 2.
 Project Area and Site
 Location Map

SITE NO.: State: 4293 Other: 3208 A PHRI: T-80

SITE TYPE: Complex (4 Features)

TOPOGRAPHY: Generally flat

VEGETATION: *Kiawe*, dense *koa-haole*, thick ground vegetation, fallen *kiawe* trees, vine with purple flowers, sword grass.

CONDITION: Poor-fair

INTEGRITY: Bulldozing in the area may have altered site

PROBABLE AGE: Prehistoric/historic

FUNCTIONAL INTERPRETATION: Habitation-agriculture

DESCRIPTION: The complex area measures c. 24.0 m at 180° Az. by 10.0-12.0 m wide. The complex consists of two mounds (Features A and B) and two C-shapes (Features C and D). The features are constructed of limestone slabs and boulders and are built atop a natural limestone bedrock outcropping. Remnants of barbed wire and bottle glass were present on the site. A metal site tag (3208-A) was found on Feature C, C-shape.

FEATURE A: Mound

FUNCTION: Agriculture

DIMENSIONS: 3.50 m by 2.30 m by 0.22-0.47 m (approx.)

DESCRIPTION: Feature A is roughly rectangular in plan. It consists of limestone boulders crudely stacked on natural limestone bedrock. The feature is disturbed to the southwest. Feature A was initially identified by Davis (1980b) who designated it as Site 3208.

A 1.0 m by 1.0 m test unit (TU-1) was excavated in the center of the feature. A datum was set c. 25 cm from the north corner along the northeast boundary of the unit at the soil surface underlying stacked limestone cobbles. The following stratigraphy was displayed:

Layer	Description
I	0-10 cmbd (datum set at 45 cm below surface of mound to mark start of soil layers); very dark brown (10YR 2/2 dry); stony silt loam and loose organic material intermixed; consistency is loose and noncoherent when dry, nonsticky when wet, and nonplastic; lower boundary is abrupt and smooth in profile;
II	10-14 cmbd; very dark grayish-brown (10YR 3/2 dry); stony silt loam intermixed with loose organic material and shell; consistency is slightly hard when dry, nonsticky when wet, and nonplastic; lower boundary is abrupt and smooth in profile;
III	14-20 cmbd; dark yellowish-brown (10YR 4/4 dry); stony silt loam and loose organic material intermixed; consistency is soft and weakly coherent when dry, slightly sticky when wet, slightly plastic; lower boundary is abrupt and smooth in profile;
IV	20-26 cmbd; brownish-yellow (10YR 6/6 dry); silty clay loam and loose organic material intermixed; consistency is soft and weakly coherent when dry, slightly sticky when wet, and slightly plastic; lower boundary is abrupt and smooth in profile;
V	26+ cmbd; bedrock.

Approximately 0.45 m of stacked limestone cobbles was removed before reaching a soil deposit. Layers I through IV were excavated by soil stratums. None of the layers contained cultural deposits. Excavation was terminated on bedrock at 0.26 mbd.

FEATURE B: Mound**FUNCTION:** Agriculture**DIMENSIONS:** 1.80 m by 1.30 m by 0.58 m (approx.)**DESCRIPTION:** Feature B is a crude mound located c. 6.0 m southwest of Feature A. It is smaller than Feature A and somewhat disturbed to the northeast. Feature B is constructed of limestone slabs and boulders, crudely stacked three courses high.**FEATURE C: C-shape State: 3208 A****FUNCTION:** Possibly temporary habitation**DIMENSIONS:** 3.40 m by 3.30 m by 0.65 m (approx.)**DESCRIPTION:** Oriented north-northeast to south-southwest, with the opening facing to the east-southeast. It is a well defined C-shape; the walls consist of small to large limestone cobbles and boulders stacked two to three courses high atop bedrock outcropping. Possible remnant of facing along the northwest interior and exterior sides. The north-northeast and south-southwest walls are collapsed, the north-northeast wall due to a large fallen *kiawe* branch. The northwest wall is intact. The floor of the C-shape has scattered cobbles and clinkers; the interior measures c. 1.8 m by 1.24 m. The wall heights range from c. 0.13 m to 0.65 m.

A broken bottle neck and another bottle fragment were found on the feature. An engraved metal washer (engraved with 3208) and a site tag with (3208-A) was also found at the feature.

A 1.0 m by 1.0 m test unit (TU-2) was excavated inside and near the opening of the feature. Two soil layers were found in the unit. Layer I (0.0-0.05 mbd) consisted of dark brown silty loam containing glass fragments. Layer II (0.05-0.15 mbd) was light brown silty loam and contained no cultural material. Excavation was terminated on bedrock at 0.15 mbd.

FEATURE D: C-shape**FUNCTION:** Possible temporary habitation**DIMENSIONS:** 2.80 m by 2.05 m by 0.60 m (approx.)**DESCRIPTION:** Oriented north-northeast to south-southwest with the opening to the east-southeast. The C-shape is small, but intact. The C-shape is constructed using small and large subangular limestone cobbles and a few boulders and slabs. The stones are stacked two to three courses high. The perimeter of the C-shape is stacked.

The southwest portion is more collapsed than the rest of the feature. There are possible remnants of facing along the interior and exterior walls of the feature. At the south-southeast end of the C-shape, it appears that the wall may have extended c. 1.0 m more; however four small trees growing in the area make this difficult to determine.

The floor of the C-shape has soil (brown sandy loam) and a few cobbles that have fallen out of place. The floor measures c. 1.42 m by 1.28 m. The heights of the walls range from 0.20 m to 0.60 m. No cultural deposit was visible at the feature.

CONCLUSION

Based on the findings of the present survey, Sites 3208 and 4293 were assessed for significance in terms of the National Register criteria for evaluation, as outlined in the Code of Federal Regulations (36 CFR Part 60). The DLNR-HPP/SHPO uses these criteria for evaluating cultural resources. Sites determined to be potentially significant for information content fall under Criterion D, which defines significant resources as ones which "...have yielded, or may be likely to yield, information important in prehistory or history." Sites potentially significant as representative examples of site types are evaluated under Criterion C, which defines significant resources as those which "...embody the distinctive characteristics of a type, period, or method of construction...or that represent a significant and distinguishable entity whose components may lack individual distinction."

The sites were assessed for potential cultural significance using guidelines prepared by the Advisory Council on Historic Preservation (ACHP) entitled "Guidelines for Consideration of Traditional Cultural Values in Historic Preservation Review" (Draft Report, August 1985). The guidelines define cultural value as "...the contribution made by an historic property to an ongoing society or cultural system. A traditional cultural value is a cultural value that has historical depth." The guidelines further specify that "[a] property need not have been in consistent use since antiquity by a cultural system in order to have traditional cultural value."

Based on the above criteria, both Sites 3208 and 4293 are assessed as significant solely for information content. No further work is recommended for Site 4293, a small complex of two temporary habitation features and two agricultural features. This site has been measured, described, photographed, plotted, and tested, and this data is considered sufficient recovery of significant information. For Site

3208, a temporary habitation feature, further data collection is recommended. After further data collection, it is anticipated that no further work would be necessary.

To further facilitate client management decisions regarding the subsequent treatment of resources, the general significance of Sites 3208 and 4293 was also evaluated in terms of potential scientific research, interpretive, and/or cultural values (PHRI CRM [Cultural Resource Management] value modes). These value modes are derived from the previously mentioned state and federal evaluation criteria. The sites were evaluated in terms of potential scientific research, interpretive, and/or cultural values. *Research value* refers to the potential of archaeological resources for producing information useful in the understanding of culture history, past lifeways, and cultural processes at the local, regional, and interregional levels of organization. *Interpretive value* refers to the potential of archaeological resources for public education and recreation. *Cultural value* refers to the potential of archaeological resources to preserve and promote cultural and ethnic identity and values. Based on the value modes, Site 4293 is assessed as having low research, interpretive, and cultural values, and Site 3208 is assessed as having moderate research value, and low interpretive and cultural values.

