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November 29, 2001

Environmental Office

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact (FONSI) and Final Environmental Assessment (EA) for Ukumehame Conservation and Landscape Management Plan (TMK: 4-8-02: 47, Lahaina, Maui, Hawaii)

Please find enclosed a completed Office of Environmental Quality Control Publication form and four copies of the final Environmental Assessment. The Hawaii Army National Guard reviewed and responded to the comments received during the 30-day public comment period beginning on April 23, 2001. We determined that this project will not have significant environmental effects and we are issuing a Finding of No Significant Impact (FONSI). Please publish this notice in the December 8, 2001, OEQC Environmental Notice.

Thank you for your help in finalizing the public review process for this project that will restore important ecosystems. If there are any questions, please contact Melissa Dumaran, Natural Resource Manager, at 733-4267.

Sincerely,

Richard Young
Colonel, Engineer, Hawaii
Army National Guard
Facility Management Officer

Enclosures

167

2001-12-08-MA-FEA

Final Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range Lahaina, Maui

Prepared for

The Hawaii Army National Guard
State of Hawaii

Prepared by

Pacific Environmental and
Information Technologies, LLC

December 2001

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List of Acronyms

CLMMP	Conservation and Landscape Management Master Plan
DEA	Draft Environmental Assessment
DOH	Department of Health
FONSI	Finding of No Significant Impact
HARNG	Hawaii Army National Guard
HRS	Hawaii Revised Statutes
NRCS	Natural Resource Conservation Service
USDA	United States Department of Agriculture
YES	Youth for Environmental Service

Executive Summary

Proposing Agency: Hawaii Army National Guard
Accepting Agency: Hawaii Army National Guard
TMK: 4-8-02: 47
Anticipated Determination: Finding of No Significant Impact (FONSI)

The Hawaii Army National Guard (HIARNG) proposes to implement a Conservation and Landscape Management Master Plan (CLMMP) for its portion of the Ukumehame Firing Range. The firing range is located on Maui's southwest shore at the foot of the West Maui Mountains. Land use near the range is primarily industrial, with active sugar cane cultivation to the west and the Maui County portion of the firing range to the east. Ukumehame Beach Park is located to the south across Honoapiilani Highway. The project site is approximately 8 miles south from the nearest population center of Lahaina.

The rifle range is a 39-acre irregularly shaped parcel used for both .45-caliber pistol firing and 600-meter long distance target practice. The pistol range consists of a small area on the north corner of the property. The 600-meter range extends the length of the eastern portion of the property. The northwest portion of the property is open and not used for firing exercises. The 600-meter range has not been used for firing exercises during most of the last decade. The firing range has two locations designated for parking and staging of equipment - one near the .45 caliber range on the northwest quarter of the property and the other at the southern boundary of the property. The .45-caliber range is accessed along an existing road, while the 600-meter range is accessed along an existing footpath.

Conditions at the rifle range are generally arid – although runoff from periodic storm events inundates the low-lying sections of the range. The rifle range is sparsely vegetated by exotic shrubs and groundcover, with large portions of the range devoid of vegetation. No endangered plants exist in the project area.

This project is proposed to address two existing problems at the site. First, the exposed surfaces of the range present a potential erosion hazard. Without adequate vegetation both wind and periodic storm events cause erosion. The introduction of vegetation will reduce the potential for wind or water borne movement of surface materials. Second, a substantial portion of the site was identified as a wetland during a wetland delineation performed by the Natural Resources Conservation Service, US Department of Agriculture. The endangered native Hawaiian Stilt (*Himantopus mexicanus knudseni*) has been observed in the wetland. The project is intended to introduce native wetland species to the wetland areas, and to create an active management regime for oversight of these areas.

Two alternatives are considered for this project: the No Action Alternative and site re-vegetation. Under the no action alternative, the site will remain in its present condition. The proposed site re-vegetation alternative involves the phased implementation of a

Conservation and Landscape Management Master Plan. Key portions of the master plan include:

1. **Conservation and Landscape Management**: Exotic species will be incrementally removed from the firing range just prior to the introduction of native plants. Re-vegetation of the entire site will be performed in phases. The plant material will be selected based upon its suitability for use in the varying environments found on the site. The pace of planting activity will be based on the success of previous planting activity. The time horizon for the project is currently estimated at five to seven years.

2. **Well and Irrigation Development**: HIARNG proposes to develop a shallow well as the source of irrigation water at the site. The estimated average daily use of water from the well is 12,500 gallons per day. Irrigation will be performed via a drip system using temporary mobile storage bladders. Plants that become established will receive less water as they mature and acclimate to the conditions of the site.

3. **Long-term Maintenance, Monitoring, and Education**: The project will be monitored by the staff of HIARNG for its effectiveness in introducing native flora to the landscape. HIARNG will photograph the site to document progress. For the community outreach portion of the project, Youth for Environmental Service will be recruited to assist in the planting and maintenance of the native plants introduced to the site. As the vegetation establishes itself, HIARNG intends to post interpretive signage to describe the plants and their ecosystem.

This project will bring localized benefits to Ukumehame on Maui through the enhancement of the character of the HIRANG firing range. Due to the localized nature of the activity and the scale of the endeavor, it is determined that the project will not have a significant impact on the environment. The evidence contained in this document supports the recommendation for a Finding of No Significant Impact (FONSI).

1.0 Introduction

The Ukumehame Firing Range (TMK: 4-8-02: 47) on Maui is comprised of the Hawaii Army National Guard (HIARNG) and County of Maui small-arms firing ranges. The Ukumehame Firing Range was developed in the late 1980s by the County of Maui, the State of Hawaii, and HIARNG. The HIARNG and County of Maui firing ranges are managed and operated as separate facilities.

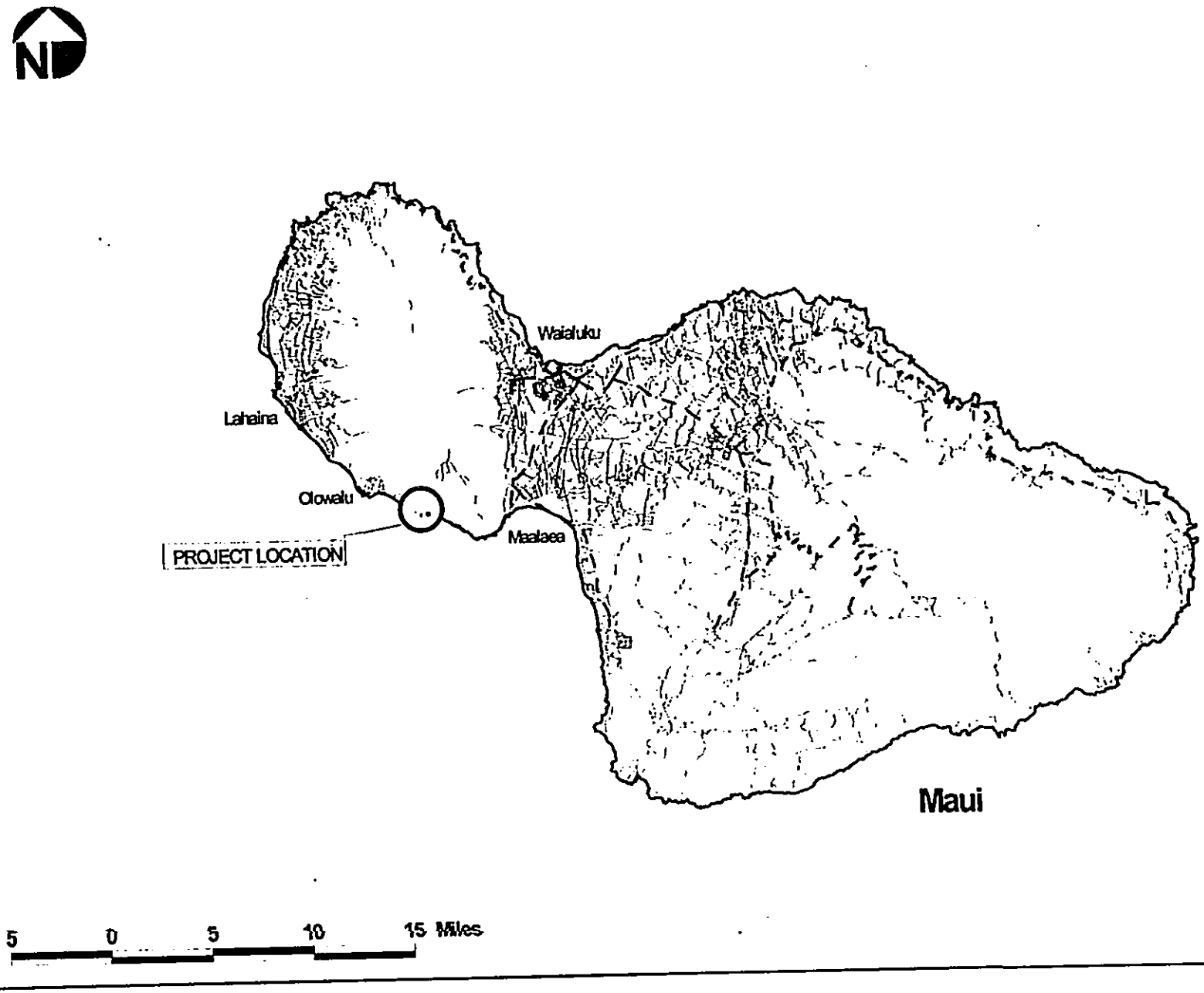
The development of the range facilities at Ukumehame resulted in changes to the landscape that in turn created the need for management and planning. The removal of the existing vegetation in the 1980s exposed the parcel in question to potential erosion inducing conditions. As part of its oversight of the HIARNG range, HIARNG is required to plan and implement erosion control measures. The removal of vegetation also established an intermittent wetland where endangered species have been sighted. HIARNG is responsible for maintaining the rifle range in a manner consistent with federal mandates for the protection of the endangered species that frequent the site.

HIARNG proposes to improve the existing environmental conditions on its portion of the Ukumehame Firing Range by implementing a Conservation and Landscape Management Master Plan (CLMMP) in three phases. The plan is designed to incrementally enhance the existing wetland and native vegetation, improve water bird habitat, reduce soil erosion, and improve overall facility land management. This plan is intended to provide a basis for natural resource management, and does not involve any engineering changes to the physical character of the site. The proposed plan is for the HIARNG facility and does not involve the County of Maui Firing Range. (For the purposes of this document and related permit applications, the term "Ukumehame Firing Range" (Range) will refer to the HIARNG facility exclusive of the County of Maui facility.)

This Final Environmental Assessment (FEA) was prepared pursuant to the U.S. Department of Army Regulation AR-200, Chapter 343, Hawaii Revised Statues (HRS), Act 50 Relating to Cultural Impact Assessments, and State of Hawaii, Department of Health Administrative Rules 11-200. This FEA is mandated under Chapter 343 HRS because (1) the proposed action uses State of Hawaii lands ((§343-5(a)(1)) and (2) because the proposed action will occur on lands classified as conservation district by Chapter 205, HRS (§343-5(a)(2)).

1.1 Project Location

The Ukumehame Firing Range is located in the watershed of Ukumehame on the southwest side of Maui (Figure 1.1). The range is approximately 8 miles southeast of Lahaina on the northern side of Honoapiilani Highway (Figure 1.2). Former agricultural lands border the facility to the west. The County of Maui firing range facility is immediately adjacent to the east. The foothills of the West Maui Forest Reserve form the northern border of the property (Figure 1.3).



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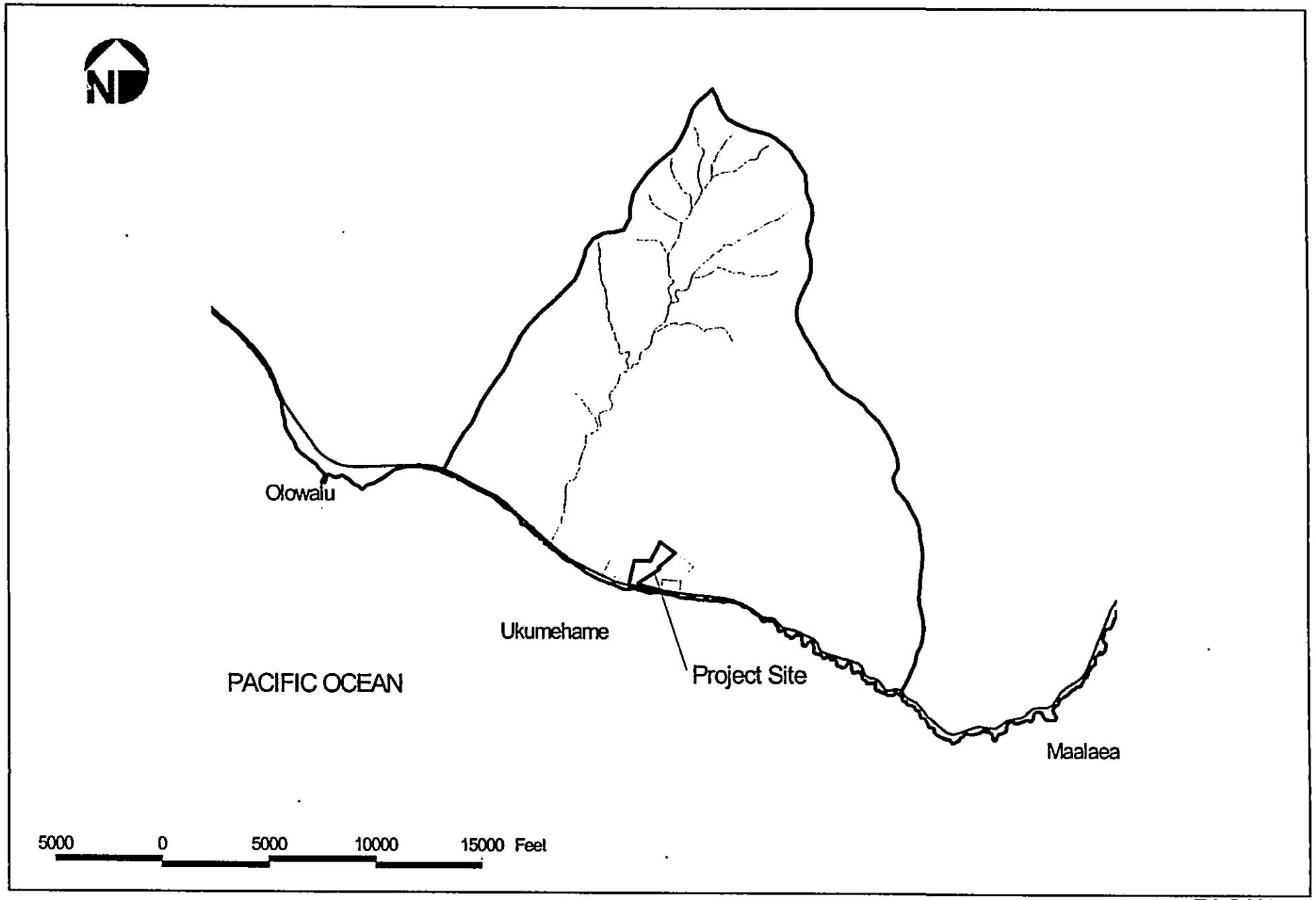
HIARNG Ukumehame Firing Range Environmental Assessment Location Map

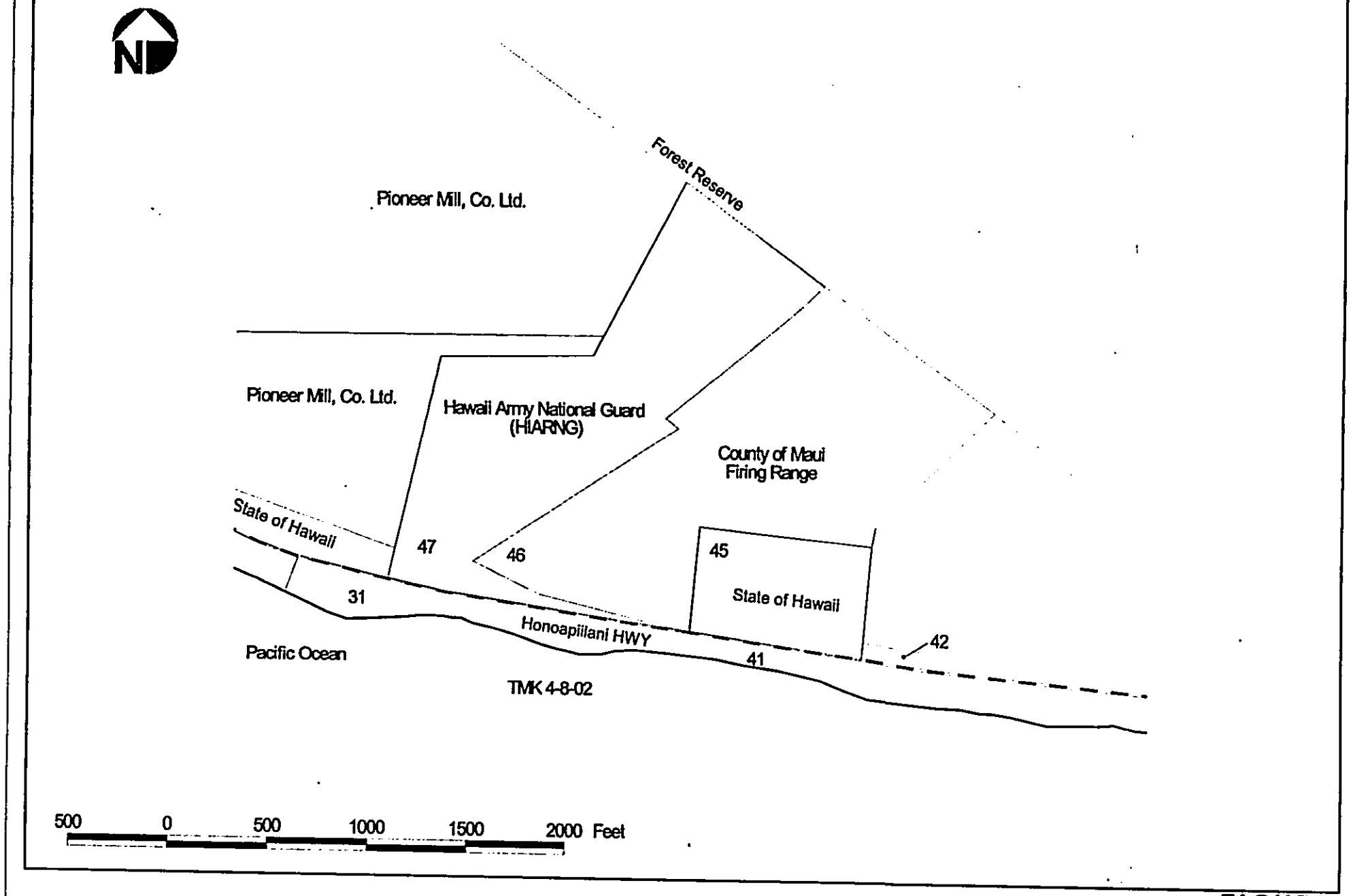
FIGURE 1.1



Pacific Environmental and Information Technologies, LLC

HIARNG Ukumehame Firing Range Environmental Assessment Project Area

FIGURE 1.2



Pacific Environmental and Information Technologies, LLC

HIARNG Ukumehame Firing Range Environmental Assessment Site Map/TMK Map

FIGURE 1.3

1.1.1 Operations at the Ukumehame Firing Range

HIARNG designed and developed the Ukumehame Firing Range to provide certified 600-Meter and .45 Caliber training ranges to local military personnel. The facility is used throughout the year for a variety of tasks, with training scheduled according to the need of HIARNG units. The 600-meter range has not been used for live firing exercises during the last decade.

Vehicles and equipment are parked at two facility staging areas during training operations. Portable restroom facilities are located at both staging areas.

1.2 Required Permits And Reviews

The actions proposed in this document require compliance with several State of Hawaii, County of Maui, and federal government permitting requirements. Required permits and reviews include:

State of Hawaii

- Commission on Water Resources Management (CWRM) Well Permit

Federal Government

- Endangered Species Act, Section 7 Consultation
- National Historic Preservation Act, Section 106 Consultation

1.3 Prior Regulatory Compliance Activities

A Conservation District Use Application (CDUP) and an Environmental Assessment (EA) were prepared for the initial development of the firing range. The planning activities covered the development of the Ukumehame Firing Range, which was apportioned between HIARNG and Maui County. The CDUP was issued on July 11, 1986 and the Final EA (FEA) was accepted in October of 1985. The FEA, as cited below, is incorporated by reference in this document.

> *Environmental Impact Assessment for Ukumehame Firing Range,* Ukumehame, Lahaina, Maui, Hawaii. Prepared for the County of Maui, State of Hawaii. October 1985. R.T. Tanaka Engineers, Inc.

A second EA was prepared in 1996 by the Natural Resources Conservation Service (NRCS). This document was prepared for the proposed landscaping of the HIARNG portion of the Ukumehame Firing Range. The EA was never submitted to the Office of Environmental Quality Control, and thus never formally reviewed through the Environmental Assessment process as prescribed in Chapter 343, HRS. The EA, in draft form, received limited review from its dissemination to both State of Hawaii and Maui

County agencies. Comments and letters received in response to the 1996 EA are incorporated by reference in this document.

1.4 Proposed Determination

The purpose of an environmental assessment is to determine if a project may have a significant impact on the environment, as defined U.S. Department of Army Regulation AR-200, and Chapter 343, Hawaii Revised Statues (HRS). In the case where significant impacts occur further scrutiny is warranted through the preparation of an Environmental Impact Statement.

The proposed action was reviewed and analyzed pursuant to U.S. Department of the Army Regulation AR-200 and Chapter 343, HRS. Through the analysis the project was found to bring localized benefits to the area through the improved natural resource management of the HIARNG facility. It is anticipated that the proposed action will not have a significant effect on the environment, and that a Finding of No Significant Impact (FONSI) is warranted.

2.0 Purpose and Need for the Proposed Action

The purpose of the proposed action is to improve the condition of conservation practices and landscape management at the Ukumehame Firing Range. Benefits from the proposed action include the removal of noxious plant species, the planting of native plant species, and the enhancement of wetland areas. Benefits also include continuing management of the natural resources at the firing range. Management consists of monitoring and documenting the growth of native plants, continued removal of noxious plant species, and removal of pests such as rats.

The actions proposed in this Conservation and Landscape Management Master Plan (CLMMP) are needed for the reasons outlined below:

1. **Reduction of erosion hazard:** The Ukumehame Firing Range currently receives little routine maintenance. Consequently, much of the facility is devoid of vegetation, with the remainder covered by exotic plant species. The lack of vegetative cover creates the risk of water and wind borne erosion. During the summer months, when the Ukumehame climate is arid, the hardpan and dry earth are exposed to tradewind conditions. During the winter, at times of increased precipitation, portions of the facility become inundated, with drainage of excess water flowing to the ocean through culverts under Honoapiilani Highway. Both factors, the wind and water, have the potential to transport surface sediment and other loose material to near-shore ocean waters.

2. **Enhancement of wetlands for use by endangered native waterbirds:** A wetland delineation conducted by the U.S. Department of Agriculture, Natural Resources Conservation Service in April 1998 (Appendix A) established the presence of a wetland at the firing range. Approximately two-thirds of the area within the 600-Meter Firing Range and a significant area of the western portion of the facility were found to be seasonal wetlands. The frequent sightings of the endangered Hawaiian Stilt (*Himantopus mexicanus knudseni*) and other avian wildlife have been attributed to the wetland conditions in the area. Introduction of native wetland plant species and active management and pest control will improve the habitat for endangered waterbirds that frequent Ukumehame.

3.0 Project Description

This chapter includes a description of the proposed project's technical, social, economic, and environmental characteristics pursuant to Department of the Army Regulation 200-2 (AR-200-2), Chapter 343, Hawaii Revised Statutes (HRS), and the State Department of Health Title 11-200-10 rules for the environmental assessment process.

3.1 Proposed Action

The Hawaii Army National Guard (HIARNG) proposes to improve the existing environmental conditions at the Ukumehame Firing Range on Maui by implementing a Conservation and Landscape Management Master Plan (CLMMP). The project will enhance the existing wetland, reduce soil erosion, reduce fugitive dust, and improve overall facility land management. The project involves the planting and cultivation of native plant species in wetland and upland areas, control of alien plant species, control of pest animal species, and development of a low-yield well. The project also will create valuable habitat for both native and non-native water birds, specifically the endangered Hawaiian Stilt. The project will not alter land uses. Figure 3.1 shows the location of various components of the proposed Conservation and Landscape Management Master Plan.

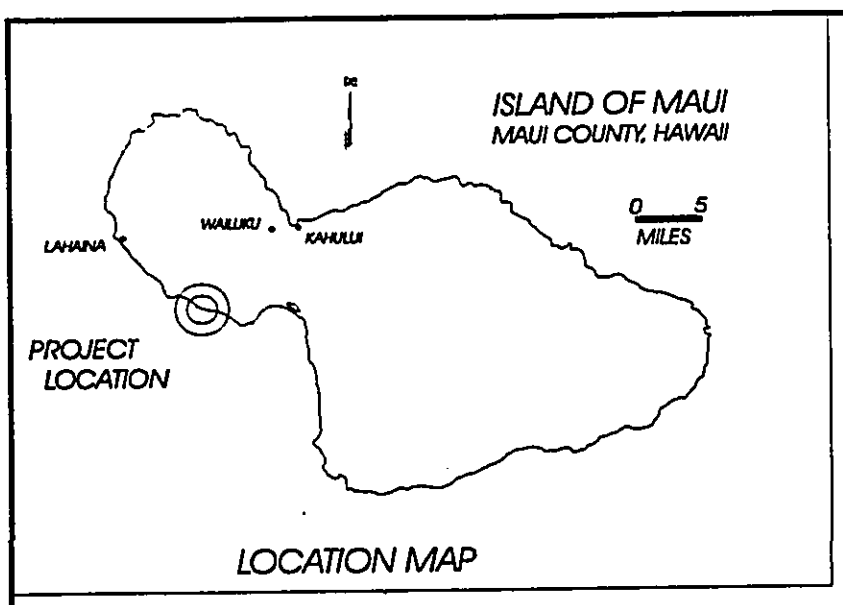
The project consists of the following three (3) components:
1) Landscaping actions
2) Well development
3) Long-term maintenance, monitoring, and education

The following sections include a brief description of the existing conditions and operational requirements of the facility and describe the proposed conservation and landscape management activities.

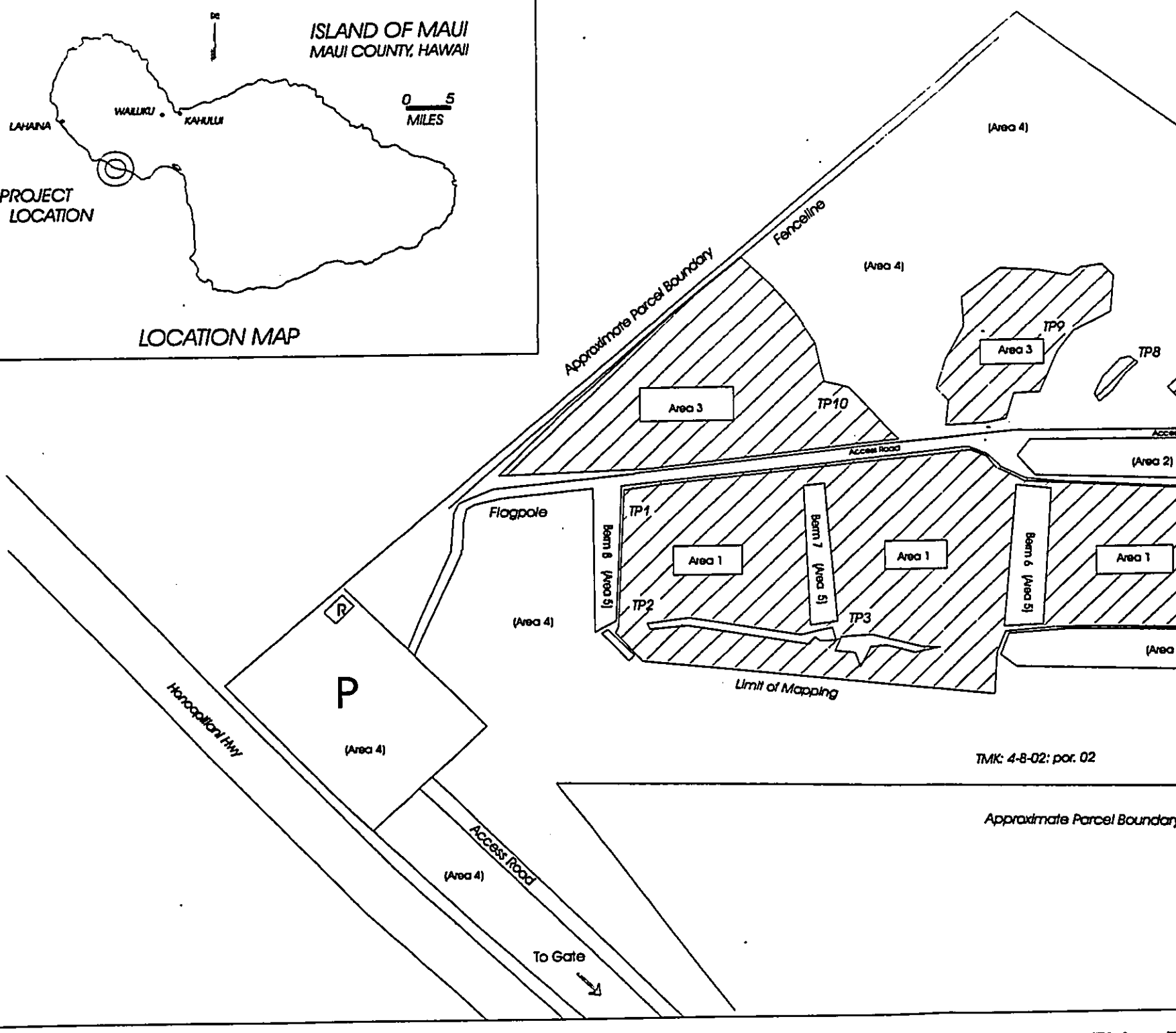
3.1.1 Conservation and Landscaping Management

Conservation and landscaping actions at the facility will focus on enhancing the wetland and upland environments by planting native species and eliminating alien pest species. These actions will improve native vegetative cover and reduce erosion at the facility. Plants used in the conservation and landscaping project will be obtained from local Maui nurseries with experience in native and endangered species propagation.

