DRAFT ENVIRONMENTAL ASSESSMENT

KA‘ENA POINT ECOSYSTEM RESTORATION PROJECT

Wai‘anae and Waialua Districts
Island of O‘ahu

In accordance with
Chapter 343, Hawai‘i Revised Statutes

Proposed by:

Division of Forestry and Wildlife
Department of Land and Natural Resources
1151 Punchbowl Street, Ste. 325
Honolulu, Hawai‘i 96813
(808) 587-0166

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I. SUMMARY

Project Name	Ka‘ena Point Ecosystem Restoration Project
Project Location	Ahupua‘a of Keawa‘ula and Ka‘ena Wai‘anae and Waialua Districts Island of O‘ahu TMKs 8-1-001-006; 8-1-001-022; 6-9-001-030; 6-9-002-004; 6-9-002-009; 6-9-002-013
Land Use Designations	Conservation District, Resource and Limited Subzones Special Management Area
Applicant	State of Hawai‘i Department of Land and Natural Resources Division of Forestry and Wildlife
Landowner	State of Hawai‘i
Approving Agency	State of Hawai‘i Department of Land and Natural Resources
Anticipated Determination	Finding of No Significant Impact
Agencies & Organizations Consulted	
Federal:	Federal Aviation Administration US Air Force, Ka‘ena Point Satellite Tracking Station US Army Garrison, Hawai‘i US Coast Guard, District 14, Office of Aids to Navigation USDA Animal and Plant Health Inspection Service, Wildlife Services USDA Natural Resources Conservation Service US Fish and Wildlife Service, Pacific Islands Office US Fish and Wildlife Service, O‘ahu National Wildlife Refuge Complex US Geological Survey, Biological Resources Discipline, Pacific Island Ecosystems Research Center NOAA Fisheries, Pacific Islands Regional Office, Protected Resources Division

	US Army Museum of Hawai‘i
State:	Department of Agriculture Department of Business, Economic Development, and Tourism, Office of Planning Department of Defense Department of Education Department of Hawaiian Home Lands Department of Health, Environmental Planning Office Department of Land and Natural Resources Division of Aquatic Resources Division of Conservation and Resources Enforcement Division of Forestry and Wildlife Division of Historic Preservation Division of State Parks Land Division Office of Conservation and Coastal Lands Public Information Office Department of Transportation, Airports Division Land Use Commission Natural Area Reserves Commission O‘ahu Island Burial Council Office of Environmental Quality Control Office of Hawaiian Affairs Office of Hawaiian Affairs: Native Hawaiian Historic Preservation Council University of Hawai‘i, Environmental Center University of Hawai‘i, Botany Department Senator Colleen Hanabusa Senator Robert Bunda Representative Michael Magaoay Representative Maile Shimabukuro
County of Honolulu:	Board of Water Supply Department of Planning and Permitting Office of the Mayor Councilmember Todd Apo Councilmember Donovan Dela Cruz
Other Organizations:	‘Ahahui Mālama I Ka Lōkahi Ahupua‘a Action Alliance American Bird Conservancy Bishop Museum, Hawai‘i Biological Survey Conservation Council for Hawai‘i

Earthjustice
Hawaiian Civic Club of Waialua
Hawaiian Civic Club of Wai‘anae
Hawaiian Railway Society
Hawai‘i Audubon Society
Hawai‘i Bicycling League
Hawai‘i Conservation Alliance
Hawai‘i’s Thousand Friends
Hawai‘i Trail and Mountain Club
Hawai‘i Fishing News
Historic Hawai‘i Foundation
Ho‘omau Ke Ola
Hui Mālama I Na Kupuna O Hawai‘i Nei
Hui Mālama o Mākua
‘Ike ‘Āina
‘Īlio‘ulaokalani Coalition
KAHEA – The Hawaiian-Environmental Alliance
Kai Makana
Kamehameha Schools
Kokua Hawai‘i Foundation
Life of the Land
Mālama Hawai‘i
Nani ‘O Wai‘anae
Native Hawaiian Legal Corporation
North Shore Environmental Coalition
North Shore Kupuna
North Shore Neighborhood Board
O‘ahu Game Fish Club
O‘ahu Invasive Species Committee
Pacific Islands Fisheries Group
Polynesian Voyaging Society
Sierra Club, Hawai‘i Chapter, O‘ahu Group
The Nature Conservancy of Hawai‘i
The Outdoor Circle
The Wildlife Society, Hawai‘i Chapter
Waialua Boat Club
Waialua Community Association
Wai‘anae Boat Fishing Club
Wai‘anae Coast Coalition
Wai‘anae Coast Neighborhood Board
YMCA of Honolulu, Camp Erdman Branch
John D. Bennett
Thomas T. Shirai, Jr.
Mary Ikagawa
Lara Reynolds
Cynthia Rezentes

Summary of Action

The Ka‘ena Point Ecosystem Restoration Project is the result of a partnership between the Department of Land and Natural Resources, Divisions of Forestry and Wildlife and State Parks, the U.S. Fish and Wildlife Service, and the Hawai‘i Chapter of The Wildlife Society. Ka‘ena Point Natural Area Reserve (NAR) hosts one of the largest seabird colonies in the main Hawaiian islands, contains several populations of endangered plants, and receives frequent visits by basking monk seals. Under current management, nesting seabirds and native plants are under constant threat from predatory animals; more than 100 ground-nesting seabirds were killed by dogs in 2006 despite on-going predator control activities. The proposed project involves the construction of predator-proof fencing (2 meters tall) to prevent feral predators such as dogs, cats, mongoose, and rats from entering into 59 acres of coastal habitat within Ka‘ena Point Natural Area Reserve. The exclusion and removal of these predatory animals is anticipated to result in an increase in the existing population of nesting seabirds, encourage new seabird species to nest at Ka‘ena Point, enhance regeneration of native plants, and benefit monk seals by reducing the risk of disease transmission. The Ka‘ena Point Ecosystem Restoration Project is expected to have primarily positive effects on the resources protected in the NAR. No significant adverse effects are anticipated with regard to the environment, archaeological features, cultural practices, viewplanes, or public access or use of this area during or after construction of the proposed fencing.

II. PROJECT PURPOSE AND NEED

In 1970, Hawai‘i became one of the first states in the country to recognize the importance of its unique natural resources by establishing the Natural Area Reserves System (NARS). The NARS were created to “...preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawai‘i.” (Hawai‘i Revised Statutes § 195-1). The system presently consists of nineteen reserves on five islands, encompassing more than 109,000 acres.

Ka‘ena Point NAR was established in 1983, by Executive Order 3162, to protect a portion of the most extensive remnant dune system on O‘ahu from damage and degradation caused by off-road vehicle use, erosion, and the spread of invasive species. At the time the NAR was created, these factors had largely destroyed most of the native vegetation within the NAR, making it unsuitable for use by nesting seabirds. After the establishment of the NAR, vehicular access to most of the reserve was blocked, and recovery of native vegetation has been significant, with increasing numbers of endangered plants such as ‘ohai

(*Sesbania tomentosa*) and recovery of the rare coastal naupaka (*Scaevola sericea*) community.

As the coastal habitat has improved, and predator control has been initiated, increasing numbers of ‘ua‘u kani, or wedge-tailed shearwaters (*Puffinus pacificus*), and Laysan albatrosses, or mōlī (*Phoebastria immutabilis*), began to breed in the NAR. Wedge-tailed shearwater chicks hatching at Ka‘ena have increased in number from zero in 1995 to over 1,500 this year (2007). Laysan albatross alone have increased from zero pairs in 1989 to approximately 60 nesting pairs last year. The reserve also acts as refuge for the endangered Hawaiian monk seal or ‘īlioholoikauaua (*Monachus schauinslandi*), and honu or green sea turtles (*Chelonia mydas*), koholā or humpback whales (*Megaptera novaeangliae*), and nai‘a or spinner dolphins (*Stenella longirostris*) are often viewed just offshore.

Current management to protect the valuable natural and cultural resources within Ka‘ena Point include maintaining the existing boulder barricade, removal of invasive habitat-modifying weeds, and predator control. In cooperation with the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, the State Division of Forestry and Wildlife conducts regular small predator control, primarily using baited traps and shooting, that has decreased the size of feral predator populations within Ka‘ena Point NAR. However, with unlimited opportunities for entry, predator control requires constant effort and expense and does not provide a consistent level of protection for the native plants and animals within the NAR.

The devastating impacts of non-native mammals such as dogs, cats, mongoose, rats, and mice on island ecosystems are well-documented. Predation by invasive species is second only to habitat loss as the leading cause of avian extinctions and declines on islands, with rats and domestic cats implicated in most (72%) avian extinctions caused by invasive predators. Despite existing predator control efforts at Ka‘ena, attacks by cats and dogs continue to occur. For example, in 2006, 113 fledgling wedge-tailed shearwater chicks were killed in a single incident at Ka‘ena by a pack of dogs. Other high-mortality attacks at Ka‘ena include a 2005 incident in which a dog killed approximately twenty shearwaters, and a 1996 incident where forty nesting shearwaters were killed in one night.

While not as well-publicized, invasive rodents (rats and mice) constitute a greater threat to native species, contributing to extinctions and ecosystem-level changes. In Hawai‘i, rats have been documented to prey on ground-nesting seabirds, forest birds (including the endangered O‘ahu ‘elepaio), and the Laysan finch. In addition, as omnivorous feeders, rats are also known to eat the seeds, fruits, leaves, and shoots of Hawaiian plants, including chewing the apical and lateral buds of naupaka (*Scaevola sericea*), stripping the bark of koa (*Acacia koa*) saplings, and eating loulu (*Pritchardia* sp.) seeds. These actions either kill

the plant outright, make it more susceptible to disease, or prevent natural reproduction. The precise impact of rats and mice on the seabirds and vegetation at Ka‘ena is unknown, but is thought to be a continuing threat despite existing predator control efforts.

Finally, the predators found at Ka‘ena act as carriers of leptospirosis, morbilli virus (distemper), and toxoplasmosis. The recently published Recovery Plan for the Hawaiian Monk Seal identifies the transfer of these diseases as one of the threats to monk seal survival. Despite existing predator control efforts, the possibility of exposure continues as long as predators can enter the reserve.

The proposed predator-proof fence is a relatively recent technology developed in New Zealand. The fencing excludes non-native predatory animals as small as a two-day old mouse, and prevents these animals from digging under or climbing over the fence. The use of the predator-proof fencing is anticipated to increase the effectiveness of existing predator control efforts, shifting the focus from reducing predator numbers to eradication. The fencing will make it feasible to remove all non-native predatory animals from within the fenced unit and to focus control efforts on two entry points along the shoreline rather than across the entire peninsula.

Biologists familiar with these fences in New Zealand stated that “far more has been achieved at a far greater pace than expected” (Day, 2007). Benefits included a noticeable improvement in ecosystem function, a documented increase in the number and density of native invertebrates, and an increase in the diversity of plant vegetation. In one installation, the results projected to occur within 10 years of construction were observed in 18 months.

As the first full-scale predator-proof fence in Hawai‘i, the proposed fencing project provides an opportunity to prove the effectiveness of this new technology in Hawaiian coastal environments. Based on the experiences in other locations, the benefits of removing predators from Ka‘ena Point are anticipated to be extremely positive. The fencing will prevent the sporadic, high-mortality events caused by a feral dog in one night, but based on results from other island eradications, the removal of rodents may turn out to provide even greater conservation benefits than excluding dogs and cats.

Anticipated benefits are increases in the breeding Laysan albatross and wedge-tailed shearwater populations; the establishment of new seabird breeding populations, such as the ka‘upu or black-footed albatross (*Phoebastria nigripes*) and the ‘ou or Bulwer’s petrel (*Bulweria bulwerii*); a greater understanding of the impact of rodents on coastal ecosystems; improved health and function of the coastal strand plant community; improved natural regeneration or the re-introduction of the 11 endangered plant populations historically found at Ka‘ena; reduced risk of disease transfer to basking monk seals; and a demonstration area for residents and visitors to observe what the Hawaiian

islands might have been like in their natural state before the introduction of invasive mammals and to develop a greater appreciation of the value of the natural and cultural resources of Ka‘ena Point. Over the long-term, protecting the nesting area at Ka‘ena is of particular importance to vulnerable seabirds, as most of their nesting areas are located on atolls and islands at greater threat by rising sea levels than Ka‘ena.

The project area is situated on State land, within the Conservation District. As such, the project requires that an Environmental Assessment be prepared in accordance with Chapter 343 of the Hawai‘i Revised Statutes.