It should be noted that the assessments and recommendations presented here have been based on an intensive surface survey and limited test excavations. There is always the possibility, however remote, that potentially significant, unidentified subsurface cultural remains could be encountered in the course of further archaeological investigations or subsequent development activities. In such situations, archaeological consultation should be sought immediately.

REFERENCES CITED

ACHP (Advisory Council on Historic Preservation)

- 1985 Guidelines for Consideration of Traditional Cultural Values in Historic Preservation Review. Washington, D.C.: Advisory Council on Historic Preservation. (Draft report, August)

Barrera, W., Jr.

- 1974 A Report on the Archaeological Reconnaissance Survey of the Proposed Barbers Point Harbor Area. Dept. Anthro., B.P. Bishop Museum. Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division.

CFR (Code of Federal Regulations)

- 36 CFR Part 60 National Register of Historic Places. Washington, D.C.: Dept. Interior, National Park Service.

Davis, B.D.

- 1980a Human Settlement and Environmental Change at Barbers Point, O'ahu. *Proceedings of the Second Conference in Natural Sciences* (1978), Hawaii Volcanoes National Park, Pp. 87-97. CPSU-UH. Department of Botany, University of Hawaii-Manoa.
- 1980b Report on Archaeological Survey of the Proposed Ewa Marina Community Development, Ewa Beach, Oahu Island. Hawaii Marine Research.
- 1981 A Research Design for the Study of Human Settlement and Environmental Change in Southwestern Oahu: A Reevaluation of the Strategy Based on New Work. *Proceedings of the Third Conference in Natural Sciences* (1980), Hawaii Volcanoes National Park, Pp. 77-86. CPSU-UH. Department of Botany, University of Hawaii-Manoa.
- 1982 Horticultural Adaptation and Ecological Change in Southwestern O'ahu: Preliminary Evidence from Barbers Point. *Proceedings of the Fourth Conference in Natural Sciences* (1982), Hawaii Volcanoes National Park, pp. 51-59. CPSU-UH. Department of Botany, University of Hawaii-Manoa.

Davis B.D., and P.B. Griffin (eds.)

- 1978 Studies in Natural History and Human Settlement at Barbers Point, Oahu. Interim Report I. Report 14-115I. Archaeological Research Center Hawaii.

Davis, B.D., A. E. Haun, and P.H. Rosendahl

- 1986 Phase 1 - Research Design for Intensive Survey and Test Excavations, West Beach Data Recovery Program. PHRI Report 217-032686. Prepared for West Beach Estates.

Dunn, A., and A.E. Haun

- 1990 Intensive Archaeological Survey and Test Excavations, Ewa Marina Community Project - Phase I, Land of Honouliuli, Ewa District, Island of Oahu. PHRI Report 763-062690. Prepared for HASEKO (Hawaii), Inc.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

APPENDIX A

HISTORICAL DOCUMENTARY RESEARCH

by Helen Wong Smith, B.A.

INTRODUCTION

Honouliuli is the largest and most western *ahupua'a* in the Ewa District of Oahu (Hammatt and Folk 1981:29). From the ridgeline of Palikea in the Waianae Range, its western border extends to the sea at Piliokahe, and on the east it reaches to Puu Loa, west of Pearl Harbor's West Loch. It is from the waters of West Loch that Honouliuli takes its name, which means "dark harbor" or "dark bay" (Jarret IN Frierson 1972, and Pukui et al. 1974:51).

Honouliuli contained all of the resource-zones necessary for full economic subsistence in ancient Hawaii: *uka* (mountain), *waena* (middle), and *kahakai* (seashore). The shoreline of Honouliuli at the project area was once an area of fishponds, shellfish resources, and salt-drying (Frierson 1972:6). Nearby Puuloa, to the east, was once an important agricultural area, and it boasted a productive fishery as well, with fishponds and fish traps. The coastal waters from Keahi Point to Kualakai were, and still are, a source of *lipoa*, an edible seaweed (Sterling and Summers 1978:44). In modern times poultry and pig farms were located in the *kiawe* forest area *mauka* of the project area. The coastal portion of the district is now the site of Oneula (red sand) County Beach Park, Del Monte Beach Park, and Alii Park (Flanders 1986).

The project area is one of the last undeveloped parcels on the Ewa Plain. Although it lies in the *ahupua'a* of Honouliuli, it is very close to the neighboring *ahupua'a* of Puuloa, and may fall partly inside it (Figure A-1). For this reason, this report includes references to Puuloa. The Barber's Point Naval Air Station abuts the project area on its north and west boundaries, but the history of this area receives only brief mention here. Because of the immense size of Honouliuli, this report is limited to the history of the southeast portion of it, which fronts the West Loch portion of Pearl Harbor.

LEGENDS AND PRE-CONTACT HISTORY

Honouliuli contains the well-known beach where the hairless human beings (*'olohe*) first landed on Oahu (Beckwith 1970:343). In Hawaiian legend the *'olohe* were said to live in caves or pits on the arid Ewa Plain. They lived in caves in the uplifted coral reef composing the plain. Such caves were once found throughout the area now occupied by the Naval Air Station.

The area behind Oneula, known today as the Coral Plains, is probably the legendary "Plain of Kaupe'a," said to be the realm of the *ao kuewa* or *ao 'auwana*, the homeless wandering souls. Located next to Puuloa by Sterling and Summers (1978:36), this was the wandering place of those who died having no rightful place to go. These souls wandered "in the wiliwili grove of Kaupe'a on Oahu," according to Kamakau (1964:47). He writes that "these wanderers on the plain of Kaupe'a beside Pu'uloa...could go to catch moths (*pulelehua*) and spiders (*nanana*)" in the hope of finding helpful *'aumakua*, souls who could save them (ibid:49). Kelly agrees with Kamakau that Kaupea was known as the place on Oahu where these friendless souls wandered (1978:1).

Mary Kawena Pukui describes an encounter with these wandering ghosts:

A wide plain lies back of Keahi and Pu'uloa where the homeless, friendless ghosts were said to wander about. These were the ghosts of people who were not found by their family *'aumakua* or gods and taken home with them, or had not found the leaping places where they could leap into the nether world. Here they wandered, living on the moths and spiders they caught. They were often very hungry for it was not easy to find moths or to catch them when found.

Perhaps I would never have been told of the plain of homeless ghosts if my cousin's dog had not fainted there one day. We (my cousin, aunt & I) were walking to Kalae-loa from Pu'uloa accompanied by Teto, the dog. The dog was a native dog (not the so-called poi dog of today) with upright ears and body and size of a fox terrier. For no accountable reason, Teto fell into a faint and lay still. My aunt exclaimed and sent me to fetch sea water at once which she sprinkled over the dog saying, "Mai hana ino wale 'oukou i ka holoholona a ke kaikamahine. Uoki ko 'oukou makemake ilio." (Do not harm the girl's dog. Stop your desire to have it.) Then with a prayer to her *'aumakua* for help she rubbed the dog. It revived quickly and after being carried a short way, was frisky and lively as ever.

Then it was that my aunt told me of the homeless ghosts and declared that some of them must have

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

wanted Teto that day because she was a real native dog, the kind that were roasted and eaten long before foreigners ever came to our shores (Pukui 1943).

Another legend holds that on the south shore of Honouliuli, at Waipuuli, is the cave where the young boy, Namakaokapaoo, hid his mother after killing his stepfather and throwing his head five miles. Though only two and one-half feet tall, Namakaokapaoo is said to have conquered Oahu by defeating the king and 18 canoe-loads of warriors (Fornander 1913, V. 2:274-8 IN Lewis 1970:5).

Northwest of the project area is the inland hill known as Puuokapolei. This prominent topographical feature is prominent in legend as well. It was here that the demigod Kamapuaa is said to have established the court of his grandmother, Kamaunuanoho, an *ali'i* who came by canoe from Kahiki to Oahu. The people of Oahu, Kauai, and Hawaii are said to descend from Kamaunuanoho, which is why the Ewa district was called the "celebrated land of the ancestors" (Kamakau 1964:68, 84).