Following the wetland delineation, the facility was divided into five (5) area categories for revegetation and landscaping. Each area will be landscaped and maintained with



LOCATION MAP



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HIARNG Ukumehame Firing R
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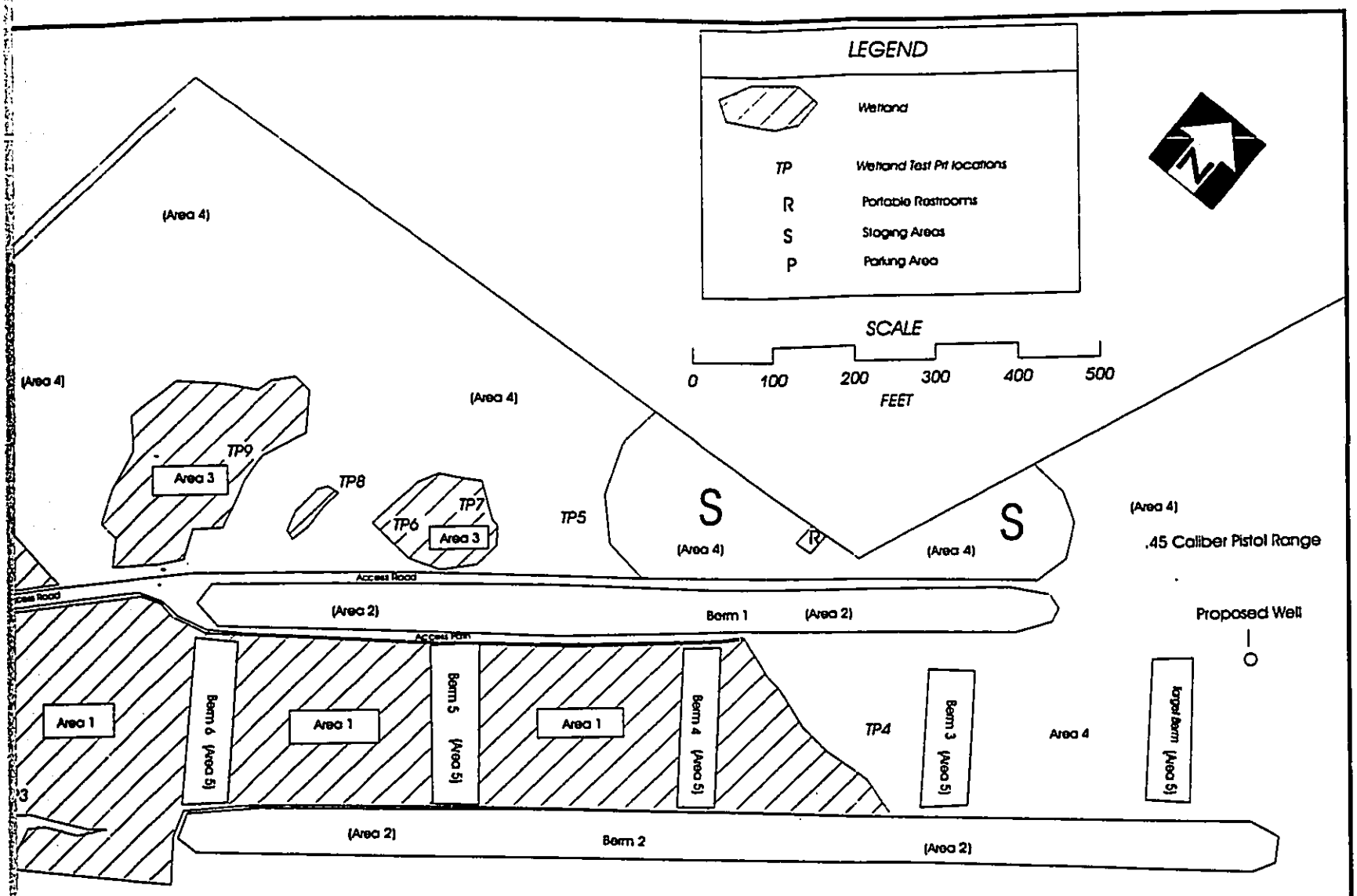


ARNG Ukumehame Firing Range
Environmental Assessment
nservation and Landscape Plan

FIGURE
3.1

different vegetation and amounts of irrigation depending on their specific requirements. The locations of these areas are indicated on Figure 3.1.

Area 1 This area is composed of seasonally flooded wetlands lying between Berms 3 and 8 on the 600-Meter Range. Plant species in the area include the salt tolerant faculative wetland plants *Atriplex semibacata* and *Helitropium indica.*

The area will be planted with a low-growing, native wetland herbaceous *Sesvium portulucastrum.* Irrigation will be installed along Berms 1 and 2 to provide water for the shrubs during the dry summer months. Alien, non-wetland species will be removed from this area using hand tools. No filling or grading will occur in this area.

This area will be densely covered with vegetation to discourage grubbing and nesting of the endangered Hawaiian stilt in the firing zone. Other areas will be managed to promote Hawaiian stilt grubbing.

Area 2 This area is composed of the two main containment berms (Berm 1 and Berm 2) on the 600-Meter Firing Range. The berms will be covered with natural geo-textile matting to increase soil stability, reduce erosion, and promote plant growth. The tops of Berms 1 and 2 will be planted with a *Scaevola sericea* hedge to reduce wind flow in the area. The sides of the Berms will be planted with a mosaic of *Heliotopum anomalum, Sida fallax, Osteomeles anthyllidifolia, Dodonea viscosa, Ipomea pescaprae, Vitex rotundifolia, Wikstromea sp., Chamecyse celastroides,* and *Lipochaeta sp.*

Area 3 This area is comprised of a series of smaller wetlands west of the 600-Meter Firing Range that extend in some portions to the property boundary. This area will be left mostly in its current state, with targeted planting of selected vegetation. The mud flats located in Area 3 will be preserved as foraging sites for wetland bird species.

Area 4 Area 4 is comprised of the upland dry areas that do not contain wetland soils, plants, or hydrologic characteristics. These areas are located in various portions of the facility including the parking and staging areas, the area behind firing Berm 8, the .45 Caliber Firing Range, and along the western boundary of the facility. In the western portion of the facility these upland areas surround existing wetlands included in Area 3.

The upland/dry areas near the .45 Caliber Firing Range and the staging area will be planted with *Hibiscus brackenridgii, Gossypium tomentosum, Erythrina sandwicensis, Pritchardia sp.,* and *Myoporum sandwicense.*

This area, currently composed *of Presopis pallida, Leucena leucocephaela*, and other weeds, has upland (non-wetland) soil types.

The forested area located between the highway and the 600-Meter Firing Range also has upland soil types and non-native vegetation. This area will be maintained as a natural forested landscape in order to provide a realistic training scenario directly in front of the firing range. Landscaping will include similar species to those used at the mauka staging area.

A silt fence will be installed along the western boundary of the facility to reduce erosion. The silt fence will act as a barrier to keep on site soils from moving toward the ocean through the irrigation ditch and storm drains located on the western and southern borders of the facility.

Area 5 This area includes the firing berms (Berms 3-8) within the 600-Meter Firing Range. These upland areas will be landscaped with salt tolerant akiaki grass *(Sporobolious virginicus)*.

Prior to the initiation of landscaping activities, soils in the various areas will be tested for their ability to sustain the various plant species. Areas found with high salinity will be targeted for planting of salt tolerant varieties.

3.1.2 Well and Irrigation Development

Seasonal rainfall variations at Ukumehame require that irrigation be provided for landscaped areas. A well with a maximum capacity of 100,000 gallons per day (gpd) will be developed on the southeast portion of the facility adjacent to the target berm at the 600-Meter Firing Range. The well water will be used to irrigate landscaped plants throughout the facility with a drip irrigation system and a temporary bladder storage units (Figure 3.1).

The objective of the irrigation system plan is to maintain ground cover and landscaping through the dry season. Wetland species planted within the 600-Meter Range will be supplied water on a year-round basis, as needed. The average amount of water pumped for irrigation will be approximately 12,500 gallons per day, or 375,000 gallons per month. Water supplied in this system will not be for human consumption. Potable water is brought to the facility during training exercises.

3.1.3 Long-term Maintenance, Monitoring, and Education

The implementation of the landscaping and conservation plan will be phased over a five-year period. Areas within the facility will be incrementally cleared of alien plant species and planted in native cover. The irrigation system will be used to maintain native

wetland plant species and reduce erosion during the summer months. Wetland areas within Area 3 will be maintained as mudflats for stilt foraging habitat.

Volunteers from the Youth for Environmental Service (YES) and HIARNG staff will implement the landscaping plan and maintain the area. No mechanized equipment or grading will occur in the areas delineated as wetlands. Staff will use hand-augers to prepare the area surfaces for planting. Composting material and peat will be added to upland areas as needed.

A pest management program will be developed and implemented by USDA Development Services under contract to HIARNG. Integrated pest management techniques will be used to manage invasive insect and plant populations. Feral pest animals, including rats and cats, will be trapped and removed from the facility in order to protect endangered waterbirds.

All landscaped areas will be monitored to gauge progress by HIARNG. Time-lapse photography and maintenance logs will be used to track vegetation growth. Irrigation regimes will be altered for individual areas according to monitoring results.

Interpretative signs of the wetlands and flora will be posted throughout the facility. These will be updated and maintained by HIARNG staff. As the landscaping project is implemented local schools will be invited to participate in maintaining the facility and enhancing the existing wetlands and upland environments.

4.0 Environmental Setting, Potential Impacts, and Proposed Mitigation Measures

Department of the Army regulations (AR-200-5-4) and State of Hawaii Department of Health (DOH) regulations (Title 11-200-10) for Chapter 343, HRS contain requirements for the content of an environmental assessment (EA). The regulations require an EA to contain a description of the affected environmental conditions of the proposed project area, a description of any potential short and long-term direct and cumulative impacts of the proposed project for the affected area, and a summary of proposed mitigation measures. This analysis includes, but is not limited to, the biological, historical, structural, cultural, socio-economic, topographic, climatic, and geologic conditions of the area.

The following sections include descriptions of the natural and built environmental conditions at the Ukumehame Firing Range, potential impacts of the proposed action, and proposed mitigation measures.

4.1 Land Use and Ownership

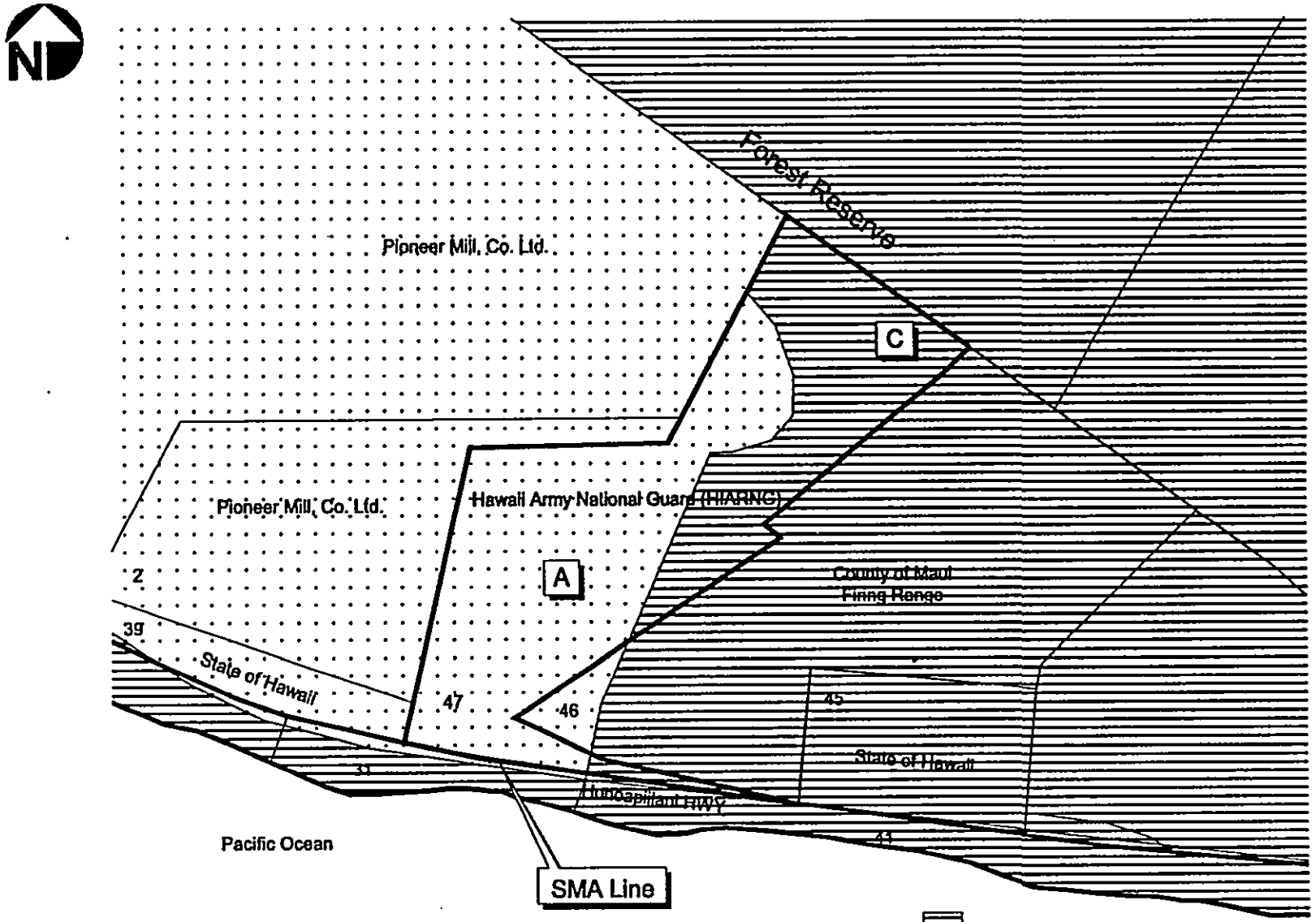
4.1.1 Existing Environment

The Ukumehame Firing Range (TMK: 4-8-02: 47) is located approximately eight miles southeast of Lahaina immediately mauka of Honoapiilani Highway. See Figures 1.1, 1.2, 1.3 for Location, Project Area, and Site Maps.

The Ukumehame Firing Range is owned by the State of Hawaii and leased to the Hawaii Army National Guard (HIARNG) for small-arms training. HIARNG maintains a 600-meter qualifying rifle range and a .45 caliber pistol range on the property. Prior to the development of the firing range in the late 1980s, the area was intensively cultivated in sugar cane.

Former agricultural lands and a small parcel of state land border the facility to the west, where sugar cane cultivation was present. The County of Maui Firing Range is located immediately to the east. The foothills of the West Maui Forest Reserve form the mauka border of the property. Ukumehame Beach Park, a site used for fishing, surfing, and snorkeling, is located to the south across Honoapiilani Highway.

Land use at the Ukumehame Firing Range is governed by state and county land use laws. The project site is located in the State of Hawaii Conservation and Agricultural Land Use Districts. The site, at its southernmost reach, is not located in the County of Maui Special Management Area (Figure 4.1). Activities in the Conservation District require that a permit be obtained from the State of Hawaii, Department of Land and Natural Resources.



Pacific Environmental and Information Technologies, LLC

HIARNG Ukumehame Firing Range
Environmental Assessment
Land Use Zones

FIGURE
4.1

4.1.2 Project Impacts

The proposed project will not alter land uses of the HIARNG property nor the neighboring lands. The property will continue to be used as a range for training exercises. The existing Conservation District Use Permit will be amended with the State of Hawaii Department of Land and Natural Resources.

4.1.3 Mitigation Measures

No mitigation measures are proposed in relation to land use. All activity in the project area will be performed in accordance with the land use laws and regulations governing.

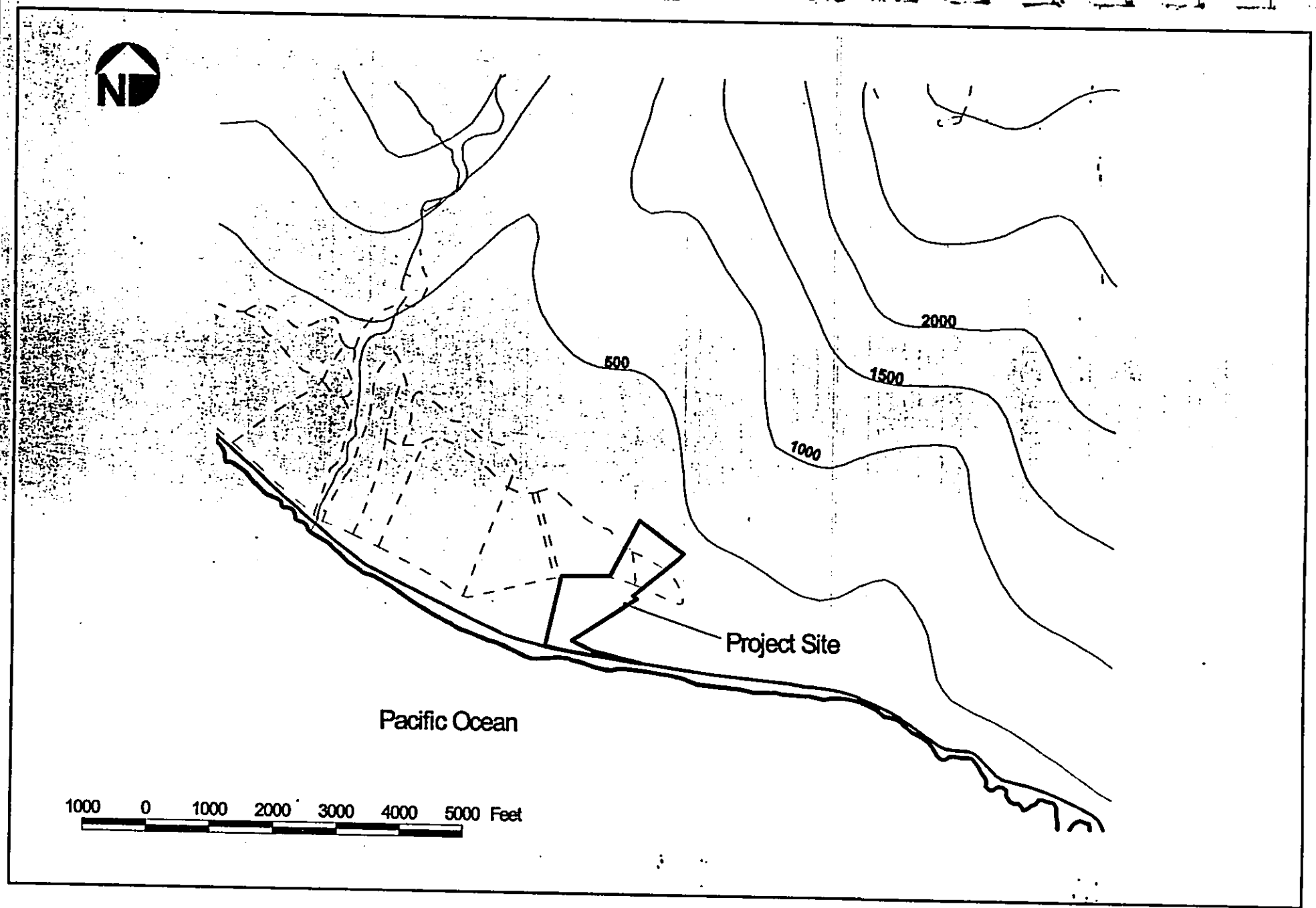
4.2 Topography and Climate

4.2.1 Existing Environment

The Ukumehame Firing Range is located on an alluvial coastal plain south of the Iao Cliff and Valley physiographic division (Department of Geography 1983). The rifle range is nearly level in relief, with elevation of the site being close to sea level (Figure 4.2). The West Maui Mountains to the immediate north of the rifle range rise steeply to the peak of Hana`ula, which is approximately 4600 feet in height.

Climate at the Ukumehame Firing Range is generally hot and dry. The average rainfall in the area is between 20-30 inches annually. Mean annual temperatures on Maui vary between 72 and 75 degrees Fahrenheit. The closest temperature tracking station to the site is located in Lahaina. Temperatures in Lahaina range between 70 and 90 degrees Fahrenheit in the summer months (June through September) and 60 to 80 degrees in the winter months (October through May) (Department of Geography 1983).

Wind conditions at the rifle range result from cyclical annual tradewind patterns and the wind shadow effect caused by the West Maui Mountains located to the immediate north of the rifle range. During the summer months the tradewinds are typically stronger and more consistent throughout the Hawaiian Islands, with speeds between 15 and 25 miles per hour. During the winter, the tradewinds may decrease in intensity or disappear altogether, being replaced by southerly winds or wind generated by local temperature variations. The average wind speed at the rifle range is approximately 15 miles per hour from the northeast (Department of Geography 1983).



Pacific Environmental and Information Technologies, LLC

HIARNG Ukumehame Firing Range Environmental Assessment Topography

FIGURE 4.2

4.2.2 Project Impacts

Implementation of the proposed project will not have an impact to climatic or topographic conditions at the rifle range.

4.2.3 Mitigation Measures

No mitigation measures are proposed in relation to project effects on climate and topography.

4.3 Soils and Surface Hydrology

4.3.1 Existing Environment

The Ukumehame Firing Range soils consist primarily of two types as identified by the Soil Conservation Service, United States Department of Agriculture (USDA) (1972). Figure 4.3 shows Kealia Silt Loam (KMW) covering the southern portion of the project area, with a slight coverage in the north. Pulehu Clay Loam (PsA) is shown in the north of the project area. At the northern project boundary is Rock Land (rRK), which is not affected by proposed landscaping activities.

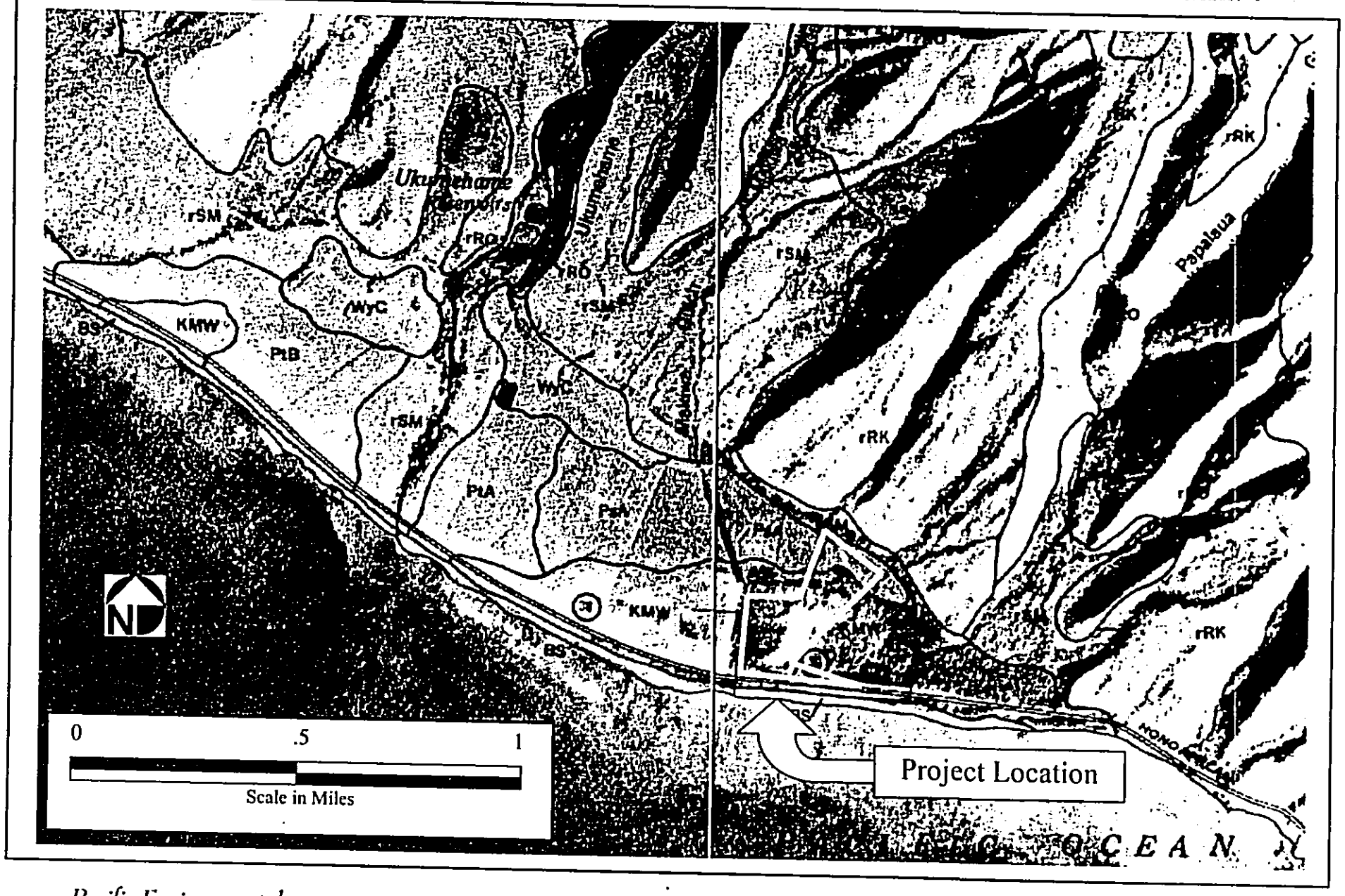
Kealia Silt Loam is moderately to rapidly permeable; runoff is slow. The resulting erosion hazard from water is slight. The wind erosion hazard is severe during arid conditions.

Pulehu Clay Loam is moderately permeable; runoff is slow. The resulting erosion hazard is slight.

Surface hydrology at the firing range is a result of the steep dissected slopes of the West Maui Mountains and the relatively flat topography of the site. The firing range is situated at the foot of a watershed bounded by the Hanaula and Papaula gulches. Runoff from the watershed and from localized sources is channeled toward the firing range where it collects and then flows to the ocean via concrete culverts. Water draining from the Papaula Gulch does not affect the firing range (R. T. Tanaka Engineers, Inc. 1985b).

4.3.2 Project Impacts

Portions of the rifle range currently lack vegetative cover. This exposure increases the risk of both wind and water induced erosion to nears-shore waters. The risk of water induced erosion to near-shore waters, although slight according to the USDA soil survey, is elevated by the proximity of the watershed directly to the north and the culverts draining to the ocean directly south.



Pacific Environmental And Information Technologies, LLC

HIARNG Ukumehame Firing Range Environmental Assessment Soils Map

FIGURE 4.3

The primary objective of the proposed project is to provide vegetative coverage for the rifle range, as indicated in the project description (Chapter 3). All areas not used for parking facilities or accessways (roads and paths) will be planted with an appropriate type of vegetation. This will reduce soil exposure, and the hazard of wind and water induced erosion.

4.3.3 Mitigation Measures

No mitigation measures are proposed in relation to potential project effects on soil conditions or surface hydrology.

4.4 Geology, Subsurface Hydrology, and Water Resources

4.4.1 Existing Environment

The Ukumehame Firing Range is located on an alluvial plain extending from the southern flank of the West Maui Mountains. The West Maui Mountains were formed by Pleistocene aged eruptions consisting of Lahaina, Honolua, and Wailuku Series basalts. The tholeiitic basalts underlying the firing range alluvium are from Wailuku Series eruptions that occurred approximately 1.3 million years ago (Stearns 1967).

Subsurface hydrology is described by a method developed by Mink and Lau (1990). They classify subsurface hydrology based upon a hierarchy that moves from general description to specific detail. Based upon this hierarchy a specific Aquifer Code is assigned that identifies hydrologic location, hydrology, and geology. The project area is located in the Ukumehame System (Aquifer Code 60206) of the Lahaina Sector, and is described as follows (Mink and Lau 1990: 17):

Characteristic	Description
Boundary	Olowalu to Lahiana-Wailuku District line in Manawainui Gulch and on to `Iao Valley.
Hydrology	Volcanic aquifers that include unconfined basal, confined basal, unconfined high-level diked, and unconfined high level perched.
Alluvial Aquifers	Coastal plain sediments.
Environment	Some sugar cane, mostly forest reserves.

Characteristic	Description
Geology	Wailuku basalt intruded by Honolua Series; Honolua Dikes and Vents; main Wailuku rift zone at the valley head with a westerly trend; coastal plain caprock forming weak caprock; old alluvium in valleys.
Groundwater Occurrence	High-level groundwater starts two miles inland and is found chiefly in dike aquifers. The escape of basal groundwater at the coast is somewhat impeded by a sedimentary caprock wedge about one-half mile wide. All of the exploitable groundwater saturates Wailuku basalt.

The aquifer system from which the proposed action will draw water currently has a sustainable yield of 6 million gallons per day. One tunnel is currently active in the Ukumehame System - Ukumehame-Pump P. This tunnel is used for irrigation, has a maximum chloride level of 500 parts per million, and has a stated capacity of approximately 4.7 million gallons of water a day.

There are various identified distinct hydrogeologic units within the Ukumehame System. These units are assigned characteristics used to determine the condition of the aquifer resource. The hydrogeologic unit upon which the firing range is located is characterized by Mink and Lau as follows:

Category	Description
Development Stage	Not currently used, but potential use
Utility	Drinking water
Salinity	Low (250-1000 mg/l Cl^-)
Uniqueness	Replaceable
Vulnerability to Contamination	High

4.4.2 Project Impacts

The proposed project is expected to occur in phases over an extended period of time, and will therefore draw water from the well at a gradual but increasing rate. At full site development, the average daily usage of water will be approximately 12,500 gallons. The water will be stored in temporary storage bladders located around the site and distributed through the irrigation system.

4.4.3 Cumulative Impacts

Pioneer Mill currently had a potential draw of 4.7 million gallons per day from the Ukumehame System. The proposed action will increase this draw by a maximum amount of 12,500 gallons per day. The increase in withdrawal from the aquifer will be negligible when added cumulatively to the maximum

withdrawal capacity. The withdrawal of 12,500 additional gallons will result in less than one half of one percent increase in total potential demand from the aquifer.