III. PROJECT DESCRIPTION

The Department of Land and Natural Resources proposes the construction of a predator-proof fence, to enclose approximately 59 acres of the peninsula of Ka‘ena Point. Figure 1 illustrates the area and the fence alignments under consideration.

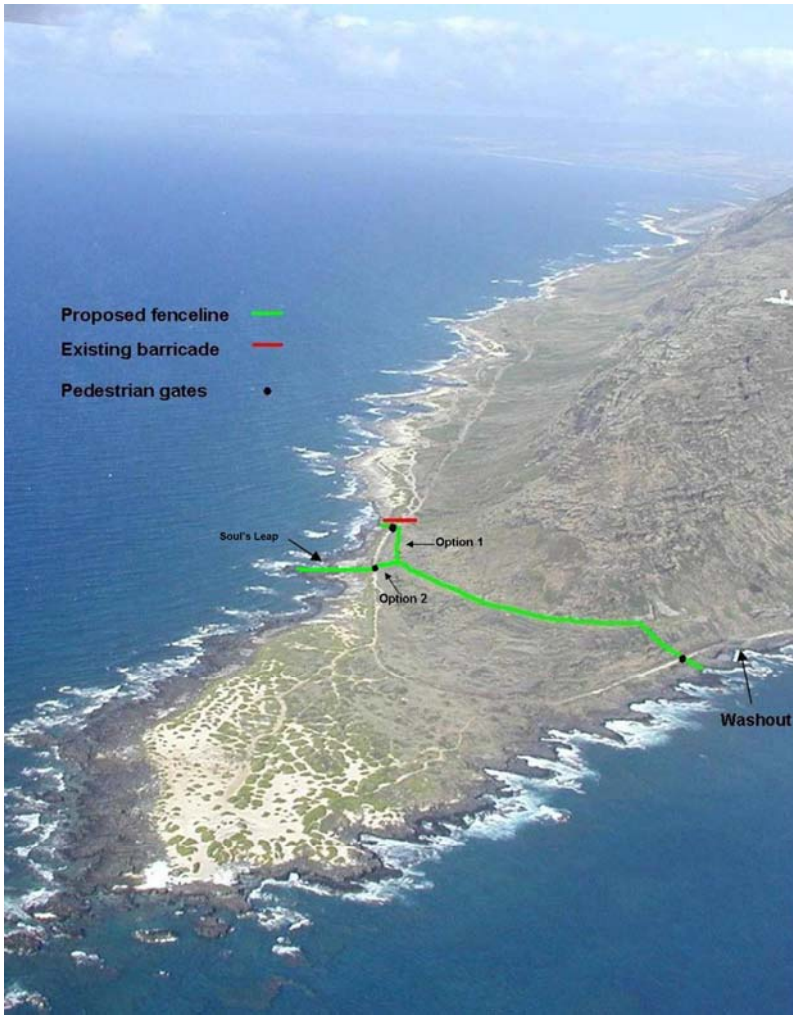

Figure 1. Aerial view of Ka‘ena Point with potential fence alignments superimposed.

The predator proof fence uses technology that has been used with great success in New Zealand in both coastal and forested areas. Trial predator-proof fences were constructed on the slopes of Mauna Loa, on Hawai‘i, demonstrating their effectiveness in excluding rats, cats, and mongoose and allowing the development of methods to exclude mice on ‘a‘ā substrate. Ka‘ena Point will be the first project-level fence of its type constructed in Hawai‘i. The project presents an exciting opportunity to utilize a fencing technology that may prove useful in other areas of Hawai‘i.

The proposed action can be divided into three phases: (1) fence corridor preparation and fence platform construction; (2) fence installation; and (3) predator eradication from within the fenced area.

The fencing corridor will be approximately four meters (13 feet) wide and 500 - 675 meters (1640 - 2200 feet) long, depending on the alignment selected. The fencing alignment largely follows a World War II-era roadbed that skirts along the bottom of the hill behind Ka‘ena Point, above the sand dunes. By following this track at the base of the slope, the alignment places the fence along the least visually intrusive area of the point, so that the greatest area might be enclosed while minimizing interference with viewplanes. On the Wai‘anae side, the fencing will contour down from the roadbed on the loose rock slope, cross the old railway easement (avoiding the railway retaining wall), and extend out towards the ocean along a rocky outcropping.

On the Mokulē‘ia side, two alignments are currently under consideration: the first runs along the roadbed to the existing boulder barricade, then crosses the old railway easement and extends to the ocean along a rocky outcropping; the second turns off the roadbed towards the ocean approximately 150 meters (500 feet) short of the boulder barricade, crosses the old railway easement and extends to the ocean along a rocky outcropping. The primary difference between the two alignments is that the first option encloses the culturally significant site, Leina a ka ‘Uhane (Soul’s Leap), within the fencing, while the second option does not. Other differences are outlined in the following table:

	Option 1: Fence extends to boulder barricade	Option 2: Fence ends about 150 m short of boulder barricade
Relative position of Leina a ka ‘Uhane (Soul’s Leap)	Enclosed within fenced unit	Remains outside the fenced unit
Length	677 meters	500 meters
Visual disturbance	Minimized impact, due to proximity to boulder barricade	Moderate impact, due to terrain

Distance to bird flight paths	Further from nesting birds	Closer to nesting birds

The final alignment will be selected based on consideration of public input, including input from cultural practitioners and lineal descendents of the area. Minor changes to the alignment are possible based on terrain considerations and permit requirements. Most of the length of the fencing alignment is within the boundaries of the NAR, but a small portion at the southern end (Wai‘anae side) will cross State Parks land as the fencing leaves the loose rock slope, crosses the railway easement, and extends to the ocean.

The existing roadbed that forms the main portion of the fence corridor is fairly level, and as a result, limited grading and little to no vegetation clearing will be required to make it suitable as a fence platform. Where the fencing leaves the existing roadbed, the corridor will be cleared of vegetation and some earthworks will be created to form the fencing platform. Ground preparation will involve the use of a bulldozer and excavator to move soil or rocks to form a level stable platform and to gently contour the ground so that rain water moves away from the fencing. No material would be imported from off-site; only soil and rock from within the planned fence corridor will be utilized. Overall, less than one acre of land area will be disturbed.

The fence design has three main elements: base fence, predator-proof mesh and skirt, and predator-proof rolled hood. The base fence provides the structural strength and framework on which predator-proof components may be added, and will be made of anodized aluminum posts and stays, with stainless steel wires and fastenings.

Fence materials and equipment will either be flown in by helicopter or driven and carried to the fence corridor. A container will be temporarily placed on-site, close to the boulder barricade on the Mokulē‘ia side, to provide secure storage for materials, tools, and equipment and to act as an on-site base of operations.

Anodized aluminum posts will be set into the ground three meters (9.8 feet) apart. One meter (3.3 feet) of the post will be buried, while two meters (6.5 feet) remains above ground. Marine grade stainless steel mesh with an aperture of 6 x 25 millimeters (0.2 x 1.0 inches) is attached to the entire face of the base fence, and is also used to form a skirt of horizontal mesh at ground level, to prevent predators from tunneling under the fencing. The mesh extends from the top of the posts to just below ground level, while the skirt will extend 300 millimeters (1 foot) from the fence, and will be pinned to the ground where possible.

Due to the largely rocky substrate found at Ka‘ena Point, the standard technique of pinning the mesh skirt into soft ground will likely prove ineffective. As such, a proven alternative strategy will likely be utilized:

- All overlapping skirt sections will be laced together using stainless steel tie wire.
- The leading edge of the mesh skirt will be positioned snugly against existing substrate.
- A dry mix of three parts fine rock particles to one part cement will then be applied over the skirt edge, holding the edge in place. If necessary, water may be applied to aid setting of the mix.

A rolled hood sits at the top of the fencing and extends 330 millimeters (1.1 feet) on the outside of the fencing. The hood is made of smooth sheet steel and prevents predators from climbing over the fence due to its slipperiness and width. The hood is supported by a series of brackets that give the hood structural strength without aiding predator movement.

Access doors are to be incorporated at locations where the fencing crosses existing trails. To minimize the opportunity for predator incursion if doors are propped open, a double-door system is planned where both doors cannot be open at the same time. Instead, a person accessing the reserve must wait for the first door to close before the second door may be opened. An emergency over-ride button will be incorporated into the design, on the interior of the fencing, so that individuals will not be trapped inside the reserve if someone props the outside door open. The area between the doors will be constructed with the same quality and design as the rest of the fence and will be large enough that up to nine people may enter together or so that a person can enter with a bicycle or fishing pole.

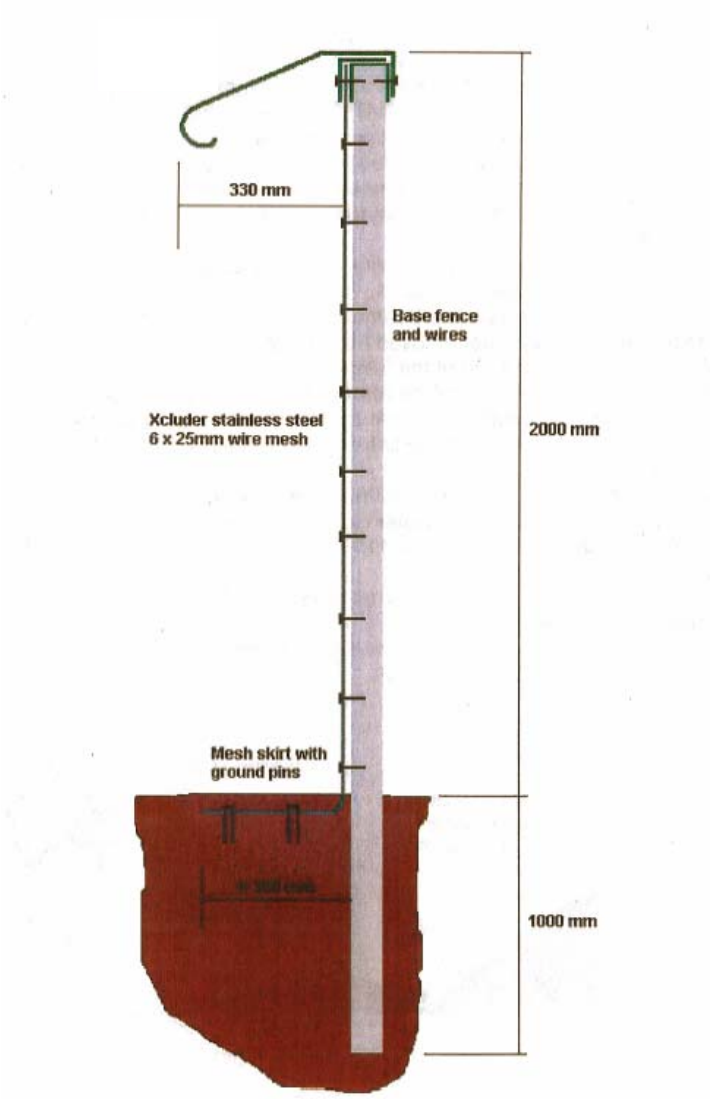

Figure 2. Schematic of proposed fencing.

Figure 3. Sample fencing and double door access system.

Figure 4. Front and side views of predator-proof fence on rocky terrain in New Zealand.

Figure 5. Predator-proof fence in coastal environment in New Zealand.

The fencing is planned to stop at approximately the high tide line, to avoid additional maintenance costs or damage due to rough seas or storm events. As a result, there may be a gap between the fencing and the ocean of up to fifteen feet, depending on tide and sea-state, which will require ongoing monitoring and

control to capture any predators that enter. The alignment on each end, utilizing rocky outcroppings, is specifically selected to present the optical illusion that the fence goes into the ocean without a gap, to discourage any potential predators from trying to cross into the reserve along the tideline.

Due to the potential for vandalism in this remote area, extra fence materials will be ordered and kept on-hand for repairs. The mesh size is too small to fit wire cutters through and too strong to be damaged by needle-nosed pliers, reducing the frequency and potential for damage to the mesh. Doors will be constructed of solid stainless steel with few moving parts to minimize potential for vandalism. If vandalism proves to be a large problem, the possibility exists to incorporate a monitoring system, using radios, cameras, and solar cells, to monitor activity near the fencing.

Upon completion of the fencing, all dogs, cats, mongoose, rats and mice will be removed from the fenced area to achieve the objective of a predator-free area. Potential techniques include trapping, shooting, and the use of Environmental Protection Agency-approved toxicants. Intensive eradication efforts and monitoring will continue until predator-free status has been achieved on the peninsula. At that point, predator control at key locations will continue to prevent or minimize re-introduction of predators into the fenced area. Regular monitoring of the entire fenceline will be a part of normal management for the area, to detect breaches for repair and regular monitoring of the interior and to detect ingress of any predator.