Kamapuaa had a practical reason for installing Kamaunuanoho at Puuokapolei: "This was to compel the people who were to pay tribute to bring all the necessities of life from a distance, to show [Kamapuaa's] absolute power over all" (Nakuina IN Lewis 1970). Nakuina claimed that the house foundations and the surrounding wall could still be seen in the late 1800s. A different version depicts Kamaunuanoho living at Puuokapolei with Kekeleai, the older brother of Kamapuaa, after they were driven out of Kaliuuaa in Kaluanui, Koolauloa (Sterling and Summers 1978:33).

Another legend of Honouliuli describes the strange fate of two women who lived on the plain called Pukaua, beyond Puuokapolei, toward Waianae. After going down to Kualakai, on the coast, to gather aama crabs, pipipi, and limu, they failed to return home before morning light, and were turned into a pillar of stone (Sterling and Summers 1962:39). Also well-known in legend is the place on the coast, west of the project area, called Kualakai. The spring located there, called Hoakalei, is associated with Hiiaka, the favorite sister of the fire goddess, Pele (Sterling and Summers 1962, I, 2:179).

Mary Pukui also tells a story about the waters of Puuloa, to the East. It was told to her by her uncle, Akoni Kawaa, a native of Aiea.

At the entrance (of Pu'uloa) was a pond built out into the water in the shape of a tennis racket. This pond, called Kapakule, was said to have been the

labor of the Menehune, a people who were something like the "little people" of old Ireland. On the left side of the pond stood the stone called Hina, which represented a goddess of the sea by that name. Each time the sea ebbed, the rock became gradually visible, vanishing again under water at high tide. Ku, another stone on the right, was never seen above sea level. This stone represented Ku'ula, Red Ku, god of fish and fishermen. From one side of the pond a long wall, composed of driven stakes of hard wood, ran toward the island in the lochs. When the fish swam up the channel and then inside of this wall, they invariably found themselves in the pond. A short distance from the spot where the pond touched the shore was a small *ko'a* or altar composed of coral rock. It was here that the first fish caught in the pond was laid as an offering to the gods. At the time I last saw it in 1907, this altar was fenced in by Edwin P. Mikalemi, the caretaker of the place and brother-in-law of Akoni Kawa'a. There were times when the sharks were caught in the pond at low tide, but no Hawaiian there ever dreamed of molesting them. Never shall I forget the day when a haole guest of Mikalemi went to harpoon one of the sharks in the pond. My uncle shouted for him to get away from there and swore as I had never heard him swear before. Those sharks were as dear to him as a relative, and he did not want to see them speared any more than he wanted us to be hurt in the same way. At the age of twelve, I was taken to the cave of Ka'ahupahau, Cloak-well-cared-for. Most of the cave was deep under water. A small plant laden with red berries hung over the entrance, and when I reached to pluck one, my uncle pulled my hand back quickly and chided me. Those belonged to Ka'ahupahau. Ka'ahupahau had a brother Kahi'uka, The Smitingtail, whose stone form was a good distance away from the cave, lying deep in the water. Yet it was plainly seen from the surface. Ka'ahupahau's son, Ku-pipi, had his home where the dry dock was built and sank about thirty years ago. These were not the only sharks at Pu'uloa, for like all members of royalty there were others to stay about and serve them. Ka'ahupahau was the chiefess of sharks in the length and breadth of the Pearl Lochs, hence the old saying, "Alahula Pu'uloa he alahela na Ka'ahupahau," "Everywhere in Pu'uloa is the trail of Ka'ahupahau."

Her brother and she were born, not sharks, but human beings. One day a shark god saw them and converted them into sharks like himself. Every day they swam up a stream at Waipahu and there they were fed on 'awa by relatives. 'Awa was always the

food of the gods. When they became too large to swim upstream, the offerings of food were carried to the lochs for them.

Because the sharks, though numerous, were not harmful within Pearl Lochs, the natives used to have fun mounting on their backs and riding them as cowboys ride horses. To turn them around, a little pressure was used just back of the eyes. Is this a tall fish story of men riding sharks? No, it is not. My uncle said that it was true and so did the historian Kamakau (Pukui 1943).

The waters West of Puuloa, near Kalaeloa (Barber's Point), are said to be the home of a famous giant *kupua* (magical) fish, named Uhumakaikai. This fish is said to have taught the art of fighting to Kawelo, a mid-16th century chief (Sterling & Summers 1978:41).

The importance of fishing to Honouliuli in pre-contact times is suggested by the presence of a fishing shrine (*ko'a*), called Kalanamaihihi, near the west end of West Loch (Kaihuopalaai), and by the presence, not too far from there, of the fishpond, Laulaunui (Figure A-1). Two place names in Honouliuli *ahupua'a* also suggest associations with fishing: Keoneoio, "sandy (place with) bone fish," and Puu Lailai, "young *lai* fish hill" (Pukui et al. 1974). The latter suggests an association with offshore fishing; the hill might have been used as a range or bearing marker for fishing grounds. The literal translation of Puu Makakilo, in the central part of the *ahupua'a*, is "observing eyes," which may also relate to fishing, because *kilo* is the Hawaiian word for a fishing observation tower or place (Hammatt and Folk 1981:33).

Puuloa is said to be the place where breadfruit was introduced to Hawaii. It is said to have been brought from Upolu, Samoa in the 12th century by Kahai, who was returning home from Tahiti (Fornander 1919-1920:313 IN Lewis 1970:5; Kelly 1985:165).

According to Sterling and Summers, Puuloa was also known as a place to collect bird feathers:

Among the places where the 'o'o, 'i'iwi and other indigenous birds were caught was at Puuloa on Oahu. There the 'o'o, 'i'iwi and other birds gathered when the noni fruit ripened. They came down to feed and when the season was over the birds returned to the mountains. - Lahilahi Webb, Coll. on Kahilis Ms. (1978:45).

The early Hawaiians used their ingenuity to make the dry inland areas of Honouliuli productive. McAllister tells how they used the naturally-occurring pits on coral plains for agriculture:

Site 146. Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near Puuloa Salt Works, belongs to the ranching period of about 75 years ago. It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population here (McAllister 1933:109).

Puukapolei was used in pre-contact times to mark the changing seasons. Here is how Kamakau says it was done:

In the same way the people of Oahu reckoned from the time when the sun set over Pu'uokapolei until it set in the hollow of Mahinaona and called this period Kau, and when it moved south again from Pu'uokapolei and it grew cold and the time came when young sprouts started, the season was called from their germination (oilo) the season of Ho'olilo. There were therefore two seasons, the season of Makali'i and the season of Ho'olilo (Kamakau Mo'olelo Hawaii Vol.I, Chap 2, p 23 IN Sterling and Summers 1978:34).

Puukapolei also figured in at least one chant used in pre-contact times. On January 13th, 1900, the newspaper *Ka Loea Kalaiaina* contained an article which recalled the chant. Headlined "Na Wahi Pana o Ewa," the article reminded readers that Puukapolei:

"...was one of the most famous hills in the olden days. The chant composed for games in the olden days began with the name of this hill and went on (with the place names) all around the island. This chant was used for those who swung with ropes, played on wooden ukeke instruments, or those who juggled with stones, noni fruit or kukui nuts" (Sterling and Summers 1978:33-34).

Several sources mention a *heiau* located on or near Puukapolei. Thrum's mention is brief: "[a] heiau on

Kapolei hill, Ewa - Size and class unknown. Its walls thrown down for fencing" (1907:46). McAllister, an archaeologist, was able to supply more information:

Pu'u Kapolei Heiau (Destroyed) Site 138, on Pu'u Kapolei hill. The stones from the heiau supplied the rock crusher which was located on the side of this elevation, which is about 100 feet away on the sea side. There was formerly a large rock shelter on the sea side where Kamapuaa is said to have lived with his grandmother (McAllister 1933:108).

One of the last pre-contact references to the area describes how the famous Oahu *kahuna*, Kaopulupulu, was killed by Kahahana's warriors at Puuloa sometime around the year 1782 (Kamakau 1961:133-134), and how two of Kamehameha's chiefs, Kekuamanoha and Kauhiwawaeono, lived at Puuloa (ibid:182). Kauhiwawaeono was the infamous murderer chief who used the bodies of his victims for shark bait (ibid:232). He was later discovered by Kamehameha I to have plotted against him (ibid:182).