4.4.4 Mitigation Measures

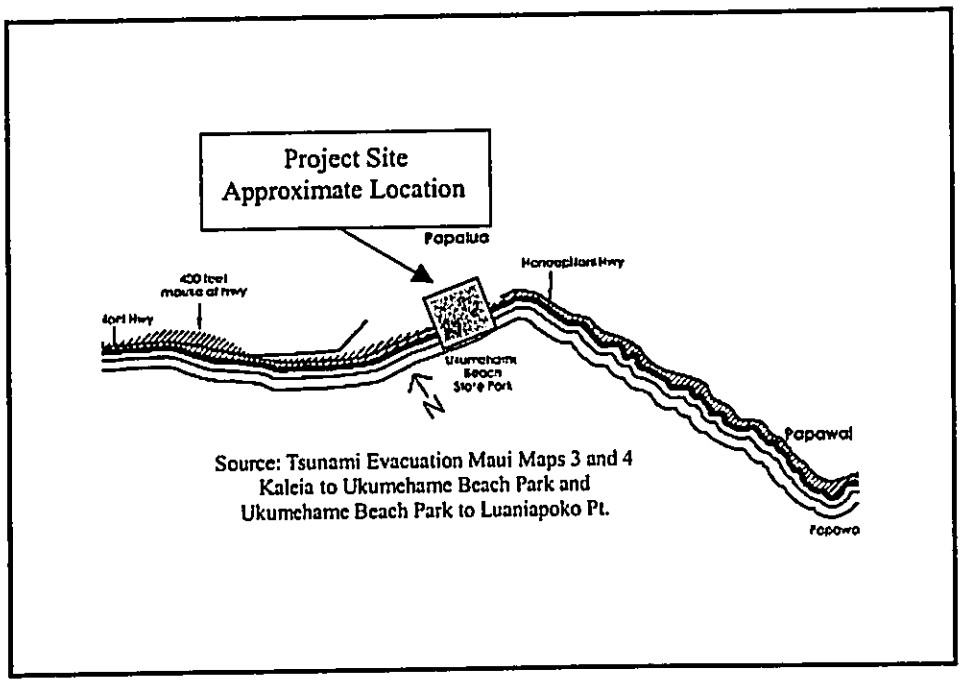
As a means to minimize the demand for water, the vegetation will be irrigated with a drip system. The drip irrigation system will supply water directly to the plants, reducing water consumption and loss. As the plants mature, irrigation will be reduced where appropriate.

4.5 Natural Hazards

4.5.1 Existing Environment

Natural hazards potentially affecting the Ukumehame Firing Range are hurricanes, tsunamis, and flood events. Hurricanes are most likely to pass near the Hawaiian Islands during hurricane season between June and November. Hurricanes are characterized by sustained winds of greater than 74 miles per hour, heavy rainfall, storm surge, flooding, and high surf. Although hurricanes are potentially destructive, they rarely occur near Hawaii. In the past 50 years fewer than ten hurricanes have caused major damage to islands in the Hawaiian archipelago (www.pdc.org).

Figure 4.4
Tsunami Inundation Zone
Ukumehame, Maui, Hawaii

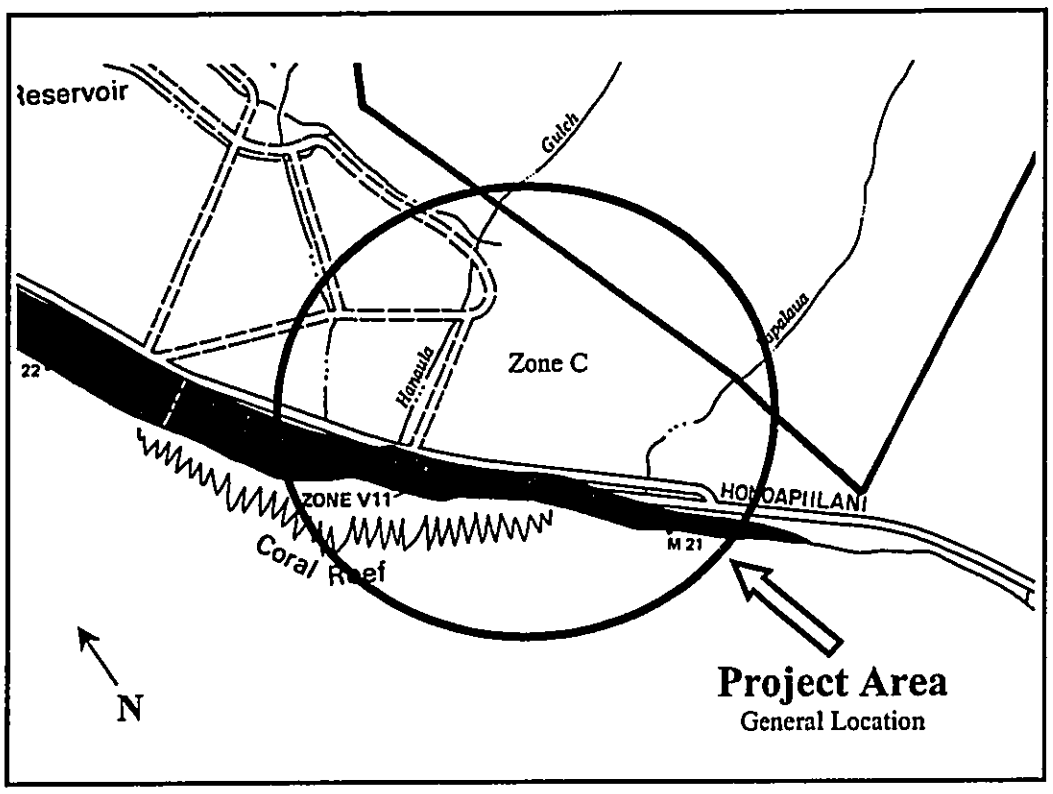


Source: Tsunami Evacuation Maui Maps 3 and 4
Kaleia to Ukumehame Beach Park and
Ukumehame Beach Park to Luaniapoko Pt.

A tsunami is a series of waves characterized by extremely long periods and wavelengths. A tsunami is generated by a large-scale displacement of ocean water, with the most prominent causes being underwater earthquakes and landslides. Tsunamis coming to the Hawaiian Islands are generally the result of earthquakes in the northern and eastern Pacific Ocean. Five tsunamis have reached the shores of the Hawaiian Islands (1946, 1952, 1957, 1960, and 1975) (www.pdc.org). The southern border of the rifle range is in or adjacent to the tsunami inundation zone as shown in Figure 4.4.

The flood hazard at the site is determined by Flood Insurance Rate Maps published by the Federal Emergency Management Agency. The rifle range, according to Figure 4.5, is located primarily in flood hazard Zone C. This zone is characterized by minimal flooding. The southernmost flank of the property is located in Zone V-11, which is subject to 100-year coastal flood events with wave action.

Figure 4.5
Flood Zone Designations
Ukumehame, Maui, Hawaii



4.5.2 Project Impacts

It is anticipated that the proposed project will not affect conditions related to any identified natural hazards.

4.5.3 Mitigation Measures

No mitigation measures are proposed in relation to project effects on natural hazards.

4.6 Traffic and Transportation

4.6.1 Existing Environment

Access to the firing range is from the south where the HIARNG property abuts Honoapiilani Highway. The access road to and from the HIARNG range is shared with the adjoining County of Maui firing range located to the east. Honoapiilani Highway is the main arterial connecting the resort areas of Kaanapali and Lahaina to the commercial and industrial centers of Wailuku and Kahului.

The Department of Transportation, Highways Division, performs vehicular traffic counts for Honoapiilani Highway on a biannual basis (Department of Transportation 1995). The traffic survey is conducted along the highway between the town of Lahaina and the firing range. The average daily traffic counts for the last available five survey periods are given in Table 4-1.

Table 4-1
Average Daily Traffic Counts

Year	Average Daily Traffic Count
1987	19,550
1989	19,893
1991	21,117
1993	19,232
1995	22,610

4.6.2 Project Impacts

Short-term impacts will involve the transport of plant materials, fertilizers, irrigation equipment, and assorted tools. The grubbing and grading of the parking areas is expected to involve heavy equipment for a short duration. Well drilling activity is expected to involve a single well drilling rig. The sum of these activities is expected to create little disruption to the normal flow of traffic on the Honoapiilani Highway.

Long-term impacts due to traffic generated by the landscape plan are expected to be insignificant. The maintenance of the site is expected to generate less than one trip per day on average.

4.6.3 Mitigation Measures

Any activities with the potential to disrupt the traffic flow on Honoapiilani Highway will be minimized. Equipment offloading and staging will take place away from the highway.

4.7 Cultural Resources

A cultural resources impact assessment was completed for the proposed project including an archaeological survey (conducted at the Ukumehame Firing Range in November 1997-included as Appendix B) and local area consultation with cultural practioners. The following is a discussion of cultural issues related to the project and a summary of the information contained in Appendix B.

4.7.1 Affected Environment

The project area is located within the Ahupua`a of *Ukumehame and is a portion of* Government (Crown) lands (Sinoto 1997). It is not located in nor contains any kuleana or Land Court Awards. (Sinoto 1997). Sinoto (1997) surmised that the lands were most probably used as settlement areas related to marine resource exploitation and some agricultural activities.

In the 1870s the Olowalu Sugar Company planted the area in sugar. The vicinity, including the project area, was taken over by Pioneer Mill in the 1930s (Sinoto 1997). In the mid-1990s the parcels adjacent to the firing range were sold by Pioneer Mill to a local group of investors. Parcels neighboring the project area are no longer in sugar cane cultivation. Some diversified agriculture takes place adjacent to the project area on former Pioneer Mill land. One family with historical roots to the area continues to farm the former sugar cane land with approximately 800 Noni trees planted adjacent to the firing range.

No archaeological sites were identified in the project area. The fieldwork conducted during the archaeological assessment showed that the whole extent of the area was disturbed with the advent of sugar cultivation (Sinoto 1997). The closest known historical sites are two heiau on either side of the Ukumehame Gulch about .75 miles northwest of the project area.

4.7.2 Project Impacts

State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) staff confirmed that the project area previously was graded and/or grubbed during an inspection in 1995 (Sinoto 1997). Based on this inspection, it was determined that the proposed project would have "no effect" on historic sites. A letter from the State Historic Preservation Office, Department of Land and Natural Resources further confirmed this finding in response to an EA initiated by the Natural Resource Service, US Department of Agriculture in 1996 (Appendix C).

Furthermore, as after discussions with local residents and practioners it is determined that the project will not have an impact on cultural resources or practices found in the vicinity of the project area. The Noni tree farm, the closest resource, will not be affected by the proposed project.

4.7.3 Mitigation Measures

No mitigation measures are proposed. If any historic sites or archaeological features are identified during the course of the proposed project work will stop and the SHPD will be notified.

4.8 Wetlands and Floral Resources

A botanical assessment of the project area was completed in November 1992 by Char and Associates. A wetland delineation was completed by the Natural Resources Conservation Service (NRCS), Hawaii Army National Guard (HIARNG), and Oceanic Companies, Inc. in March 1998. The Botanical Assessment is included as Appendix D. The Wetland Delineation Report is included as Appendix A. The two reports are summarized below.

4.8.1 Existing Environment

The Ukumehame Firing Range previously was graded and heavily disturbed during both its initial development for sugar cane cultivation, and subsequent transformation to a firing range facility. Consequently, vegetation on the property is scarce and consists mainly of grasses and herbaceous species (Char 1992, NRCS 1998). The vegetation consists primarily of alien species, with few natives present. None of the plants found on the project area are listed as threatened or endangered, nor are any plants considered rare or vulnerable (Char 1992).

The wetland delineation performed by the NRCS in 1998 used the US Army Corps of Engineers "Routine Method" for the field investigation. The "Routine Method" identifies potential wetlands based upon three factors: vegetation type, soil type, and area hydrology.

The investigation identified a significant portion of the site as wetland (for a more detailed description see Chapter 3). The wetland covers the central and northwest portion of the firing range, with three small wetland areas to the north. Vegetation found on the wetland areas was primarily herbaceous, consisting of *Atriplex semibacca, Chloris inflata, Heliotropium indicum,* and *Pluchea indica.*

4.8.2 Project Impacts

The primary goal of the project is the reintroduction of native vegetation to the rifle range. As detailed in Chapter 3, the rifle range will be planted with

vegetation appropriate to the soil conditions and the requirements of military training. The dry areas will be incrementally converted to native dry forest. The berm areas will be planted with low growing native shrubs and ground cover. The use of shrubs and ground cover minimizes ricochet hazard during firing exercises. The wetlands will be planted with native low growing herbaceous vegetation accustomed to seasonal variation in precipitation. There is no proposed filling of any wetlands.

4.8.3 Mitigation Measures

Due to the degraded state of the vegetation at the site, no mitigation measures are proposed. Most clearing work at the site, particularly in the wetland areas, will be performed with hand tools under the supervision of a trained botanical specialist. If, during clearing or planting activities on site, threatened or endangered species are identified, work will be halted until the appropriate actions have been taken to protect the plant or plant community.

4.9 Avifaunal and Terrestrial Mammal Resources

4.9.1 Existing Environment

The Ukumehame Firing Range has been the subject of several avian surveys by the US Fish and Wildlife Service (FWS). The two most recent surveys were conducted on November 25, 1996 (Young 1996) and April 12, 1997 (Harper 1997). The avian surveys were undertaken to document the presence of federally endangered Hawaiian stilts (*Himantopus mexicanus knudeni*) and Hawaiian coots (*Fulica alai*). Both species are protected under the Federal Endangered Species Act of 1973.

The 1996 FWS survey counted between 20 and 30 Hawaiian stilts. According to the survey (Young 1996) the birds were not observed on the HIARNG facility. They were observed behind the adjacent civilian firing range. The 1997 FWS survey documented 23 birds on site - 22 Hawaiian stilts and one Hawaiian coot. Of the 22 stilts, 13 were adults with the remaining subadults.

Terrestrial mammals on site consist of introduced species such as mongoose, rats, and mice (R. T. Tanaka Engineers, Inc. 1985).

4.9.2 Project Impacts

One of the objectives of the proposed project is habitat revitalization for native wetland birds that have been observed near the rifle range. This objective will be achieved through the planting of appropriate species in the wetland areas, maintenance of seasonal mud flats, and the active management of pest species at the range such as rats and mongoose.

The Draft Revised Recovery Plan for Hawaiian Waterbirds, Second Edition (1999: 14-15) published by the U.S. Fish and Wildlife Service describes the habitat requirements for both the Hawaiian coot and Hawaiian stilt. The Hawaiian coot prefers freshwater wetlands and taro patches, although it frequents reservoirs and brackish waters. Feeding normally takes place in water less than 30 centimeters, with a mix of dense emergent vegetation and open water preferred for nesting. The Hawaiian coot loafs on logs, vegetation rafts, narrow dikes, mud bars, artificial islands, as well as open bodies of water.

The Hawaiian stilt requires habitat with low growing vegetation, successional marshlands with water depths of less than 24 cm., or tidal flats. The stilt has been found to feed in shallow water that is fresh, brackish, or saline. Nesting sites are generally located on small islands found within fresh, brackish, or saline water. Loafing areas are generally open mudflats or open pasture.

Two wetland areas identified during the wetland delineation (Area 1 and Area 3 - refer to Figure 3.1) will be targeted for habitat improvement. The improvements will benefit both birds, but will favor the Hawaiian stilt. The rifle range is generally flat without any large water bodies, which the Hawaiian coot prefers. The seasonal mud flats and wetland areas found at the Ukumehame Firing Range appear to be an ideal setting for the Hawaiian stilt.

Improvements to the wetland areas will primarily consist of removing noxious weeds from Area 1 and planting the low growing native wetland species *Sesvium portulacastrum*. Area 3 will be targeted for selective planting, but will remain mostly in its present condition as an open landscape that provides mud flats during winter months.

4.9.3 Mitigation Measures

The proposed project is intended to provide the appropriate habitat conditions for native birds frequenting the firing range. This will be done by vegetating Area 1 with the appropriate wetland species, and maintaining Area 3 as an exposed seasonal mudflat. The task of vegetating the site will be accomplished with the assistance of the Natural Resource Conservation Service, and in consultation with US Army Corps of Engineers and the US Fish and Wildlife Service.

Pest management is essential in developing a wetland area that is suitable for use by endangered bird species. HIARNG will contract USDA Development Services for a pest management program aimed at reducing threats to the birds that visit the site. Feral pest animals, including rats and cats, will be trapped and removed from the facility.

HIARNG, in a consultation with the US Fish and Wildlife Service, received a biological opinion under Section 7 of the Endangered Species Act of 1973

regarding the use of pest management activities at the firing range (Appendix E). The biological opinion concluded that:

> After reviewing the current status of the Hawaiian stilt and Hawaiian coot, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that predator control at HIARNG's Ukumehame Firing Range is not likely to jeopardize the continued existence of the Hawaiian stilt or Hawaiian coot (Fish and Wildlife Service November 2000: 7).

4.10 Noise and Air Quality

4.10.1 Existing Environment

Noise: The Ukumehame Firing Range is located in an industrial setting that includes sugar cane cultivation, and rifle and pistol firing activities. The HIARNG firing range is used primarily for training exercises, which involve the discharge of .45 cal. and .9 mm munitions (the rifle range where 5.56 mm and 7.62 mm rounds are fired is not currently used). Adjoining the HIARNG facility is the County of Maui Firing Range, which is used for training Maui County public safety personnel. Firing activity from these two ranges comprise the major source of noise affecting the area.

Air Quality: Presently no significant industrial airborne emissions occur on the firing range. Air quality on the site is occasionally affected by fugitive dust that results from gusty winds blowing across exposed dirt and soil surfaces.

4.10.2 Project Impacts

Noise: Noise will be generated during well development and installation. During the remainder of the project the generation of noise above ambient levels is not expected. Power hand tools may be used during vegetation removal at the site that may create short-term noise impacts. However, the tools will be used during the day and will not exceed State of Hawaii noise thresholds.

Air Quality: The principle sources of air emissions associated with the proposed action will be fugitive dust from vehicular movement on-site, and the removal of vegetation. Some fugitive dust emissions are anticipated during the drilling of the well and the planting of vegetation. Effects are expected to be short-term.

4.10.3 Mitigation Measures

Noise: No mitigation measures are proposed due to the industrial nature of the area, and the minimal use of heavy equipment. The closest potentially affected

population is located across Honoapiilani Highway at Ukumehame Beach Park. Noise from activities on the range is not expected to affect users of this beach.

Air Quality: In order to eliminate the potential release of fugitive dust, a water truck will be maintained on site during construction and landscaping activity. Over the long term, the landscaping of the rifle range will serve to reduce fugitive dust generated by activities, such as training, that occur at the site.

4.11 Solid Waste

4.11.1 Existing Environment

HIARNG training activities are the currently the only potential source of solid waste at the site. Since the site has not been used for training during the past decade, no waste has been generated at Ukumehame Rifle Range. The wastes that are generated during training activities are from weapons use and the provision of meals during training. Wastes generated during training are policed at the termination of activities and removed from the site. Portable sanitary facilities are provided for the duration of training. Waste management operations are managed through the HIARNG Solid Waste Management Plan.

4.11.2 Project Impacts

Wastes generated during both the development cycle of the project and long-term maintenance will consist primarily of biogenic materials. The materials will come from removal of weeds and other unwanted vegetation.

4.11.3 Mitigation Measures

Solid wastes generated by all HIARNG activities must be handled as specified in the HIARNG Solid Waste Management Plan. Wastes generated from landscaping activities, in the short term, will come from the removal of noxious plant species. Where possible, these plants will be mulched and used as compost at a later time. Similarly, biogenic wastes generated by landscape maintenance over the long-term will be composted. Any wastes generated otherwise (such as unusable tubing from the drip irrigation system) will be disposed of properly in accordance with the HIARNG Solid Waste Management Plan.

4.12 Hazardous Wastes and Materials

4.12.1 Existing Environment

Hazardous wastes are not generated or stored at the rifle range. Potentially hazardous materials in the form of rifle and pistol ammunition are stored on site during training exercises. These are removed at the termination of each training activity.

4.12.2 Project Impacts

The landscaping of the rifle range will involve little or no use of hazardous substances. The clearing and planting of vegetation will be performed chiefly by manual methods, with targeted use of chemical herbicides and pesticides.

4.12.3 Mitigation Measures

Herbicides and pesticides will be used as part of an integrated pest management system. Management of vegetation will include both mechanical and chemical means, as the situation warrants. Similarly, pesticides will be employed in conjunction with manual methods of pest eradication. HIARNG is currently in a formal Endangered Species Act Section 7 consultation with the US Fish and Wildlife Service. The consultation is being undertaken so that HIARNG can deploy weed and pest management practices consistent with federal requirements for protecting endangered water birds that frequent the site.

4.13 Socio-Economic Characteristics

4.13.1 Existing Environment

Administratively, the rifle range is located in the southeast corner of the Lahaina District on the Island of Maui. According to the 1997 Hawaii Data Book the resident population of Maui is 100,374, with the Lahaina District having a population of 14,574 residents. The nearest commercial or residential activities are located approximately three miles away along the Honoapiilani Highway at Ma`alaea Harbor to the east and Olawalu to the west, respectively.

The primary social and economic activities occurring near the rifle range are diversified agriculture, firing range activities, and ocean leisure activities. To the east is the Maui County Firing Range, which is used for training and sport shooting. To the south, across Honoapiilani Highway, is Ukumehame Beach Park where tourists and local residents use the area for swimming, surfing, and picnicking.

4.13.2 Project Impacts

An integral component of the project is the inclusion of the local community in the planting and maintenance of native habitat. The Hawaii Army National Guard intends to involve Youth for Environmental Services (YES) in the project. This will give hands on experience in the restoration of coastal Hawaiian landscapes to members of community. In addition, this partnership will promote environmental education.

The economic benefits that accrue from the project to the local economy – in terms of direct dollars introduced – will be small. The project will require the use of a contractor to install the well, which will employ a small Maui firm for the duration of the installation process. HIARNG personnel will perform all other landscaping and irrigation activities at the rifle range.

4.13.3 Mitigation Measures

No mitigation measures are proposed in relation to project affects on socio-economic conditions.

5.0 Significance Determination

In accordance with the significance criteria on Section 11-200-12 of Title 11, Chapter 200, it is determined in this EA that the proposed project will have no significant adverse impact on the environment. Reasons supporting a Finding of No Significant Impact (FONSI) are presented below:

1) *The proposed project does not involve an irrevocable commitment to loss or destruction of any natural or cultural resource.*

   The proposed conservation and landscape management project will not result in a loss or destruction of any natural or cultural resources. The proposed project is intended to enhance and improve natural resource management and landscaping of the area. The archaeological survey of the proposed project indicated there are no historic properties, including burials, within the boundaries of the project area. Consequently, there will be no adverse affect to historic properties.

2) *The proposed project does not curtail the range of beneficial uses of the environment.*

   The project area was developed as a firing range in the late 1980s and early 1990s. The proposed project does not alter use of the area. The proposed project will enhance the natural environment and increase potential beneficial uses of the area by local bird populations.

3) *The proposed project does not conflict with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.*

   The proposed project is consistent with the environmental policies, goals, and guidelines defined in Chapter 344, HRS. The proposed project will enhance and improve conservation in the area.

4) *The proposed project does not substantially affect the economic or social welfare of the community or State.*

   The proposed project will not affect the economic or social welfare of the community or State. The proposed project is limited to landscaping and natural resource conservation and does not alter nor affect economic uses of the area.

5) *The proposed project does not substantially affect public health.*

   The proposed project will not affect public health. The implementation of the project will be done in accordance with all state and local regulations to ensure the protection of human health and the environment.

6) *The proposed project does not involve substantial secondary impacts, such as population changes or effects on public facilities.*

The proposed project involves revegetation and landscaping of an existing facility. The proposed project is not expected to include substantial secondary impacts, such as population change or effects on public facilities.

7) *The proposed project does not involve a substantial degradation of environmental quality.*

The proposed project does not involve a substantial degradation of environmental quality. Proposed project improvements will enhance the environment by reducing run-off and restoring native vegetation. Overall environmental quality and resource conservation will be improved as a result of the proposed project

8) *The project is individually limited, and does not cumulatively have considerable effect upon the environment or involves a commitment for larger actions.*

No other projects (federal, state, county, and community) were identified in the vicinity of the proposed project area. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on the environment are expected.

9) *The proposed project does not substantially affect a rare, threatened, or endangered species, or its habitat*

The proposed project will enhance the natural environment at the Ukumehame Firing Range by landscaping the area with native plants. The project does not include construction activities that would affect local bird populations nor does it include placement of any fill in the wetland area located at the firing range. The proposed action does not include any new uses of the area so it is anticipated that there will be no impact to endangered fauna.

10) *The proposed project does not detrimentally affects air or water quality or ambient noise levels.*

The potential impacts to air quality and noise will be insignificant and limited in duration to initial development of the well and some landscaping activities. The proposed project will have a beneficial impact on water quality by reducing run-off and at the facility.

11) *The proposed project does not affect nor is it likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.*

The proposed project area includes a wetland, an environmentally sensitive area. The action is intended to enhance and improve overall management of the project area. It is anticipated that the proposed project will not detrimentally affect the wetland. In addition, it is anticipated the continued use of the area as a firing range will not be affected by its proximity to the wetland.

The proposed project also is located in the flood plain and tsunami inundation zones. Since the proposed project does not include construction of facilities and is limited to landscape management it is anticipated there will be no affect to the proposed action from its location.

12) *The proposed project does not substantially affect scenic vistas and view planes identified in county or state plans or studies.*

The proposed project area is not located in an identified scenic vista or view plane and therefore, it is anticipated that it will not affect have on scenic resources.

13) *The proposed project does not require substantial energy consumption.*

The proposed project does not include any requirements for long-term energy consumption, therefore, it is anticipated it will not have a substantial affect on energy consumption in the state or local areas.

6.0 Consulted Agencies

The following agencies were consulted during the environmental assessment process:

County of Maui

Department of Planning
Department of Parks and Recreation

State of Hawaii

Department of Land and Natural Resources
Commission on Water Resources Management
Land Division
Department of Health
Office of Environmental Quality Control

Federal Government

US Department of Agriculture
Natural Resource Conservation Service, US Department of Agriculture
US Army Corp of Engineers
Engineering and Construction Division, Environmental Branch

6.1 Environmental Assessment Distribution List

County of Maui

Department of Parks and Recreation
Department of Planning
Department of Public Works and Waste Management
Department of Water Supply
Lahaina Public Library

State of Hawaii

Department of Business, Economic Development and Tourism
Department of Health
Department of Land and Natural Resources
Department of Transportation
Department of Agriculture
Office of Hawaiian Affairs
University of Hawaii
Environmental Center

Federal Government

US Department of Agriculture
Natural Resource Conservation Service
US Department of the Interior
US Fish and Wildlife Service
US Army Corp of Engineers
Engineering and Construction Division, Environmental Branch

Community Groups

Hawaii Audubon Society
Sierra Club

APPENDIX A

WETLAND DELINEATION REPORT

Hawaii National Guard Firing Range
Ukumehame, Maui, Hawaii

Wetland Delineation Report

The Natural Resources Conservation Service (NRCS)[1], Hawaii National Guard[2] and Oceanic Companies, Inc[3] conducted a wetland delineation of the National Guard firing range in Ukumehame, Maui, Hawaii on March 17-18, 1998. The firing range is a 39 acre, low elevation estuarine flat. It is barren land (little vegetation), with man-made berm features created for target practice. 1965 aerial photographs make evident that the site was more vegetated than its current condition.

Soils on site are mapped Kealia silt loam, 0-1% (KMW) and Pulehu clay loam, 0-3% slope (PsA). Most of the property is the Kealia series. See attached soil survey. Kealia soil is on the hydric soil list[4], with a good probability of having non-hydric soil inclusions[5]. Pulehu series is a nonhydric soil which has improbable hydric inclusions. Aerial imagery from 1990-1991 and other photographs show large areas of ponding within the parcel.

The field investigation confirmed that seasonal wetland conditions occur in portions of the site (see attached wetland map). Soil indicators, hydrology indicators, and hydrophytic vegetation were field investigated per the "Routine Method" in the Corps' 1987 Wetland Delineation Manual[6]. Also used was Section F, "Atypical Situations", since the vegetation and soils in some areas on the property have been disturbed (via grading) after the 1965 photograph. Also used was Section G, "Problem Areas", since Kealia soils have been termed "problem area soils" due to their thick A horizons and dark colors (values of 3 or less) which often mask hydric indicators, and because the area could be clearly identified as a "seasonal wetland" which we were assessing during one of the worst droughts on Maui. Section G allows the use of hydric soil indicators developed by NRCS.[7]

Following the Routine Method, the team assessed vegetation, soils, and hydrology. We estimated representative vegetation cover within a 30 foot radius, calculated relative percentages, figured dominant plant cover per the Corps' 50/20 rule. The "National List

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[1] Ranae Ganske and Terrell Kelley (Reg IV certified)
[2] Trae Menard
[3] Chris Welch and Andrew Tomlinson
[4] Hydric Soils of the US, In Cooperation with the National Technical Committee for Hydric Soils, Soil Conservation Service, Pub Number 1491, (1990)
[5] Hawaii Mapping Conventions, August 1, 1994
[6] Corps of Engineers Wetlands Delineation Manual, Tech Report &-87-1, January 1997, Department of the Army, Waterways Experiment Station
[7] "Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils", USDA, NRCS Version 3.2, July, 1996

of Plant Species That Occur in Wetlands: Hawaii (Region H)[8] was then checked to determine wetland indicator status. To assess hydrology, we used old aerial photographs which indicated inundation and clear evidence of ponding in the soils. To assess soils, we dug test pits (16-18" deep) and profiled soil peds, noting soil color using the Munsell Soil Color Charts, texture, and other features.

Vegetation

Vegetation on the property is scarce. The vegetation that does exist is mainly herbaceous, and appears to be early successional. Most species found can sustain relatively high levels of salinity in the soil and are often found in disturbed areas. It is very likely that the plant community is also seasonally influenced (i.e. different species grow during rainy season/ponding times).

Vegetation in the wetland areas included:

Atriplex semibacca (FACU)[9]
Chloris inflata (FACU)
Heliotropium indicum (FAC)[10]
Pluchea indica (FAC)

Vegetation in the upland areas included:

Leucaena leucocephala (UPL)[11]
Waltheria indica (UPL)
Prosopis palida (FACU-)

Hydrology

Because our investigation took place during the drought, hydrology was difficult to find. However, aerial photographs showed evidence of ponding, and the soils more clearly suggested that much of the area is seasonally inundated. Hydrology indicators from the surface layers of the soil included: strong coarse platy structure, cracked surface, and surface salinity due to high water table and/or elevated capillary fringe.

Soils

Kealia soils are formed in silty and clayey alluvial and aeolean sediments from upland soils, which is a very likely scenario for this property. Typical Munsell colors found were 7.5 YR 2.5/2, with common, medium, distinct mottles of 5 YR 4/6 in the horizon that began from 1-4 inches below the surface. This meets the 87 manual indicator,

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[8] Biological Report 88, May 1988, Porter B. Reed, JR, US Fish and Wildlife Service
[9] Facultative Upland (FACU), Usually occur in nonwetlands (estimated probability 67-99%) but occasionally found in wetlands (estimated probability 1-33%)
[10] Faculative (FAC), Equally likely to occur in wetalnds or nonwetlands (estimated probability 34-66%)
[11] Upland (UPL) Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in nonwetlands in the region specified.