Weed control, outplanting of rare plants, and related habitat restoration efforts at Ka‘ena Point are ongoing and will continue after fence construction. Ka‘ena Point currently acts as an outdoor classroom where many students on O‘ahu come to learn about native species, and this activity is expected to continue. Additional signage at entry points, explaining why the fence was built and the importance of the natural resources protected by it, will be installed so that interaction with the fencing provides an opportunity for education.

Fence construction is planned to occur once all permissions and approvals have been received. Related conservation actions, such as predator control, weed control, outplanting, and outreach/education, are ongoing. Fence construction will be timed for October-early November or July-August. These time periods will avoid the Laysan albatross nesting season (November through June) and avoid the initial nesting period (April through June) and the primary fledging periods (September through October) for wedge-tailed shearwaters. Construction is anticipated to take approximately three to four weeks, weather-dependent. Fence crews will work in 2 10-day increments, with a break in between. Construction may involve temporary closures to the NAR, or portions of the NAR, for safety.

The fence is anticipated to cost approximately $250,000-$300,000 to construct. The total costs associated with predator control after the completion of fencing will depend on the success of initial control methods and the total amount of time it takes to remove predators from within the fenced unit. After predators have been removed, ongoing control activities along the edges of the fencing are anticipated to be about $10,000 per year.

Funding for this project is primarily through a grant awarded by the U.S. Fish and Wildlife Service to The Wildlife Society, Hawai‘i Chapter. The State is providing in-kind donations of staff time during the planning and permitting process. In addition, ongoing conservation management at Ka‘ena Point is made possible by State funds, primarily through the Natural Area Reserve Special Fund. The University of Hawai‘i is anticipated to provide in-kind donations by coordinating and implementing the monitoring of natural resources before and after construction. The predator-proof fencing is a cooperative effort of the State Department of Land and Natural Resources’ Division of State Parks and Division of Forestry and Wildlife, the U.S. Fish and Wildlife Service, and The Wildlife Society, Hawai‘i Chapter.

IV. SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT

Location and Physical Characteristics of the General Area

Ka‘ena Point is a wilderness area known for its unspoiled natural beauty, located on State land at the western corner of O‘ahu, in the ahupua‘a of Ka‘ena and Keawa‘ula. Ka‘ena Point Natural Area Reserve, established in 1983, forms the westernmost tip of this peninsula, and is entirely surrounded by Ka‘ena Point State Park lands.

The area contains shoreward basalt benches with numerous tidepools and a diverse intertidal flora and fauna, rare coastal sand dune communities, and rare coastal dry shrub and grasslands. Offshore from Ka‘ena is habitat for reef and pelagic fish, sea turtles, seabirds, and cetaceans.

The rugged, wind-swept peninsula consists of a low platform that extends 2100 feet beyond the base of high, wave-cut cliffs that converge like the prow of a ship behind Ka‘ena Point. The shore at the point is of black lava, mixed with white fragments disgorged from ancient coral reefs, and rises immediately to the heavily salt-spray influenced coastal strand and a band of sand dunes, before rising gently into rockier, less salty coastal zone shrublands at the base of the slope.

Above the low coastal platform, basalt-talus slopes tower above, rising to an elevation of 969 feet at Pu‘u Pueo directly above the point, with steep cliffs to the north and south. Though Kuaokalā Ridge, the westernmost extension of the Wai‘anae Mountain Range, descends relatively gently to the point compared with the steeper cliffs, it requires less than half a mile to gain nearly 1000 feet.

To the south of Ka‘ena, steep cliffs extend unbroken, past the beaches of Keawa‘ula (Yokohama) Bay, and into Mākua Valley. To the north of the point, the cliffs of Mokulē‘ia extend to the east, broken by ‘Ālau and Manini gulches, before continuing towards Dillingham Airfield.

The elevation in the project area ranges from sea level to approximately 100 feet. The project area is relatively dry; rainfall averages less than forty inches per year, with most occurring during winter. The landscape here is generally harsh, being heavily influenced by wind-blown salt spray and unsheltered from the sun, with consistent northeasterly tradewinds and an annual temperature range from 62-89°F.

Geology

The Island of O‘ahu was formed by the coalescence of two volcanoes, Ko‘olau to the east and the older Wai‘anae to the west, which may have built upon a still older volcanic mass. The Wai‘anae Volcano is thought to be approximately four million years old, while Ko‘olau is around 2.75 million years in age. The younger lava flows of Ko‘olau are banked against the slope of Wai‘anae, forming the broad Schofield Plateau. An erosional unconformity between rocks of the two volcanoes may be found along Kaukonahua Gulch, at the eastern foot of the Wai‘anae Range, where Wai‘anae lavas with a slope of 10-15° to the northeast are overlain by Ko‘olau flows dipping 5° northwest. Both volcanoes are now referred to as mountain ranges, as extensive erosion has formed the once-great shield volcanoes into what are essentially long, narrow ridges. What remains of Ko‘olau is the western half of the original volcano, as the entire eastern half slid cataclysmically into the ocean. This slide, known as the Nu‘uanu Slide, included much of the Kailua-area summit caldera. Massive fragments are strewn over the ocean floor as far as 100 miles to the northeast of O‘ahu. Wai‘anae Volcano was also subject to a massive slide, the southwest-trending Wai‘anae Slump. The Wai‘anae caldera was in the region west of Kolekole Pass, extending for about nine miles from the northern side of Mākaha Valley to the head of Nānākuli Valley.

The volcanoes of O‘ahu, as well as the majority of volcanoes in the main Hawaiian Islands – excluding Haleakalā on Maui and the Hawai‘i Island volcanoes other than Kohala – are considered to be dormant volcanoes in the rejuvenation, or renewed volcanism, stage. Though unlikely, renewed volcanic eruptions have been known to occur as late as five million years after emergence. Renewed volcanism eruptions usually consist of temporally and spatially limited episodes of isolated volcanic activity that occur on the heavily eroded slopes of old volcanoes, and generally show little relation to the orientation of earlier volcanic rift zones. Numerous examples of renewed volcanism episodes may be found on O‘ahu in association with Ko‘olau Volcano. These renewed eruptions began about 0.8 million years ago, with the most recent possibly occurring as recently as 6000 years ago. Resulting features may include cratered cones resulting from ash and cinder eruptions, such as

Diamond Head (Lē‘ahi), Punchbowl (Pūowaina), and Koko Crater (Kohelepelepe), or may be eruptions with lava flows and ash production, such as those that formed Mount Tantalus (Pu‘u ‘Ōhi‘a) and Round Top (Pu‘u ‘Ualaka‘a).

Fossilized coral reefs also comprise an important component of the geology of the Hawaiian Islands, and the emerged reefs found on O‘ahu are more extensive than on any of the other islands. The Honolulu and ‘Ewa Plains, as well as much of the rest of the southern edge of O‘ahu, are underlain by a broad, elevated coral reef. These emerged reefs are generally formed during interglacial sea level highstands. Most of the fossil reefs of southern O‘ahu are about twenty-five feet above current sea level, but evidence exists to indicate that, during the past two million years, eustatic sea level changes in Hawai‘i may have been as great as 250 feet above present levels and as low as 300 feet below current sea levels. At Ka‘ena Point, fossiliferous conglomerate is found eighty-nine feet above sea level, with loose coral cobbles as high as 100 feet up on Pu‘u Pueo, indicating a highstand of about ninety-five feet above present sea level. This highstand, known as the Ka‘ena Highstand and estimated to have begun between 423-362 thousand years ago, was one of the most significant interglacial highstand events of the past million years, and may have lasted approximately 60,000 years.

Ka‘ena Point itself is rich in fossil reef deposits, and has been referred to as a “geological museum” whose layers of fossilized reef are a “natural archive of global change” (Chip Fletcher; Honolulu Advertiser 1998). The oldest reef found here is the one associated with the Ka‘ena Highstand, some 100 feet above sea level. A lower stratum along the shoreline includes giant molluscs and coral heads and is about 130,000 years old. Fossilized reefs descend down the underwater extension of Kuaokalā Ridge to a vertical wall 100 feet deep, known as the Mākua Shelf.

The slopes of Pu‘u Pueo, as well as the underlying substrate in the Ka‘ena area, is composed of shield-building lava flows of the Kamaile‘unu Member of the Pliocene-era Wai‘anae Volcanics. There are also numerous sedimentary deposits of more recent vintage in the area, including the Holocene dune deposits of Ka‘ena Point, which are interspersed with smaller patches of calcareous reef rock and marine sediment – O‘ahu is the only island where these emerged reef deposits are exposed subaerially. The point itself is largely composed of dunes overlying fossil reefs and lava flows, as discussed above, but other sedimentary deposits on shores nearby include Holocene beach deposits and alluvium, which are composed chiefly of unconsolidated sediment, and are found along the coast and in drainages, respectively.

Soils in the project area are primarily characterized as beach (BS) and as rock lands (rRK). Beaches are described as sandy, gravelly, or cobbly areas washed by ocean waves, while rock lands are characterized as areas where exposed rock

covers 25-90% of the surface, with rock outcrops of basalt and andesite and shallow soils being the main characteristics. Beaches are considered highly suitable for recreational uses and resort development, while rock lands are suitable for pasture, wildlife habitat and water supply.

Groundwater beneath the project area is generally described as being basal (freshwater in contact with seawater), unconfined (not confined under pressure beneath relatively impermeable socks or soil), and within a sedimentary type aquifer. The aquifer is classified as a portion of the North aquifer sector, Mokulē‘ia system. The groundwater here is considered replaceable, not of importance either ecologically or as drinking water, and saline and, as such, is of limited importance.

Land Use

Both the State Park and the Natural Area Reserve are located in the Conservation District. The project area falls partially in the Resource Subzone (where the fencing joins the coastline) and partially in the Limited Subzone (along the old roadway). The area is zoned by the County as P-1 Restricted. The project area is located entirely within the County Special Management Area. A portion of the fencing project along the coastline is located within the tsunami evacuation zone.

Historically, the Ka‘ena coast may have supported small villages in the 1800s and early 1900s. The O‘ahu Railway and Land Company began operating a railway around the Point in 1898 to service sugarcane operations. The Coast Guard constructed a passing light for navigation purposes in 1920. Because of its strategic location, Ka‘ena Point was actively used by the military for coastal defense after World War I through World War II. Military use declined after World War II and the railway ceased operation in 1947. In 1971, the State Department of Transportation developed plans for a two-lane paved road around Ka‘ena Point. Due to significant opposition from the public, the concept was withdrawn. However, every so often, the idea of a road connecting the North Shore and Wai‘anae coast through Ka‘ena is raised again at the Legislature, most recently in 2000 (SCR 160). Continued public opposition, combined with the estimated high cost of the project, has prevented the road from becoming a high transportation priority.

During the 1970s, the State began to purchase lands in the area for a proposed Ka‘ena Point State Park. In 1978, a Ka‘ena Point State Park Conceptual Plan was completed. Ka‘ena Point NAR was established in 1983, composed of twelve acres on the leeward side of the point. In 1986, an additional twenty-two acres on the windward side were added to the NAR.

The project area is one of the last relatively wild areas on O‘ahu and has been valued as a natural escape from the pressures of urban life. Ka‘ena Point NAR is accessible to the public by foot or bicycle, and its primary uses include

recreation, hiking, nature study, education, and the observation of wildlife. Shore fishing, spear fishing, and gathering of marine resources have traditionally been important uses of the Ka‘ena coast. A site ½ mile off of Ka‘ena Point is used by surfers, and during rare combinations of winter conditions, rideable 50-60 foot surf has been seen.

Flora

The area of Ka‘ena Point is generally affected by sun, salt spray, and seawater, and is limited by the sandy, rocky substrate. This sort of challenging, coastal strand environment is usually dominated by low shrubs and perennial herbs, vegetation that is adapted for such conditions. Farther uphill in the coastal zone, where the influence of salt and wind is less acute, arid shrublands are generally found. Appendix B includes a partial inventory of the flora and fauna found at Ka‘ena Point. Two native natural communities are found in Ka‘ena Point Natural Area Reserve, the rare Naupaka (*Scaevola sericea*) Mixed Coastal Dry Shrubland and an ‘Ilima (*Sida fallax*) Coastal Dry Mixed Shrub and Grassland. Though naupaka itself is not rare, this community type was classified by the Hawai‘i Heritage Program to be critically imperiled globally, meaning that there are 1-5 occurrences worldwide. The ‘ilima community is considered to have a restricted range, of 21-100 occurrences.