POST-CONTACT HISTORY

Despite the plentiful marine resources of Honouliuli and Puuloa, early Westerners failed to appreciate the importance of these areas in the Hawaiian economic system. According to Kelly, "the coastal area near Ewa has historically provided significant marine resources, with neighboring areas, particularly Puuloa containing large fishponds and traps" (1978:1). Early Westerners ignored this abundance in their accounts and focused on the coral plain, which seemed marginal and desolate to them. The failure to understand the Hawaiian economic system frequently led to misconceptions concerning the importance of certain lands to the Hawaiians, and to misconceptions about Hawaiian land use patterns in general (Hammatt & Folk 1981:33).

In March of 1792, Captain George Vancouver sailed past the southwest point of Oahu, recording the first Western observation:

This point is low flat land, with a reef round it, extending about a quarter of a mile from shore. The reef and low land continue some distance to the eastward towards Whyteete Bay....Not far from the S.W. point is a small grove of shabby cocoa-nut trees, and along these shores are a few struggling fishermen's huts" (Vancouver 1798, I:167).

From these shores we were visited by some of the natives, in the most wretched canoes I had yet seen amongst the South-Sea islanders; they corresponded however with the appearance of the country, which from the commencement of the high land to the westward of Opooorah [Puuloa], was composed of one very barren rocky waste, nearly destitute of verdure, cultivation or inhabitants, with little variation all the way to the west point of the island (ibid. II:217).

A year later, while anchored in Pearl Harbor off Puuloa, Vancouver again recorded his observations:

The part of the island opposite to us was low or rather only moderately elevated, forming a level country between the mountains that compose the east [Koolau] and west [Waianae] ends of the island. This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of fertility; although we were told that at a little distance from the sea, the soil is rich, and all necessaries of life are abundantly produced (ibid. III:361-363).

Vancouver sent a boat into Pearl Harbor to take soundings, and the officer in charge reported:

The soil in the neighborhood of the harbor appeared of a loose sandy nature; the country low for some distance, and, from the number of houses within the harbor, it would seem to be very populous, but the very few inhabitants who made their appearance were an indication to the contrary (ibid. II:215-216).

Vancouver's cartographer, Lt. C.R. Malden, indicated on his map the presence of a few stone walls, a few trees, and enclosures in the Kualakai area on the south shore of Honouliuli (Kelly 1985:160).

Barber's Point, west of the project area, was known to the Hawaiians as Kalaeloa ("the long point"). In 1786, Captain Nathaniel Portlock gave it the name, Point Banks, in honor of Sir Joseph Banks, who was then president of the Royal Society in London, and who had been naturalist on Cook's first voyage to the Pacific (Kelly 1985:165).

Point Banks was later renamed in honor of the unfortunate English Captain, Henry Barber, who lost his ship on the reef

off the Kualakai coast, near the point. There are several versions of the story of Captain Barber. Those below are cited in *Sites of Oahu*:

In October 1795 Captain Henry Barber made one of several trips to Oahu. At this time Kamehameha I was on Oahu and he and Capt Barber became very friendly. When Barber departed he gave Kamehameha gifts. He intended giving him a keg of brandy but after thinking it over decided that to give the heathen king a whole keg of good brandy which he wouldn't appreciate was a great waste. He therefore had the keg half drained and filled up with water and sent this watered brandy to the king. On leaving Oahu he ran aground at Kalaeloa (Oct. 31, 1796) and when the natives saw the ship's plight they swarmed out to it taking everything they could lay their hands on. In the meantime Kamehameha had left for Kona and Barber seeking his help to recover the stolen goods went to Kona to see him. There he was treated cordially and a large feast was prepared. When the awa was passed around Barber was surprised and chagrined to find that his awa cup held nothing but watered awa, thus did Kamehameha remind Barber that he was not a fool. In spite of Barber's treatment of Kamehameha the king sent him back with kapu sticks and orders that the Hawaiians must return all which had been stolen. When the Hawaiians saw that Barber came with authority they immediately returned all that had been taken. - Joseph Emerson, as told to Mrs. Beatrice Greenwell (IN Sterling and Summers 1978).

History recalls that on one of his visits to Hawaii Capt. Barber and his good ship *Arthur* became shipwrecked on a reef near Pearl Harbor. His crew of 22 men were saved, six were drowned. Hawaiian hospitality overwhelmed them and some time was spent here. Later, King Kamehameha salvaged a dozen brass cannon from the wreck of the *Arthur* and mounted them. Capt. Barber arriving unexpectedly two years later, had two kegs of gunpowder for the cannon. A sharp bargain was driven by the Hawaiian king and the swap was made. Barber admitted he was worsted in the transaction. - *Honolulu Advertiser*, Feb. 18, 1939 (ibid.).

At the end of 1802 he sailed for China and again called at Honolulu. He took the opportunity to visit Kamehameha at Lahaina on Maui, and saw that the king had a battery of ten guns placed for the defense

of his palace with its brick walls and glazed windows. Barber learned that these had been recovered from the wreck of the brig *Arthur* near Barber's Point, and he asked the King to return them, but Kamehameha refused. The king's divers had brought the guns up from the bottom with great difficulty and the king had had them for six years. He wouldn't be convinced that the original owner who had left them derelict, had any right to them. Possession was nine parts of the law.

Nor would he listen to Barber's suggestion that his possession of the guns entitled the captain to "the most-favored individual" treatment. He wanted gunpowder that Barber had on the *Unicorn*, however, for his planned expedition against Kauai and Niihau, and refused to exchange provisions for anything but powder. Barber had to accept; Kamehameha got the powder and kept the cannon, and Barber got only the supplies. - Laselle Gilman, *Honolulu Advertiser*, July 2, 1939, Bishop Museum Scrapbook p. 102 (ibid.).

According to another source, Kamehameha's *ha'ole* advisor, John Young, succeeded in convincing the king to return Barber's goods:

Numerous native canoes went back and forth, salvaging the cargo and ship's equipment. John Young interceded with Kamehameha I on behalf of Barber, so that the salvaged materials were returned to him rather than kept by the natives (*The Friend* 1862:43). Since then "the long point", *Ka lae loa*, has been known as Barber's Point (Lewis 1970:7).

Shortly after Western contact, the destruction of Hawaii's sandalwood forests began, as traders attempted to supply an insatiable Chinese market for the fragrant wood. In Honouliuli, sandalwood thrived in the higher elevations in the mixed evergreen forest, and dense stands of sandalwood probably extended down into the plain, to the 300-foot elevation, where it grew in the open grassland with scattered 'ohe (bamboo) and wiliwili trees (Frierson 1972:4-6).

The *ali'i* and *konohiki* had cultivated a taste for exotic wares. They sent their retainers to the forests to harvest sandalwood to trade for the foreign goods they craved. As a result Hawaiians abandoned their taro patches and other means of subsistence. The sandalwood trade reached its peak between 1815-1830. Since the immensely valuable trees were distributed throughout the lower dry ridges of the Waianaes and leeward Koolaus, much of Honouliuli was

heavily harvested. Not only were thousands of trees cut down, but harvesters burned much of the Ewa Plain in order to detect by the odor of the smoke any sandalwood logs they had overlooked (St. John IN Frierson 1972:7).

Nearly one quarter of the entire Ewa District population lived in Honouliuli *ahupua'a* in the 1830s (Schmitt IN Kelly 1978:2). By the count of the 1831-32 missionary census, Honouliuli had a population of 1,026. But the area soon went into decline, probably due to disease brought in by Westerners (ibid.), and the 1835 census counted only 870 residents. Lowell Smith, an early missionary, estimated that in 1835 eight to 10 deaths occurred for every birth in the Ewa District (Ewa Station Report for 1835:8). Kamakau relates that at one time "Honouliuli had over ten school houses with their teachers...Oahu was then thickly populated." After that time "whole villages had vanished leaving not a man" (Kamakau 1961:424-5).

In 1839, E.O. Hall, a member of the mission, recorded his crossing of Honouliuli:

Passing all the villages (after leaving Pearl River) at one or two of which we stopped, we crossed the barren desolate plain, at the termination of which is Barber's Point (Hall IN Kelly 1985:160).