"Gleyed or low chroma color", since at 10" or below the A horizon the colors have a matrix with a chroma of 2 with mottles. Per the Problem Area of the manual, the soils also meet NRCS' indicator F6, Redox Dark Surface.[12]

All test pits were flagged and numbered, and wetland boundaries were also flagged and numbered. NRCS conducted a survey of the flags on March 26, 1998. The attached map shows the location of wetland test pits and the surveyed wetland boundaries (cross-hatched). Each test pit has a corresponding field form, also attached.

Questions about this delineation can be directed to Ms. Ranae Ganske, Maui NRCS office, (808) 244-3729 or Ms Terrell Kelley, State NRCS office, (808) 541-2600, ext. 109.

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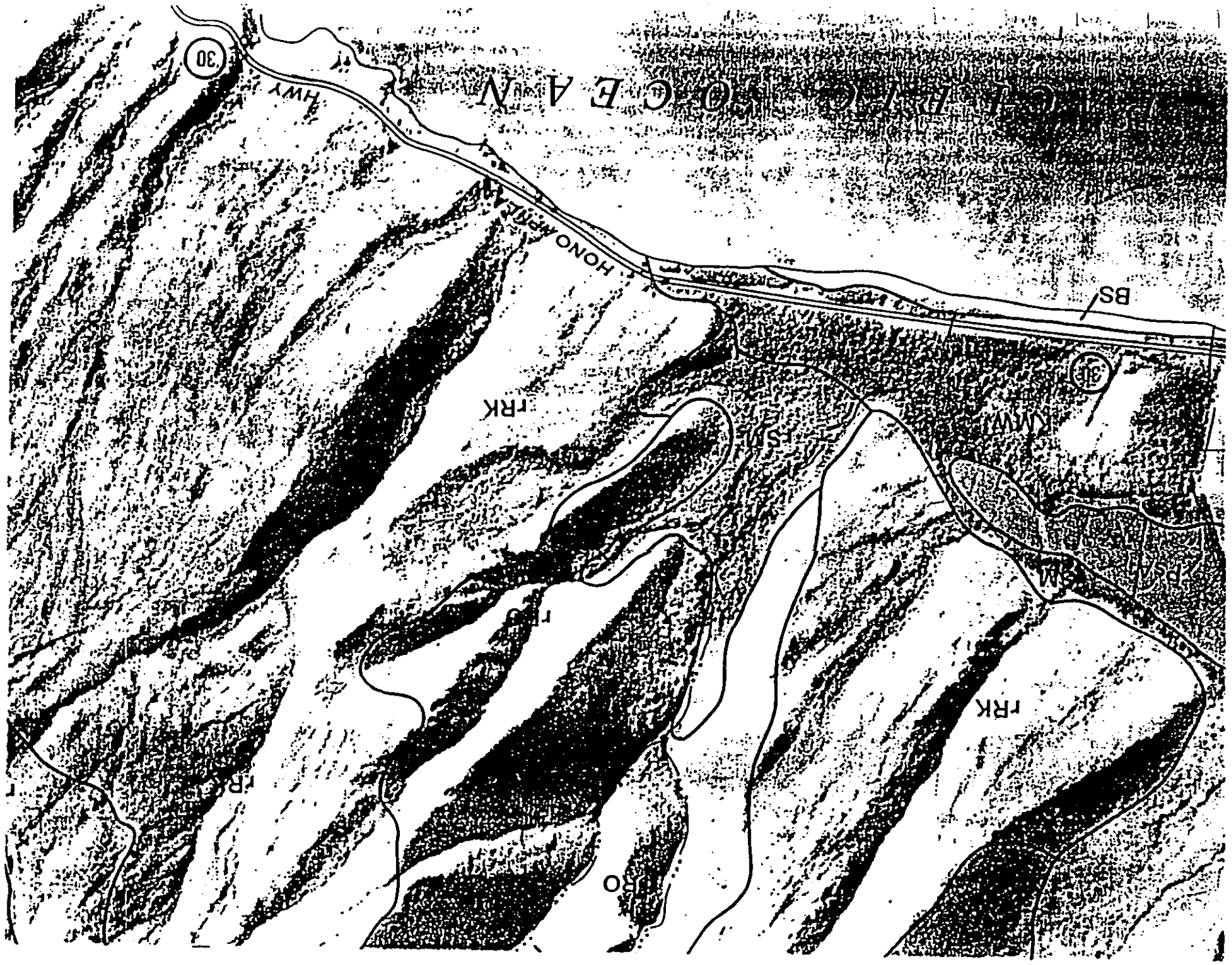
[12] F6. Redox Dark Surface. For use in all LRRs except W, X, and Y. Presence of a layer at least 10 cm. (4 in.) thick entirely within the upper 30 cm. (12 in.) of the mineral soil that has:: a. matrix value 3 or less and chroma 1 or less and 2% or more distinct or prominent redox concentrations as soft masses or pore linings, or b. matrix value 3 or less and chroma 2 or less and 5% or more distinct or prominent redox concentrations as soft masses or pore linings.



DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Army National Guard
Applicant/Owner: ST HAWAII
Investigator: USDA - NRCS - Gamsle

Date: 3/17/98
County: MAUI
State: HI

Do Normal Circumstances exist on the site? Yes (No)
Is the site significantly disturbed (Atypical Situation)? (Yes) No
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Atri Plex semibaccata	H	FACU*
2. HEliotropiumIndicum	H	FAC*
3. Pluchea Indica	H	FAC
4. Chloris Inflata	H	FACU
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/2 = 50% (NOT)

Remarks: DROUGHT CONDITION AFFECTS VEGETATION ATYPICAL AND PROBLEM AREA SECTIONS USED

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ✓ Aerial Photographs PONDING
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ✓ Local Soil Survey Data
- ___ FAC-Neutral Test
- ✓ Other (Explain in Remarks)

Remarks: SURFACE CRACKING, EVIDENCE OF PONDING, DRAINAGE PATTERNS VISIBLE, PLATEY STRUCTURE
Kealia Soil - Probable inclusions

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: HAWAII ARM National Guard Applicant/Owner: ST OF HI Investigator: USDA – NRCS	Date: 3/17/98 County: MAUI State: HAWAII
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: (2)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Heliotropium Indicum	H	FACU*
2. Alri Plr semibicata	H	FAC*
3. Pluchea indica	H	FAC
4. Chloris inflata	H	FACU
5. Prosopis Pallida	H	FACU
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/2 < 50%

Remarks: DROUGHT CONDITION AFFECTS VEGETATION

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ✓ Aerial Photographs ponding
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ✓ Local Soil Survey Data
- ___ FAC-Neutral Test
- ✓ Other (Explain in Remarks)

Remarks: EVIDENCE OF PONDING

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual).

Project/Site: Hawaii Army Nat. Guard
Applicant/Owner: ST OF HAWAII
Investigator: USDA - NRCS

Date: 3/11/98
County: MAUI
State: Hawaii

Do Normal Circumstances exist on the site? Yes (No)
Is the site significantly disturbed (Atypical Situation)? (Yes) No
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: (3)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Heliotropium Indicum	H	FACU
2. Atriplex Semibicata	H	FAC
3. Chloris Inflata	H	FACU
4. Pluchea Indica	H	FAC
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: Plant community sparse in particular area. Atypical

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
✓ Aerial Photographs ponding
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
✓ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
✓ Local Soil Survey Data
___ FAC-Neutral Test
✓ Other (Explain in Remarks)

Remarks: Mud flat, ponding surface cracking

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Hawaii Army Nat. Guard
Applicant/Owner: ST OF HI
Investigator: T-NA - NRCS

Date: 3/17/98
County: MAUI
State: HAWAII

Do Normal Circumstances exist on the site? Yes (No)
Is the site significantly disturbed (Atypical Situation)? (Yes) No
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: (4)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Hale Koa		UPL
2. Melthiria Indica		UPL
3. *Chlorus Inflata		FACU*
4. Kiawe		UPL
5. Atriplex Semibaccata		FAC
6. Sitaria		FACU
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0% 0/1

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
✓ Aerial Photographs clear veg diff. 0
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: No evidence of ponding,

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Hawaii Army National Guard Applicant/Owner: St Hawaii Investigator: USDA -NRCS	Date: 3/17/99 County: Maui State: Hawaii
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: 5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Chloris Inflata	H	FACU*	9.		
2. *Atri Plex Semibicata	H	FACU*	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0/2 = 0%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ✓ Aerial Photographs ponding not occurring in plot area
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ✓ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Army Nat. Guard Applicant/Owner: State OF HI Investigator: USDA-NRCS	Date: 3/17/98 County: MAUI State: HI
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: (6)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Fuchsia Indica	H	FAC+
2. Chloris Inflata	H	FACW
3.		
4.		
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/2 = 50%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: FILLED / DISTURBED AREA

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

3/18/98

Project/Site: National Army Guard
Applicant/Owner: ST HI
Investigator: USDA - NRCS

Date: 3/17/98
County: MAUI
State: HI

Do Normal Circumstances exist on the site? Yes (No)
Is the site significantly disturbed (Atypical Situation)? (Yes) No
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: 7

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Chloris Inflata	H	FACU
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

*20%

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0/1, but atypical

Remarks: Area is bare and ponding is apparent See profile description

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
✓ Aerial Photographs ponding
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)
Depth to Free Water in Pit: _____(in.)
Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
✓ Local Soil Survey Data
___ FAC-Neutral Test
✓ Other (Explain in Remarks)

Remarks: Area suggests ponding. w/ Wetland corresponds w/ signature on colored aerial which identifies saturated/ponding surface.

13 flags are placed to identify boundary

3/18/98

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Army National Guard	Date: 3/18/98
Applicant/Owner: ST HI	County: Maui
Investigator: USDA-NRCS	State: HI
Do Normal Circumstances exist on the site? Yes (No)	Community ID:
Is the site significantly disturbed (Atypical Situation)? (Yes) No	Transect ID:
Is the area a potential Problem Area? (Yes) No	Plot ID: 8
(If needed, explain on reverse.)	

VEGETATION

	Dominant Plant Species	Stratum	Indicator
50	1. Plychea indica	H	FAC
50	2. Chloris inflata	H	FACU
2	3. Atriplex semibaccata	H	FACU
1	4. Prosopis pallida	H	FACU
103	5.		
	6.		
	7.		
	8.		
	9.		
	10.		
	11.		
	12.		
	13.		
	14.		
	15.		
	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/2 = 50%

Remarks: Flags identify the wetland area.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ✓ Aerial Photographs ponding
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ✓ Local Soil Survey Data
- ___ FAC-Neutral Test
- ✓ Other (Explain in Remarks)

Remarks: Evidence of ponding / surface layer cracked and soil saturated within 12"

3/18/98

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: National Guard
Applicant/Owner: ST HI
Investigator: HDA - NRCS

Date: 3/18/98
County: MAUI
State: HI

Do Normal Circumstances exist on the site? Yes No
Is the site significantly disturbed (Atypical Situation)? Yes No
Is the area a potential Problem Area? Yes No
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: 9&10

NOTE: See sheet #8 - same situation Flags are identifying wetland area. 20 Flags Total

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Atriplex semibaccata	H	
2. Chloris Inflata	H	
3.		
4.		
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ✓ Aerial Photographs ponding
- ___ Other

___ No Recorded Data Available

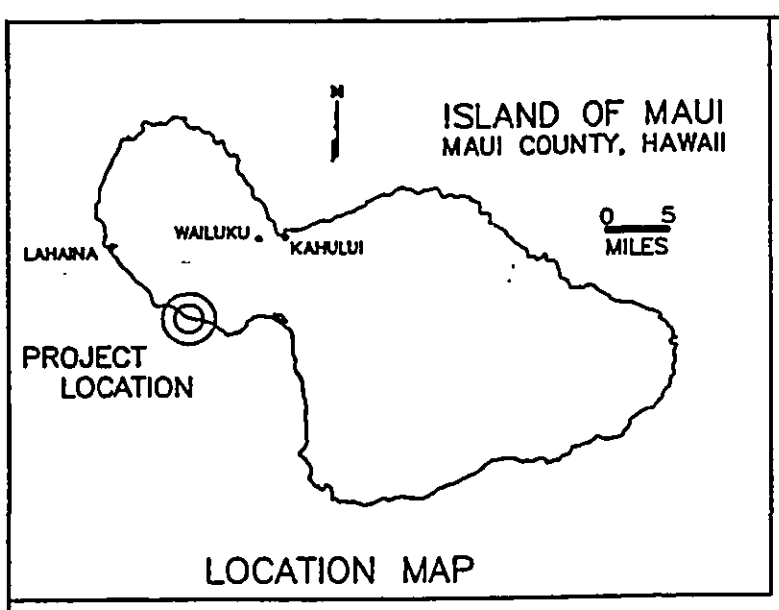
Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: 12 (in.)

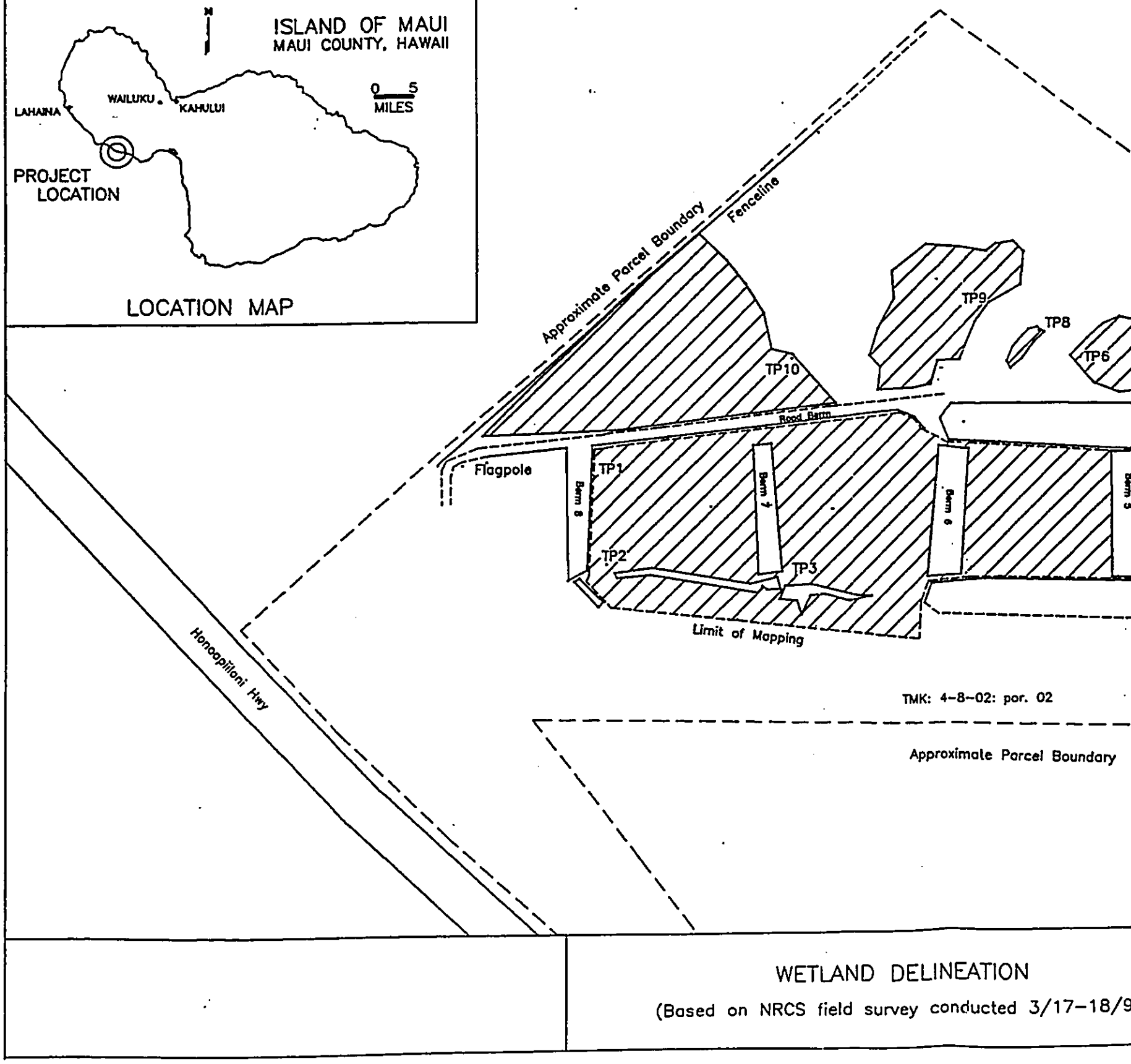
Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ✓ Local Soil Survey Data
- ___ FAC-Neutral Test
- ✓ Other (Explain in Remarks)

Remarks: Ponding evidence - cracks, platey structure,

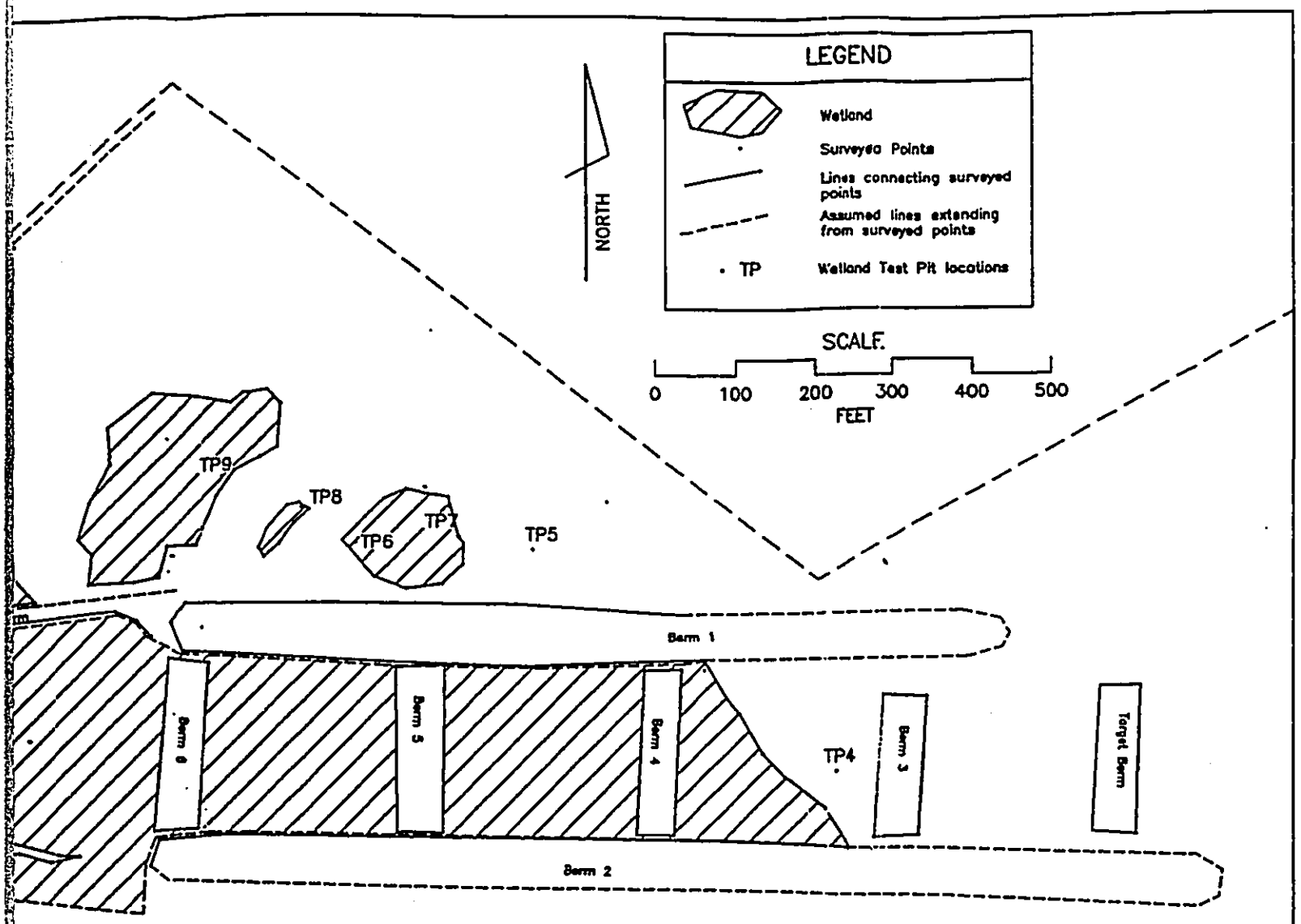


LOCATION MAP



WETLAND DELINEATION

(Based on NRCS field survey conducted 3/17-18/9



_AND DELINEATION ield survey conducted 3/17-18/98)	Hawaii National Guard Firing Range Ukumeha ne, Maui, Hawaii

APPENDIX B

ARCHAEOLOGICAL SURVEY

AN ARCHAEOLOGICAL ASSESSMENT OF THE NATIVE PLANT CONSERVATORY PROJECT UKUMEHAME FIRING RANGE UKUMEHAME, LAHAINA, MAUI TMK 4-8-2:47

Aki Sinoto Consulting
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by

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for

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revised
November 1997

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EXECUTIVE SUMMARY

A conservation project, referred to as the Native Plant Conservatory, is being undertaken by the Hawaii Army National Guard at their firing range facility located in Ukumehame, Lahaina District, Maui Island. The project area consists of an irregular-shaped parcel (TMK 4-8-2:47), encompassing roughly 39 acres, located on the narrow coastal flat previously cultivated in sugar cane.

An archaeological assessment procedure was performed by Aki Sinoto Consulting of Honolulu under request from Tim Chow Planning Consultant, also of Honolulu. The archaeological procedures included brief literature and documents searches and a walk-through surface survey. The surface survey completed on June 10, 1997 consisted of walking transects of varying intervals. Focused inspection of berms built up through bulldozer activities were also undertaken. Both procedures resulted in negative findings. No archaeological remains were encountered during the current field procedures. Thus, no evidence of former cultural activities in the area were found.

In view of the results of the current assessment and previous conclusions reached by the archaeologist from the State Historic Preservation Division, any further pre-construction archaeological procedures and archaeological monitoring of ground-altering activities during the implementation of the conservation project are not recommended. Should any inadvertent discoveries be made during the course of development, all construction-related activities in the immediate vicinity of the find shall be halted and the Maui Office of the State Historic Preservation Division shall be contacted.

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INTRODUCTION

An archaeological assessment procedure involving a brief literature search and walk-through surface survey was performed by Aki Sinoto Consulting of Honolulu under contract to Tim Chow Planning Consultant, also of Honolulu. This project took place in conjunction with a proposed conservation project, referred to as the Native Plant Conservatory, being undertaken by the Hawaii Army National Guard at their firing range facility located in Ukumehame, Lahaina District, Maui Island.

PROJECT AREA

The project area; occurring in a locality known as Ukumehame, *ahupua'a* unknown, Lahaina District, Maui Island; is an irregular shaped parcel (TMK 4-8-2:47) encompassing 39.279 acres. It is situated on the *mauka* side of Hono-a-Pi'ilani Highway (30) at the southern coastal area of West Maui, roughly halfway between Papawai Point to the east-southeast and Hekili Point in Olowalu to the west-northwest (Figs. 1 & 2). It occupies the area between Papalaua Gulch to the southeast and Hanaula Gulch to the northwest with the foothills of the West Maui mountains to the north, existing sugar cane fields to the west, Hono-a-Pi'ilani Highway to the south, and a 44.857 acre Maui County parcel to the east where a police combat range, built in 1992, is also located. Situated at the southeast corner of the County parcel is the 11.880 acre existing Papalaua Drainage Sump, a rectangular basin, which is surrounded by an earthen berm (Fig. 3). The total extent of the project area has undergone several episodes of compounded extensive disturbance beginning with sugar cane cultivation and most recently the construction of the firing range.

ENVIRONMENT

The project area is located within the inland portions of a narrow coastal flat on the southern leeward shoreline of West Maui. Although the terrain is markedly flat today, due to the results of artificial grading, prior to alteration, the area most likely exhibited a topography gently sloping southward towards the ocean. The elevation ranges from a few feet above sea level to 80 or 120 ft amsl at the inland terminus of the project parcel which coincides with the Forest Reserve Boundary.

Soil in most of the project area consists of Kealia Silt Loam which is described as:

> ...poorly drained and has a high content of salt. Ponding occurs in low areas after a heavy rain. When the soil dries, salt crystals accumulate on the surface. The soil has a brackish water table that fluctuates with the tides; the water table is nearer the surface along the shoreline than in inland areas. The slope ranges from 0 to 1 percent...

> ...Permeability is moderately rapid. Runoff is slow to very slow. The hazard of water erosion is no more than slight, but the hazard of wind erosion is severe when the soil is dry and the surface layer becomes loose and fluffy...This soil is used for wildlife habitat and pasture, but it has low grazing value. It is not used for crops, because of poor drainage and high salt content. Small areas are used for urban development (Foote et al. 1972:67-68).

The inland-most areas incorporate stony alluvial land which consists of stones, boulders, and soil along the bottoms of gulches (Foote et al. 1972: 120) and the neighboring cane fields to the west are Pulehu clay loam which also occur on alluvial areas (Foote et al. 1972:115-116). Recent alluvial deposition; consisting of rocks, boulders, and soil; can be seen on the surface of the lowlying areas within the project area. Pieces of coral, marine sand, and shell fragments are incorporated in the surface matrix of the area.

The annual rainfall in the area is less than 15 inches and more rainfall occurs during the winter and spring months of November through March. The dominant vegetation is *kiawe* (*Prosopis pallida*) with notable stands of *koa haole* (*Leucaena leucocephala*) especially along the boundary of the cane fields, and various dry grasses and bushes including *'akulikuli-kai* or pickleweed (*Batis maritama*).

PAST LAND USE

The current project area is a portion of Government (Crown) Lands. It is not incorporated within nor contains any Land Court Awards or *kuleana*. Without the data contained in these land documents, precontact use of the area can only be surmised as settlements related to marine resource exploitation on the coastal areas and possibly agricultural activities in the inland gulch areas. First leased for sugar cultivation by the Olowalu Sugar Company in the 1870s and by 1877 the area is shown to have been planted in sugar cane on early maps. The vicinity, including the project area was taken over by Pioneer Mill in 1930 or 1931 and sugar cane cultivation still continues in the neighboring parcels today. The project area too was cultivated in cane as recently as 1988 when the berms were constructed for the firing range facility. Remnant black plastic drip irrigation tubes are still visible in the project area. The extensive alteration of the original landscape is readily apparent. Appendix A provides brief definitions of the land-related terminology used in this section.

PREVIOUS ARCHAEOLOGY

No archaeological investigations have been undertaken in the subject area other than in conjunction with the currently proposed conservation project. A brief surface inspection of the project area was undertaken on December 6, 1995 by Ms. Theresa Donham, the then Maui resident staff archaeologist for the State Historic Preservation Division of the Department

of Land and Natural Resources (SHPD/DLNR). The inspection confirmed that "the area of the conservation project has been previously graded and/or grubbed...[and]...(b)ased on the condition of the property and on past land use, [they] believe(d) that the conservation project will have 'no effect' on historic sites" (letter dated Dec. 5. 1995 from Don Hibbard of SHPD/DLNR to Mr. Neal Fujiwara, District Conservationist, USDA).

Only two other projects have been conducted in the vicinity of the current project area. In 1989, Bishop Museum (Riford and Cleghorn), did an assessment for alternative sites for electrical powerplants and transmission lines. During the months of April through June of 1993, Cultural Surveys Hawaii (Robins et al. 1994)) conducted an archaeological inventory survey of a 14.7 mile long and 300 feet wide corridor for the proposed Maalaea to Lahaina electrical transmission line. No significant remains were discovered in the immediate vicinity of the current project area.

According to available documentation, the closest previously recorded sites are two *heiau*, one on either side of the mouth of Ukumehame Gulch about .75 mile to the northwest of the project area. Heki'i *heiau*, Site 50-50-08-0002, is located on the southwest edge of the gulch near the 160 foot elevation and Ukumehame *heiau*, Site 50-50-08-0003, is located near the 200 foot elevation on the northwest side of the gulch. Both sites reportedly have undergone disturbance and modification. Statewide Inventory Forms for both sites are provided in Appendix B of this report.

METHODOLOGY

The current survey took place on Tuesday, June 10, 1997. The fieldwork was conducted in coordination with the field visit conducted by Tim Chow Planning Consultant. The archaeological procedures were undertaken by Ms. Lisa Rotunno-Hazuka of Archaeological Services Hawaii and Aki Sinoto.

The surface survey was conducted by walking transects of variable intervals, depending on terrain and vegetation. Focused inspection was made on areas of subsurface exposure through erosion and also the bulldozed berms where tailings could be examined. B&W photographs showing pertinent overviews of the project area were taken in 35mm format.

Archival documents and map research was conducted in the State Survey Office of the Department of Accounting and General Services and the Hawaii and Pacific Collection of the State Library. Archaeological reports on previously completed investigations were researched at the library and files of the State Historic Preservation Division of the

Department of Land and Natural Resources. No records, samples, artifacts, or other materials requiring curation were generated during the course of the current archaeological procedure.

RESULTS OF FIELDWORK

No archaeological remains, such as surface structural remnants, midden scatters, portable artifacts, or areas of exposed subsurface deposition, were encountered during the current procedure which covered 100% of the surface area of the project parcel. The focused inspection of the artificial berms of the firing range also did not reveal any evidence of former cultural activities in the area.

The fieldwork showed that the whole extent of the project area was extensively disturbed and the documents research indicated that compounded surface modifications have been taking place over an extended period of time beginning in the late 1800s with the advent of sugar cane cultivation. Sugar cultivation continued for over a century and ended in the late 1980s when the firing range was constructed.

DISCUSSION

The negative results of fieldwork as well as the information gathered from documents research, indicate the probable paucity of archaeological remains in the area. The extensive disturbance notwithstanding, the project area was part of a lowlying intermittently wet, high salinity area and probably did not support much past cultural activities. Most likely, sedentary activities took place closer to the shoreline and/or more inland in the gulches. Thus, even should systematic excavations be conducted, the expectability of significant archaeological remains is extremely poor to none.

RECOMMENDATIONS

In view of the results of the current assessment and the conclusions reached previously by the State archaeologist, neither any further pre-construction archaeological investigations nor archaeological monitoring during the ground-altering activities slated to be undertaken during the implementation of the conservation project are recommended. However, should any inadvertent discoveries be made during the course of construction, all construction-related activities should be halted in the immediate vicinity of the find and the Maui Office of the State Historic Preservation Division should be contacted.

PLATES

Plate 1. (top) Aerial Oblique Overview of Project Area. To NW.
Plate 2. (bottom) Detail of Project Area with Rifle Range Visible. To NW.