Naupaka Mixed Coastal Dry Shrubland dominates the point. This community occurs on dunes and fossil reefs from the high-water mark throughout the coastal strand, and is generally dominated by a dense but non-continuous canopy of naupaka kahakai (*Scaevola sericea*). In the Reserve, the naupaka canopy is generally 2-4 feet in height, and opens to a varied cover of low grasses and shrubs that includes ‘aki‘aki (*Sporobolus virginicus*), pōhinahina (*Vitex rotundifolia*), hinahina kū kahakai (*Heliotropium anomalum* var. *argenteum*), and pā‘ū o Hi‘iaka (*Jacquemontia ovalifolia* subsp. *sandwicensis*). With the absence of off-road vehicles, this community is recovering well.

The ‘Ilima Coastal Dry Mixed Shrub and Grassland community covers the gentle alluvial slopes above the sand dunes in the Reserve as a thin strip, rarely exceeding eighty feet in elevation. This community is capable of withstanding extreme drought conditions. The dominant ‘ilima is a shrub that can be prostrate or upright to more than three feet. In addition to ‘ilima, there may be a variety of codominant native shrubs and grasses. The prostrate vine pā‘ū o Hi‘iaka is the most frequent codominant with the ‘ilima in the Reserve. Taller native shrubs, such as naupaka and naio (*Myoporum sandwicense*), are scattered throughout the community. Other shrubs include alena (*Boerhavia repens*) and ‘ōhelo kai (*Lycium sandwicense*). Pili grass (*Heteropogon contortus*) and the upright shrub ma‘o (*Abutilon incanum*) are locally common in the upper reaches of the community and nehe (*Wollastonia integrifolia*) nearer the point. Also found near the point is an endangered variety of ‘akoko endemic to Ka‘ena (*Chamaesyce celastroides* var. *kaenana*). Invasion by non-native plants presents a serious problem for this community.

Other notable native plants found within the Reserve include the endangered species ‘ohai (*Sesbania tomentosa*) and one of the only known occurrences of the endangered *Schiedea kealiae*. In total, eleven endangered plant species have been recorded at Ka‘ena Point, and the area is designated as critical habitat for seven of those species. Also known from the area is Hawaiian cotton, called ma‘o or huluhulu (*Gossypium tomentosum*). A full list of notable species of flora and fauna thought to occur in or near the project area is including in Appendix A.

Outside the Reserve, other native plant communities may be found nearby. The rare Alahe‘e (*Psydrax odorata*) Mixed Lowland Dry Shrubland exists in relatively dry regions of basaltic slopes, and is found from 50-800 feet in elevation on the windward slopes from ‘Ālau Gulch to Manini Gulch. Alahe‘e growth is densest on the upper talus slopes and the lower cliff edges, with canopy height from 3-10 feet, depending on wind exposure. Common native shrubs of the understory include ‘ilie‘e (*Plumbago zeylanica*) and ‘ilima, and native vines such as koali (*Ipomoea indica*, *I. cairica*) and huehue (*Cocculus trilobus*) are common. During the wet winter season, the annual native vine ‘ānunu (*Sicyos pachycarpus*) is profuse. Other native vegetation associated with this community are the grasses pili, kāwelu (*Eragrostis variabilis*), and kākonakona (*Panicum torridum*), the herb ‘ala‘ala wai nui (*Peperomia leptostachya*), and kumuniu (*Dryopteris decipiens*), a fern. In the Ka‘ena area, the alahe‘e shrublands are severely degraded, with weed cover exceeding 50% in most areas.

Kāwelu Coastal Dry Grassland typically occurs on basaltic coastal cliffs, and is found in the Ka‘ena region on steep windward cliffs and the upper reaches of talus slopes. The grasslands attain their best development closest to Ka‘ena Point at about forty feet in elevation, but extend east to ‘Ālau Gulch and up to 800 feet in elevation near the cliff tops. Kāwelu grasslands tend to form a low cover – generally less than twenty-five inches – and reach a maximum on slopes exposed to the prevailing winds. Distributed among the kāwelu are other native grasses, such as kākonakona and pili, and native shrubs such as ‘ilima. A scattering of taller shrubs, such as naio and alahe‘e, often project above the short canopy. Largely bare rock faces amidst kāwelu often support the shrub hinahina kuahiwi (*Artemisia australis*). An interesting phase of this community may be found near the point, where ‘akoko (*Chamaesyce* sp.) is codominant with kāwelu in a small area. Non-native grasses and shrubs are invading to various degrees.

Naio Coastal Dry Shrubland, also considered a rare community, is known only from a few areas in the Hawaiian Islands, including the Ka‘ena coast. These shrublands cover extensive areas of the windward side from near the point to beyond Manini Gulch. Starting on the gentle alluvial fans at the base of the talus slopes, the shrublands extend up the slopes, sometimes onto the basalt

ledges. This community is characterized by scattered, rounded naio shrubs, from 3-8 feet tall, with other shorter shrubs and grasses between. The most common are ‘ilima and a rare nehe (*Wollastonia lobata* var. *lobata*), with occasional patches of native grasses, such as pili, kāwelu, and kākonakona. The native shrub alahe‘e is also common. The naio shrublands at Ka‘ena are highly degraded by non-native species.

Non-native plants in the area compete with native vegetation, especially in areas outside the Reserve. Koa haole (*Leucaena leucocephala*) dominates many of the dry slopes near Ka‘ena on the leeward side, forming a non-native community referred to as Koa haole Mixed Coastal Dry Shrubland. Koa haole typically covers 70-90% of drier leeward slopes and 25-50% of windward slopes, but had shown a decline in the late-1980s due to the introduction of a non-native psyllid, *Heteropsylla cubana* (Psyllidae), resulting in emergence of native shrubs such as ma‘o and ‘ilima in some formerly infested areas. Within koa haole shrublands a variety of non-native grasses, shrubs, and herbs exist. Guinea grass (*Panicum maximum*) heavily infests the flats near the road and on the lower slopes, and kiawe (*Prosopis pallida*) is intermittent on the lower slopes and flats, with 5-10% coverage on the windward side. Other abundant weeds are the grasses swollen fingergrass (*Chloris barbata*), with up to 25% coverage of roadside areas and mid-slopes, and sourgrass (*Digitaria insularis*), which is found in the flats and open areas near the road and dominates open areas around koa haole stands. Buffel grass (*Cenchrus ciliaris*) is another common non-native grass. Vegetation along the proposed fencing corridor is primarily non-native.

Fauna

Both Laysan albatrosses and wedge-tailed shearwaters have re-established breeding colonies in the Reserve. Currently, approximately 60 pairs of Laysan albatross nest at Ka‘ena Point, along with over 1,500 pairs of wedge-tailed shearwaters.

The success of a breeding population of Laysan albatross at Ka‘ena Point is of particular importance, as it is one of only three communities in the main Hawaiian Islands. Considered a species of concern vulnerable to extinction by the World Conservation Union (IUCN), populations of Laysan albatrosses have not fully recovered from widespread feather hunting that took place in the early 1900s, and now face threats from longline fisheries and lead poisoning of the major population at Midway. Laysan albatrosses, or mōlī (*Phoebastria immutabilis*), spend the majority of their lives at sea, coming ashore only for breeding purposes. The birds, which can live at least fifty years, mate for life. At 7-10 years in age, birds begin courtship rituals, involving elaborate dancing and calls. Breeding pairs will return to the same nest site every year. While the breeding season runs from November through June each year, birds usually begin to arrive in October, and the last chicks may not leave until July. As ground nesting birds, Laysan albatross are particularly vulnerable to predation.

The wedge-tailed shearwater, or ‘ua‘u kani (*Puffinus pacificus*), is relatively abundant at Ka‘ena Point. Populations in Hawai‘i historically numbered in the tens of millions; they are now considered “common” seabirds with an estimated population of only 40-60,000 pairs in the main Hawaiian Islands. The Hawaiian name for the bird means moaning petrel, and refers to the various strange nocturnal moans, groans, and wails heard from a nesting colony. These shearwaters are also pelagic birds, spending the majority of their lives at sea, and will usually depart the colony before dawn and return after dusk. Adults usually arrive in March, and females lay a single egg in June. As ground nesting birds, shearwaters face threats from feral predators at nesting sites and also easily disoriented by urban lights.

White-tailed tropicbirds, or koa‘e kea (*Phaethon lepturus*), have also been known to nest at Ka‘ena Point in small numbers. Other seabirds, including red-footed (*Sula sula*), brown (*S. leucogaster*), and masked (*S. dactylatra*) boobies, collectively known as ‘ā; brown (noio kōhā, *Anous stolidus*) and black noddies (noio, *Anous minutus*); ‘ou or Bulwer’s petrel (*Bulweria bulwerii*) and an occasional ka‘upu or black-footed albatross (*Phoebastria nigripes*), have been observed from the point. Great frigatebirds, or ‘iwa (*Fregata minor*); and grey-backed (pākalakala, *Sterna lunata*), sooty (‘ewa‘ewa, *S. fuscata*), and white (manu-o-Kū, *Gygis alba*) terns have been observed at Ka‘ena on occasion, and any number of other seabirds could potentially be seen here. Migratory shorebirds, including the wandering tattler, or ‘ūlili (*Heteroscelus incana*); Pacific golden-plover, or kōlea (*Pluvialis fulva*); and ruddy turnstone (‘akekeke, *Arenaria interpres*) may also be seen. All of the seabirds and shorebirds found at Ka‘ena Point are federally protected under the Migratory Bird Treaty Act of 1918.

Hawaiian short-eared owls, or pueo (*Asio flammeus sandwichensis*), have been seen in the Reserve, and it is possible that they may nest in the Reserve or nearby. And, while not generally observed, the tide pools of the Ka‘ena coast could provide temporary habitat for the endangered Hawaiian coot, or ‘alae ke‘oke‘o (*Fulica alai*).

It is possible that, with the protection afforded by the predator-proof fence, one or more of the species of seabirds will establish nesting colonies at Ka‘ena Point. Bulwer’s petrels have been observed in the area and might have unsuccessfully attempted to nest in shearwater burrows, and the removal of rats could result in their return. Black-footed albatrosses are thought to have been observed ‘prospecting’ for nesting sites. The FWS has just initiated the review process to consider listing the black-footed albatross as threatened or endangered, and is considered by the IUCN to be globally endangered, on the basis of a projected 60% population decline over the next fifty years due to incidental mortality in longline fisheries.

The reserve also acts as a refuge for the endangered Hawaiian monk seal, or ‘īlioholoikauaua (*Monachus schauinslandi*), and for honu, or green sea turtles (*Chelonia mydas*). The subtropical monk seal genus (*Monachus* sp.) is one of the most highly endangered groups of animals in the world. Only three species are known from modern times. Of these, the Caribbean monk seal is now extinct, the Mediterranean monk seal is considered by the IUCN to be critically endangered, and the Hawaiian monk seal is listed as endangered by both the USFWS and the IUCN. Observations of the Hawaiian monk seal, or ‘īlioholoikauaua (*Monachus schauinslandi*), sunning on the beach or the rocks at the point have increased over the past decade. Several individuals are regulars at Ka‘ena Point, and a female seal gave birth to and successfully raised a pup there in 2006.

Honu, or green sea turtles (*Chelonia mydas*), are known to utilize the shallow waters of Ka‘ena Point for resting and feeding, and are federally listed as a threatened species in Hawai‘i. Humpback whales (koholā, *Megaptera novaeangliae*), listed as an endangered species, are commonly seen in the waters off the point during the winter breeding season. Hawaiian spinner dolphins (nai‘a, *Stenella longirostris*) may also be seen in the waters near Ka‘ena Point.

Little documented information exists regarding native invertebrates within the reserve. Native bees of the genus *Hylaeus* (Colletidae) are thought to pollinate the rare native plant ‘ohai (*Sesbania tomentosa*). A native Succineid land snail is known from Ka‘ena. Non-native invertebrates are common in the reserve, and an unstudied entomofauna is known to exist in association with seabirds.

Non-native birds are commonly seen in the Reserve. These include the red-crested cardinal (*Paroaria coronata*), bulbul (*Pycnonotus* sp.), common myna (*Acridotheres tristis*), Japanese white-eye (*Zosterops japonicus*), spotted dove (*Streptopelia chinensis*), zebra dove (*Geopelia striata*), house finch (*Carpodacus mexicanus*), Northern mockingbird (*Mimus polyglottos*), grey francolin (*Francolinus pondicerianus*), and Erckel’s francolin (*Francolinus erckelii*).

Non-native predators are also present in varying numbers within the reserve, and these are the primary motivation for the proposal of a predator-proof fence. Problem animals for the reserve include feral dogs (‘īlio, *Canis lupus familiaris*) and cats (pōpoki, *Felis silvestris catus*), as well as the black rat (*Rattus rattus*), Polynesian rat (‘iole, *R. exulans*), house mouse (*Mus musculus*), and Indian mongoose (*Herpestes javanicus*).