Kamehameha III requested a survey in 1840, and it was recorded that, "There are no chiefs or any persons of distinction residing in the districts; the people are laborers or Kanakas, and the landholders reside near the King at Lahaina, or at Honolulu" (Wilkes IN Lewis 1970).

LAND TENURE

When Kamehameha I conquered Oahu in 1795, he placed his own supporting chiefs as managers over the various districts (*moku-o-loko*), *ahupua'a*, and the sub-district land divisions called *'ili'aina*. From these lands they fed themselves, their families, and their supporters (Kelly 1985:165). It was at this time that Kamehameha installed Kekuamanoha and Kauhiwawaeono at Puuloa (see p.8) (Kamakau 1961:182).

In 1848, during the reign of Kamehameha III, the traditional Hawaiian land ownership system was replaced with a more Western-style system. This radical restructuring was called The Great Mahele (division). The Great Mahele separated and defined the undivided land interests of the King and the high-ranking chiefs, and the *konohiki*, who were originally those in charge of tracts of land on behalf of

the king or a chief (Chinen 1958:vii and Chinen 1961:13). More than 240 of the highest-ranking chiefs and *konohiki* in the kingdom joined Kamehameha III in this division. The first mahele was signed on Jan. 27, 1848 by Kamehameha III and Princess Victoria Kamamalu, and by her guardians Mataio Kekuanaoa and Ione Ii. The last mahele was signed by the King and E. Enoka on March 7, 1848 (Chinen 1958:16).

The mahele did not convey title to any land. The chiefs and *konohiki* were required to present their claims to The Land Commission to receive awards for lands quitclaimed to them by Kamehameha III. They were also required to pay commutations to the government in order to receive royal patents on their awards. Until an award was issued, title remained with the government. The lands awarded to the chiefs and *konohiki* became known as Konohiki Lands. Because there were few surveyors in Hawaii at the time of the Mahele, the lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This expedited the work of the Land Commission and speeded the transfers (Chinen 1961:13).

During this process all land was placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and Konohiki Lands. These were all "subject to the rights of native tenants," (Laws of Hawaii, 1848:22). Native tenants were the common Hawaiian people who lived on the land and worked it for their subsistence. Questions concerning the nature of these rights began to arise as the King, the government, and *konohiki* began selling parcels of land. On December 21, 1849 the Privy Council attempted to clarify the situation by adopting four resolutions intended to protect the rights of native tenants referred to in the 1848 law (Chinen 1958:29).

These resolutions authorized the Land Commission to award fee simple title to all native tenants who occupied and improved any portion of Crown, Government, or Konohiki lands. These awards were to be free of commutation except for house lots located in the districts of Honolulu, Lahaina, and Hilo (ibid.).

Before receiving their awards from the Land Commission, the native tenants were required to prove that they cultivated the land for a living. They were not permitted to acquire wastelands or lands which they cultivated "with the seeming intention of enlarging their lots." Once a claim was confirmed, a survey was required before the Land Commission was authorized to issue any award. These lands became known as "Kuleana Lands" (ibid:30). Until its

dissolution on March 31, 1855, the Land Commission issued thousands of awards to the native tenants for their *kuleana*; even so, less than 30,000 acres of land were awarded to the native tenants as Kuleana Lands.

In 1826, Kawaa was the *konohiki* for Honouliuli (Bingham IN Frierson 1972:9). The Mahele reserved no land there to the Crown or the government, though many other Ewa lands were reserved, including the entire *ahupua'a* of Aiea. Honouliuli's 43,250 acres were confirmed to M. W. Kekauonohi, a high chiefess, great-granddaughter of Kekaulike (King of Maui), and granddaughter of Kamehameha I. It is uncertain whether this award was through her father, Kinau, or her mother, Wahinepio, who was governess of Maui (Frierson 1972:9). Kekauonohi was one of Liholiho's five wives. She later ran off with a Kaahumanu stepson, after which she married Hoapili. He left her a widow, and she married again, this time to Levi Haalelea. Kekauonohi died in 1851 (Board of Commissioners 1929:27-28, 40-44, 50-52, 67-70, 301). Two years before her death, she had sold the 2,300 acre *ahupua'a* of Puuloa to Isaac Montgomery, for \$11,000 (Bureau of Conveyances Book 4:41; Lewis 1970:12). When she died, her widower, Levi Haalelea, inherited the remainder of her lands.

According to Kelley, of the Honouliuli lands, 97 awards totalling 106,524 acres were set aside for people who claimed *kuleana* (Frierson gives a figure of 150 acres [1972:12]). Using Kelly's figure, the average grant size was 1.098 acres, with most of the awards granted in the wet-land taro gardens of Honouliuli, not in the dry plain. In 1863 all of these grants were deeded to Haalelea by their owners in payment of debts to him (Kelley 1985:168).

The only mention of the vegetation there at that time speaks of taro lands in the foothills, and of an "old kukui tree," which was one of the boundary markers between Honouliuli and Hoaeae. This tree was a lone reminder of the former forest, and Kunia Road now runs along the boundary it represented (Frierson 1972:11-12). No Land Commission Awards are listed for the immediate vicinity of the project area (Board of Commissioners 1929), nor are any settlements shown on W.D. Alexander's survey map of 1873. However, Division of Land Management records show that a 3/4-acre parcel at Oneula, being *Apana* 8 of Royal Patent (School) Grant No. 30, was set aside for the Board of Education in 1852. This lot and two others at Kualakai and Waimanalo had been abandoned by the turn of the century. A Territorial Land Court boundary map for Honouliuli, dated 1933-34, locates this parcel in the present Oneula Beach Park (Davis 1979:19).

Kelly (1985:168-9) reports that in 1858, Haalelea sued Montgomery's brother, Daniel, to get back the fishing rights associated with the land of Puuloa (Civil Court Case No. 348). Montgomery based his defense, in part, on the claim that after selling Puuloa, Kekauonohi withdrew her *konohiki* from the area and ceased to maintain any control over that fishery (Law Equity, Admiralty and Probate, 1857-1865:1-29; Reports of a Portion of the Decisions Rendered by the Supreme courts of the Hawaiian Islands.). But the judge ruled that Montgomery had only tenant's rights in the fishing grounds, along with all other tenants of Honouliuli (Civil Court Case No. 248:22-23).

Isaac Montgomery and Kamehameha III entered into a lucrative partnership for the salt works at Puuloa. At first the salt was traded to the other islands (Kamakau 1961:409), but by 1897 they counted local meat packers among their customers, and the Russian settlements in the North Pacific, which used the salt for packing salmon (*Hawaiian Gazette* 29 Jan. 1897). A saltworks was also established at Kualakai in Honouliuli, to the west. The remnants of the structures there were still visible in 1935 (Kelly 1985:169).

When Levi Haalelea died, the property went to his wife, Anadelia Amoe, who in 1871 rented it to James Dowsett and John Meek for grazing stock (Frierson 1972:13). These men introduced grazing in areas too high or dry for agriculture. The seed pods from the *kiawe* trees growing there provided food for the cattle, and *kiawe* wood made excellent charcoal (Henke 1929 IN Frierson 1972).

Amoe deeded Honouliuli to her sister's husband, John H. Coney, who sold it to James Campbell in September 1877, for \$95,000. The deed put the size of Honouliuli at 43,640 acres, "or thereabouts" (Bureau of Conveyances Book 52:210), approximately 400 acres more than Kekauonohi's original award (Kelly 1985:169).

By 1881, Honouliuli was the site of a prosperous ranch that "had 10,000 acres devoted to agriculture, with abundant pasturage of various kinds." Campbell put up fences and chased out the 32,000 head of cattle, owned by other people, that roamed the area (Briggs IN Lewis 1970:13, Dillingham 1885). This was twice the number of cattle estimated for all of Oahu in 1879 (Henke IN Frierson 1972:13). Campbell also granted leases for rice lands, fishing rights at Pearl Harbor, and a lime quarry. In addition, he made a business of fattening and slaughtering cattle from other ranches to supply the Honolulu market (*ibid.*).