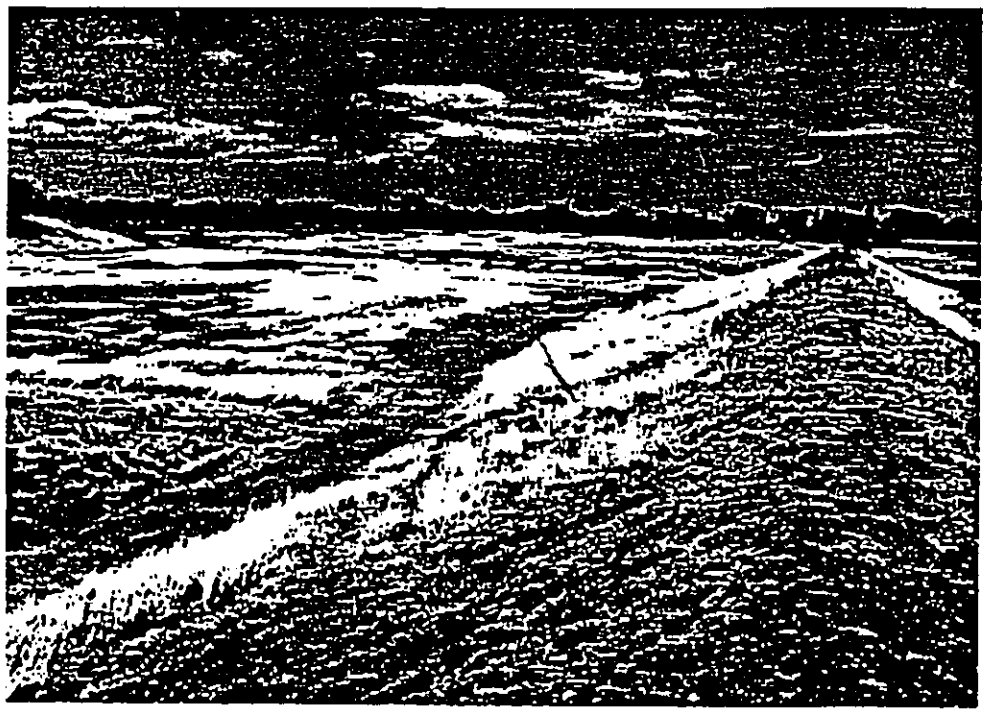
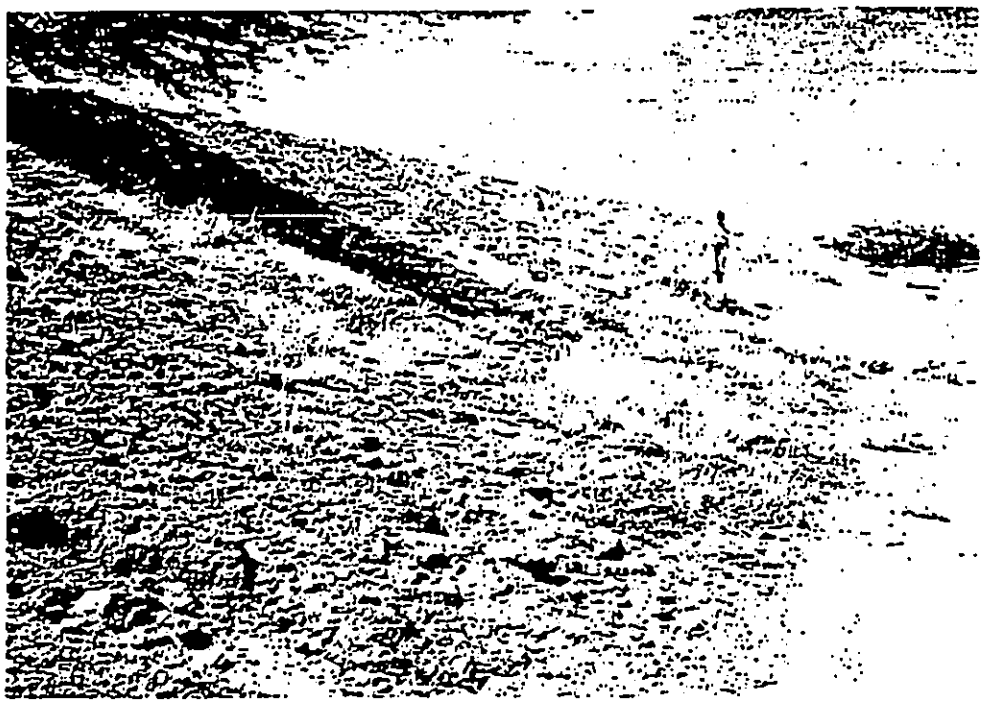


Plate 3. (top) Northwest Berm of Known Distance Rifle Range. View NE.
Plate 4. (bottom) Same Berm. View SW.



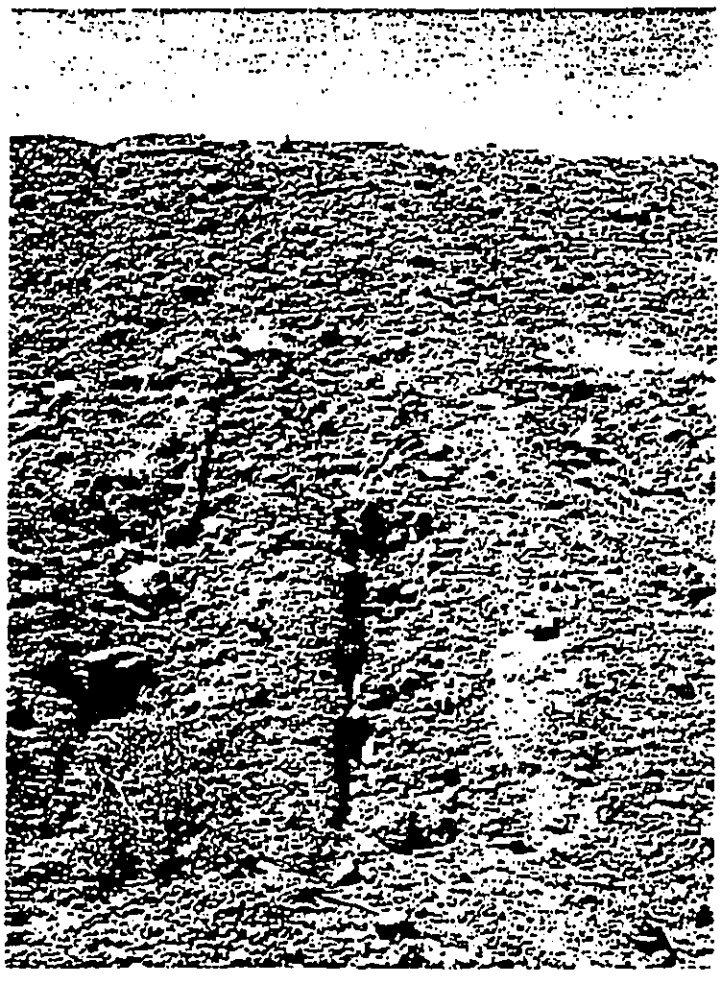


Plate 5. (top) Northeast Berm of Rifle Range. View SW.
Plate 6. (bottom) Eroded Berm Slope. View SE.

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APPENDIX A

DEFINITION OF LAND TERMS USED IN THIS REPORT

Excerpts taken from two informative books by Jon J. Chinen that describe the land titles and ownership process during the historic period in Hawaii are presented here. Terminology used in the Past Land Use section of this report are emboldened as they appear in the following excerpts:

> "The first major step in the reformation of the land system in the Islands was the passage of the Act of December 10, 1845, which among other things, established the Board of Commissioners To Quiet Land Titles, commonly known as The Land Commission. The act provided for a board of five commissioners to be appointed by King Kamehameha III to investigate and decide upon all the claims of private individuals to any land acquired prior to the passage of the act. Upon the confirmation of a claim, the Land Commission was required to issue a *Palapala Hooko*, or a certificate of award, to the successful claimant, with all the lands awarded to be surveyed at the the expense of the awardee. This award of the Land Commission was called the **Land Commission Award**, and it was generally given a number that corresponded to the number that was assigned to the claim filed with the Land Commission." (Chinen 1961:9)

> "The most important event in the reformation of the land system in Hawaii was *The Great Mahele* of 1848. This event separated and defined the undivided land interests of King Kamehameha III and the high-ranking chiefs and *konohikis*, and led to the end of the feudal system that existed in the Islands." (Chinen 1958:vii)

> "...(T)he King divided the lands reserved unto himself into two parts. One part he retained for himself, his heirs and assigns; the other part he set aside to the government...The lands retained by the King was first known as the King's Land, and then, after the creation of the Commissioners of Crown Lands on January 1, 1865, became known as **Crown Lands**. The lands set apart to the government became known as Government Lands." (Chinen 1961:15)

> "These lands identified and separated in 1848 as Crown Lands, Government Lands and *Konohiki* Lands were all 'subject to the rights of native tenants.'...(O)n August 6, 1850, the Legislature...authorized the Land Commission to award native tenants fee simple titles covering the lands lying within any Crown, Government or *Konohiki* Lands which they actually occupied and which they had improved. These lands so awarded to the native tenants under this act of August 6, 1850 became known as **Kuleana Lands**." (Chinen 1961: 15-16)

The awarding of these *kuleana* to the native tenants completed the *mahele*, or division, of the lands of the Hawaiian Islands into Crown Lands, Government Lands, *konohiki* Lands, and *kuleana* Lands. Thus, effectively, the ancient system of land tenure in Hawaii was brought to an end and opened the way to land ownership by outsiders and foreigners.

APPENDIX B

NORTH AT

FEATURE MAP [illegible]

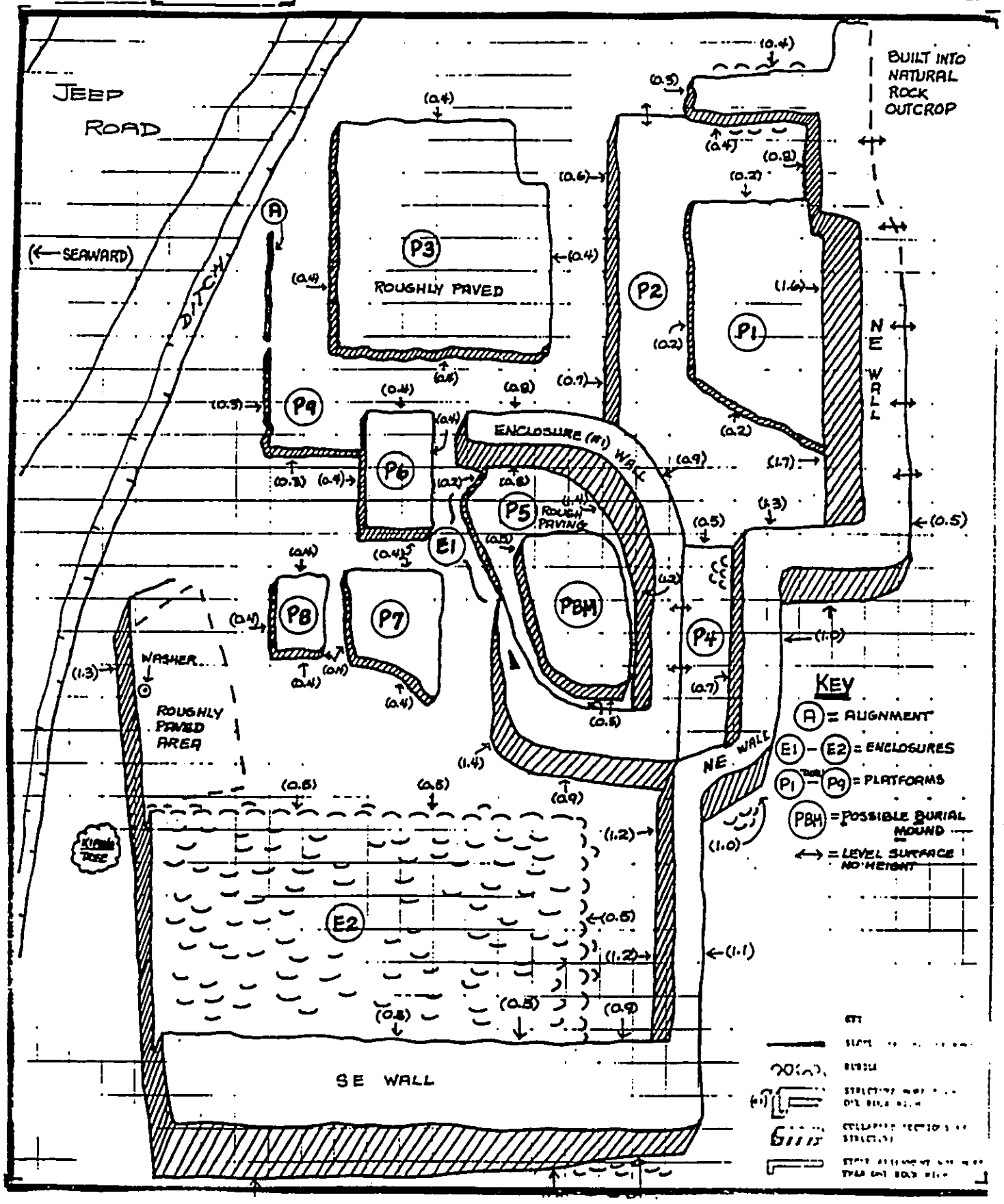
50-50-8-2

0 1 2 3 4

cm MV

TRUE NORTH

[illegible] 03



Coordinates: 20° 48' ~~38~~ 46" N / 156° 35' ~~27~~ 24" W

FEATURE DESCRIPTION FORM

50 - 5 0 (ISLAND) - 0 8 (QUAD) - _ _ _ _ (IDENTIFICATION NO.) 2

VERBAL DESCRIPTION MUST INCLUDE: bearings and sources used to locate feature; size; shape; construction technique; materials used; terrain features; condition; surface artifacts; midden. SIGNIFICANCE STATEMENT MUST INCLUDE: research potential; interpretive potential; unusual or important characteristics; probable function; importance as representative of its class; recommendation of Register status.

DESCRIPTION:

This site is called Hikii heiau. To locate it, we drove to Olowalu Store by way of Highway 30. We turned onto the old road that parallels highway 30 at Olowalu Store and drove E about 2 miles. We turned left (inland) on a cane-field road between telephone poles 4 and 5. We drove up this road 0.5 mile to the end and turned right. We drove 20 m more and parked next to site 50-50-8-3 (Ukumehame heiau). We then walked NE across Ukumehame Gulch 300 m up by a watertrough and small irrigation works. The Hikii heiau is situated above the irrigation machinery, or the E side of Ukumehame Gulch on the foothill of the West Maui mountains. Vegetation includes kiawe, algaroba and haole koa (Leucaena glauca).

Walker visited this site and reported that the heiau was filled with modern graves (1931:106). There are 3 platforms and a mound that may be graves. These structures resemble others previously observed that are known to be graves; however, excavation in order to verify this assumption might prove useful.

Hikii heiau is irregular in shape, measuring 33.4 x 22 m. It is in fair condition, with many of the interior features fallen and the walls deteriorated. There is an irrigation ditch that runs through the heiau on the W. The NE wall has 2 notches or jogs in the middle, one angular the other curved. The function of these notches, if any, is unknown. The wall dimensions are 37.5 m long (including notches), from 1 to 1.4 m wide and 0.5 to 1.7 m high. The wall is of core-filled construction with waterworn boulders on the outside filled with smaller waterworn rocks and pieces of pahoehoe. The SE wall is 16 m long, 0.9 to 1.6 m high, and 2.5 m wide. It is also core-filled. There is a short wall (3.7 m long) that borders platform 2 on the N. It is also core-filled and is about 0.4 m high x 1.3 m wide. All walls are slightly deteriorated with fallen areas both on the exterior and interior.

There are 9 platforms in the heiau interior. Platform 1, situated on the NE side, is of irregular shape, measures about 7 x 4 m, and is raised 0.2 m. The surface is of light brown earth. There is no evidence of pavement. Platform 1 is situated on top of platform 2, which is rectangular in shape. Platform 2 measures about 12.4 x 6.5 m and ranges from 0.6 to 0.7 m high. Again, there is no evidence of pavement, and the surface is of light brown earth. The functions of platforms 1 and 2 are unknown. Platform 3 is situated in the NW corner just below platform 2. It is rectangular in shape with a small notch in the N corner. It measures 7 x 6.4 m and is 0.4 m high. It is roughly paved with large waterworn stones. Its function is unknown. Platform 4 is situated along the NE wall along the area of the 2 notches. It is roughly rectangular in shape, measuring 6.6 x 1.8 m. It is 0.5 m above platform 2, and 0.7 m below the NE wall, and is level with the wall of the irregular shaped enclosure that is W of it. The function of platform 4 is also unknown. Platform 5 is situated in the irregular shaped enclosure below the notches. Platform 5 is irregularly shaped, measuring about 7.5 x 5.5 m and is 0.2 m high; Platform 5 is probably a house site.
However, on it is a large mound, possibly a burial mound. The mound is 0.5 m high and measures about 4 x 3 m. It consists of red soil which differs from the soil in the heiau interior. This mound may be one of the "modern graves" Walker reported in 1931. Plat.6 is 1 m W of platform 5. It is rectangular in shape, measuring 3.5 x 2 m and 0.4 m high. Platform 6, like the heiau walls, is of core-filled construction.

FEATURE DESCRIPTION FORM

50 - 5 0 - 0 8 - ____ 2 - ____
ISLAND QUAD IDENTIFICATION NO. FEATURE NUMBER

VERBAL DESCRIPTION MUST INCLUDE: bearings and sources used to locate feature; size; shape; construction technique; materials used; terrain features; condition; surface artifacts; midden. SIGNIFICANCE STATEMENT MUST INCLUDE: research potential; interpretive potential; unusual or important characteristics; importance as representative of its particular class; probable function; recommendation for Register status.

Platform 7, ⌒ SW of platform 5, is roughly rectangular in shape. It measures 3.3 x 2.8 m and is 0.4 m high. It is also of core-filled construction. Platform 8, situated SW of platform 7, is rectangular in shape. It measures 2.3 x 1.6 m and is 0.4 m high. It is also of core-filled construction. Platforms 6, 7, and 8, due to their size and shape, may be more of the modern graves Walker reported. These platforms, along with the mound mentioned earlier, should be excavated to determine their function and contents. Only a corner remains of platform 9, just S of platform 3. The corner was of core-filled construction and was 0.3 m high. The rest of the platform may have been destroyed during the irrigation-ditch construction, or possibly when the modern graves were built.

There are 2 enclosures in the heiau interior. The irregularly shaped enclosure (1) with the possible burial mound within is referred to above. The enclosure measures about 10 x 6.4 m. The enclosure wall is of core-filled construction, and ranges from 0.8 to 1.4 m high and from 0.5 to 1.5 m wide. There is a platform (platform 5) in the interior. The paving is rough, and is built of pahoehoe. The other enclosure (2) is rectangular, measuring 12.8 x 6.8 m. This enclosure is completely deteriorated. The walls have all fallen to ground level. The rubble is 0.5 m high on the W end. There is a roughly paved area, about 7 x 2.5 m, NW of and connected to the deteriorated enclosure. It is paved with waterworn rocks and pieces of pahoehoe.

Little midden was seen in the heiau. A few deposits of cowrie, drupe, and other unidentified shell fragments were found scattered in the NW corner of the heiau. No artifacts were seen.

SIGNIFICANCE: The research potential of this site lies chiefly in the excavation of the interior platforms (especially 6, 7 and 8) and the mound to determine precisely the contents and, if possible, their functions. Excavation of this site might show different functions at different times or a progression of functions for the one site. One of the possible progressions would be from originally a heiau to a house site to a graveyard. The major distinguishing characteristics for each of these types would be: 1) heiau - large size, intensive construction, prominent position on the land. 2) House site - midden deposits and, 3) graveyard - excavation necessary to confirm burials. After this is done, little else can be done, because of the only fair condition and lack of concentrated midden deposits. If excavation results showed no burials, the interpretive potential would be good. However, all ancient burial sites that are not officially designated as cemeteries deserve legal protection. Therefore, until such determination can be made, we recommend Reserve status.

SIGNED Robert D Connolly III DATE Oct. 28, 1973
ARCHAEOLOGIST

FORM 3 1 : 1 2 PROPERTY OWNERSHIP

50 - 5 3 0 4 - 0 5 8 6 - _ 7 _ 8 _ 9 _ 10 2 11
ISLAND QUAD IDENTIFICATION NO.

USE 1	USE 2	STAT	OWNR	ATTD	ACCS	zone	sect	plat	parcel
2 6 (12 13)	_ _ (14 15)	2 (16)	2 (17)	1 (18)	2 (19)	4 (20)	8 (21)	_ 0 2 (22 23 24)	_ _ 9 (25 26 27)
						TAX	MAP	KEY	

PROPERTY OWNER: P I O N E E R _ M I L L _ C O _ _ _ (28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45)

STREET ADDRESS: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63)

TOWN OR CITY: L A H A I N A _ _ _ (64 65 66 67 68 69 70 71 72 73)

STATE: H I (74 75)

ZIP CODE: 9 6 7 6 1 (76 77 78 79 80)

FORM 4 1 : 1 2 BACKGROUND DATA

50 - 5 3 0 4 - 0 5 8 6 - _ 7 _ 8 _ 9 _ 10 2 11
ISLAND QUAD IDENTIFICATION NO.

AHUPUA'A: U K U M E H A M E _ _ _ _ _ _ _ _ (12 13 14 15 16 17 18 19 20 21 22 23 24 25 26)

PREVIOUS SURVEYS: A R C H A E O L _ O F _ M A U I _ _ _ (27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44)

PREVIOUS SITE DESIGNATION(S): M A - C 8 - 2 _ _ 2 _ _ _ _ _ _ _ _ _ (45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62)

LAST NAME OF SURVEYOR: W A L K E R _ _ _ _ _ _ _ (63 64 65 66 67 68 69 70 71 72 73 74)

INSTITUTION	YEAR	FILED AT
0 5 (75 76)	3 1 (77 78)	0 5 (79 80)

FEATURE DESCRIPTION FORM

50 - 5 0 - 0 8 - ____ 2 - ~~FEATURE NUMBER~~
ISLAND QUAD IDENTIFICATION NO.

VERBAL DESCRIPTION MUST INCLUDE: bearings and sources used to locate feature; size; shape; construction technique; materials used; terrain features; condition; surface artifacts; midden. SIGNIFICANCE STATEMENT MUST INCLUDE: research potential; interpretive potential; unusual or important characteristics; importance as representative of its particular class; probable function; recommendation for Register status.

HIKII HEIAU, INTERIOR
SMa(a)48-21

HIKII HEIAU; POSSIBLE
BURIAL PLATFORM
SMa(a)48-24

SIGNED _____ DATE _____
ARCHAEOLOGIST

FEATURE DESCRIPTION FORM

50 - 5 0 - 0 8 - ____ 2
ISLAND QUAD IDENTIFICATION NO.

RBAL DESCRIPTION MUST INCLUDE PERTINENT DATA ON: bearings and sources
ed to locate feature; terrain and vegetation; size; shape; construction technique; materials used; condition; surface artifacts or midden visible. SIGNIFICANCE STATEMENT MUST INCLUDE: unusual or important characteristics; accessibility; interpretive and research potential; evaluation of the site's importance as a representative of its class; recommendations for register category.

CORE-FILLED SOUTH WALL
OF HIKII HEIAU
SMa(a)48-26

DATE:

SIGNED:

FORM 51

50 - 50 - 08 - ___ 2

1/10 1/11
CARD NO

SITE NAME/TYPE (Columns 12-43) HIKII HEIAU

DISTRICT (Columns 44-55) _____

AHUPUA'A (Columns 56-80) UKUMEHAME

PREVIOUS SITE NUMBER(S) MA-C8-2 ; SITE 2 NUMBER SYSTEM BISHOP MUSEUM; WALKER

BACKGROUND DATA

Source	Volume	Page(s)
75975	__	106
9025	__	Ma-C8-2
	__	
72000	__	128
	__	

CONDITION DATA

Extent of Destruction MODERATE

Agent of Destruction NATURAL

Destruction Reported by STOKES in THRUM p. 121
Source/Page

Date Reported 1918

PROCESSING CHECKLIST	DATE	INITIALS
Literature xeroxed	5-9-73	SDC
Field Map plot	5-9-73	SDC
Final Mylar plot		
Final ink sketch(es)	7/23/73	DH
Statement drafted	8-10-73	SDC
Cover sheet complete	8-10-73	SDC
Form 01/11 complete	8-10-73	SDC
Form 21 complete	—	—

Form 31 complete	10-19-73	DK
Form 41 complete	10-19-73	DK
Supplementals complete	—	—
Checked	10-29-73	LM-P
To typist	10-18-73	LM-P
Typing complete	10-19-73	DK
Typing proofed	10-21-73	LM-P
To xeroxing		
Xeroxing complete		

DISPOSITION

3/10 1/11 CARD NO

12 13 / 14 15 / 16 17 / 18 19 / 20 21 / 22 23 THEME (S)

24 25 26 . 27 28, 19 29 30 TO REVIEW BOARD

31 32 33 . 34 35, 19 36 37 REVIEWED

STATE CATEGORY 38 SIG LEVEL 39 NAT'L REG NOM 40

41 42 43 . 44 45, 19 46 47 TO TRUSTEES

48 49 50 . 51 52, 19 53 54 TO STATE LIAISON OFFICER

55 56 57 . 58 59, 19 60 61 TO NATIONAL REGISTER

62 63 64 . 65 66, 19 67 68 NATIONAL REGISTER ACTION

NRHP DISPOSITION: 69 OK 70 NO 71 RET

9025 Ma-C8-2 50-50-08-2

Site: Ma-C8-2 State: 50-50-08-2 Heiau Hikii Date:

Land: Ukumehame, Wailuku

TMK:

Owner:

General Survey _x_ Excavation ___ Artifacts ___ HHD-___ HRC-

Description: Built of rough blocks of red basalt. NE and SE side walled; an open terrace fronts the sea. Outline of edge of old wall can be seen below the modern wall; graves of recent date fill the interior; modern ditch crosses one corner.

Sources: Walker, Site 2 map, p. 106, fig. 2
Stokes J. of P.P.S. Hawaii, Ann. 1918
Thrum - photos #13 - 2

Photos: Color
B/W

Photographs numbered USGS Quadrangle 1000 Meter Grid

Made Bishop Museum ___N ___E

UNIVAC ANALYSIS CARD FORM Y9 SPERRY RAND CORPORATION - TODD DIV. - L HADLEY PRINTED IN U.S.A.

Ukumehame Region

WALKER 75995
1931 p. 106

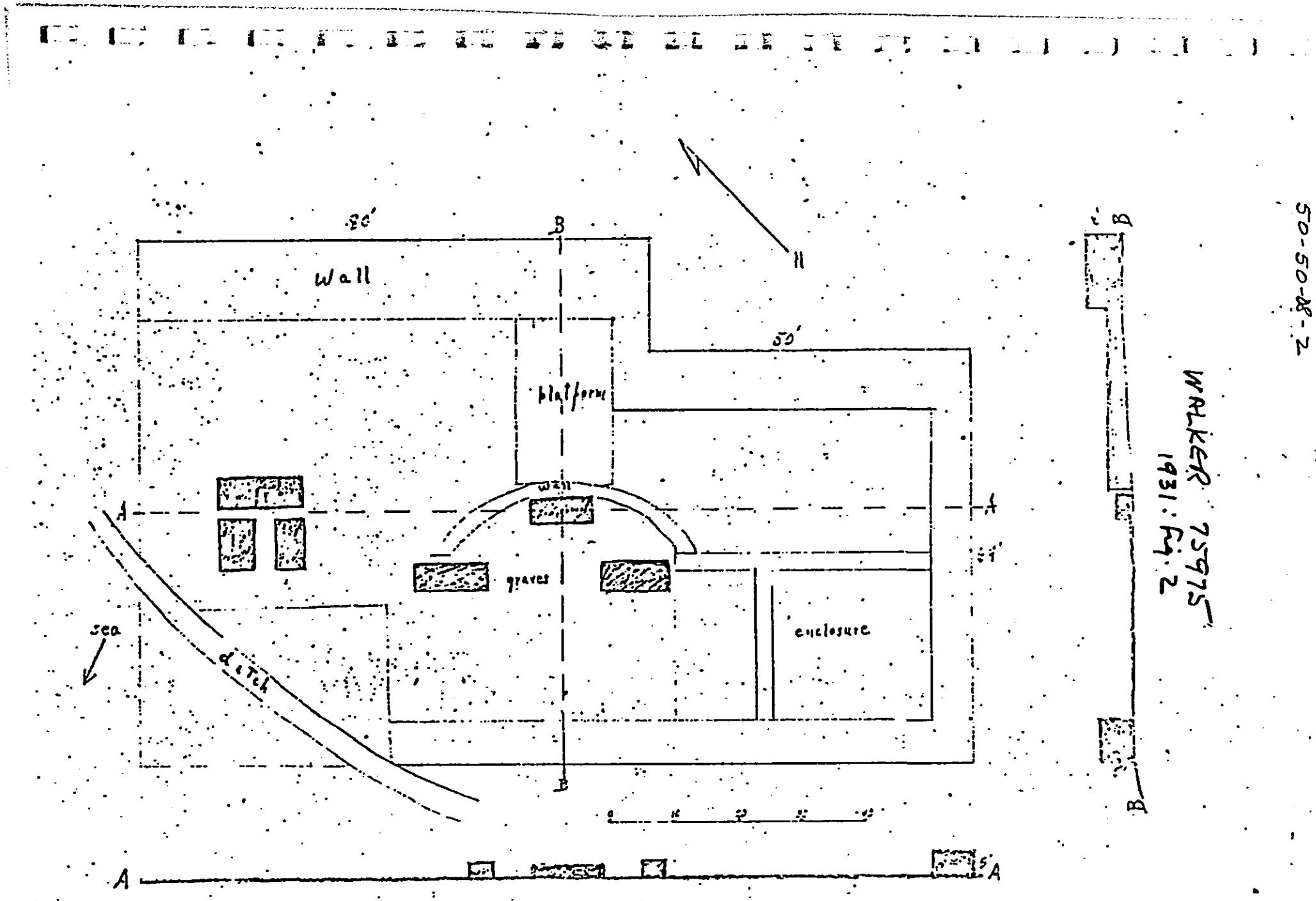
Heiau Site 2 C8-2

Name: Hikii

Location: On the east side of Ukumehame Gulch directly opposite site at an elevation of about 200 feet. It is just above the cane lands and the modern ditch crosses one corner of it.