Significant and Sensitive Habitats

The State considers Ka‘ena Point to be significant and sensitive habitat for a variety of reasons.

Ka‘ena Point is considered by many to be the last wild stretch of coastline on O‘ahu. By restricting vehicular access into the Natural Area Reserve, damage to the coastal dunes, the surrounding terrain, cultural sites, and vegetation was halted and the ecosystem has demonstrated remarkable recovery. Despite their recovery, these coastal resources remain fragile and coastal dune remain rare across the State.

The project area is also designated critical habitat for seven endangered species of plants: ‘ohai (*Sesbania tomentosa*), ‘āwiwi (*Centaurium sebaeoides*), ‘akoko (*Chamaesyce celastroides* var. *kaenana*), *Vigna o-wahuensis*, pu‘uk‘aa (*Cyperus trachysanthos*), ma‘o hau hele (*Hibiscus brackenridgei*), and *Schiedea kealiae*. Ka‘ena Point provides important habitat for nesting seabirds, in particular the Laysan albatross, and is commonly used by the endangered Hawaiian monk seal.

Finally, Ka‘ena Point was proposed as a Natural National Landmark in a 1981 National Park Service survey of the Hawaiian Islands.

Archaeological Sites and Cultural Practices

The following steps were taken to determine the cultural and historical significance of the project area: (1) field inspections by the Division of State Parks archaeologist; (2) review of State reports and documents available in the State Parks and State Forestry and Wildlife files; (3) literature review for sources with information relevance to the project area; (4) preparation of a Summary of Known and Possible Historic Properties at Ka‘ena Point by the Division of State Parks archaeologist; (5) sending of pre-consultation letters to a wide variety of agencies and organizations that might be interested in the project or have relevant information about archaeological or historic sites or cultural practices, including: US Air Force, Ka‘ena Point Tracking Station, US Army Museum of Hawai‘i, State Historic Preservation Division, Office of Hawaiian Affairs, Department of Hawaiian Home Lands, O‘ahu Island Burial Council, ‘Ahahui Mālama I Ka Lōkahi, Ahupua‘a Action Alliance, Hawaiian Civic Club of Waialua, Hawaiian Civic Club of Wai‘anae, Hawai‘i Railway Society, Historic Hawai‘i Foundation, Ho‘omau Ke Ola, Hui Mālama I Nā Kūpuna O Hawai‘i Nei, Hui Mālama o Mākua, ‘Ike ‘Āina, KAHEA – The Hawaiian-Environmental Coalition, Kai Makana, Nani ‘O Wai‘anae, Native Hawaiian Legal Corporation, North Shore Kūpuna, and Polynesian Voyaging Society; and (6) meetings with identified groups or individuals connected to the area. A summary of the archaeological and cultural resources found at Ka‘ena Point is presented below.

The Ka‘ena Point area was traditionally separated into different land divisions, with the north side belonging to the Ka‘ena ahupua‘a of the Waialua moku, and the south side of the point belonging to the Keawa‘ula ahupua‘a of the Wai‘anae moku. Ka‘ena, which literally translates as ‘the heat,’ is thought to have been named for a brother or cousin of Pele. Other sources note that Ka‘ena means ‘the end point,’ underlining the area’s cultural significance as a sacred place

where the spirit goes after death. Keawa‘ula translates to ‘the red harbor;’ the name comes from the great schools of muhe‘e (cuttlefish) that came into the bay in such numbers, the reddish color of their back under the water gave the water the appearance of being reddish.

Ka‘ena Point itself is a culturally significant landscape. There is a strong relationship in Native Hawaiian culture between the people and the land on which they live. The ‘āina (land), wai (water), and kai (ocean) formed the basis of life and established the spiritual relationship between the people and the environment. This relationship is demonstrated through traditional mele (songs), pule (prayer chants), genealogical records, and stories about particular areas, celebrating the qualities and features of the land. The relationship to the land is also shown through the strong attachments of kama‘āina to their ancestral homelands. For example, Thomas Shirai Jr. traces his genealogy in Waialua at least seven generations, was raised in Mokulē‘ia, and remains active in the Waialua moku. His ancestors, including his great-great-grandfather Kaaemoku Kakulu, his great-great-grandmother Annie Keahipaka, and his great-grandfather David Keao, provided information about Ka‘ena during previous endeavors to record traditional Hawaiian knowledge (Handy’s The Hawaiian Planter and McAlister’s Archaeology of Oahu). Mr. Shirai continues the tradition by sharing family stories that illustrate the importance of Ka‘ena for marine resources.

Mr. Shirai shared that he and his grandparents would periodically go to Ka‘ena to gather shellfish (‘opihi and pipipi), seaweed (limu kohu), sea cucumber (loli), sea urchin (wana, hā‘uke‘uke, and hāwa‘e), and other resources, and that they would make pa‘akai (salt) on a parcel of land his family owned at Ka‘ena. His grandfather was a taro farmer and lobster fisherman, who used Ka‘ena as one of his fishing grounds. His grandfather learned his skills from his grandfather, Kaaemoku Kakulu, the last konohiki of Kawaihāpai, located between Waialua and Ka‘ena.

In an article published in the Hawai‘i Fishing News, Mr. Shirai connected old family stories to modern events. After relaying a family version of the story of how the Pōhaku o Kaua‘i was formed (repeated below), he tells a story of how Maui caught a huge red fish (kūmū) at Ka‘ena and dragged it to Kuakala Heiau, where the menehune found it, named it Kumunuiakea, and cut it into small pieces. When the sea covered the land, pieces of the fish went back into the ocean, and since then kūmū at Ka‘ena are small. Mr. Shirai then recalls a 1994 Hawai‘i Fishing News story remembering how three scuba divers discovered a pristine kūmū fishing ground, catching many of this species, but of an average size of five pounds, back in 1957.

Mr. Shirai shared a third story, about an octopus called Kakahe‘e that lived at Ka‘ena. Piikoi-a-ak-Alala and his father were traveling to O‘ahu where they sighted a huge octopus. They took aim and shot at Kakahe‘e with a bow and

arrow, then landed at Waiakaaiea and proceeded to beat it to death. Kakahe‘e is reported to have shared the same fate as Kumunuiakea, thus creating an abundance of he‘e (octopus). Mr. Shirai then notes that the State record for largest octopus was caught at Ka‘ena, and that the February 1994 issue of Hawai‘i Fishing News featured a fisherman who caught a large octopus at Ka‘ena.

These stories provide invaluable information about Ka‘ena and connect historic events with present use. There are likely many other residents of Wai‘anae and Waialua with similar stories and recollections. While most likely involve the rich marine resources of Ka‘ena, many of the native plants found at Ka‘ena are also associated with traditional cultural practices and may have been used by previous families. ‘Ilima papa vines were used for basketry, the flowers for lei, and parts of the plant for medicinal and ceremonial purposes; hinahina was used for lei and medicinal purposes; and naio provided hard durable wood and was used for medicinal purposes.

Sites of O‘ahu (1978) identifies several archaeological sites in the Mokulē‘ia-Ka‘ena region. In Kamananui, on the slopes of the Wai‘anae Mountain Range behind the old Waialua Sugar Company mill, the remains of a heiau were found along with stone piles and burial caves. Makai of these sites, along the coastline, were found a fishing shrine, or ko‘a, and skeletal remains. In western Mokulē‘ia, a heiau site and a ko‘a – both now destroyed – as well as extensive terracing have been recorded. Further into the valley area are sites that indicate that there was once a significant Hawaiian settlement there, including house sites, old coconut trees or dead trunks, and terracing. In Kawaihāpai, between Waialua and Ka‘ena, a heiau, ahu, ko‘a, and extensive terracing were recorded, as well as the four ‘hidden waters.’ These are the legendary streamlets Ulunui, Koheiki, Ulehulu, and Waiaka‘aiea that Hi‘iaka, one of the sisters of Pele, discovered at Ka‘ena and at which she quenched her thirst. The Keālia Trail, which zigzags up into the Wai‘anae Mountain Range from the coast, provided easy access to the Mokulē‘ia plateau. The Moka‘ena heiau in Kuaokalā, situated on the ridge at 1200 feet in elevation overlooking Ka‘ena Point and Keawa‘ula Bay, has the highest location of any heiau on O‘ahu. At Ka‘ena, the now-destroyed Ulehulu heiau was also located on the mountain ridge.

Historic properties identified so far at Ka‘ena Point within or near the project area fall within one of the following four major time-periods and uses: (1) Native Hawaiian subsistence and cultural uses; (2) Pasturage and ranching; (3) O‘ahu Railway and Land Company (OR&L); and (4) Ka‘ena Point Military Reservation. The following information is based on the Summary of Known and Possible Historic Sites; the full report, with photos, is included as Appendix C.

To date, a total of five extant historic properties that are considered native Hawaiian properties have been documented at Ka‘ena Point. Together they form the Ka‘ena Complex, which was listed on the Hawai‘i Register of Historic

Places in 1988. Major features of the Ka‘ena Complex include cultural deposits in the sand dune area, two stone platforms, Pōhaku o Kauai, and Leina a ka ‘Uhane (Soul’s Leap).

The oldest of these properties are the subsurface cultural deposits and burials in the sand dune area near the actual point. These sites were first documented in 1971, and recorded in more detail during a 1982 recovery effort prompted by deterioration of the sand-dune knoll due to off-road vehicle use. As part of the 1982 effort, two partial burials exposed by erosion were removed and placed in a more stable reburial site for protection. Additional data recovery work was conducted in 1989. Prior to 1989, the site was described as having remnant walls constructed of water-worn basalt stones and two distinct buried cultural layers. The two cultural layers were marked by dark, charcoal-stained sand containing coral and basalt ‘ili‘ili (water-worn pebbles), pit features, a few artifacts, and midden composed of bird and fish bone, crab, sea urchin, kukui nut fragments, marine shells, and charcoal pieces. The stone walls had been reduced to foundation alignments in 1982 and 1989, and the upper cultural layer was no longer intact by 1989. An analysis of the lower layer in 1989 indicated the long-standing importance of fishing and marine resources in this dry environment, and the presence of habitation features suggested a sustained use of the area, whether on a permanent or recurrent basis. Spatially, the cultural deposits extend over an area approximately 30 by 50 meters, and surface midden scatters and darkened sand exposure indicate that the deposits could extend an additional 300 meters to the east and 30 meters to the south.

The two stone platforms included in the Hawai‘i Register complex are thought to have been constructed for religious purposes. One was described in 1988 as a partially buried basalt boulder platform with coral pieces scattered among the boulder paving of the platform. The presence of coral and the location of the platform on a distinct rise above the sand dunes indicate that it could be a fishing ko‘a (shrine or triangulation point). It is possible, but not confirmed, that this could be Alau‘iki, a fishing shrine recorded in 1930 by McAllister.

The second stone feature is upslope from Leina a ka ‘Uhane (Soul’s Leap), above the proposed fence alignment. It has been described as a “small rectangular platform of basalt cobbles, with scattered coral on the surface.” Its possible religious function is suggested by its size, the presence of coral, upright stones along the edge of the platform, and its vantage point. The possible ritualistic nature of these two features is consistent with the prevalence of known fishing shrines in the area and with the richness of its fisheries. McAllister recorded eight named ko‘a between Keawa‘ula and Mokulē‘ia.

Two natural formations compose the remaining two features of the Ka‘ena Complex: Pōhaku o Kaua‘i and Leina a ka ‘Uhane (Soul’s Leap). Both should be considered traditional cultural properties; the identification and evaluation of these otherwise natural features rely on known native Hawaiian traditions and

beliefs. Pōhaku o Kaua‘i marks the end of a series of partially submerged rock outcrops that form the westernmost extent of O‘ahu. According to several recorded traditions, this rock formation was once part of Kaua‘i. In one tradition, the demigod Maui attempts to join Kaua‘i and O‘ahu by standing at Ka‘ena Point and using his hook, Manaiakalani, to pull Kaua‘i towards O‘ahu. When he pulled the hook, only a single, huge rock from Kaua‘i fell at his feet, to become known as the Pōhaku o Kaua‘i. The hook was attached to ‘ie‘ie cordage, which ended up in Ka‘ie‘ie Channel (between Kaua‘i and O‘ahu) and the hook landed in Pālolo Valley, hollowing out a crater. In a related version told by Annie Keahipaka, a lineal descendant of the area, Maui had many helpers pulling the line. When one disobeyed orders and looked back at Kaua‘i as they pulled it towards O‘ahu, the line broke and Kaua‘i slipped back into the ocean, with only the fragment Pōhaku o Kaua‘i remaining as proof of Maui’s great effort. In a third tradition, a Kaua‘i chief named Ha‘upu hurled a huge boulder from Kaua‘i to O‘ahu to forestall what he thought was a fleet of O‘ahu warriors about to invade Kaua‘i. The group was, in fact, driving fish towards nets laid off-shore of O‘ahu. When the boulder fell, it killed the chief Ka‘ena who was leading the drive and many of his followers. From then on, the point bore the name of this chief and the rock was called Pōhaku o Kaua‘i. Pōhaku o Kaua‘i is also mentioned incidentally in other traditions, demonstrating that it was a commonly known landmark.