Campbell had contracted with John Ashley to drill a well behind his ranch house in Honouliuli in July of 1879, and the result was the first artesian well in the Hawaiian Islands. It flowed until 1939, when it was sealed by the City and County of Honolulu, and all that remains of it is a commemorative plaque on Fort Weaver Road (Pagliaro 1987:2). The success of this well inspired those who understood the link between water and prosperity, and from 1890 into the 1920's, 71 additional wells were drilled, with a capacity of over one hundred million gallons per day (Lewis 1970:14).

THE PLANTATION AND THE RAILROAD

With readily available water, commercial agricultural came to the plains. In 1889, Honouliuli was leased to Dillingham for 50 years, and on January 29, 1890, the Ewa Sugar Plantation Company was chartered. Ewa Plantation soon began operations in the lower portion of the *ahupua'a* (Kelley 1978:3). The first fields were plowed for sugar in 1890 (Lewis 1970:16), and Chinese tenants grew rice in taro fields abandoned by the vanished Hawaiians (Briggs IN Lewis 1970).

It was said that "what had been veritable desert now began to blossom into a full-fledged sugar venture" (Conde and Best 1973:278). Ewa Plantation was at one time said to be the "richest sugar plantation in the world" (*Paradise of the Pacific* Dec. 1902:19-22). Later, Oahu Sugar Company began operations in the upper portion of Honouliuli (Kelly 1978:3).

The plantation operators recognized the agricultural potential of the coral plain. For a few years during the early part of this century, Ewa Plantation undertook a land reclamation project in order to put some of this wasteland into cultivation. They devised a complex system of drainage ditches running from the lower slopes of the Waianae Range to the coral plain. Before the rainy season, the slopes were plowed so as to induce erosion, and when the heavy rains began, great quantities of soil were carried down into the drainage ditches and onto the plain. As much as this practice seems to contradict modern notions of soil conservation, it was considered successful by the men who used it, and in the few years it was tried, about 373 acres of coral wasteland were reclaimed (Immisch 1964:70).

Seeking a greater return on his investment, Campbell collaborated with Dillingham in 1885-1886 on a "great land colonization scheme" for Honouliuli (Thrum 1886:73-80). They proposed to form a development company that would offer small tracts of land for agriculture and homesteads.

They touted 7000 acres of "rich, smooth bottom land lying at the southeastern end of the Waianae mountains," with an "inexhaustible supply of water" (Dillingham 1885). They described the climate as perfectly suited to sugar, rice, grapes and other fruits, but they had almost no takers.

Construction of a railroad by Oahu Railway and Land Company (OR&L) began in 1889, and by 1895 the tracks extended through Honouliuli to Waianae (Figure A-2). On June 19, 1890, *The Pacific Commercial Advertiser* noted, "The first carload of freight to Ewa Plantation went over the OR&L Co.'s line yesterday," and on August 1st, the *Honolulu Advertiser* reported:

On Wednesday last the track of the Ewa Plantation railway was completed to the harbor front, so the first train reached the wharf and several carloads of bananas were placed in scows and put on board the Australia.

To create business for the railroad, Dillingham sublet all the land below 200 ft to William Castle, who sublet again to the Ewa Plantation Company, which planted sugar cane (Frierson 1972:15). Dillingham also established a string of ranches along the proposed line (ibid:16).

There are indications of a spirited legal battle between the plantation and the Oahu Railway & Land Co. over use of the OR&L Co. tracks in the plantation. The 1893 Annual Plantation Report describes the settlement:

The settlement of the dispute with the Oahu Railway & Land Co., as regards the intention of the lease gives the plantation fee use of the Oahu Railway & Land Co.'s track within the boundary of the plantation for plantation purposes for the full term of the lease (Conde & Best 1973:279).

This appeared to benefit both the plantation and the railway. A reporter for the *Louisiana Planter* wrote in 1910:

One of the biggest things about this plantation is its railway system. There are two or three motor cars on the plantation used on the railway tracks; in fact these are indispensable, as it is impossible to get from point to point, between which there is often a distance of several miles, quick enough without them. The general manager's car is two-seated and holds four persons, and in this we made our inspection of the many miles of track and the numerous fields being harvested. This plantation has thirty miles of permanent track rockballasted, and twelve or fifteen miles of portable trackage for



Figure A-2.
OR&L ROUTE

transient field work. On the former, we at times sped along at 35 miles per hour, and almost as easily as in a Pullman. In spite of being able to attain great speed on straight stretches of track, it took us hours to see the whole plantation (ibid:280).

The beginning of the end for the railroad was the dissolution of ties with Oahu Railway and Land Company. The plantation manager's report for 1947 contains this comment: "For over fifty years we have depended upon the reliable and efficient service of the Oahu Railway & Land Co. to transport our sugar, molasses and supplies. We regret it has been necessary for them to terminate this service at the end of 1947" (ibid:315). The last load of sugar cane came in by rail from the fields on November 14, 1950. In an entry under "Harvesting," the Oahu Sugar Company manager noted that by the end of 1951, "transportation of the entire crop from field to factory was done for the first time, the railroad being eliminated" (ibid:316).

SOCIAL CHANGE AT EWA PLANTATION

Management of the immigrant labor force at Ewa Plantation was a complex and challenging job. This is evident in a report made by the first manager for Ewa Plantation Company, W.J. Lowrie:

"There is one thing that probably some of you are not aware of, and that is, that the more scarce labor is, the more independent they are, and the less work they do. I am sure 3 Chinamen at the present rate of wages, \$24.00 per month, are not any more than equal to what 2 Chinamen were two years ago at \$18.00 per month; and if I am correct you can see that Chinese labor for the past season has cost exactly 100% more than two years ago (Ewa Plantation Co. Annual Report 1890:6).

We expect to plant 1000 acres for the next crop, and will require by next July at least 500 more laborers. Our Japanese are doing very well. There were no deaths in 1890, but so far in 1891 we have lost two, quite a number of them are on the sick list, and it is not to be wondered at when we consider how they live. They seem to prefer sending a large portion of their earnings to Japan, rather than buying proper food and keeping in good health. But we are slowly overcoming this difficulty by encouraging them to eat meat, potatoes, etc. All other classes of people on the place appear to keep in good health (ibid.)

In her 1987 historical study of Ewa Plantation, Penny Pagliaro discusses such problems as labor-management relations and health care. She argues that Lowrie's cultural insensitivity was typical of the period (1987:6). She adds that his collected letters do not show him to have been either negative or positive toward specific immigrant groups, except in relation to their willingness to abide by their contract with the company (ibid.).

Lowrie's answer to labor shortages was to try to develop a stable work force by establishing a profit-sharing program for his employees. By 1894, he was able to report the formation of "five new [profit-sharing] companies, with about one hundred acres each. They are giving good satisfaction" (Ewa Plantation Co. Annual Report 1894:12). Ewa Plantation was spared much of the turmoil experienced elsewhere when the contract labor system was abolished in 1900, possibly due to the profit-sharing system. The succeeding manager, George F. Renton Sr., reported:

While laborers came and went in the period of unrest following the termination of the contract system on June 14th last, there was practically no change in the personnel of the Profit Sharing 'Companies'; and...this branch of [the plantation] was not set back in the slightest degree (Ewa Plantation Co. Annual Report 1900:4).

Renton tried to insure that employees thought of Ewa Plantation as their permanent home. In 1918, he explained this to the stockholders:

That in the evolution of things a better housing of our workmen and their families is necessary, and that any reasonable expenditure for their comfort and happiness in any direction will be profitable, is beyond doubt. The main idea being to have the employees look upon the plantations as their homes and not as temporary camps to be left as soon as enough money has been saved to enable them to do so (Ewa Plantation Co. Annual Report 1918:7).

This, Renton believed, was the foundation of a stable and reliable work force (Pagliaro 1987:10). This policy was continued by Renton Jr., who succeeded his father. He recorded that 4,967 persons lived in the various villages on Ewa Plantation lands as of December 31, 1928. Pagliaro notes that Renton's job included many duties normally the responsibility of a city mayor.