Description: A good sized heiau built of rough blocks of red basalt. The northeast and southeast sides are walled to a height of 6 feet and range from 9-12 feet in thickness. An open terrace fronts the sea on the other sides. The outline of the edge of the old wall can be seen below the modern wall. The heiau is 130 feet long and 81 feet wide. Some coral and bits of shell were found on its terraces. Graves of recent date fill the interior.

See fig. 2
Stokes J. 4, 124 (pl. 75th)



50-50-18-2

50-50-08-2

72000 Thrum Hawaiian Annual 1918
"More Maui Heiau Sites"
written by J.F.G.Stokes

and level with ground. No other features. Said by several natives to be a "heiau for dead people". Probably only a sacred place without temple structure.

4/ Wailuku heiau, in ili of Kawililipoa, Kamaole, mauka. Not seen.

4/ Kolea heiau, in ili of Kawililipoa, for sacrifice. Not seen.

4/ Heiau, name unknown, in same ili, on sea plain, 200 feet makai or west of lower road and same distance south of Mormon church. Destroyed, probably a kahua. (Guide for last told of previous two.)

4/ Heiau reported on Puu hele, Waikapu. Not examined.

4/ Hikii heiau, at Ukumehame; on knoll east side of stream about a mile from the sea and 200 feet elevation. Northwest and northeast walls changed and interior used for grave-yard. Two remaining walls would indicate a size of 55 feet square. named after chief Hikii. (Kaahui, informant, aet. 93.)

A reputed heiau, located on west side of the stream, opposite Hikii; also used as a grave-yard. Kaahui denies that it was a heiau.

c. 4/ Heiau Kaiwalea, at Olowalu, on hill near power line; a large, walled heiau in fair condition. Many graves in its enclosure.

4/ A heiau at Honokahua was reported; name unknown, of which no particulars could be gathered.

Certain Japanese papers of this city for some time past have been endeavoiring to create a spirit of dissatisfaction among plantation laborers with their wages, notwithstanding the liberal bonus system that was entered upon last year in addition to their monthly wage, whereby day laborers on a number of plantations have averaged from $36.20 to $39.50 per month, while contracting cultivators show earnings ranging from $23.69 to $52.96 per month, and these figures are already being exceeded by the higher rates ruling this year's sugar market. It is estimated that the bonus to be paid laborers for the 1917 sugar crop will reach $7,000,000. Some people, with the I. W. W. spirit, want the earth.

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

50-08-__-__-__-__-1
(1 2 - 3 4 - 5 6 7 8 9)
SITE IDENTIFICATION NUMBER

2 (10) 1 (11) PRE-1778 (12 13 14 15 16 17 18 19 20)
ARD No. DATE/PERIOD

SITE NAME/TYPE: HIKII HEIAU
DISTRICT: LAHAINA
AREA: 700 square m s
CATEGORY: X Single Feature ___Complex ___Places
OWNERSHIP: ___Public X Private
PHOTOGRAPHS: X Yes ___No (Temp/Tech)
KNOWN PRESSURES ON SITE: NONE
PRESENT LAND USES: UNUSED
DESTRUCTION: X No Known Future Danger ___Possible Future Danger ___Future Danger Certain
___Present Danger ___Presently Being Destroyed
STATUS: ___Occupied X Unoccupied CONDITION: ___Excellent ___Good X Fair ___Deteriorated
INTEGRITY: X Unaltered, Orig Loc ___Unaltered, Moved ___Altered, Orig Loc ___Altered, Moved
ACCESSIBILITY: ___Unrestricted X Restricted ___Inaccessible

LEGENDARY MATERIALS KNOWN: ___Yes X No WRITTEN HISTORICAL MATERIALS: ___Yes X No
IMPORTANCE AS EXAMPLE OF TYPE SITE: ___Good ___Moderate X Poor
SUSCEPTABILITY TO INTERPRETATION: ___Good ___Moderate X Poor
RESEARCH POTENTIAL: ___Good ___Moderate X Poor
LOCAL ATTITUDES ABOUT SITE: ___Valuable ___Moderate Value ___Low Value ___Ambivalent X Unknown
BRIEF DESCRIPTION (Columns 21-80): HEIAU AND GRAVEYARD

STAFF EVALUATION: ___High Value ___Valuable X Reserve ___Marginal
SUGGESTED THEMES: POLYNESIAN HAWAI'I ; RELIGION

SUBMITTED TO REVIEW BOARD:

REVIEWER'S RECORD AND EVALUATION

NAME: DATE REVIEWED
CATEGORY: ___High Value ___Valuable ___Reserve ___Marginal
SIGNIFICANCE: ___National ___State ___Local
RECOMMENDED DISPOSITION: ___Nominate National Register ___State Register ___Staff Files
RECOMMENDED THEMES:
REVIEWER'S COMMENTS:

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: RECORDER:
OFFICIAL CATEGORY: ___High Value ___Valuable ___Reserve ___Marginal
OFFICIAL SIGNIFICANCE: ___National ___State ___Local
OFFICIAL THEMES:
OFFICIAL DISPOSITION: ___National Register Nomination ___State Register ___Staff Files
REVIEW BOARD COMMENTS:

VOTING RECORD: Daws___ Hormann___ Jackson___ Kikuchi___
Lind___ Mark___ Nagata___ Paglinawan___
Roche___ Tuggle___

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE PARKS DIVISION

HAWAII REGISTER OF HISTORIC PLACES

ARCHAEOLOGICAL FORMS

FORM 0 1: FIELD SURVEY

4 CORNER	SINGLE POINT COORDINATE LOCATION
12	2 13 14 15 16 . 17 18 N. / 19 20 21 . 22 23 E.

DISTRICT	LOC	FACTOR	AREA SQUARE	CATEGORY	SIG 1	SIG 2
24 25	26	27	28 29 30	31	32 33	34 35
5 4	5	4	7 0 0	1	1 0	6 1

DESTR	LAND CLASS	PHOTOS	INITIALS	INSTITUTION	MONTH	YEAR
36	37 38 39	40	41 42 43	44 45	46 47	48 49
1	7 3	1	R D C	0 5	8	7 3

HISTORICAL OR COMMON NAME: H I K I I H E I A U (50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67)

FEATURE CLASSIFICATION CODE	COND	INTG	PERIOD
68 69 70 71 72 73 74 75 76 77.	78	79	80
5 4 1 20	3	1	4

CLASS: Nominated ____ Accepted ____ NRHP

HRHP: A ____ B ____ C ____

Category

Keypunched

FORM 1 1: FOUR CORNER LOCATION

NW CORNER:	12 13	2 14 15 16 17 . 18 19 N. / 20 21 22 . 23 24 E.
NE CORNER:	25 26	2 27 28 29 30 . 31 32 N. / 33 34 35 . 36 37 E.
SE CORNER:	38 39	2 40 41 42 43 . 44 45 N. / 46 47 48 . 49 50 E.
SW CORNER:	51 52	2 53 54 55 56 . 57 58 N. / 59 60 61 . 62 63 E.
	QUAD	NORTH GRID COORDINATE / EAST GRID COORDINATE

50 - 50 - 08 - 7 8 9 10 11 2

ISLAND QUAD IDENTIFICATION NO.

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

- 5 0 - 0 8 - _ _ _ _ 3
1 2 3 4 5 6 7 8 9
SITE IDENTIFICATION NUMBER

SITE NAME/TYPE: UKUMEHAME HEIAU
DISTRICT: LAHAINA
AREA: 825 square meters s
CATEGORY: X Single Feature ___Complex ___Places
OWNERSHIP: ___Public _X_Private
PHOTOGRAPHS: X Yes ____No (Temp/Tech)
KNOWN PRESSURES ON SITE: CATTLE

2 1 P R E _ 1 7 7 8 _
10 11 12 13 14 15 16 17 18 19 20
RD No. DATE/PERIOD

PRESENT LAND USES: CATTLE GRAZING

DESTRUCTION: ____No Known Future Danger _X_Possible Future Danger ____Future Danger Certain
____Present Danger ____Presently Being Destroyed

STATUS: ____Occupied _X_Unoccupied CONDITION: ___Excellent ___Good ___Fair _X_Deteriorated
INTEGRITY: ___Unaltered, Orig Loc ___Unaltered, Moved _X_Altered, Orig Loc ___Altered, Moved
ACCESSIBILITY: ____Unrestricted _X_Restricted ____Inaccessible

LEGENDARY MATERIALS KNOWN: ____Yes _X_No WRITTEN HISTORICAL MATERIALS: ____Yes _X_No
IMPORTANCE AS EXAMPLE OF TYPE SITE: ____Good ____Moderate _X_Poor
SUSCEPTABILITY TO INTERPRETATION: ____Good ____Moderate _X_Poor
RESEARCH POTENTIAL: ____Good ____Moderate _X_Poor
LOCAL ATTITUDES ABOUT SITE: ___Valuable ___Moderate Value ___Low Value ___Ambivalent X Unknown
BRIEF DESCRIPTION (Columns 21-80): HEIAU OR POSSIBLE GRAVEYARD DISTURBED BY CATTLE AND ROAD CONSTRUCTION.

STAFF EVALUATION: ____High Value ____Valuable _X_Reserve ____Marginal
SUGGESTED THEMES: POLYNESIAN HAWAI'I: RELIGION

E SUBMITTED TO REVIEW BOARD: _____

REVIEWER'S RECORD AND EVALUATION

NAME: _____ DATE REVIEWED _____
CATEGORY: ____High Value ____Valuable ____Reserve ____Marginal
SIGNIFICANCE: ____National ____State ____Local
RECOMMENDED DISPOSITION: ____Nominate National Register ____State Register ____Staff Files
RECOMMENDED THEMES: _____

REVIEWER'S COMMENTS: _____

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: _____ RECORDER: _____
OFFICIAL CATEGORY: _____High Value _____Valuable _____Reserve _____Marginal
OFFICIAL SIGNIFICANCE: _____National _____State _____Local
OFFICIAL THEMES: _____

OFFICIAL DISPOSITION: _____National Register Nomination _____State Register _____Staff Files
REVIEW BOARD COMMENTS: _____

ING RECORD: Daws_____ Hormann_____ Jackson_____ Kikuchi_____
Lind_____ Mark _____ Nagata_____ Paglinawan_____
Roche_____ Tuggle_____

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE PARKS DIVISION

HAWAII REGISTER OF HISTORIC PLACES

ARCHAEOLOGICAL FORMS

FORM 01: FIELD SURVEY

4 CORNER (12)

SINGLE POINT COORDINATE LOCATION: 2 (13-16) . (17-18) N. / (19-21) . (22-23) E.

DISTRICT (24-25)	LOC (26)	FACTOR (27)	AREA SQUARE (28-30)	CATEGORY (31)	SIG 1 (32-33)	SIG 2 (34-35)
54	5	4	825.	1	10	61

DESTR (36)	LAND CLASS (37-39)	PHOTOS (40)	INITIALS (41-43)	INSTITUTION (44-45)	MONTH (46-47)	YEAR (48-49)
2	73	1	RDC	05	08	73

HISTORICAL OR COMMON NAME: UKUMEHAME HEIAU (50-67)

FEATURE CLASSIFICATION CODE (68-77)	COND (78)	INTG (79)	PERIOD (80)
541 20	4	3	5

CLASS: Nominated ____ Accepted ____ NRHP

Category A ____ B ____ C ____ HRHP

Keypunched

FORM 11: FOUR CORNER LOCATION

NW CORNER:	(12-13)	2 (14-17) . (18-19) N. /	(20-22) . (23-24) E.
NE CORNER:	(25-26)	2 (27-30) . (31-32) N. /	(33-35) . (36-37) E.
SE CORNER:	(38-39)	2 (40-43) . (44-45) N. /	(46-48) . (49-50) E.
SW CORNER:	(51-52)	2 (53-56) . (57-58) N. /	(59-61) . (62-63) E.
	QUAD	NORTH GRID COORDINATE	EAST GRID COORDINATE

50 - 54 (3-4) - 08 (5-6) - ____ (7-11) ISLAND QUAD IDENTIFICATION NO.

FEATURE MAP FORM

50-50-8-3

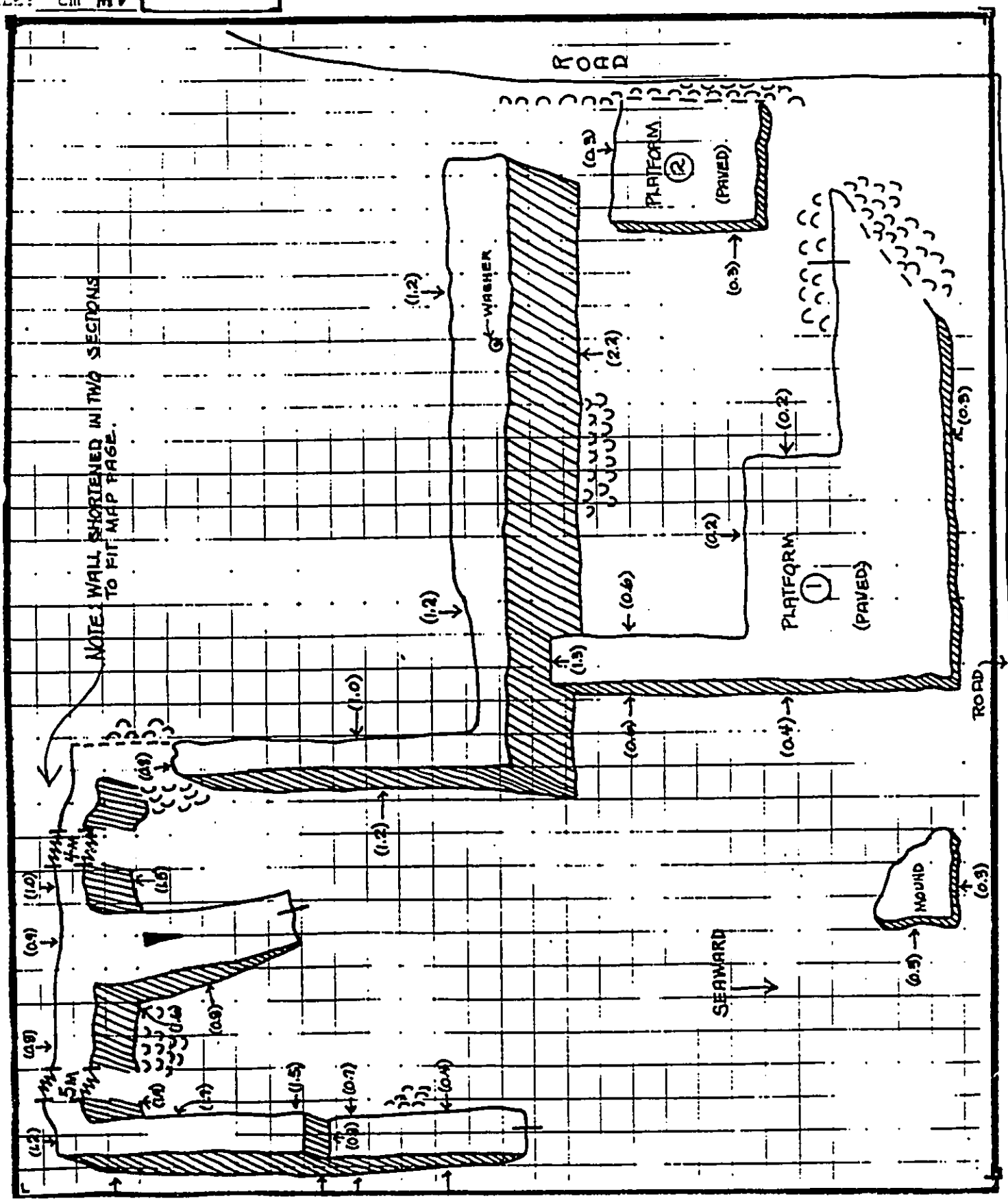
NORTH ARROW

TRUE NORTH

1 2 3 4

SCALE: cm MV

MAPPING TECHNIQUE: 03



20° 48' 40" N / 156° 35' 35"W

FEATURE DESCRIPTION FORM

50 - 5 0 - 0 8 - _ _ _ _ 3
ISLAND QUAD IDENTIFICATION NO.

VERBAL DESCRIPTION MUST INCLUDE: bearings and sources used to locate feature; size; shape; construction technique; materials used; terrain features; condition; surface artifacts; midden. SIGNIFICANCE STATEMENT MUST INCLUDE: research potential; interpretive potential; unusual or important characteristics; probable function; importance as representative of its class; recommendation of Register status.

DESCRIPTION: This site was named Wkumehame heiau by the inventory team because it is situated just W of Wkumehame Gulch. To locate it, we drove W on Highway 30 toward Olowalu. At Olowalu General Store, we turned E on the old road that parallels Highway 30. We drove E for about 2 mi and turned left on an inlandcane field road between telephone poles number 4 and 5. We drove on this road for 0.5 mi to the end and turned right on another cane field road. We drove 20 m on this road and parked. The heiau is situated justinland of this road. It is situated W of Wkumehame Gulch in the foothills of the West Maui mountains. The vegetation consists of kiawe* haole koa* and an unidentified species of grass. Across the road a cliff drops down to a river.

Winslow Walker visited this heiau in 1931 (p. 107) and reported it half-destroyed. Since then, road construction has destroyed about half of what Walker reported, including sections of the W and E walls, and some of what he reported as graves. The heiau is presently irregular in shape, measuring about 38 x 27 m. In the E section there are two platforms. Platform #1 is irregularly shaped, measuring 14.7 x 6 m, and is paved with fistsized and larger aa. It is from 0.2 to 0.4 m in height and, in the interior, coral, waterworn stones, and cowrie were found. A wall 6 m in length by 0.6 m high extends W from the NW corner. Platform #2, located on what is now the E edge of the heiau, is 4.3 x 4 m and is 0.3 m high. It is also paved with fist-sized and larger aa. Both platforms #1 and #2 are what Walker reported as graves. Excavation of these platforms is needed to determine the validity of this report. The N wall in this section is 17.3 m in length, ranges from 1 to 1.8 m in width, and ranges from 1.2 to 2.2 m in height. In the W section of the heiau, the wall dimensions are as follows: The W wall is 19.2 m long, from 0.8 to 1.9 m high, and from 0.7 m to 1.3 m wide; the E wall measures 13.2 m long, 1m to 1.2m high, and 1 m in width; the N wall is 13.7 m long, from 0.4 to 1.7 m high, and 1.4 m wide. There is a wall dividing the W wall of the W section, measuring 6 m in length, 0.8 to 1.3 m in height and about 1.8 m wide. All walls in the heiau, with the exception of the W wall, are of multiple-stacked construction and are built with red waterworn boulders. The W wall is of core-filled construction with waterworn boulders on the outsides, and a smaller aa rock fill. All walls are fairly deteriorated, even though they were rebuilt for the use as a cattle pen, according to Walker (1931: 102). It was difficult to determine which walls were rebuilt and which were not. Cattle still roam the area.
About 2 m from the road on the S and about 4 m W of platform #1, there is a small mound about 2.5 x 2.2 m. It is 0.3 m high. It is constructed of small, waterworn boulders. This is also a possible grave according to Walker's report. There was no midden seen except for that already mentioned on platform #1. No artifacts were found.

*kiawe: algaroba
haole koa: (Leucaena glauca)

(continued)

FEATURE DESCRIPTION FORM

50 - 5 0 - 0 8 - 3
ISLAND QUAD IDENTIFICATION NO.

VERBAL DESCRIPTION MUST INCLUDE: bearings and sources used to locate feature; size; shape; construction technique; materials used; terrain features; condition; surface artifacts; midden. SIGNIFICANCE STATEMENT MUST INCLUDE: research potential; interpretive potential; unusual or important characteristics; importance as representative of its particular class; probable function; recommendation for Register status.

SIGNIFICANCE: The research potential of this site lies in the excavation of the platforms to determine whether they are actually graves. Other than this, due to the condition of the heiau, little research is possible. Because of the deterioration and the possibility that the interior platforms may be graves, the interpretive potential is low or zero. Because of the pssibility of graves in the interior, the status of this structure is uncertain; it may be a heiau or a graveyard. Walker in the his remarks on this site noted that"Thrum questioned the use of this structure as a heiau on the advice of his informant Kaahui, who says it was only a graveyard. Many of the Maui heiau have graves on them, but there is no question that they are heiau. Modern natives often cannot discriminate between a heiau and a burying ground for this reason." (Walker 1931, site 3). As a heiau, it would be a Marginal site, however, due

UKUMEHAME HEIAU; NW CORNER (INTERIOR)

SMa(a)48-17

to the possible graveyard, we recommend Reserve status.

SIGNED Robert D Cordy III
ARCHAEOLOGIST

DATE Oct 22, 1973

FORM 3 1 2: PROPERTY OWNE

50 - 5 0 - 0 8 - _ _ _
ISLAND QUAD IDENTIF TION

2 1 | 2 4 | 2 | 2 | 1 | 2 | 4
USE 1 | USE 2 | STAT | OWNR | ATTD | ACCS | zone

PROPERTY OWNER: P I O N E E R _ M I
STREET ADDRESS:
TOWN OR CITY: L A H A I N A _ _ _ H
STA

9025 Ma-D1-

Site: Ma-~~C8~~-D1-3
Lan: Ukumehane, ~~Wes~~
TMK:
Owner:
General Survey x
Description: Walle side of Ukum evidence of obliterated
Sources: Walker,
Photos: Color B/W
Geographic coo
latitude
longitude
UNISORT ANALYSIS

FORM 4 1 2: BACKGROUND DATA

50 - 5 0 - 0 8 - _ _ _ _
ISLAND QUAD IDENTIFICATION

AHUPUA'A: U K U M E H A M E _ _ _ _
PREVIOUS SURVEYS: A R C H A E O L _ O F _ I
PREVIOUS SITE DESIGNATION(S): M A - C 8 - 3 _ _ 3 _ _ _
LAST NAME OF SURVEYOR: W A L K E R _ _ _ _ _ _

0 5 | 3 1 | 0 5
INSTITUTION | YEAR | FILED AT

9025 Ma-D1-3

Site: Ma-~~C2~~-D1-3 State: H

Loc.: Ukumehame, ~~Waiehu~~ LAU

TMK:

Owner:

General Survey __x__ Excava

Description: Walled heiau I
side of Ukumehame Gu
evidence of terraces
obliterated with mod

Sources: Walker, Site 3.

Photos: Color
B/W

Geographic coordinates
latitude
longitude

UNISORT ANALYSIS CARD FOR

Ukumehame Region

WALKER 1 175

Heiau Site 2 C8-2

Name: Hikii

Location: On the east side of Ukumehame Gulch
an elevation of about 200 feet. It is ju
the modern ditch crosses one corner of it

Description: A good sized heiau built of rough l
northeast and southeast sides are walled t
range from 9-12 feet in thickness. An open
the other sides. The outline of the edge of
below the modern wall. The heiau is 130 feet
Some coral and bits of shell were found on it.
recent date fill the interior.

See fig. 3
Sites p. 4, 12 + (Fig. 3, 4)

9025 Ma-D1-3 50-50-08-3

Site: Ma-~~62~~ D1-3 State: 50-50-8 3 Heiau Date:

Land: Ukumehame, ~~Waiehu~~ LAHAINA

TMK:

Owner:

General Survey x Excavation ___ Artifacts ___ HHD- ___ HRC-

Description: Walled heiau partially destroyed and altered for a cattle pen on the W side of Ukumehame Gulch. Irregular in shape; enclosure in the NW corner; evidence of terraces and platforms spread w/ pebbles and shells; largely obliterated with modern graves.

Sources: Walker, Site 3. Hab p. 107, Mau. Fig. 3

Photos: Color
B/W

Geographic coordinates	USGS Quadrangle	1000 Meter Grid
latitude	O'LOWALU	
longitude	Bishop Museum	___N/___E

UNISORT ANALYSIS CARD FORM YB BURROUGHS CORPORATION - TODD DIV. - L HADLEY PRINTED IN U.S.A.

50-50-08-3

Walker 1931
75975 p. 107

Ukumehame Region

Heiau Site 3 ~~50-~~ D1-3

Name: Unknown

Location: On the west side of Ukumehame Gulch just above the ditch at the edge of the cane lands.

Description: A walled heiau partially destroyed and altered for a cattle pen. It is irregular in shape, having a wall 142 feet long on the west and 165 feet on the north broken by several deep jogs. New walls have been built on the site of the old a little back from the original edge, so that their appearance is uneven. There is an enclosure 50 feet long in the northwest corner and a small square hole 3 x4 in the corner where the side wall of the enclosure leaves the west wall. There are evidences of terraces and platforms spredd with shells and pebbles but these have been largely obliterated by the modern graves. The heiau faces the sea. See fig 3

Remarks: Thrum dectionS the use of this structure as a heiau on the advice of his informant, Kaahui, who says it was only a graveyard. Many of the Maui heiaus have graves on them, but there is no question that they are heiaus. Modern natives often can not discriminate between a heiau and a burying ground for this reason.

enclosure

wall

D

graves

terraces

ROAD

Flat rock

ditch

N

HEIAU AT UKUMEHAME

UKUMEHAME HEIAU

CITY OF HONOLULU P. STORAGE

75-975
Walker 1931 fig. 3

E-80-05-05

D-13

DOCUMENT CAPTURED AS RECEIVED

LEGEND:

PRACTICE:	PLANNED:	EXISTING:
Windbreak:	x x x x x	* * * * *
Grass Waterway:	—GWW→	~~—GWW→~~
Diversion:	—D—D→	~~—D—D→~~
F[illegible]eline:	—/—/—/—	—X—X—X—
[illegible]:		
S[illegible]d:		
Boundary Line:		

DOCUMENT CAPTURED AS RECEIVED

APPENDIX C

STATE HISTORIC PRESERVATION OFFICE LETTER

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

December 15, 1995

Mr. Neal Fujiwara, District Conservationist
USDA Natural Resources Conservation Service
210 Imi Kala Street, Suite 209
Wailuku, Hawaii 96793

LOG NO: 16130
DOC NO: 9512KD07

Dear Mr. Fujiwara:

SUBJECT: **National Historic Preservation Act, Section 106 Review of a Proposed Conservation Project -- Ukumehame Firing Range**
Ukumehame, Lahaina District, Island of Maui TMK: 4-8-02: 02 (por.)

Thank you for the opportunity to comment on an proposed conservation project at the Ukumehame firing range. The project will consist primarily of revegetation along previously graded portions of the property.

The proposed project area was graded and grubbed in 1988 for construction of the firing range berms and target areas. Additional grading occurred in 1992 for the Phase I, Police Combat Range. A review of the additional grading was conducted by our office and it was found that the construction would have "no effect" on historic sites.

A brief inspection of the project area was conducted by State Historic Preservation Division staff December 6, 1995. The inspection confirmed that the area of the conservation project has been previously graded and/or grubbed. Undisturbed lands which contain sites are present, beyond the limits of the proposed project.

Based on the condition of the property and on past land use, we believe that the conservation project will have "no effect" on historic sites.

Please contact Ms. Theresa K. Donham at 243-5169 if you have any questions.

Aloha,

DON HIBBARD
Deputy State Historic Preservation Officer

KD:jen

APPENDIX D

BOTANICAL ASSESSMENT

BOTANICAL ASSESSMENT

UKUMEHAME FIRING RANGE

TMK 4-8-02: PORTION 2 AND 39

MA'ALAEA QUAD, MAUI

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: HIARFM

November 1992

BOTANICAL ASSESSMENT
UKUMEHAME FIRING RANGE
TMK 4-8-02: PORTION 2 AND 39
MA'ALAEA QUAD, MAUI

INTRODUCTION

The Ukumehame Hawaii Army National Guard Firing Range is located on TMK 4-8-02: portion of parcels 2 and 39, Lahaina District, island of Maui. The firing range consists of 39.279 acres bounded by HonoaPi'ilani Highway to the south, actively cultivated sugar cane fields to the west, kiawe forest to the east, and grassland with scattered shrubs on the north where it adjoins the West Maui Forest Reserve.

A botanical reconnaissance survey of the site was conducted on 27 May 1992; a team of four botanists ~~was used~~. The primary objectives of the survey were to: 1) describe the vegetation on the firing range, and 2) search for threatened and endangered plants protected by Federal and State laws.

DESCRIPTION OF THE VEGETATION

Except for a line of tall kiawe trees, about 20 to 25 ft. high, at the base of the foothills where the firing range abuts the West Maui Forest Reserve, the majority of the vegetation on the site consists of a mixture of grass and herbaceous species with a few scattered clumps of shrubs and smaller kiawe trees. The most abundant grass on the site is sprangletop (Leptochloa uninervia) which forms a dense cover in the many low-lying areas on the site. Other grasses found here in lesser numbers are swollen finger grass (Chloris barbata), buffel grass (Cenchrus ciliaris), and

barnyard grass (Echinochloa crusgalli). Weedy herbs and small shrubs include saltbush (Atriplex suberecta), 'uhaloa (Waltheria indica), 'ilima (Sida fallax), and nena or kipukai (Heliotropium curassavicum). Young trees of kiawe (Prosopis pallida) and shrubs of Indian pluchea (Pluchea indica) occur in small, scattered patches throughout the site. The firing range appears to be somewhat periodically maintained by bulldozing and clearing away any scrubby growth, primarily the shrubs and small kiawe trees.

Portions of the site especially in the areas closer to the highway had standing water at the time of the survey. Two endangered Hawaiian Stilt or Ae'o (Himantopus mexicanus knudseni) were observed feeding in the ponded area next to the drainage ditch which runs alongside the highway. Pickleweed (Batis maritima) and 'akulikuli (Sesuvium portulacastrum) are locally abundant around wet areas.

DISCUSSION

The vegetation on the subject property is dominated primarily by introduced or alien species, many of them weedy. The native plants, such as 'ilima, 'uhaloa, nena, 'akulikuli, etc., found on the site are indigenous species, that is, they are native to the Hawaiian Islands and also elsewhere throughout the Pacific. All the plant species found on the property can be found in similar environmental habitats throughout the islands. None of the plants are officially listed threatened and endangered species (U.S. Fish and Wildlife Service 1989); nor are any proposed or candidate for such status (U.S. Fish and Wildlife Service 1990). None of the plants is considered rare or vulnerable (Wagner et al. 1990). Given the findings above, the continued use of the site as a firing range should not have a significant negative impact on the botanical resources.

Of major concern, is the presence of wetlands on the property. Wetland indicator species (Reed 1988) observed on the site are:

Scientific name	Common name	Indicator status
Batis maritima	pickleweed	OBL
Echinochloa crusgalli	barnyard grass	FACW
Heliotropium curassavicum	nena, kipukai	FAC
Leptochloa uninervia	sprangletop	FACW
Pluchea indica	Indian pluchea	FAC*
Sesuvium portulacastrum	'akulikuli	FAC

Indicator categories are OBL obligate wetland -- occur almost always (greater than 99%) under conditions in wetlands; FACW facultative wetland -- usually occur in wetlands (probability 67%-99%), but occasionally found in nonwetlands; FAC facultative -- equally likely to occur in wetlands or nonwetlands (probability 43-66%).