Leina a ka ‘Uhane (Soul’s Leap) is a limestone formation approximately 150 meters (500 feet) from the existing boulder barricade, perched between the existing trail and the ocean. It forms a tangible representation of native Hawaiian traditions and beliefs that identify Ka‘ena Point as a place where the fate of departing souls is determined as death nears. Departing souls either passed into one of several spirit realms or were returned to the body to continue life. The fate of these souls often depended on the help or absence of friendly ‘aumakua (ancestral family or personal god) that would guide a soul to the appropriate realm: ao kuewa, a place of wandering souls, ao ‘aumakua, where the soul could be reunited with the souls of ancestors, or au milo or pō pau ‘ole, a place of eternal night. In another version of what happens to souls after death, a soul wanders to Leina a ka ‘Uhane if all its earthly obligations are fulfilled (if they are not, the soul returns to the body), where it is thrown into a pit know as Lua ahi a Kehena, at which time death actually occurs to the body.

A road, following the traditional Wai‘anae-Waialua trail, was constructed through the area and around the point sometime in the 1860s-70s. Several small fishing villages are thought to have existed in the area during this period. A settlement called Nēnēle‘a is documented as being about a mile east of Ka‘ena Point, and several house foundations, measuring 14 x 20 feet, are documented from the area. An 1832 census listed the population of the Ka‘ena ahupua‘a at forty-nine individuals. Based on the known fishing shrines, recorded interviews, and the number of stories, fishing was an important activity. Ka‘ena is noted as an excellent fishing ground, and one story describes how Maui

caught a huge red fish, which left a trail from Pōhaku o Kauai to Kuakala heiau (up in the mountains) as he dragged it. The menehune found the fish and cut it into small pieces, which went back in the ocean when the sea covered the land, and is the reason why kūmū (goatfish, *Parapeneus porphyreus*) are now small.

Based on historic accounts and recorded traditions, there may be additional as-yet unidentified historic properties at Ka‘ena Point and would most likely reflect uses and customs associated with the area’s rich fisheries and the lack of any other dominant land use in this waterless hot area. These could include additional ko‘a, the remnants of shelters and settlements for fishermen, burials, canoe landings, and salt-making sites. However, later uses of the area (described further below) have significantly reduced the probability of these properties surviving on the flatter portions of the Point or along lower ridge slopes.

The first reference to lands at Ka‘ena being used for pasturage appear in survey notes by J.S. Emerson for 5 Royal Patent Grants. These government grants reflect a district-wide attempt by Waialua residents to secure land for pasturage and may also provide evidence that permanent settlements were absent along this coast in 1850. Most of the government lands and private lands at Ka‘ena were leased for ranching during the second half of the 1800s and the first half of the 1900s. When the privately-owned lands along the coast were acquired by the State of Hawai‘i in the 1970s to create Ka‘ena Point State Park, all were owned by ranching interests or by families with ranching interests in the area. Despite references to Ka‘ena Point and adjacent lands being used for pasturage, none of the stone features or sites generally associated with grazing or ranching have been identified at the Point or within the project area. There are no stone wall enclosures or corrals, nor do the boundaries of the grants appear to have been walled to contain grazing cattle or horses.

The former alignment and features of the O‘ahu Railway and Land Company (OR&L) railway are among the most visible historic properties at Ka‘ena Point. Completed in 1898, the railway connected Honolulu to Kahuku, via Wai‘anae and Waialua. It was meant to serve plantation towns and ranches, but also became a scenic tour. Railway service ended and the railway was abandoned in 1947, after damage by a 1946 tsunami and a decline in railroad use caused by the increase of personal vehicles. The main railway bed is still visible through its route through Ka‘ena, but no traces of the tracks or railroad ties remain. Today, the railway bed forms the primary path used by visitors hiking out to the Point. Rock-work features associated with the railway such as bridge foundations, culverts, and rock retaining walls can still be observed along the railroad track. In addition to the main railway line, a 15-car siding track once ran from the northern side of the bend to the Point and is depicted on 1929 and 1940 USGS topographic maps. No physical evidence of this siding was apparent during the field inspection.

Finally, Ka‘ena contains historic features associated with its military use. Ka‘ena Point Military Reservation was established in 1923; construction of military defense facilities began in 1924 and continued through 1946, capitalizing on the strategic location of Ka‘ena Point. Four complexes of structures and associated features still exist within or near the project area, and a fifth could be identified with additional field inspections. These include a fire control and base end stations built on a ridge knoll (above Ka‘ena Point) in 1924 and 1934, a radar station used in the 1940s (located on the ridge above Ka‘ena Point), a search light position established in 1942, a cantonment established in 1942 for military personnel manning the various operations (“Camp Ka‘ena,” located on the flat area down at Ka‘ena Point), and a battery begun in 1943. The concrete structures associated with the fire control and base end station remain intact, the concrete foundations of Camp Ka‘ena remain recognizable, and concrete structures associated with a radar station remain visible.

The battery, BCN-409, was designed to support two 8-inch naval guns and army M1 barbette cartridges. It involved the construction of a tunnel complex and was 60% complete when the project was abandoned in 1945, after studies determined that batteries of this type could not withstand modern air attack. Given the elevation of the tunnel entrances, a substantial amount of cut and fill was needed to create the appropriate grade for an access road and maneuvering area in front of the tunnel entrance. Tailings from tunnel excavations were used as fill for the road and terrace, and gunite was pressure-sprayed over the ridge cuts at each tunnel entrance to stabilize the rock face. Much of the components of BCN-409 are still recognizable; while the tunnel entrances have been sealed, the access road and terrace features and the piles of tailings that form the faces of the terrace are intact. Military use of Ka‘ena Point declined after World War II, with use primarily consisting of small-size maneuvers.

The Ka‘ena Passing Light, operated and maintained by the U.S. Coast Guard, was constructed at Ka‘ena Point in 1920. Initially consisting of a sixty-five foot tall concrete tower, the light was replaced in 1990 by a new beacon on a thirty-foot steel pole. The old light tower, a historic structure, was toppled and lies in the sand at Ka‘ena Point, north of the new beacon.

After the railway closed, a rough track followed the rail grade. A nine-mile dirt road was constructed around the point from 1954-1956, using prison labor. In 1971, the State Department of Transportation developed plans for a two-lane paved road around Ka‘ena Point. Due to significant opposition from the public, the concept was shelved and efforts shifted towards protection of this area. During the 1970s, the State began to purchase lands in the area for a proposed Ka‘ena Point State Park. In 1978, a Ka‘ena Point State Park Conceptual Plan was completed. In 1984, a portion of Ka‘ena Point Military Reservation was declared excess property and deeded to the State for park purposes.

Ka‘ena Point NAR was established in 1983, composed of twelve acres on the leeward side of the point. In 1986, an additional twenty-two acres on the windward side were added to the NAR. Degradation by off-road vehicle use was significant, and the primary management for the new NAR was to close the area to motorized vehicles. Erosion of the roadbed on the Wai‘anae side of the point prevented vehicular entry, and a boulder barricade was erected for this purpose on the Mokulē‘ia side. The results of prohibiting vehicles are positive and noticeable, with the regeneration of native coastal plant communities and the re-establishment of breeding populations of seabirds.

Visual Resources

The remote undeveloped nature of Ka‘ena provides stunning views of coastal sand dunes, cliff faces, the natural shoreline, and the ocean. Ka‘ena Point is unique in that one has views of both the Wai‘anae coast and the Mokulē‘ia coast from one vantage point. The Wai‘anae Sustainable Communities Plan (2000) identifies the protection of scenic views as a priority, including the green valleys, steep walled ridges and mountains, and the ocean, but makes no specific mention of Ka‘ena. The North Shore Sustainable Communities Plan (2000) identifies the preservation of scenic views as a priority, while generally identifying coastal cliffs, the coastline, and the Pacific Ocean as scenic views to be preserved. The plan specifically identifies stationary views from the shoreline between Ka‘ena Point and Makaleha Beach as views to be preserved.

From Ka‘ena Point, looking towards Wai‘anae, the view extends seven miles towards Mākaha to Kepuhi Point. Kea‘au Beach Park, Mākua Valley and Mākua Beach, and Keawa‘ula (Yokohama Beach) can all be observed, along with views of the Wai‘anae mountains. From Ka‘ena Point, looking towards Mokulē‘ia, the view includes much of the north shore coast, and part of the Ko‘olau mountains can be observed to the north, sloping towards Waimea.

V. ALTERNATIVES CONSIDERED

Two project alternatives are described: the construction of predator-proof fencing followed by removal of all predators from within the fenced unit (preferred alternative); and conservation management without the fencing (status quo, or the no-action alternative).

Alternative #1: Construct predator-proof fence, followed by feral predator eradication, to create a pest-free protected area on Ka‘ena Point peninsula (preferred alternative)

The preferred alternative is to construct a predator-proof fence, followed by aggressive predator control, to create a protected area at Ka‘ena Point. The construction of the fencing will make it possible for Ka‘ena Point to become a predator-free nesting area for seabirds. Since closing the point to motorized vehicles, numbers of nesting Laysan albatrosses and wedge-tailed shearwaters

have increased dramatically. Other species of seabirds may begin to nest at Ka‘ena in the future, if a safe haven is created. Rare native plants may also benefit with the removal of rats and mice, as their seeds will be safe from rodent predation. Biologically, eradication of predators is anticipated to provide greater conservation benefit than the existing program of ongoing control. From a cost perspective, while construction of predator-proof fencing has significant up-front costs, over the long-term the costs of fencing with predator control at the sea-ends is estimated to be less than the cost of the existing predator control program throughout the Reserve. The fencing is also anticipated to have a public education component. As Ka‘ena Point is accessible and highly visited by tourists and residents, the predator-proof fence may act as a demonstration project that increases overall appreciation for the natural resources protected by the fencing and improves understanding of conservation management.

Alternative #2. No action.

The no-action alternative is the status quo – continued predator control without fencing. This alternative fails to take advantage of existing funding opportunities to construct a predator-proof fence at Ka‘ena Point and requires sustained predator control actions. Moreover, despite the current predator control program, seabird predation by dogs, cats, and other mammals is still a significant problem. Under the no-action alternative, seabird populations are not anticipated to increase significantly, additional seabird species are not anticipated to be attracted to the area to breed, and native plants will continue to be impacted by seed predation by rodents. Over the long-term, the no-action alternative does not provide the same benefits to native species and contributes less to the long-term conservation needs of these species.

Further, when evaluated over time, the no-action alternative is projected to cost more. For this assessment, costs of the fencing alternative include the initial costs of fence construction and pest eradication, shown above, the annual costs of fence inspection and maintenance (estimated at 5% of capital fence cost), and the annual cost of managing a pest buffer zone at the sea ends of the fence (estimated at 30% of current annual pest control). The fence lifespan is estimated to be 25 years, with full fence replacement included every 25 years. Ongoing pest management for the no-fence alternative is estimated at $32,000 per year.