Possibly more important to the well-being of plantation residents was Renton Jr.'s crusade for improved health care, especially for infants and children. The infant mortality rate in 1929 reached a shocking 160.7 deaths per thousand. That year, in conjunction with Queen's Hospital, Ewa Plantation opened a small, experimental health center for the purpose of reducing the infant mortality rate. The results were spectacular, and within two years Hawaii Sugar Planters Association had agreed to underwrite a portion of the cost in return for the general dissemination of the results to all plantations (Pagliaro 1987:16).

By 1934, the full impact of the program was apparent:

The Health Center is continuing its commendable work. Daily about 280 babies (approximately 90% of the total) are brought to the Health Center for their food. About 80 children, or a little over one-half of those attending our free Kindergarten, ages 3 to 6 years, are enrolled in our Health Center and thus obtain proper lunches. In the Ewa Public School there are about 1,030 children — ages 6 to 17 years. Of these, 620 are served with lunches at the school, the menus having been approved by the Director of the Health Center, and the other children bring their lunches from home.

The general health of the children is good. With 100 live births this past year, there were but five deaths—three infants died of meningitis, one of beri-beri, and one was prematurely born. This represents an infant mortality rate of 50, which is considered good (Ewa Plantation Co. Annual Report 1934:9).

According to Pagliaro, the Ewa Plantation Health Center project revolutionized the concept of child health care on Island plantations (1987:17).

The next manager, J.D. Bond, recognized individual employees in the annual report for the first time, paying tribute to the contributions of his workers:

You will find a list of names of 592 of you in this booklet. Those of you who are recorded have an unbroken service record at Ewa of at least 10 years. You have invested a part of your lives in this Company and in some slight recognition of this, we include this list in the annual report. At the top of the list, Mr. Joe Fernandez stands alone. Joe will have completed 48 years of continuous service at Ewa in 1939, and I hope will complete many more (Ewa Plantation Co. Annual Report 1938:18).

The Ewa Plantation Company operated until 1947 (Hammatt & Shideler 1989:7). It was sold on April 18, 1970 to Oahu Sugar Co. (American Factors) by Castle and Cooke, Inc. (*Honolulu Star-Bulletin* 1970:A-4).

FIBER CROPS AND COASTAL MARINE RESOURCES

Sugar was not the only crop the planters tried. Fiber plants, henequen and sisal, had been introduced about 1840 for rope production (Franck 1937 IN Frierson 1972). Sisal was planted in the area southeast of Puuokapolei, and on the land now occupied by Barber's Point Naval Air Station. According to the *Pacific Commercial Advertiser* (1894:7) sisal was planted first in 1894 for cordage, resulting in the name "Sisal" for the area southeast of Puuokapolei (Kelly 1978:3; Frierson 1972:11). Successful experiments with sisal in Hawaii led to the organization of the Hawaiian Fibre Company in 1898:

This corporation secured about 300 acres on the coral limestone coastal plain which skirts leeward Oahu, and began planting on a commercial basis. The original investment represented about \$37,000. The land controlled by this company now comprises about 3,000 acres, with a capitalization of \$150,000, and an annual yield of about 500 tons. The company employs about 60 laborers, men and women; at present all are Japanese. The minimum [pay is] \$1.25 per day (U.S. gold); in addition to this, living quarters, land for gardens, water, insurance, fuel, and medical attendance are furnished by the company. This gratuity represents an expenditure of over \$.25 per day per laborer. These wages correspond with those of the sugar and pineapple plantation for the same classes of labor, and strikingly indicate that Hawaii, contrary to popular opinion upon the mainland, does not possess "cheap labor" (MacCaughy and Weinrich 1918:43).

William Castle Jr. describes the sisal fields and their surroundings in Honouliuli in 1913:

From Pearl Harbor the train cuts across the broad cane fields of Ewa Plantation....Beyond, on the barren plains that slope upward to the Waianae Mountains, there are fields of sisal, each plant looking like a rosette of spears protruding from the ground. Through scrub algaroba [Kiawe] forests, where honey bees are raised, the railroad passes (Frierson 1972:17).

In the early 20th Century, fishermen occasionally built shanties by the shore, where they lived as squatters, trading fish for taro at Ewa. Their drinking water, taken from nearby ponds, was so brackish that other people could not drink it. Near Barber's Point there was a pond with freshwater shrimp, which were assumed to have been brought down from inland streams and put there to propagate (Herman Von Holt, interview April 6, 1970 IN Lewis 1970:16).

The following account by Eleanor Williamson of Bishop Museum, whose family lived at Kualakai (see Fig. 1), recalls the abundance of seafood in the area and includes a reference to the sisal which was so common:

In the Honouliuli area the train stopped among the kiawe (algaroba) trees and malina (sisal) thickets. We disembarked with the assorted food bundles and water containers. Some of the Kualaka'i 'ohana met us to help carry the 'ukana (bundles) along a sandstone pathway through the kiawe and malina. The distance to the frame house near the shore seemed long.

When we departed our 'ukana contained fresh lobsters, limu (algae), fish and i'a malo'o (dried fish)....Tutu ma (grandfolks and others) shared and ate the seafoods with great relish (Williamson IN Kelly 1985:160).

By 1920, land use in Honouliuli looked something like this:

Ewa Plantation - 12,000 acres, including sugar cane, a large mill, residential areas for several thousand people, a sisal plantation, large wood-lot at Waimanalo, and a limestone quarry.

Oahu Sugar Co. - 3000 acres, partially in sugar, which was primarily at the lower elevations.

Honouliuli Ranch - 20,000 acres, much of it classified as "waste" because of rocks and gullies; 2000-4000 cattle, plus hogs, horses and mules.

Pineapple, forest, and wasteland occupied the remaining 6000 acres.

HONOULIULI FOREST RESERVE

Much of the pasture land later went into pineapple production, but some higher elevation pasture was included in the Honouliuli Forest Reserve, which was established on

Feb. 2, 1925 (ibid:18). The October-December 1924 issue of the *Hawaiian Forester and Agriculturist* contained a detailed report on the Honouliuli Forest Reserve, which included the following description:

[Honouliuli Forest Reserve consists] of 4,936 acres in the ahupua'a of Honouliuli...[it] is entirely owned by the James Campbell Estate. The land at present is under lease to the Oahu Railway and Land Co. with an unexpired term of about 15 years, and is used in part as a cattle range.

Of the total area of 4,936 acres included in this reserve, 75% is covered with forest, and the heaviest forest is found in the Popouwela section at the north end, where higher elevations and a greater mountain mass induce more moisture. The wet or lehua type of forest naturally occurs near the crest of the range, and occupies 14% of the reserve area. The kukui type is found next below, in which clumps of koa on slopes, and other species already mentioned are frequent. It is of a very open nature, due largely to cattle and other depredations, and occupies 57% of the reserve area. At the south end, partly inside the kukui type, approximately 200 acres, or 4% of the reserve area, are occupied by a planted forest of cypress, eucalyptus, koa, plum, silk oak, sugi, and other species. Areas covered only with brush such as lantana and oi weed, with grass, or entirely bare of vegetation, amount to 25% of the total reserve area.

The ridges at the south end of this section are bare as the result of erosion, and are exposed to drying winds. The native forest of koa on the ridges and kukui in the valleys has been badly depleted in the past by overgrazing, so that practically only half of the area is covered by original forest.

The forest situation in this section has been vastly improved, however, by the artificial planting, done under the direction of Mr. H.M. von Holt during the past 20 years. This has resulted in an excellent forest in places of koa, several different species of eucalyptus, cypress, plum, Japanese cedar, and other sturdy trees.

Although cattle have been kept out of this section for many years past, horses in limited numbers have been allowed on the area without much apparent damage.

Although there are no permanently running streams on the area at present, I feel, as did my predecessor, that it would be best in the long run to begin now the protection and extension of the native forest by the exclusion of cattle and other grazing stock (Judd 1924).