Besides standing water during certain times of the year, other hydrologic indicators include algal and mineral crusts on the surface of the soil (Environmental Laboratory 1987). The soil on the site is mapped as "KMW", Kealia silt loam (Foote et al. 1972), a hydric soil. This soil type is found on coastal flats. It is hydric because of saturation due to a water table at or near the surface and is seasonally flooded or ponded.

It is recommended that a wetlands determination and delineation be conducted for the property by the Corps of Engineers.

References

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual", Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

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Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: Hawaii (Region H). U.S. Fish and Wildlife Service Biological Report 88(26.13).

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_____. 1990. Endangered and threatened wildlife and plants; Review of plant taxa for listing as Endangered and Threatened Species; Notice of review. Federal Register 55 (35): 6184-6229.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i and Bishop Museum Press, Honolulu. Bishop Museum Special Publication No. 83.

CONSERVATION PLAN APPROVAL

Client: Hawaii Army National Guard Hawaii Army National Guard
ted By: James Ino

No Records Found.

CERTIFICATION OF COMPLIANCE WITH THE FOOD SECURITY ACT, 1985

I (We) concur in the conservation practices and installation schedules indicated in this conservation plan for all fields labeled HEL*. I (We) understand that, when this conservation plan for HEL fields is applied to the land and maintained on a continuing basis, the conservation system will meet all of the Food Security Act of 1985 requirements for conservation compliance. Furthermore, I (we) understand that if any fields other than those HEL fields specified in this plan will be used for the production of agricultural commodities, I (we) will contact ASCS and SCS for an HEL determination.

Cooperator (Producer) Date

The above Conservation Plan meets the requirements of the Field Office Technical Guide.

strict Conservationist Date

Approved by

Conservation District Date

S. DEPARTMENT OF AGRICULTURE
IL CONSERVATION SERVICE
iiluku Field Office

CONSERVATION PLAN

lient: Hawaii Army National Guard Hawaii Army National Guard
.ced By: James Ino

LAND UNITS		PLANNED			APPLIED		PLANNED CONSERVATION TREATMENT
ARM	FIELD	AMOUNT	MONTH	YEAR	AMOUNT	DATE	
							Firing Range Land will be primarily used for a firing range for Hawaii Army National Guard. Fields 1,2,3 and 4 will be established with native plants to assist in training of plant identification for soldiers. Field 1, identified as the .45 caliber pistle range, Field 2, existing target range,Field 3 borders Pioneer Mill field 970 and Field 4 are the berms bordering the north and south sides of field 2.
-1	F-1	15.0Ac					
-2	F-2	15.0Ac					
3	F-3	6.0Ac					
-4	F-4	3.0Ac					
1	F-1	15.0ac	10	1996			Brush management Control brush and undesirable grass's with mechanical, chemical or bioligical. Practice will reduce erosion and encourage native vegetation to be established.
2	F-2	15.0ac	02	1997			Cover and green manure crop Plant grasses or legumes to improve the soil and protect the soil between crop plantings. Establish salt tolerant, low growing grass's and plant material on berms and within fields 2 and 3. Practice will reduce erosion.
3	F-3	6.0ac	02	1998			
	F-1	15.0ac	10	1996			Cover and green manure crop Establish ground cover that are adaptable to area. Grass's native grass's such as piligrass to reduce erosion.
	F-4	3.0ac	02	1999			
-1	F-1	750.0ft	10	1996			Diversion Construct diversion according to NRCS specifications. Diversion will reduce offsite runoff and erosion. Refer to conservation plan map for location.
-3	F-3	800.0ft	10	1997			
-1	F-1	1000.0ft	02	1997			Field windbreak Establish native brush and trees for windbreak. Practice will reduce wind velocity within firing range. Establish windbreaks along edge of fields. Refer to conservation plan map for location.
F-2	F-2	3000.0ft	02	1998			
-3	F-3	3000.0ft	02	1999			
-1	F-1	15.0ac	10	1997			Grassed waterway Construct grassed waterway to prevent erosion by providing for the safe disposal of excess surface water. Channel is shaped or graded to required dimensions and established in suitable vegetation for the stable conveyance of runoff.
-3	F-3	6.0ac	10	1997			
-1	F-1	2.0ac	10	1997			Irrigation water management Apply irrigation water at a time and rate that meets the crop needs and conserves water.
-2	F-2	5.0ac	10	1997			
-3	F-3	6.0ac	10	1997			

. DEPARTMENT OF AGRICULTURE
IL CONSERVATION SERVICE
iiluku Field Office

CONSERVATION PLAN

:lient: Hawaii Army National Guard Hawaii Army National Guard
ted By: James Ino

LAND UNITS		PLANNED			APPLIED		PLANNED CONSERVATION TREATMENT
ARM	FIELD	AMOUNT	MONTH	YEAR	AMOUNT	DATE	
4	F-4	3.0ac	10	1998			
1	F-1	15.0ac	10	1997			Nutrient management Managing the amount, form, placement, and timing of application of plant nutrients. To supply plant nutrients for optimum crop and forage yields, minimize the entry of nutrients to surface and groundwater, and maintain or improve the chemical and biological condition of the soil.
2	F-2	15.0ac	10	1997			
3	F-3	6.0ac	10	1998			
4	F-4	3.0ac	10	1998			
1	F-1	15.0ac	10	1996			Pest management Refer to NRCS Specifications.
2	F-2	15.0ac	10	1997			
3	F-3	6.0ac	10	1997			
4	F-4	3.0ac	10	1998			
1	F-1	1000.0Ft	10	1996			Pipeline Irrigation Mainline to be installed for windbreaks and for other crop needs.
3	F-3	1000.0Ft	02	1998			
4	F-4	250.0Ft	02	1999			
1	F-1	2.0ac	05	1997			Trickle irrigation system Install a trickle irrigation system to apply water efficiently and uniformly for crop needs.
2	F-2	5.0ac	05	1997			
3	F-3	6.0ac	05	1997			
	F-4	3.0ac	05	1997			
1	F-1	15.0ac	10	1997			Wildlife wetland habitat management will be carried out Retaining, creating, or managing wetland habitat for wildlife.
2	F-2	15.0ac	10	1997			
3	F-3	6.0ac	10	1997			
4	F-4	3.0ac	10	1997			

APPENDIX E

BIOLOGICAL OPINION

BIOLOGICAL OPINION
of the
U.S. FISH AND WILDLIFE SERVICE
for the
EFFECTS OF PREDATOR CONTROL FOR ENDANGERED WATERBIRDS
at
UKUMEHAME FIRING RANGE, MAUI, HAWAII

NOVEMBER 2000

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard
Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: 1-2-00-F-06 (DH/EAS)

NOV 22 2000

Richard Young, Lieutenant Colonel
Hawaii Army National Guard
Attn: Environmental Division
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Re: Biological Opinion on the Potential Effects of Predator Control for Endangered Waterbirds at Hawaii Army National Guard's Ukumehame Firing Range, Maui, Hawaii (Formal Consultation Log Number 1-2-00-F-06)

Dear Lieutenant Colonel Young:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed predator control activities at Hawaii Army National Guard's (HIARNG) Ukumehame Firing Range, Maui, Hawaii, and its effects on the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*) and the endangered Hawaiian coot (*Fulica alai*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The proposed predator control activities are designed to protect these endangered waterbirds from alien mammalian predators such as cats (*Felis catus*), mongooses (*Herpestes auropunctatus*), and rats (*Rattus* spp.). This action was determined to be necessary by the HIARNG and the Service because of the HIARNG-created wetland that, given the presence of introduced mammalian predators, now acts as an attractive nuisance for these endangered waterbirds. Your April 10, 2000, request for formal consultation was received on April 17, 2000. Additional information was obtained during the consultation.

This biological opinion is based upon the following information: 1) HIARNG's April 10, 2000, request for formal consultation; 2) the Service's Technical/Agency Draft Revised Recovery Plan for the Hawaiian waterbirds (USFWS 1999a); 3) other biological literature (see References at the end of the document); and, 4) information contained in our files. The administrative record of this consultation is on file in the Service's Pacific Island office in Honolulu, Hawaii.

Consultation History

The November 19, 1999, pre-draft environmental assessment for predator control at Ukumehame Firing Range (UFR) was reviewed by the Service and on January 28, 2000, HIARNG met with the Service regarding their activities on UFR. During this meeting, it was determined that the proposed predator control activities had the potential to result in take of endangered species and notified the Service that they would be requesting formal consultation under section 7 of the Act. HIARNG's April 10, 2000, letter requesting formal section 7 consultation was received by the Service on April

17, 2000. There have been no prior consultations for this project.

BIOLOGICAL OPINION

I. Description of the Proposed Action

The HIARNG received a parcel of land by executive order (TMK#:4-8-02:47) to be used as a small arms firing range. This facility lies adjacent to the County firing range at Ukumehame, west Maui, and occupies just over 40 acres (16 hectares). Construction of the firing range included bulldozing soils to create a series of berms that enclose a portion of the 600-yard (602-meter) rifle range. As a result of these land modifications, standing water accumulates in the low-lying areas of the range on wet years, both on County and HIARNG portions of the firing range. These areas have been officially delineated as wetlands as defined by the U.S. Army Corps of Engineers. The wetland forms during years of high precipitation and may persist as late as June. However, during most years the wetland is present for a much shorter period or may not form at all. The wetland areas that may be utilized by waterbirds are fragmented and scattered throughout the UFR and the County range. During wet years, the total emergent wetland area occupies 10-15 acres (4-6 hectares). Both Hawaiian stilts and coots may fly or walk to this wetland from adjacent wetland areas such as that found to the west on property belonging to Pioneer Mill Limited. Waterbirds utilize the area only when the wetland forms, but coots may be present in irrigation ditches adjacent to UFR's western boundary. Most of the HIARNG and County range area is enclosed with a cyclone fence, greatly reducing the potential of predation by dogs. However, portions of the property perimeter (western boundary between UFR and Pioneer Mill Limited lands) are separated with a standard 3-strand barbed wire fence and dogs may be able to enter.

Because the wetland partially lies on HIARNG lands, natural resource managers have proposed that predator control activities be carried out to protect the endangered waterbirds when these birds are present. Cats and mongooses will be trapped using Have-A-Heart® live traps that would be placed around the wetland perimeter under shrubs, vegetation, and/or near points of access to the wetland area. Traps will be set once monthly for 2- to 3-day periods and checked daily when open. Captured animals will be euthanized using methods approved by the University of Hawaii Animal Care and Use Committee. The HIARNG also proposes to utilize diphacinone for the control of rats. Diphacinone will be placed in tamper-proof bait boxes which would be distributed in a grid pattern throughout the area. Diphacinone is currently registered for such use in the State of Hawaii. If predation or harassment of endangered or migratory waterbirds by dogs occurs, the HIARNG may wish to expand predator control activities to include the capture and removal of dogs, and/or provide more appropriate fence to ensure that dogs cannot gain access to the wetland area.

II. Status of the Species

A total of 106 endemic species and subspecies of birds have been described from the Hawaiian Islands (Olson and James 1991). Of these, 35 became extinct before the arrival of Captain Cook in 1778, and an additional 23 since then, leaving 48 extant endemic bird taxa. Presently there are six species of extant endemic waterbirds: the Hawaiian duck *(Anas wyvilliana)*, Laysan teal or duck (*Anas laysanensis*), Hawaiian gallinule or moorhen (*Gallinula chloropus sandvicensis*), Hawaiian goose or nene (*Branta sandvicensis*), Hawaiian stilt, and the Hawaiian coot. All of these species are listed by the State and Federal government as endangered. Two of these species were observed on UFR, but it is possible that both the Hawaiian duck and gallinule could be seasonal visitors to the

wetland. The Hawaiian coot and stilt were added to the Federal and State endangered species list in 1970 (USFWS 1999a) and assigned recovery priority numbers of 15 and 9 respectively. Critical habitat has not been designated for these species.

Hawaiian coot

The Hawaiian coot is known from all of the main islands except Kahoolawe. It is found in fresh or brackish water habitats, typically in reservoirs, irrigation ditches or marshes with open areas of water. Coots nest in vegetation adjacent to wetlands and may construct floating nests in open bodies of water. Nesting may occur throughout the year, but typically occurs from March through September. Clutch size ranges from 3-10 eggs, with a mean of 5 eggs per clutch and are incubated from 23-27 days (Berger 1972; USFWS 1999a). The chicks are precocial. Coots are generalist feeders, either dabbling at the surface, diving, or foraging on land in open areas adjacent to water. Their diet consists of vegetation, seeds, invertebrates, and other animals that they may be able to capture. Many of their behaviors are related to weather patterns. Nesting occurs during wet periods, when water bodies form or are at higher volumes, and flocking occurs when water levels are low and wetlands become limiting.

Many wetland habitats in Hawaii are man-made and coots are often present in these artificial habitats (e.g., sewage treatment ponds, golf course hazards, reservoirs, taro ponds). The loss of natural lowland wetlands has likely played a role in the reduction of coots throughout the islands in the past. Hunting in the 19th and early 20th centuries may also have contributed to their decline. Currently, the most immediate threat to these birds is predation from introduced mammals such as the small Indian mongoose and cats. Other current threats come from habitat alteration by introduced water plants that encroach upon and/or overgrow open bodies of water (e.g., California grass (*Brachiaria mutica*), pickleweed (*Batis maritima*), and cattail (*Typha* spp.)), altered hydrology, disease, and environmental contaminants. Their population is believed to be stable, although it fluctuates with wetland abundance, and is reported to range from 2,000 to 4,000 birds throughout the State (USFWS 1999a).

Hawaiian stilt

The Hawaiian stilt is more restricted in its habitat needs, relying on extensive areas of shallow water (≤9 inches in depth [22.9 centimeters]) where the birds wade and feed on small aquatic invertebrates and fish. Nesting occurs next to these habitats, typically from March through August. Ponds and reservoirs with steep sides and little shallow water are not considered to be appropriate habitat, and pre-fledgling stilts have been documented to drown in such habitats. Eggs are laid on exposed scrapes on open ground or mud flats. In general, early successional, shallow wetland habitats with sparse or low vegetation are preferred by stilts. Clutch size ranges from 3-4 eggs, incubation lasts approximately 24 days and, as with coots, the young are precocial (Berger 1972; USFWS 1999a).

Like the coot, Hawaiian stilts have likely suffered from loss of habitat. The Mana Marsh of southern Kauai likely supported many thousands of stilts, coots, gallinules, and ducks before it was channelized and converted for modern agricultural practices. Stilts were also a heavily hunted game bird in the 19th and early 20th centuries. As with the coot, some water use practices (e.g., taro cultivaton) may have benefitted stilts or helped offset other impacts. The most significant threats to stilts at this time are introduced mammalian predators and habitat alteration from human activities or habitat encroachment and modification by introduced weeds. Additional threats include altered

hydrology, disease, and environmental contaminants. The State-wide population is believed to range from 1,000 to 2,000 birds, which occupy, at least seasonally, all of the main islands except Kahoolawe.

Hawaii's endemic waterbirds are not distributed evenly throughout the State. The required wetland habitats are more abundant on larger islands with lowland alluvial deposits, supporting wetland development, with Maui, Oahu, and Kauai having the largest populations. While waterbirds do occur on the island of Hawaii, commonly inhabiting anchialine and other coastal pools (USFWS 1999a), appropriate wetlands are rare because the geomorphology of that island and the abundant porous rock is not conducive to formation of natural wetlands. Kauai has the largest populations of waterbirds, likely attributable to the abundance of well-developed wetlands, high annual rainfall over much of the island, and lack of mongoose on that island. Interisland movement of these birds is relatively common among certain islands (e.g., Maui and Molokai, Kauai and Niihau), but varies from year to year depending on rainfall and the formation of temporary wetlands.

III. Environmental Baseline

The environmental baseline describes the status of the species and factors affecting the environment of the species or critical habitat in the proposed action area contemporaneous with the consultation in process. The baseline includes State, local, and private actions that affect a species at the time the consultation begins. Unrelated Federal actions that have already undergone formal or informal consultation are also a part of the environmental baseline. Federal actions within the action area that may benefit listed species or critical habitat are also included in the environmental baseline.

As previously stated, the wetland on UFR is seasonal in nature and only forms during years of heavy rainfall. Therefore, the area is only used for loafing, feeding, and foraging by these birds during wet years. It is believed that much of the normal State-wide fluctuations seen in waterbird populations are attributable to availability of appropriate wetland habitats which varies from year to year with rainfall. Resident populations of stilts and coots occur at two large nature reserves on Maui, Kanaha Pond State Wildlife Sanctuary and Kealia Pond National Wildlife Refuge. These and smaller, permanent wetlands provide year-round habitat for waterbirds. During years of heavy rainfall, small ephemeral wetlands such as the one at UFR likely provide breeding opportunities for birds that disperse from the larger, permanent wetlands, but are unable to provide adequate breeding habitat during normal rainfall years.

During surveys conducted by the USFWS (1999b), over 30 post-fledgling stilts were observed to utilize the area for foraging and loafing and at least one stilt nest was located on HIARNG land. Although three eggs were observed in the nest, only a single pre-fledgling bird was ever observed, suggesting that predation of eggs or juveniles had occurred.

IV. Effects of the Action

Overview

Hawaii's endangered waterbirds are all ground nesters, although coots and gallinules may nest on vegetation islands created in shallow water or that float in deeper waters. Ground nesting makes these species highly susceptible to predation from introduced mammals. The proposed action of the HIARNG is to conduct predator control activities on their lands in an attempt to protect these

waterbirds when they are present. The action will be restricted to wet years when the UFR wetland forms; no predator control will be conducted during dry years. It is intended that the predator control program will benefit endangered waterbirds by protecting eggs, nestlings, subadults, and adults from predation by introduced mongooses, cats, and rats. Predator control will begin with the onset of heavy rains, prior to the formation of the wetland. Should the wetland dry before waterbirds recruit to it, then predator control can be discontinued until the need arises (e.g., additional rains and wetland emergence).

The proposed predator control program will be conducted only on lands owned by the HIARNG, and possibly on some of the adjacent County lands. As a result, there will be constant ingress of predators from surrounding areas into the HIARNG action area. The rate of predator ingress is directly related to the density of predators in the surrounding area and may be influenced by the attraction of the wetland, both as a source of water and food. It is therefore imperative that the intensity (number of traps), duration (number of consecutive trap days), and frequency (frequency of trap periods) of predator control activity be assessed through preliminary trials and ongoing monitoring. Such trials should be conducted prior to formation of the wetland or use of the area by waterbirds. Continued monitoring of trapping effectiveness should be conducted after wetland formation and arrival of waterbirds to determine if ingress, and the need to intensify predator control, is needed when the waterbirds are present. When deployed, traps will have to be checked once daily, and as directed in methods approved by the University of Hawaii Animal Care and Use Committee. While human visitation to some traps may agitate resident waterbirds, it will not result in prolonged stress or harassment of these endangered species.

The program will attempt to reduce the numbers of predators, through the use of live traps and registered toxic baits, to zero or densities that will significantly reduce threats of predation on adult, subadult, eggs, and pre-fledgling endangered Hawaiian waterbirds (e.g., coots and stilts). Continued monitoring for the presence of predators in the area should show marked decreases in the frequency of their capture as well as their activities (e.g., predation, tracks) within the action area. This should result in increases in the number of observed pre- and post-fledgling stilts and/or coots in the UFR wetland (Gassmann-Duvall 1994b), and may result in a greater number of nesting pairs of stilts and/or coots within the wetland. Therefore, the direct and intended effects of this action will provide an overall benefit.

Although the direct and intended effects of this project will aid in the recovery of the listed waterbirds through increased successful breeding, there is a remote chance that birds, especially the Hawaiian coot, could be captured in a live trap. The U.S.D.A. Animal and Plant Health Inspection Service's Animal Damage Control (now "Wildlife Services") predator control activities in Kaloko-Honokohau National Historic Park (KAHO) resulted in the incidental take of several waterbirds. Although none of these captures were of species that occur at the UFR project site, these accounts are provided as supplemental information as they relate to your proposed activities. On July 7, 1994, an adult Hawaiian moorhen (*Gallinula chloropus sandvicensis*) was found dead in one of the traps a Hanalei National Wildlife Refuge (NWR). In November of that same year one adult and three juvenile moorhens were discovered in one of the traps at Hanalei NWR. In December of that year an adult Hawaiian goose (nene) (*Branta sandvicensis*) was found in a dog trap and released unharmed. Later that month, two of three goslings found in a trap a Kilauea Point NWR died. It was the opinion of the Service that the take resulting from the proposed action was not likely to jeopardize the continued existence of endangered waterbirds.

Potential indirect effects from the action include, but are not limited to: 1) increased ingress into the area by mammalian predators due to trails inadvertently created by land managers while conducting the predator control program, or attraction due to use of trap baits; 2) increased presence of avian predators such as cattle egrets, black-crowned night herons (*Nycticorax nycticorax)*, or owls (barn owl, *Tyto alba*, or Hawaiian short-eared owl, *Asio flammeus sandwichensis*) in the absence or reduction of mammalian predators; and 3) use of trails and/or tampering with traps and bait stations by civilians visiting the County range.

While there may be increased ingress of predators into the area due to increased human activity, adequate predator control efforts should compensate for this. Avian predators such as egrets and owls are known to prey on juvenile waterbirds, but no studies exist that show a corresponding increase in their number as a result of the control or removal of mammalian predators. However, the HIARNG natural resource managers may wish to monitor these other predators and consider measures to reduce the numbers of some of these birds if their densities increase or if predation by them becomes apparent.

General Effects of Predator Control on Hawaiian Waterbirds

Predator control should be conducted with the onset of heavy winter rains, in anticipation of wetland formation, to eliminate or reduce predators in the area prior to recruitment of waterbirds. The predator control program should continue throughout the breeding season to ensure or increase survivorship of pre-fledgling juveniles. While some waterbirds could be harmed in predator traps, the benefits from reducing the number of predators outweighs the potential harm it could cause to endangered waterbirds.

Conclusion

Based on evidence from a study conducted at Kanaha Pond State Wildlife Sanctuary (Gassmann-Duvall 1994a, b), it is anticipated that the proposed action will result in an increase in the stilt and coot populations on Maui. Adult and pre-adult birds will be able to seek out suitable habitat on their own when the emergent wetland at UFR dries up. It is hoped that this predator control program will result in an increase in the number of Hawaiian stilts and coots on Maui and an increase in the total area of protected seasonal habitat on State and County lands utilized by these and other waterbirds. Without the proposed action, reproductive efforts of endangered waterbirds at this location would result in few, if any, fledged birds becoming established in the population. It will also provide an example of a mutually beneficial relationship between government agencies to benefit an endangered species, and evidence that endangered Hawaiian waterbirds can coexist with certain land use practices.

Given its proximity to the main wetland, ongoing land use activities conducted at the County firing range may present some risk in the form of harassment to waterbirds. Additionally, visible traps, bait boxes, and trails resulting from the predator control program may attract personnel and civilians using the range, leading to more harassment. Appropriate signage at the County range and instructions provided to HIARNG personnel on avoidance and minimization of disturbance to the wetland and endangered species should adequately reduce these impacts.

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any cumulative effects in the project area that may impact these endangered waterbirds.

VI. Conclusion

After reviewing the current status of the Hawaiian stilt and Hawaiian coot, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that predator control at HIARNG's Ukumehame Firing Range is not likely to jeopardize the continued existence of the Hawaiian stilt or Hawaiian coot. No critical habitat has been designated for these species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the HIARNG so that they become binding conditions of any grant or permit issued to the HIARNG, as appropriate, for the exemption in section 7(o)(2) to apply. The HIARNG has a continuing duty to regulate the activity covered by this incidental take statement. If the HIARNG fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the HIARNG must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take Anticipated

As described earlier in the Effects section of this biological opinion, there is a remote chance that birds, especially the Hawaiian coot, could be captured in a live trap. Based on this information, the Service anticipates the following levels of incidental take:

1. Capture (without injury or death) of one (1) Hawaiian stilt or coot family unit per calendar year (average unit is one or two adults and up to four chicks); and capture

(without injury or death) of two (2) individual stilt chicks and two (2) individual coot chicks per calendar year.

2. Injury or death of zero (0) Hawaiian stilts or coots per calendar year.

Effect of the Take

In the accompanying biological opinion, the Service determined this level of anticipated take is not likely to jeopardize the continued existence of the Hawaiian stilt or coot. The management activities are being undertaken in a limited area so that even if one stilt, coot family unit, or single chicks, as specified above, are taken, the island-wide populations are sufficiently viable to tolerate such a loss.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take on Hawaiian stilts and coots:

1) Minimize potential of endangered waterbirds from being trapped, injured, or dying in live traps.

2) Ensure trapping is conducted in a safe and effective manner.

3) Provide a means to determine the effectiveness of the proposed action as well as the level of incidental take that may result from the project.

Terms and Conditions

The following terms and conditions are based on the implementation of the modified project description proposed by the Service and confirmed by HIARNG in the Description of the Proposed Action and Effects sections of this biological opinion. In order to be exempt from the prohibitions of section 9 of the Act, the HIARNG must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

To implement Reasonable and Prudent Measure Number 1:

1(A) Live traps will be placed strategically and as needed in order to prevent or reduce predator ingress into the UFR wetland area.

1(B) Live traps will not be placed adjacent to the wetland in order to minimize the chance of capturing endangered waterbirds. All such traps will be set back from the wetland margin, away from areas typically utilized by foraging, feeding, and nesting waterbirds.

1(C) When deployed and set, live traps should be checked daily to ensure that endangered or other non-target species that may be captured in the live traps can be released promptly, minimizing the chances of injury or death to those non-target species. Daily monitoring of traps, as well as providing water within the trap, will minimize the risk of a captured bird

dying. Should a healthy Hawaiian coot or stilt be captured, it will be released immediately.

1(D) Place live traps in shaded or otherwise sheltered areas and provide water to avoid heat-stressing the animals.

1(E) A contingency plan for providing veterinary care to any injured waterbird that may be accidentally captured in a trap must be developed and approved by the Service prior to the implementation of the trapping effort.

To implement Reasonable and Prudent measure number 2:

2(A) In addition to the methods described in the Proposed Action, HIARNG will conduct preliminary trapping to determine the effectiveness of the proposed trapping regime. This preliminary trapping will be conducted prior to the wet season and in the absence of waterbirds. If the proposed 2- to 3-days of trapping per month does not maintain predator numbers at a sufficiently reduced level, then the number of trap-days and/or the trap distributions should be modified in order to determine the duration of trap-days and trap coverage necessary to decrease predator numbers to an acceptable level. A similar preliminary study should be conducted to determine the effectiveness of the rat control methods proposed for the UFR. It is important that both predator and rodent (e.g., rat) control be conducted simultaneously so that increased rodent populations, in the absence of predators, will not result in increased impacts to waterbirds and to ensure that remaining predators will not become a greater threat to the waterbirds in the absence of rodents. HIARNG should consider the strategies and employ the methods outlined in Gassmann-Duvall (1994a).

2(B) HIARNG will monitor waterbird populations and nest success throughout the duration of the predator control action. Predator and rodent control activities should be conducted throughout the period of residency of waterbirds at the wetland. Special attention should be paid to nest predation (i.e., eggs and/or incubating adults) and to pre-fledgling mortality. Once nests are located, they should be monitored twice weekly, after which, bird monitoring can be conducted less frequently, e.g., once per week. Monitoring for and removal of other predators, not targeted by the above outlined control methods (e.g., cattle egrets (*Bubulcus ibis*)), should also be considered by the HIARNG should they appear to pose a threat.

2(C) Given the close proximity of the County range to the action area and the possibility that predator control activities may be conducted on portions of this area, it is possible that tampering with the traps and bait stations may occur. The HIARNG should post signs and warnings, as well as label bait boxes and traps, to inform users of the area of the predator control program, and its merits; request cooperation in not approaching the wetland, traps, or bait stations; and not conduct activities that will harm or harass wetland birds or their habitat (e.g., no off-road driving in the area when the area is flooded). Appropriate signage as well as labeling of bait boxes is a legal requirement for use of registered diphacinone-containing rodenticides.

2(D) All captured mammalian predators will be handled and euthanized utilizing methods approved by the University of Hawaii Animal Care and Use Committee.

To implement Reasonable and Prudent measure number 3:

> 3(A) Notify the Service (telephone: 808/541-3441 and in writing: U.S. Fish and Wildlife Service, Attn: Field Supervisor, 300 Ala Moana Blvd., Rm. 3-122, Honolulu, HI 96850) within three (3) working days of any take of Hawaiian stilt or coot. Any incidence of capture, injury, or death of a native waterbird will be immediately reported to the Service and all trapping will be suspended until these or similar impacts can be re-evaluated by the Service and the HIARNG.
>
> 3(B) A report of all monitoring efforts, including complete and accurate records of all incidental take that occurred during the course of the actions described herein, will be submitted to the Service by December 31 each year at the above Service address unless otherwise directed. This report will also describe how the terms and conditions of all Reasonable and Prudent measures were implemented. This report should include information on other activities being planned and carried out, that may impact the wetland.

The Service believes no more than one Hawaiian stilt or coot family unit and single chicks, as specified above, will be taken per calendar year as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to avoid the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of this consultation and review of the reasonable and prudent measures provided. The HIARNG must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

> 1) The Service recommends that the proposed predator control program be conducted in such a way that will maximize conservation benefits to endangered Hawaiian waterbirds, by determining and utilizing the needed trap effort to eliminate or reduce predator ingress in to the UFR wetland and adjacent areas.
>
> 2) The Service recommends that the HIARNG monitor nesting success and use of the wetland by the endangered waterbirds addressed in this Biological Opinion to determine the effectiveness of the predator control program.
>
> 3) The Service recommends that the HIARNG monitor the number of predators (e.g., cats, rats, and mongooses) captured and removed by the predator control activities as well as the activities of those predators within the action area.
>
> 4) The Service recommends HIARNG augment existing habitat conditions by creating safe

nesting sites comprised of restored native vegetation within the wetland areas. These sites will benefit the endangered birds during the wet season by providing protection from predators and benefit the HIARNG training mission during the dry season by providing enhanced tactical concealment units.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects to, or benefitting, listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION-CLOSING STATEMENT

This concludes formal section 7 consultation on this action. As required in 50 CFR 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an adverse affect to the listed species that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

I appreciate the assistance of your staff in helping to complete this biological opinion. If you have any questions, please contact biologists Jay Nelson, or Dave Hopper of this office (phone: 808/541-3441; fax: 808/541-3470).