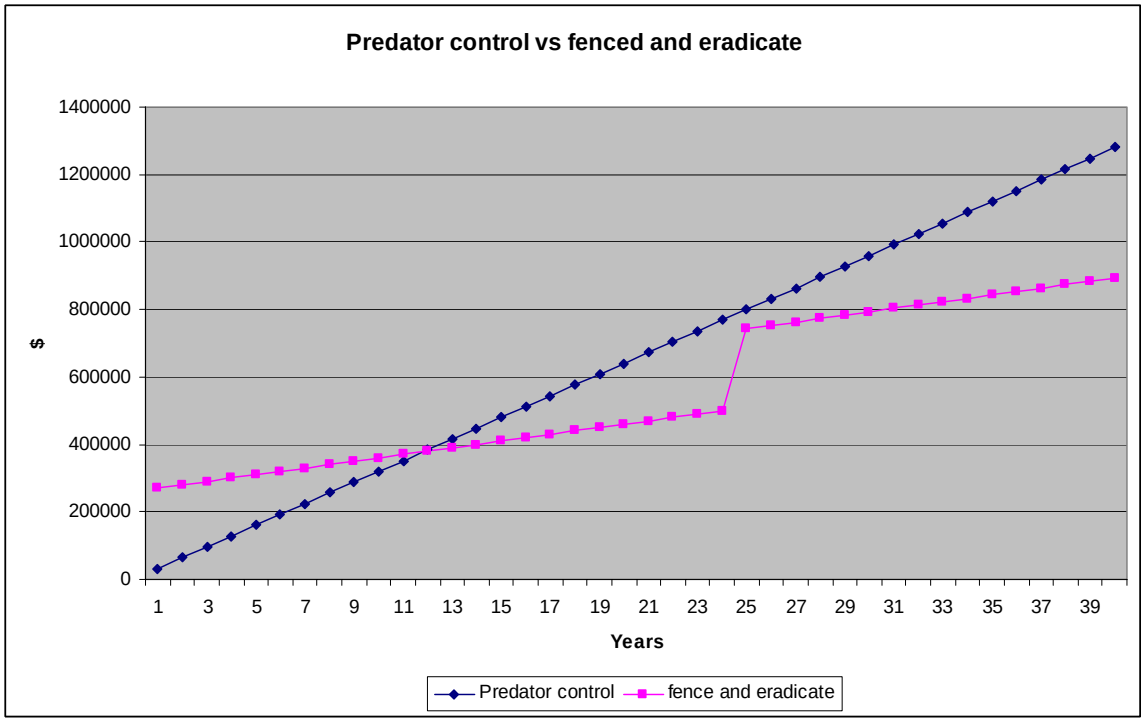

Figure 6. Cost comparison of preferred alternative (eradication) with the no-action alternative (control).

VI. ANTICIPATED IMPACTS OF THE PREFERRED ALTERNATIVE AND PROPOSED MITIGATION MEASURES

Vegetation: Construction of fencing would result in the disturbance and destruction of limited amounts of alien vegetation within a fencing corridor up to fifteen feet wide as a result of the minimal clearing and grading needed to facilitate construction. The fence corridor outside the roadbed has been preliminarily surveyed for endangered plants and the final alignment will be surveyed again to ensure all areas with sensitive biological resources will be avoided.

Rare species protocols will be implemented to avoid impact to any rare plant species (e.g., *Chamaesyce* or *Cyperus*) that may be located in or near the fence corridor. Specifically, in addition to the plant survey to be conducted in advance of construction, any rare plants found will be flagged and a buffer zone of at least 15 feet will be maintained from the plants. In addition, DOFAW will provide a botanist on-site before construction to review the locations of rare plants and discuss protocols with the fence crew to prevent unintentional harm to any rare plant in the fence corridor.

It is anticipated that the benefit to both listed and non-listed native coastal plants provided by the protection from rodents will more than compensate for any unavoidable damage caused during construction.

Alien species: The disturbance to the ground surface and vegetation involved with fence construction may create conditions suitable for the establishment of weedy plants, and workers, their equipment, and the fence materials could be agents for the unintentional introduction of invasive species. The following practices will be implemented to minimize the introduction of alien plants and insects and to reduce the possibility of establishment. First, boots, equipment and materials will be inspected for seeds, eggs, larvae, etc., prior to delivery and/or entry into the project area, and cleaned as necessary. Any heavy equipment used during construction will be inspected and cleaned as needed, following appropriate alien species prevention protocol recommended by DOFAW and USFWS. All construction workers will be instructed on specific procedures to prevent the spread or introduction of noxious alien plants in the project area. In addition, precautions will be taken to prevent spreading alien plants already found in the project area, and all food, refuse, tools, gear, and construction scrap will be removed upon completion of work.

Immediately after fence completion, alien mammals within the fenced unit would essentially be penned in. This could result in a short period of amplified damage to listed species. However, due to the relatively small size and open nature of Ka‘ena, it is unlikely that large predators, such as dogs, would be trapped within the completed fence. Any cats or mongoose trapped inside would have a limited impact on plants since they are not herbivorous, and timing construction to avoid nesting season should minimize impact on nesting seabirds. Moreover, due to the placement of the hood on the outside, climbing predators cannot get into the fenced area, but could get out if their home range is disrupted by the fencing. Rats and mice would likely be trapped inside, but due to their small home ranges, it is unlikely that the fencing will trap in many rodents that would normally have been outside the fence or exclude many rodents that would have tried to get out. Under the circumstances, no significant increase in the density of pest species is anticipated.

Native birds: Noise and activities associated with the construction of fencing may temporarily disrupt the activities of seabirds nesting within the NAR. Fence construction will be timed for October-early November or July-August. These time periods will avoid the Laysan albatross nesting season (November through June) and avoid the initial nesting period (April through June) and the primary fledging periods (September through October) for wedge-tailed shearwaters. Construction activities are likely to cause some seabird disturbance. Because wedge-tailed shearwaters typically takeoff before dawn, and return to the colony at dusk, the chance that any bird will be impacted by construction activities during takeoff or landing remote.

After construction, the presence of the fencing is considered unlikely to disorient seabirds. The fencing alignment has specifically been selected based on information from ongoing research on Laysan albatross to maintain a significant buffer zone from nest sites identified during past breeding seasons.

In addition, the alignment was selected so that the fence is sufficiently distant from bird use areas to minimize any opportunity for collisions on takeoffs or landings. Monitoring is planned to ensure that disruption to seabirds is minimized during fencing activities. If necessary, the top portion of the fence could be colored in such a way as to make it more visible to seabirds.

Based on existing information about nesting habits of Laysan albatross and wedge-tailed shearwaters, it is highly unlikely that any bird will actually be nesting within the project area, which is largely rocky, but activities will cease in the event of such activity and consultation with appropriate agencies will occur to determine the appropriate course of action to minimize impact to the birds.

The primary motivation for this project is to create the first “predator-free” area in the State and allow for expansion of native species populations. Over time, this action facilitates the recovery of the ecosystem to its original condition (a condition without non-native predators) and provides an opportunity for visitors to experience the type of natural ecosystem found in the Northwestern Hawaiian islands. The short-term disruptions due to construction are expected to be generously offset by the anticipated long-term benefits provided by the removal of predators, from dogs to rodents.

Monk seal: Because monk seal haul-out locations are over 500 meters from the proposed fencing corridor, construction is not anticipated to affect them. In addition, predator control activities planned for after the completion of the fencing, which are similar in nature to existing predator control actions, are also not anticipated to disturb the seals in any way. Proposed conservation activities are likely to benefit monk seals, by removing predators that act as carriers of diseases identified as threats to monk seal survival.

Archaeological Sites or Cultural Resources: In general, construction of the fencing primarily on top of the existing gravel road (constructed in the 1940s for military purposes) minimizes the impact to archaeological resources in the project area. This road provides a level, previously-disturbed foundation for the fence and its position on the slope of the ridge avoids the sand dunes and sandy soils in which subsurface cultural deposits and burials are a high probability. Construction and use of the road from 1943 to 1945 would have destroyed other sites or features associated within preceding periods or uses, and this corridor avoids cultural sites such as fishing shrines or heiau previously documented at Ka‘ena.

Construction of the fencing may, however, have an impact on the following cultural or historic features: Leina a ka ‘Uhane (Soul’s Leap), the OR&L Railway bed and associated features, and the Battery Construction No. 409 (BCN-409).

Leina a ka ‘Uhane (Soul’s Leap) is located near the northern end of the gravel road where the road turns east. While the formation itself can easily be avoided by the fencing, the precise location of the fencing in relation to the formation and the proximity of the fencing to this traditional cultural property may affect cultural beliefs and practices associated with Leina a ka ‘Uhane. Some stakeholders have indicated that having the Leina a ka ‘Uhane (Soul’s Leap) within the fenced unit would prevent souls from coming down from the mountain and leaping off into the next world, while other stakeholders have indicated that the fence would not be a problem because souls can move easily through barriers. Under either fencing alignment, the fence would have a visual impact on this cultural feature due to proximity. While visual and cultural effects will be avoided to the extent possible, they cannot be eliminated if the fence is constructed.

The fencing must cross the OR&L Railway bed at the northern and southern ends. At both ends, sections of the railway bed were found during field inspections that can be crossed without altering any of the character-defining features constructed to create the desired grade of the bed (e.g., raised railway bed, trenches, stone retaining walls) or any of the segments with paving slabs. Crossing at these areas would minimize the effect of the fence on the historic integrity of the railway bed and its associated features. On the southern end, the fence would need to breach a low stone wall which parallels the railway bed. The length of the wall and its location make it impossible to avoid. The breach would, however, remove only one relatively small section of the wall, and not a segment that is particularly unique or exemplary. To mitigate the impact of the fencing, the wall will be mapped and photographed, to allow restoration if the fencing is ever removed.

The selected fence alignment is on top of a gravel road that is itself a historic property, as it is over 50 years old and part of the BCN-409 complex. The road itself is not particularly unique or exemplary nor is it a key feature of the BCN-409 complex. The fence is not anticipated to irreparably alter the integrity of this complex as the installation will not disturb the complex’s significant components (e.g., the tunnel entrances, gunnite-coated facings, terrace retaining walls). In addition, construction requires minimal grading and so will not alter the fundamental formation or foundation of the road, which is made of excavated fill and tailings. Road sections will be documented as a form of mitigation, and the manner of fence installation will allow the road’s general appearance to be readily restored if the fence is removed at some point in the future.

Ka‘ena Point itself also has great cultural significance, apart from the individual cultural sites. During the previous public discussions on the concept of a road connecting the North Shore to the Wai‘anae coast through Ka‘ena, it is clear that many Native Hawaiians value the area and would consider any major changes or developments, such as a road, to be a sign of disrespect for the place.

As a result, there are likely to be some who believe that the proposed fence will have a negative impact on the cultural landscape.

At the same time, the purpose of the project is to allow the eradication of feral predators and assist in the preservation and long-term restoration of Ka‘ena Point and the unique natural resources found therein. To some stakeholders, natural resources are cultural resources, and a project designed to enhance seabird and native plant populations, without limiting public access, has a positive impact on cultural resources.

Based on a review of the circumstances, including the distance from the dune area likely to contain cultural deposits, the disturbed condition of the railway and the military road, the limited permanent impact of the fencing on the remaining historic features, the anticipated benefit to natural resources, the importance of these resources from a cultural perspective, the continuation of public access into the area, and the ability to modify the fencing alignment to minimize the impact on cultural features, the proposed action is not expected significantly impact archaeological or historic sites or significantly impact Native Hawaiian traditional and cultural practices.

A section 106 consultation has been initiated by the USFWS with SHPD for this project because of the Federal funding. Any mitigation requirements resulting from the section 106 consultation will be incorporated into the project and implemented before or during construction, as appropriate.

While archaeological features or cultural sites are not anticipated to be significantly impacted by the proposed action, should evidence of any archaeological or cultural properties be encountered during construction, vegetation clearing and fence construction would immediately cease and the appropriate parties would be consulted immediately. If necessary, the fence alignment will be adjusted to reduce or eliminate impact to any features located during surveys or construction or as recommended during Section 106 consultation to be conducted for this project.

Viewplanes: The remote, undeveloped nature of Ka‘ena Point, with views of the cliffs, coastal sand dunes, the natural shoreline, and the ocean, is one of the primary attractions to those visiting the areas. The planned fence alignment and design is designed for minimal interference with the ocean and shoreline views. The marine grade mesh used in the fencing is painted carraca green at the factory, and field tests by the manufacturer have determined that this color blends best into a diverse range of landscapes. In addition, the green fence is less reflective than traditional stainless steel fences, making it less visible from the ocean.

Coming from the Mokulēʻia side, the fence alignment is largely hidden behind the existing boulder barricade that prevents vehicular access to the point. As

one crosses the boulder barricade into the core of Ka‘ena Point NAR, the fencing will interfere with the spectacular views of the point, sky, and sea that lie in front for only a short distance until one reaches the fencing. Once one passes through the double-door system, the impact of the fence on the scenic vista looking towards the Point and the Lighthouse will cease.

As one reaches the point and turns back to view the land, the fence will be visible, but should not interfere with the eye’s focus on the cliffs that tower above, dwarfing the fence. The fence, some six feet tall, will lie almost ½ mile inland at its greatest distance from the point, nearer the base of the cliffs. There is an existing white sign approximately four feet high within the fence corridor that is largely invisible from the point. Based on the difficulty of picking out this white sign and the photo simulations (below), it is anticipated that the visual impact of a green mesh fence two feet higher will be minimal. The fencing is anticipated to blend into the background due to the color and the ability to see through mesh.