GOVERNMENT OCCUPATION

In 1888, the Hawaiian Government established the Barber's Point Lighthouse, one of the first government structures in the area (Thrum 1889:89). In 1937, United States Government emergency funds were used to construct about 18 miles of road in the Barber's Point area. A map of Ewa Plantation dated July 27, 1939 clearly depicts the United States Army Road running west from the Puuloa Area, paralleling the coast to its termination near Barber's Point Lighthouse (Albert 1980:290).

In late 1939 and early 1940, the United States Navy acquired over 3,500 acres of land from the Campbell Estate, and built the first military installation in Honouliuli, the Ewa Marine Corps Air Station, Barber's Point. The facility remained operational until the current Naval Air Station was commissioned in 1942 (Kelly 1978:3).

World War II accelerated the pace of construction at the Naval Air Station, and it was already being heavily used before its completion on April 15, 1942 (Kelly 1985:175). It was reported that by October 1947 the Station had the largest landing mat in the Pacific, and that takeoffs averaged 1,500 planes daily during World War II (*ibid.*).

During World War II, the military also used the OR&L rail system. In 1944, the plantation manager reported: "We have continued to haul large quantities of ammunition over our railroad tracks and are continuing to supply the Armed Forces with buildings and electricity" (Conde & Best 1973:282). Hammatt notes that the coastline "has clearly been dramatically altered, mostly for coastal defense during the early 1940's. Concrete structures, including antiaircraft emplacements, tank traps, etc. are still visible. Their construction would have involved bulldozing and grading in surrounding areas" (1984:2).

Oneula Beach Park is within the boundaries of the project area. The Oneula Archaeological District contains the last remaining archaeological sites in the vicinity (Flanders 1986). As of September 30, 1986, Site 50-OA-2873 within the Oneula Archaeological District was considered eligible for inclusion on the National Register of Historical Places.

REFERENCES CITED**Albert, R.H.**

- 1980 Appendix III. A Study of the Wartime History of Camp Malakole, 1940-1946 IN Hammat and Folk 1981.

Barrera, W.M.

- 1975 A Report on the Archaeological Reconnaissance Survey of the Proposed Barbers Point Harbor Area. Dept. Anthro., B.P. Bishop Museum. Prepared for United States Army Corps of Engineers, Pacific Ocean Division.

Beckwith, M.

- 1970 *Hawaiian Mythology*. Honolulu: University of Hawaii Press.

Board of Commissioners

- 1929 Indices of Awards Made by the Board of Commissioners to Quiet Land Titles in the Hawaiian Islands. Territory of Hawaii, Honolulu.

Chinen, J.J.

- 1958 *The Great Mahele: Hawaii's Land Division of 1848*. Honolulu: University of Hawaii Press.

- 1961 *Original Land Titles in Hawaii*. Honolulu.

Clark, S. D.

- 1979 Archaeological Reconnaissance Survey for Barber's Point Beach Park Improvements, Ewa, Oahu (TMK:9-1-26:27). Kualoa Archaeological Research Project. Prepared for City and County of Honolulu, Dept. of Parks and Recreation.

Conde, J.C. and G.M. Best

- 1973 *Sugar Trains*. Felton, California: Glenwood Publishers.

Davis, B. D.

- 1979 Progress Report on Emergency Excavations at Barbers Point, O'ahu: First Quarter (January-March), 1979. Dept. Anthro., University of Hawaii.

- 1979 Progress Report on Emergency Excavations at Barbers Point, O'ahu: Second Quarter (April-June), 1979. Dept. Anthro., University of Hawaii.

- 1979 Progress Report on Emergency Excavations at Barbers Point, O'ahu: Third Quarter (July-August), 1979. Dept. Anthro., University of Hawaii.

- 1979 Report on Archaeological Survey of the Proposed Ewa-Marina Community Development, Ewa Beach, Oahu Island. Hawaii Marine Research, Inc.

Dillingham, B.

- 1885 IN Frierson 1972.

(The) Estate of James Campbell

1978 *James Campbell, Esq.* Honolulu: The Estate of James Campbell.

Flanders, E.A.

(Letter dated 20 March 1986 from Everette A. Flanders, Chief, Constructions-Operations Division of the Army, Ft. Shafter to the Keeper of the National Register)

Frierson, B.

1972 A Study of Land Use and Vegetation Change: Honouliuli, 1790-1925. Term Paper, Geography 750, University of Hawaii.

Hammatt, H.H.

1984 Reconnaissance and Evaluation of Archaeological Sites in the Proposed Ewa Marina Community, Ewa, Oahu, Hawaii. Cultural Surveys Hawaii.

Hammatt, H.H. and W.H. Folk

1981 Archaeological and Paleontological Investigation at Kalaeloa (Barber's Point), Honouliuli, 'Ewa, O'ahu, Federal Study Areas 1a and 1b, and State of Hawaii Optional Area 1. Archaeological Research Center Hawaii, Inc. Prepared for United States Army Corps of Engineers (United States Army Engineer District, Honolulu) and State of Hawaii Department of Transportation Harbors Division Contract DACW84-79-C-0010. Report No. 14-115.

Hammatt, H.H. and D. Shideler

1989 An Archaeological and Paleontological Assessment of Proposed Ewa Marina; Phase II Lands at Honouliuli, Ewa, O'ahu. Cultural Surveys Hawaii. Prepared for Belt Collins and Assoc.

Immisch, G.B.

1964 Land Reclamation and the Role of the Hydroseparator at Ewa Plantation: A Case Study of Some of the Effects of Mechanized Harvesting in the Hawaiian Sugar Industry. M.A. Thesis, University of Hawaii.

Jarrett, L.H.

1930 A Sourcebook in Hawaiian Geography. M.A. Thesis, University of Hawaii.

Judd, C.S.

1924 Report on Honouliuli Forest Reserve. *The Hawaiian Forester and Agriculturist*. Advertiser Publishing Co., Ltd., Honolulu.

Kamakau, S. M.

1961 *Ruling Chiefs of Hawaii*. Honolulu: The Kamehameha Schools Press.

1964 *Ka Po'i Kahiko*. B.P. Bishop Museum Special Publication 51. B.P. Bishop Museum Press.

Kelly, M.

- 1978 Archaeological & Historical Information re: Ewa Beach, Oahu (TMK:9-1-12:1,2,5-8, 10-16, 9-1-11:1-7). HMR Report IN Ewa Beach Marina EIS.
- 1985 Appendix A: Notes on the History of Honouliuli IN An Archaeological Survey of the Naval Air Station, Barber's Point, O'ahu, Hawai'i. A.E. Haun, Project Director. Dept. Anthro., B.P. Bishop Museum. Prepared for Commander, Pacific Division Naval Facilities Engineering Command, Pearl Harbor, Hawai'i 96860. Contract No. N62742-84-R-0075.

Lewis, E.

- 1970 Appendix C: The Campbell Project: A Preliminary Report IN W. Barrera 1975.

MacCaughey, V. and W. Weinrich

- 1918 Sisal in the Hawaiian Islands. *Hawaiian Forestry and Agriculture*.

McAllister, J.G.

- 1933 Archaeology of Oahu. *B.P. Bishop Museum Bulletin*. 104. B.P._Bishop Museum Press, Honolulu.

Pagliaro, P.

- 1987 Ewa Plantation: An Historical Survey 1890 to 1940. Ms. Historic Preservation Program, University of Hawaii.

Pukui, M.K.

- 1943 *Ke Awa Lao o Pu'uloa*. *Hawaiian Historical Society 52nd Annual Report*.

Pukui, M. K., S.H. Elbert and E.T. Mookini

- 1974 *Place Names of Hawaii*. Honolulu: University of Hawaii Press.

Sterling, E.P. and C.C. Summers

- 1962 *Sites of Oahu*. Book 6, Vol. 1. Honolulu: B.P. Bishop Museum Press.
- 1978 *Sites of Oahu*. Honolulu: B.P. Bishop Museum Press.

Thrum, T.G.

- 1878 IN Lewis 1970.
- 1886 IN Frierson 1972.
- 1889 IN Lewis 1970.
- 1907 Heiau and Heiau Sites Throughout the Hawaiian Islands. *The Hawaiian Annual*, Honolulu.

Vancouver, G.

- 1798 IN Lewis 1970; Davis 1979.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