Sincerely,

for Paul Henson
Field Supervisor
Ecological Services

cc: DOFAW, Maui
FWS-R1 (Section 7 coordinator)

LITERATURE CITED

Berger, A.J. 1972. Hawaiian Birdlife. Univ. Hawaii Press, Honolulu, Hawaii. 270 pp.

Gassmann-Duvall, R. 1994a. Long-term trapping program for the reduction and elimination of predators at the Kanaha Pond Wildlife Sanctuary, Maui. A report prepared for the USFWS by The Conservation Council for Hawaii. 14pp.

Gassmann-Duvall, R. 1994b. Assessment of the significance of predators on the endangered waterbird population at the Kanaha Pond Wildlife Sanctuary, Kahului, Maui. A report prepared for the USFWS by The Conservation Council for Hawaii. 41pp.

Olson, S.L., and H.F. James. 1991. Descriptions of 32 new species of birds from the Hawaiian Islands: Part I. Non-passeriformes. Ornith. Mono. 45.

USFWS. 1999a. Draft Revised Recovery Plan for Hawaiian Waterbirds. U.S. Fish and Wildlife Service, Portland, Oregon. 107 pp.

USFWS. 1999b. Endangered and Rare species Survey on Hawaii Army National Guard Lands on the Islands of Maui and Molokai, Hawaiian Islands. Report submitted to the Hawaii Army National Guard. 119 pp.

APPENDIX F

Comments and Responses on the Draft EA

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

May 17, 2001

HIENG
Department of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495

Dear Messrs.:

Subject: Draft Environmental Assessment and Conservation and Land Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

This is in reference to your materials, including the Draft Environmental Assessment prepared by Pacific Environmental and Information Technologies, sent on April 26, 2001, requesting review and comments on the conservation and landscaping management projects at the Ukumehame Firing Range. The Office of Hawaiian Affairs has a few comments regarding the draft environmental assessment.

If the project is subject to HRS 343 requirements, OHA inquires as to whether a cultural impact assessment was completed. If so, the results, discussion, and analysis of such an assessment should be included in the final EA. From what is present in the draft, there is only mention of an archaeological survey cited to, and a confirming opinion relating to grading issued by SHPD. This alone does not provide the adequate reporting of what is contemplated by conducting a cultural impact assessment for HRS 343 purposes.

Cultural impact assessments will often include reporting and analysis of:

- Identification of and consultation with individuals and organizations with expertise the types of cultural resources, practices and beliefs found within the broad geographical area of the project (e.g., district or ahupua`a);
- Identification of and consultation with individuals and organizations with knowledge of the area potentially affected by the proposed action;

- Receiving information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
- Conducting ethnographic, historical, anthropological, sociological, and other culturally related documentary research;
- Identification and description of the cultural resources, practices and beliefs located within the potentially affected area;
- Assessing the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified
- Obtaining interviews and oral histories from knowledgeable individuals, and field visits by the document preparers accompanied by the knowledgeable individuals.

OHA generally is concerned that the project may uncover or discover historical, archaeological, or cultural items, including human remains. OHA relies on your assurance that proper mitigation and consultation will occur should any unanticipated or unidentified cultural, historic, or burial sites or items be encountered during project development.

Thank you for the opportunity to review and comment regarding the proposed project. If you have any questions, please contact Wayne Kawamura, Policy Analyst at 594-1966, or email him at waynek@oha.org. Should you need assistance in finding resources in the community who may be able to assist you in the assessment the cultural resources in that particular area of Maui, please feel free to contact Thelma Shimaoka, our community resource coordinator for Maui at (808) 984-2400.

Sincerely,

Colin Kippen, Jr.
Deputy Administrator

CK:wk

cc: BOT

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Colin Kippen, Jr.
Deputy Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Mr. Kippen:

Re: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for your comments regarding the subject project and draft document. We appreciate your efforts in reviewing the document and provide the following response to your comments.

The Hawaii Army National Guard recognizes the inherent importance of cultural resources in Hawaii. To identify and protect cultural property in the subject project area a comprehensive archaeological survey was completed for the subject property when the Ukumehame Firing Range was initially constructed. After a review of this survey and other documents in relation to the proposed project we anticipate, and the State Office of Historic Preservation concurs, there will be no adverse impacts to cultural resources.

The proposed project does not include construction, subsurface excavation, grading, or earth removal and principally is limited to the revegetation of the project area with native species. In addition, the proposed project area was once under cultivation for sugar cane and was heavily graded during the initial construction of the firing range. Consequently, we anticipate that the proposed project will not disturb any historic sites.

A cultural impact assessment was completed for the proposed project and is summarized in Section 4.7 of the Final EA. Local residents and practioners were identified and contacted regarding the proposed project and how it may effect or be affected. As a result of this consultation, it was determined that no cultural resources or practices within or adjacent to the project area would be adversely affected.

If you have any questions, please call Melissa Dumaran at 733-4268.

Sincerely,

Andrew S. Tomlinson
Pacific Environmental and Information Technologies, LLC.

Rcd
May 11, 01

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109
Telephone (808) 270-7816 • Fax (808) 270-7833

May 8, 2001

Mr Andrew S Tomlinson
Pacific Environmental and Information Technologies, LLC
P O Box 161256
Honolulu HI 96816

RE: Draft Environmental Assessment and Conservation and Landscape Management Plan For the Ukumehame Firing Range - TMK# 4-8-02-047

Dear Mr Tomlinson:

Thank you for the opportunity to review the above-mentioned draft environmental assessment.

We understand that the proposed project will consist primarily of revegetation and does not include development of infrastructure.

The Department of Water Supply has the following comments/recommendations:

1. While erosion management and wetland restoration are laudable goals, to further protect the water resources, we recommend the use of steel shots rather than lead shots, wherever possible. However, if lead shot is used, we suggest that a management plan with procedures for the regular removal of lead shot pellets and unexploded ordinance be developed ;

2. The project site is located in the "Maui County Planting Plan" - Zones 3 and 5. Please refer to the "Maui County Planting Plan" and the related attached documents. We encourage the applicant to consider using climate-adapted and salt-tolerant native plants. Native plants adapted to the area, conserve water and further protect the watershed from degradation due to invasive alien species : and

3. In order to protect groundwater and surface water resources, DWS recommends that the applicant utilize Best Management Practice (BMPs) designed to minimize the infiltration and runoff from all construction and vehicle operations. We have attached sample BMP's for principle

operations and alist of references. Additional information is available from the State Department of Health.

If you need more information, please contact the Water Resources and Planning Division at 270-7199.

Sincerely,

David Craddick
Director
eam

xc: Engineering Division

xc: applicant with attachments:/HIARNG
-Excerpt for the Maui Department of Water Supply Planting Plan
-Selected BMPs on Erosion Prevention ans Sediment Control for Residential and Commercial Source Control

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

David Craddick
Director
Department of Water Supply
County of Maui
P.O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Mr.Craddick:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan. To respond to the three points in your comments:

1. You recommend the use of steel shot in firing range exercises, as opposed to lead shot. You infer that the use of steel shot would assist in protecting water resources at the site. This recommendation is noteworthy, but outside the scope of the proposed project. The project is for the restoration of the natural environment at the firing range, and does not have any bearing on military training or operations at the range.
2. You recommend the use of climate-adapted and salt-tolerant plants for the proposed project. You suggest that we refer to the Maui County Planting Plan as a resource for plant information that is site appropriate. We thank you for the reference to this resource. We will consult the Maui County Planting Plan prior to site revegetation.
   We would like to note that the Draft Environmental Assessment (DEA) does contain a plant species list. This list was compiled in consultation with the US Natural Resources Conservation Service, and is intended to be site specific in the use of native plant species. Section 3.1.1 (Conservation and Landscaping Management) details the use of native plants in the five identified unique landscaping areas.
3. Thank you for the reference to Best Management Practice (BMP) resources. We agree that BMP's are beneficial in guiding activities so as to help reduce runoff and infiltration of undesirable industrial products (such as oil, pesticides, fertilizers), as well as reducing erosion. We will develop BMP's as appropriate for the activities proposed in this Environmental Assessment.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

Our People...Our Islands...In Harmony

May 16, 2001

Hawaii Army National Guard
ATTN: LTC Richard Young, HIARNG-ENG
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Dear Colonel Young:

Subject: Draft Environmental Assessment (DEA) and Conservation and Landscape Management Plan – Ukumehame Firing Range, Ukumehame, Maui, Hawaii

We have reviewed the above mentioned document and have the following comments to offer:

Construction of access roads within the perimeter should consider the natural drainage of runoff to culverts located at Honoapiilani Highway. Properly designed access roads are needed to operate and maintain the function of the firing range.

The wetland delineation report (Appendix A) is very factual in regards to the "routine method" for the NRCS field investigation that was conducted. All factors, vegetation type, soil type, and area hydrology have been adequately addressed in the report.

Thank you for the opportunity to review this document.

Sincerely,

for KENNETH M. KANESHIRO
State Conservationist

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Kenneth M. Kaneshiro
State Conservationist
Natural Resources Conservation Service
US Department of Agriculture
P.O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan.

We agree with your assessment that construction of access roads within the perimeter of the firing range should consider the natural drainage of runoff to culverts located on Honoapiilani Highway. However, since this project does not include the construction of access roads, we cannot incorporate this information in the Final Environmental Assessment. HIARNG will take the comment under advisement in the case where road construction activity is planned at the firing range.

Thank you for your concurrence on the methodology and content of the wetland delineation.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

May 14, 2001

Ms. Melissa Dumaran
Resource Manager
HIENG
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Dear Ms. Dumaran:

Subject: Draft Environmental Assessment (DEA) and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for forwarding the subject DEA for review and comment by the staff of the U.S. Geological Survey, Water Resources Division, Hawaii District office. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document and are returning the DEA for your future use.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon Tribble
District Chief

Enclosure

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 25, 2001

Gordon Tibble
District Chief
US Geologic Survey
US Department of the Interior
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

Dear Mr. Tribble:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan. We regret that you did not have the time and resources to review the document.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

DEPARTMENT OF
PARKS AND RECREATION
COUNTY OF MAUI

1580-C KAAHUMANU AVENUE WAILUKU, HAWAII 96793

JAMES "KIMO" APANA
Mayor

FLOYD S. MIYAZONO
Director

ELIZABETH D. MENOR
Deputy Director

(808) 270-7230
FAX (808) 270-7934

May 15, 2001

Andrew S. Tomlinson
Pacific Environmental and
Information Technologies, LLC
P.O. Box 161256
Honolulu, Hawaii 96816

Dear Mr. Tomlinson:

SUBJECT: UKUMEHAME FIRING RANGE
DRAFT ENVIRONMENTAL ASSESSMENT AND CONSERVATION
AND LANDSCAPE MANAGEMENT PLAN

We have reviewed the draft Environmental Assessment and Conservation and Landscape Management Plan for the subject project and have no objections to the proposed actions. However, we would like to review and approve the design for the proposed improvements.

Thank you for the opportunity to review and comment. Should you have any questions, please contact Mr. Patrick Matsui, Chief of Parks Planning and Development, at (808) 270-7387.

Sincerely,

FLOYD S. MIYAZONO

Patrick Matsui, Chief of Planning and Development

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Floyd S. Miyazono
Director
Department of Parks and Recreation
County of Maui
1580-C Kaahumanu Avenue
Wailuku, Hawaii 96793

Dear Mr. Miyazono:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

JAMES "KIMO" APANA
Mayor

JOHN E. MIN
Director

CLAYTON I. YOSHIDA
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

May 9, 2001

Lieutenant Colonel Richard Young
HIARNG-ENG
3949 Diamondhead Road
Honolulu, Hawaii 96816

Dear Lieutenant Colonel Young:

RE: Draft Environmental Assessment (DEA) for the Conservation and Landscape Plan for the Ukumehame Firing Range, by the Hawaii National Guard, Maui Tax Map Key: 4-8-002:047

Thank you for the opportunity to review this project. Its purpose is to curb erosion at the existing facility, and improve the wetlands function. Some non-native plants will be removed, and natives planted in their stead. In addition, a small well producing approximately 12,000 gallons a day is planned in order to water the plants.

Our only comment is in regard to the statement that the project would need a SMA permit. After reviewing our maps and those contained in the DEA, it appears to us that the entire project is outside of the SMA. As a result, no permit is necessary from this office.

If further clarification is required, please contact Mr. William Spence, Staff Planner, of this office at 270-7735.

Very truly yours,

JOHN E. MIN
Planning Director

JEM:WRS:cmb
c: Clayton Yoshida, AICP, Deputy Planning Director
William Spence, Staff Planner
Project File
General File
S:\ALL\WILL\AACORESP\2001\ukumehame.wpd

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

John E. Min
Planning Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Dear Mr. Min:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan, and for informing us that a Special Management Area Permit will not be required for the project. Per your comment, we will remove the language in the final document that states that a Special Management Area Permit is required.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

June 14, 2001

Edward Correa, Jr.
HI Army National Guard
3949 Diamond Head Road
Honolulu HI 96816

Attn: Melissa Dumaran

Dear Major General Correa:

Subject: Draft environmental assessment (EA) for **Ukumehame Firing Range Management Plan**

We have the following comments to offer:

Contacts: No community or citizen groups were included in your pre-consultation and draft EA distribution lists. Community consultation is required by law. We recommend notifying area community groups, organizations that would have an interest in this project, and the nearest neighbors or neighboring landowners, allowing them sufficient time to review the draft EA and submit comments. Document all contacts in the final EA and be sure to include copies of any correspondence.

Significance criteria: Include a discussion of findings and reasons, according to the significance criteria listed in HAR 11-200-12, that supports your forthcoming determination, either Finding of No Significant Impact (FONSI) or EIS preparation notice. You may use the enclosed sample as a guideline.

Two-sided pages: In order to reduce bulk and save on paper, please consider printing on both sides of the pages in the final document.

Wetlands Enhancement: In addition to providing an enhanced habitat for the Hawaiian Stilt and Hawaiian Coot, do you expect other threatened or endangered species of birds to use these areas?

Educational activities: Section 3.1.3, *Long-Term Maintenance, Monitoring, and Education,* notes that local schools will be invited to participate in facility maintenance. Will parking capacity need

to be increased? What will be the impacts to the traffic?

If you have any questions, please call Nancy Heinrich at 586-4185.

Sincerely,

GENEVIEVE SALMONSON
Director

Enc.

c: Chris Welch/Andrew Tomlinson

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Genevieve Salmonson
Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan. To respond to the five points in your comments:

1. Contacts: Thank you for informing us about our omission in including community/environmental groups on our distribution list. We have corrected this oversight, and have mailed copies of the Draft Environmental Assessment (DEA) to the Audubon Society of Hawaii and the Sierra Club of Hawaii.
2. Significance Criteria: We have included a detailed discussion of findings and reasons for our FONSI determination, as requested in your comments. See Chapter 5 of the DEA.
3. Two-Side Pages: In order to reduce bulk and save on paper, we will consider printing on both sides of the pages in the final document.
4. Wetlands Enhanced: A major goal of the proposed project is to provide an enhanced wetland environment for native bird species. As noted in the DEA, the US Fish and Wildlife Service has conducted surveys of the area for native avian species. Two surveys, cited in the DEA, provide evidence of the presence of the Hawaii Stilt (*Himantopus mexicanus knudseni*) at the firing range. The latter of the two surveys provides evidence that the Hawaiian Coot (*Fulica alai*) can also be found at the site. As these survey documents provide the basis for judgments regarding native avifaunal resources at the firing range, we currently have no evidence that other native avian species are found at the site. Based on the current evidence, we do not expect other threatened or endangered bird species to be found at the Ukumehame Firing Range.
5. Educational Activities: In Section 3.1.3, *Long-Term Maintenance, Monitoring, and Education* we note that schools will be invited to participate in facility maintenance. The anticipated nature of the school participation is through field trip type activities, wherein the students learn about the makeup of the Ukumehame natural environment, and then assist in restoration activities. Movement to and from the Ukumehame Firing Range are thus expected to be via school bus. As such, we do not believe that parking will be an issue, nor do we believe that traffic will be significantly impacted.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LINNEL NISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

June 1, 2001

Ms. Melissa Dumaran
HIENG, Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

LOG NO: 27606
DOC NO: 0105CD29

Dear M. Dumaran,

SUBJECT: National Historic Preservation Act Section 106 Review Pertaining to the Draft Environmental Assessment and Conservation Landscape Management Plan for the Ukumehame Firing Range Ukumehame Ahupua`a, Lahaina District, Island of Maui, Hawaii TMK: 4-8-02:047

Thank you for the opportunity to comment on the Draft Environmental Assessment (DEA) and Conservation Landscape Management Plan (CLM) for the Ukumehame Firing Range. Our review is based on reports, maps, and aerial photographs maintained at the State Historic Preservation Division. Two field inspections have been conducted of the proposed project area. Based on the submitted DEA and CLM. we understand the proposed undertaking consists of the development and implementation of conservation and land management measures for the Ukumehame Firing Range. This includes the planting of native vegetation and the introduction of native wetland species to the wetland areas, and the creation of an active management regime for the oversight of these areas. In addition, we understand the proposed undertaking does not include the development of any structures.

The initial field inspection was conducted in 1995, by the then SHPD staff archaeologist Theresa Donham. Ms. Donham found that prior disturbances of the subject property have altered the landscape to the point that it was unlikely that historic sites would still be present (SHPD DOC NO.: 9512KD07). In 1996, Ms. Donham made a field inspection of the northwestern corner of the project area (SHPD DOC NO.: 9612KD03), and determined that the then proposed plant conservancy would have "no effect" on significant historic sites, making an archaeological inventory survey unnecessary.

Subsequently, an archaeological assessment of the proposed project area was conducted by Aki Sinoto Consulting in 1997, for the proposed native plant conservancy project. During the archaeological assessment survey, no significant historic properties were identified. The report documenting the assessment findings was reviewed and accepted by this office (SHPD DOC NO.: 9806BD32/LOG NO.: 21746).

Given the above information, we believe that there will be "no historic properties affected" by the proposed undertaking.

As a contingency, should any historic remains (human skeletal remains, etc.) be inadvertently encountered during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional damage, and the State Historic Preservation Office needs to be contacted immediately at 243-5169, on Maui, or at 692-8023, on O`ahu.

Please call Cathleen Dagher at 692-8023, if you have any questions.

Aloha,

for Gilbert Coloma-Agaran
State Historic Preservation Officer

CD:jen

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Gilbert Coloma-Agaran
Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Coloma-Agaran

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan. As was stated in your response, we believe that there will be "no historic properties affected" by the proposed project. However, in the case that any historic remains are uncovered, all work will be suspended in the area of near the discovered remains, the remains will be protected from further damage, and the State Historic Preservation Office will be contacted immediately.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

April 26, 2001

Mr. Gilbert Coloma-Agaran, Chairman
Commission on Water Resources Management
1151 Punchbowl Street, Room 227
Honolulu, Hawai'i 96813

Dear Mr. Coloma-Agaran:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Enclosed is the above-referenced document for your review, per Office of Environmental Quality Control's requirement for agency review of proposed State projects. The project involves conservation and landscaping management of the Ukumehame Firing Range. The proposed project does not include development of any structures.

Please submit comments to HIENG, Department of Defense, 3949 Diamond Head Road, Honolulu, Hawaii 96816-4495, by June 7, 2001.

If there are any questions, please have your staff contact Ms. Melissa Dumaran, Resource Manager, at 733-4267.

Sincerely,

Andrew S. Tomlinson
Pacific Environmental and Information Technologies, LLC.
Enc.

We have no comments.

Signed: Roy Hardy
ROY HARDY

Dated: 5/15/01

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Gilbert Coloma-Agaran
Commission on Water Resources Management
State of Hawaii
1151 Punchbowl Street, Room 227
Honolulu, Hawaii 96813

Dear Mr. Coloma-Agaran

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

REF:PB:MA

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

Ms. Melissa Dumaran, Resource Manager
HIENG, Department of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495

MAY 18 2001

Dear Ms. Dumaran:

Subject: **Draft Environmental Assessment and Conservation and Landscape Management Plan for Ukumehame Firing Range, Maui, Hawaii**

The Land Division Planning Branch has reviewed the submitted Draft Environmental Assessment and Conservation and Landscape Management Plan. The Planning Branch has no objections to the information presented in the document.

The Planning Branch would like to note that the EA states that a significant portion of the site has been classified as wetland or potential wetland. We commend the management goals stated in the plan to conserve and manage this resource. Your efforts at involving the local community in your management plan, through collaboration with the groups Youth for Environmental Service and National Resource Conservation Service are also commendable.

Thank you for this opportunity to comment. If you have any questions regarding this issue please contact Masa Alkire of our Planning Branch at 587-0385.

Aloha,

DEAN Y. UCHIDA
Administrator

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Dean Y. Uchida
Land Division
Department of Land and Natural Resources
State of Hawaii
PO Box 621
Honolulu, Hawaii 96809

Dear Mr. Uchida:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan.

We appreciate your comments regarding our efforts toward conservation and community involvement. We intend that the association with Youth for Environmental Service (YES) fulfill two goals: (1) instilling a sense of stewardship in those that participate in the revegatation of the firing range; and (2) providing visibility in the local community for environmental projects undertaken by HIARNG. This type of program is a win-win situation for all involved.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

CEPOH-EC-R (1145)

21 June 2001

MEMORANDUM FOR Office of the Adjutant General, State Department of Defense (ATTN: Col. Richard Young), 3949 Diamond Head Road, Honolulu, Hawaii 96816-4495

SUBJECT: Review of Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii (TMK 2-4-8-02: 47), File No. 200100388

1. The subject document and supplemental project description have been reviewed by my Regulatory Branch with respect to the Corps' authority to issue Department of the Army permits under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344). Based on the information you provided, I have determined that a DA permit is not required for the proposed landscaping activity.

2. POC: Mr. Peter Galloway, Regulatory Branch (CEPOH-EC-R/P. Galloway); telephone (808)438-8416; fax (808)438-4060.

RONALD N. LIGHT
Lieutenant Colonel, EN
Commanding

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Ronald N. Light
Lieutenant Colonel
US Army Engineer District, Honolulu
Department of the Army
Ft. Shafter
Hawaii 96858-5440

Dear Colonel Light:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

JAMES "KIMO" APANA
Mayor

DAVID C. GOODE
Director

MILTON M. ARAKAWA, A.I.C.P.
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
LAND USE AND CODES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH M. NAGAMINE, L.S., P.E.
Land Use and Codes Administration

RONALD R. RISKA, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

Solid Waste Division

BRIAN HASHIRO, P.E.
Highways Division

June 12, 2001

Mr. Andrew S. Tomlinson
PACIFIC ENVIRONMENTAL AND INFORMATION
TECHNOLOGIES, LLC.
P.O. Box 161256
Honolulu, Hawaii 96816

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
UKUMEHAME FIRING RANGE

Dear Mr. Tomlinson:

We have reviewed the subject application and have no comments.

Should you have any questions, please feel free to contact Milton Arakawa at 270-7845.

Very truly yours,

DAVID GOODE
Director of Public Works
and Waste Management

MA:rg
S:\LUCA\CZM\Ukumehame.wpd

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

David Goode
Director of Public Works and Waste Management
250 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Goode:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan. We will note you have no substantive comments on the proposed project.

Sincerely,

Andrew Tomlinson
Pacific Environmental and Information Technologies, LLC.

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

IN REPLY REFER TO:

HWY-PS
2.2917

MAY 17 2001

Mr. Andrew S. Tomlinson
Pacific Environmental and Information Technologies, LLC
P.O. Box 161256
Honolulu, Hawaii 96816

Dear Mr. Tomlinson:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the opportunity to review the subject document.

We have the following comments:

1. We recommend setting back the parking lot by an additional 25 feet from the Honoapiilani Highway right-of-way to accommodate future widening for passing lanes or for a four-lane configuration.

2. The conservation and landscape management plan should have minimal impact on the State Highway system.

3. No additional storm water runoff will be allowed to be directed to the State Highway right-of-way.

4. Construction plans must be submitted for all work done within Honoapiilani Highway.

If you have any questions, please contact Ronald Tsuzuki, Head Planning Engineer, Highways Division, at 587-1830.

Very truly yours,

Brian K Minaai

BRIAN K. MINAAI
Director of Transportation

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Brian K. Minaai
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Minaai:

Subject: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for the response to our request for comments on the Draft Environmental Assessment and Conservation and Landscape Management Plan. We respond to your comments as follows:

1. HIARNG will make accommodations to move the parking lot an additional 25 feet from the Honoapiilani Highway right-of-way for future road widening projects;
2. We agree that the proposed project will have minimal impact on the State Highway system;
3. One of the goals of this project is the re-establishment of the wetland at the firing range. Once the wetland is established, runoff from the site should be measurably reduced. As such, the restriction regarding additional runoff to the State Highway right-of-way should not be contravened;
4. Construction plans will be submitted to the Department of Transportation prior to any work being done within Honoapiilani Highway.

Sincerely,

Christopher Welch
Pacific Environmental and Information Technologies, LLC.

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Krauss Annex 19 · 2500 Dole Street · Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 · Facsimile: (808) 956-3980

EA:0263
June 22, 2001

Ms. Melissa Dumaran
Hawaii Army National Guard
HIENG, Department of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4485

Dear Ms. Dumaran:

Draft Environmental Assessment
Ukumehame Firing Range Management Plan
Lahaina, Maui

The applicant Hawaii Army National Guard (HIANG) is proposing to improve existing environmental conditions to a portion of Ukumehame Firing Range. The project has two main objectives, to introduce vegetation cover to arid parts of the land to prevent further erosion from wind and rain, and to introduce native wetland species to the wetland area. The project will implement an active management plan and recruit Youth For Environmental Service for assistance in planting and maintenance. The endangered Hawaiian stilt (*Himantopus mexicanus knudeni)* and Hawaiian Coots (*Fulica alai*) are known to exist in the area.

This review was conducted with the assistance of Mark Merlin, Biology, David Duffy, Botany; and Renee Thompson, Environmental Center.

General Comments

In general we would like to commend HIANG for their conservation efforts. We would like to see the final EA contain more information about the frequency and distribution of the endangered bird species within the project site. This information would ease in the review of impact on the birds. The National Guard's plan to protect and perhaps enhance the marshy area to promote native Hawaiian waterbird use is an example of good stewardship by a state agency. If done correctly, it can be something they will be proud of and be a sign of their environmental good will.

Long-term Maintenance, Monitoring and Education

The last paragraph on page 3-5 deals with the placing of interpretive signs for the purpose of educating visitors about the native vegetation and the nature of the wetlands. We commend the National Guard for the inclusion of interpretive signage as a way to inform and educate the range's users of the value of wetlands and native flora. When will the signage be placed?

Pesticides

The section on Hazardous and Waste Materials, Mitigation Measures on page 4-18 mentions that herbicides and pesticides will be used as part of an integrated pest management system. What types of herbicides and pesticides may be used?

Consultation

According to section 5.0 Consulted Agencies, only governmental agencies were consulted in making this document. The HIANG should consider seeking the input of community organizations for additional consultation regarding the wetland management and endangered species mitigation. It is important to seek input from private sectors of the community in order to demonstrate a community commitment. We suggest contacting the Nature Conservancy of Hawaii, the Hawaii Audubon, and the Sierra Club.

Vegetation Management

As indicated in section 4.3 Soils and Surface Hydrology the soil on the project site is moderately to rapidly permeable. If this is the case what measures will be taken to prevent herbicides and pesticides from leaching into the surface and ground water? Given that the management will be utilizing Youth for Environmental Service and possible school groups we suggest that HIANG maintain weed control manually, this will demonstrate a commitment to the environment and set a good example for youth groups that will be on the site.

Monetary Resources

It is not clear how much resources HIANG will apply to monitoring or to adaptive management if unseen complications develop. How do we know there will not be a big budget cut for their environmental staff next year and all the great enhancement plans wither away unmonitored? We need explicit details of resources for monitoring, which means a more explicit description of the effort.

Conclusion

We commend the National Guard for their effort to replant the Ukumehame Firing Range with native vegetation and enhance the wetland area. These changes will help stabilize the soil, cutting down on wind-blown erosion. In addition, we would like to see a projected budget that outlines the cost of the project as well as the source of funding.

We note one typo on page 4-9 in the section on Natural Hazards. In the next to the last line in the paragraph the word "years" should follow the figure 50.

Thank you for the opportunity to comment on this Draft Environmental Assessment.

Sincerely,

Peter Rappa,
Environmental Review Coordinator

cc: OEQC
James Moncur, WRRC
Chris Welch
Andrew Tomlinson, Pacific Environmental
Information Technologies, LLC
Renee Thompson
David Duffy
Mark Merlin

PACIFIC ENVIRONMENTAL AND INFORMATION TECHNOLOGIES, LLC
P.O. BOX 161256
HONOLULU, HAWAII 96816

November 23, 2001

Mr. Peter Rappa
Environmental Review Coordinator
University of Hawaii
Environmental Center
Honolulu, Hawaii 96822

Dear Mr. Rappa:

Re: Draft Environmental Assessment and Conservation and Landscape Management Plan for the Ukumehame Firing Range, Ukumehame, Maui, Hawaii

Thank you for your comments regarding the subject project and draft document. We appreciate your efforts in reviewing the document and provide the following response to your comments.

Signs

Interpretative signs will be erected in the initial stages of the project to help facilitate awareness among HARNG personnel.

Herbicides and Pesticides

HIARNG will only use EPA approved herbicides and pesticides at the Ukumehame Firing Range. These may include Roundup and Bushwhacker organically compounded pest control products. To reduce the use of chemicals HIARNG will attempt to take your suggestion and manually control weeds at the site. To avoid pesticide leaching at the site, pesticide control products like Bushwhacker Fire Ant controller will be directed to problem areas only as needed. It is anticipated that only small amounts of chemicals will be used and that these will dissipate before entering the groundwater.

Consultation

HIARNG concurs that community organizations should be consulted in the development of the project. Consequently, the Hawaii Audubon Society and the Sierra Club were given Draft EAs and contacted for comment on the proposed project. To accommodate their potential desire to comment on the Draft EA the comment period for the Draft EA was extended until November 2001 from June 2001.

Monetary Resources

Not unlike the University of Hawaii Environmental Center and its programs, HIARNG is aware of the economic and political realities of the budgeting process that may constrain agency actions, particularly as they involve long-term programs and staffing. While budgeting details are beyond the scope of the Chapter 343, HRS review process and are difficult to gage accurately, it should be noted that HIARNG is fully committed to support the proposed actions with staff and budget. HIARNG field staff will complete implementation and monitoring of the proposed project for the foreseeable future.

Thank you for your comments and suggestions regarding the proposed project. If you have any questions, please call Melissa Dumaran at 733-4268.

Sincerely,

Andrew S. Tomlinson
Pacific Environmental and Information Technologies, LLC.