Coming from the Wai‘anae side, the fence alignment is largely hidden by the topography and curves of the cliff. After crossing the existing washout, the fencing will obstruct views of the point for only a short distance until one reaches the fencing. Once one passes through the double-door system, the impact of the fence on the scenic vista looking towards the Point and the Lighthouse will cease.

Digital simulations from 3 perspectives were developed for the project by Turner & deVries, Ltd. to illustrate the anticipated impact of the fencing on the viewplanes. The first view is from the boulder barricade on the Mokulē‘ia side, looking towards the point. The second view is from just after the washout on the Wai‘anae side, looking towards the point. The third view is from the point, looking back towards the mountains.

Figure 7. Simulation of fencing (Alignment Option 2), Mokulē‘ia side, view towards Ka‘ena Point.

Figure 8. Simulation of fencing, Wai‘anae side, view towards Ka‘ena Point.

Figure 9. Simulation of fencing, view from Ka‘ena Point.

While some interference with the scenic vistas at Ka‘ena Point may be unavoidable, the fence’s role in helping to improve the wild and natural, predator-free character of the point is anticipated to outweigh these impacts. Additional consultation with appropriate agencies and groups will occur to minimize the visual impact of the fence upon cultural features at the point, such as Leina a ka ‘Uhane.

Public access: Public access is not anticipated to change significantly due to the construction of predator-proof fencing. Access doors are to be incorporated at locations where the fencing crosses the primary trails into and out of the Point from the Mokulē‘ia and Wai‘anae sides. Access for those approaching the fence from other locations will be maintained as these individuals can easily follow the fence alignment to one of the doors; access along the shoreline is not anticipated to be affected as the fencing will stop at or before the high tide line. The double-door system will be constructed with the same quality and design as the rest of the fence and will be large enough that up to nine people may enter together or so that a person can enter with a bicycle or fishing pole. As a result, the impacts on public access are not anticipated to be significant.

Soil and water: Short term soil disturbance is unavoidable, but no lasting changes to normal patterns of runoff or percolation are expected. To minimize the potential for erosion, at locations along the fenceline where natural drainage channels exist or where surface water is likely to collect, the ground will be

prepared to move water away from the fencing. All ground preparation will be consistent with the normal runoff pattern of the roadbed, where stormwater runs off to the sides of the road. Best Management Practices will also be incorporated into the project to minimize the potential for soil erosion and include planning the construction phasing to reduce exposed ground areas, minimizing the length and steepness of disturbed areas, and avoiding earthwork during inclement weather. Due to the methods of fence construction planned, the underlying soil characteristics, the lack of streams, and the generally arid nature of the project area, no noticeable impacts are expected.

Air pollution: Limited air pollution from vehicles, equipment, and small power tools will be unavoidable during fence construction. Use of this equipment is temporary and is not anticipated to have a significantly negative contribution to the overall air quality in the region. Fugitive dust may be created on the Wai‘anae side, when creating the fence platform on the loose soils contouring down the hill. Best Management Practices will be incorporated into the project to minimize the impact of fugitive dust as needed. Given the remote location of the project site and the narrow width of the fencing corridor to be disturbed, the impacts of fugitive dust are not anticipated to be significant.

Air traffic: FAA Advisory Circular 150/5200-33A (“Hazardous Wildlife Attractants On or Near Airports”) recommends certain minimum separation criteria for land-use practices that attract hazardous wildlife to the vicinity of airports, including a recommendation of five statute miles between the farthest edge of the airport’s area of operations and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure space. The construction of fencing designed to protect nesting seabirds and encourage increases in populations could be perceived to fall within this advisory circular, as the fencing is just less than five miles from the edge of Dillingham Airfield. Dillingham Airfield is a general aviation joint-use facility limited to daytime operations by small single-engine and light twin-engine aircraft, sailplanes, ultra-light aircraft, and helicopters. Because this type of air traffic at Dillingham utilizes a distance shorter than five miles for approach and departure patterns, it is unlikely that the proposed fencing will cause hazardous wildlife movement into or across the approach or departure space used. Moreover, the fencing could be considered to reduce the risk of bird strikes, by enticing birds nesting at sites closer to Dillingham to move to Ka‘ena Point.

Social impacts: Periodic noise from potential helicopter flights, power tools, and other activity associated with fence building will be unavoidable during the construction period. In addition, there will be short-term impacts associated with temporary closures of portions of the NAR (area under construction) for safety purposes. Any closures that impact the ability of the public to access the interior of Ka‘ena Point will be publicized in advance and will be limited in duration and location only to the extent necessary for public safety. Due to the

remote nature of the project area, the temporary nature of any closures, and the planned concurrent educational outreach efforts explaining the purpose of the fencing, negative social impacts resulting from the project are not anticipated to be significant.

Economic Impacts: The proposed action involves the expenditures of funds necessary to construct the fencing, including the purchase of fencing materials, the hiring or contracting of crews, and the purchase or rental of equipment including helicopters, and, after fence construction, to remove predators from within the fenced unit. Current funding for the project includes funds provided by the U.S. Fish and Wildlife Service and the State.

The project is not expected to have any major negative economic impacts. Positive economic impacts will result from the release of project funds into the State economy and the opportunities for training in the methods for building predator-proof fences. The proposed action may attract additional funding for habitat restoration, predator control, research, or monitoring activities because of the presence of a predator-proof fence.

VII. ANTICIPATED DETERMINATION

It is not expected that this project will have a significant negative impact on the environment, and a Finding of No Significant Impact is anticipated.

VIII. FINDINGS AND REASONS SUPPORTING ANTICIPATED DETERMINATION

The goal of the proposed action is to create a predator-free environment on 59 acres at Ka‘ena Point through the use of predator-proof fencing and predator removal. The permanent removal of predators from the Ka‘ena Point peninsula is anticipated to provide a long-term benefit to nesting seabirds and to native plants. Without fencing, sustained predator control efforts must continue in order to maintain the status quo of low levels of predators, and predation by feral animals on nesting seabirds and native vegetation will remain a significant problem.

The anticipated Finding of No Significant Impact is based on the evaluation of the project in relation to the following criteria identified in the Hawai‘i Administrative Rules §11-200-12:

1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The proposed action does not involve an irrevocable commitment to loss or destruction of any natural or cultural resource. Instead, the goal of the proposed

action is to benefit the natural environment by facilitating the eradication of predators from Ka‘ena Point, important habitat for seabirds and rare plants.

2) Curtails the range of beneficial uses of the environment.

The proposed action will not curtail beneficial uses of the environment. Instead, the project will enhance protection of important habitat for nesting seabirds by facilitating the removal of a range of non-native predators. Public access will not be impacted, and public appreciation of the natural resources supported at Ka‘ena Point is likely to increase.

3) Conflicts 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 action is consistent with the environmental policies established in Chapter 344, Hawai‘i Revised Statutes (HRS) and contributes to the conservation of threatened and endangered species, as covered by Chapter 195D, HRS. It is also consistent with Section 3 of the City and County of Honolulu General Plan (1992), which sets goals and policies for maintaining O‘ahu’s natural environment, and with Chapter 3 of both the North Shore and Wai‘anae Sustainable Communities Plans, which concerns land use policies, principles, and guidelines. Finally, protection of habitat at Ka‘ena Point implements the Hawai‘i Comprehensive Wildlife Conservation Strategy (2005), the USFWS Recovery Plans for O‘ahu Plants (1998), the Multi-Island Plants (1999), the Maui Plant Cluster (1997), and for *Panicum fauriei* var. *carteri* (1993), the North American Waterbird Conservation Plan (2002), and the USFWS Regional Seabird Conservation Plan (2005). In addition, both Laysan albatrosses and wedge-tailed shearwaters are federally protected under the Migratory Bird Treaty Act of 1918.

4) Substantially affects the economic or social welfare of the community or state.

The proposed action will not adversely affect the economic or social welfare of the community or state. The ecosystem-related goals of the project will directly benefit the economic, cultural, educational, and social interests of the community and the State by helping to facilitate the continued restoration of the natural environment at Ka‘ena Point.

5) Substantially affects public health.

The proposed action is not anticipated to substantially affect public health. The proposed action may have a positive impact on public health by protecting coastal habitat, thus encouraging more people to hike and appreciate the natural resources of the area.

6) Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed action is not anticipated to result in any substantial secondary impacts, such as population changes or effects on public facilities. The proposed action does not involve any changes in population, as no people reside at Ka‘ena Point, and the only public facility within the project area, a U.S. Coast Guard Aid to Navigation, will not be impacted by the project.

7) Involves a substantial degradation of environmental quality.

The proposed action does not involve a substantial degradation of environmental quality. Instead, environmental quality is anticipated to improve with the implementation of the proposed action. Construction of predator-proof fencing, followed by aggressive predator control, will enhance environmental quality of the project area by improving the quality of protected nesting seabird and rare plant habitat.

8) Is individually limited but cumulatively has considerable effect upon environment or involves a commitment for larger actions.

The proposed action involves the construction of predator-proof fencing at Ka‘ena Point. The proposed fencing is anticipated to have only cumulatively beneficial effects upon the environment, and does not involve a commitment for larger actions, other than ongoing fence maintenance and predator control.

9) Substantially affects a rare, threatened or endangered species, or its habitat.

There are no known rare, threatened, or endangered plants within the planned fencing corridor; however, globally rare seabirds and several species of rare native plants will benefit from the protection this fencing will provide from non-native predators. Exclusion of dogs, cats, mongooses, rats, and mice will provide significant protection to the ground-nesting seabirds that utilize Ka‘ena Point. Predator proof fencing should significantly reduce the number of seabirds killed each year by small mammals and encourage an increase in the breeding population. Native plants are also anticipated to benefit from the removal of seed-eating rodents. Thus, it is not anticipated that the project will negatively affect a rare, threatened or endangered species.

10) Detrimentally affects air or water quality or ambient noise levels.

The proposed action will have no detrimental effects on air quality, water quality, or noise levels. The area is remote, and construction noise and air quality impacts are expected to be localized and temporary.

11) Affects or is 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 project area is located on the coastal peninsula of Ka‘ena Point. There is the possibility that portions of the fencing could be damaged by extreme surf conditions, storms, tsunami, or coastal erosion. Previous experiences in New Zealand indicate that these fences can withstand winds up to 180 km/hr (over 100 mi/hr). The value of predator-proof fencing that enhances seabird survival and promotes habitat restoration for rare plants and seabirds rates outweighs the potential costs associated with loss of fencing due to damage. The planned fencing has a lifespan of approximately 25 years, and it is anticipated that the benefits of the fencing and predator removal will be visible almost immediately. The proposed action will not damage or adversely affect any environmentally sensitive areas.

12) Substantially affects scenic vistas and view planes identified in county or state plans or studies.

The North Shore Sustainable Communities Plan (2000) identifies the preservation of scenic views as a priority, while generally identifying coastal cliffs, the coastline, and the Pacific Ocean as scenic views to be preserved. The plan specifically identifies stationary views from the shoreline between Ka‘ena Point and Makaleha Beach as views to be preserved. The Wai‘anae Sustainable Communities Plan (2000) also identifies the protection of scenic views as a priority but, while mentioning several significant stationary views, makes no mention of Ka‘ena.

The proposed action will not affect the viewplane from any existing roadway or residential area. However, the proposed fencing may affect the scenic vista for visitors to Ka‘ena Point. The planned fencing corridor utilizes topography to minimize views of the fencing to hikers as they approach Ka‘ena Point from either the Wai‘anae side or the Mokulē‘ia side and as they look backwards from the Point. The fence will be visible for a short period as visitors approach it after crossing the boulder barricade on the Mokulē‘ia side and for a short period after visitors round the edge of the hill past the washout on the Wai‘anae side. When looking mauka from the Point, the fence will be visible but is anticipated to be largely inconspicuous against the cliffs. The fence, some six feet tall, will lie almost ½ mile inland at its greatest distance from the Point, nearer the base of the 1,000 foot tall cliffs. While the proposed action may have some impact on the scenic views at Ka‘ena Point, because of the placement of the fencing, it is not expected that scenic vistas will be substantially affected.

13) Requires substantial energy consumption.

The proposed action does not require substantial energy consumption, but instead will consume small amounts of energy during fence construction through the use of small power tools and transportation of materials and crews.

IX. LIST OF PERMITS REQUIRED FOR PROJECT

Construction of the project is anticipated to require the following approvals and permits:

Permit	Issuing/Approving Agency
Special Management Area Use Permit - Major	City and County of Honolulu, Department of Planning and Permitting (DPP)
Shoreline Setback Variance	DPP
Shoreline Certification Application	State Department of Land and Natural Resources, Land Division

Based on conversations with staff from the DLNR Office of Conservation and Coastal Lands, a new Conservation District Use Application will not be required for this project. Instead, the project is permitted under existing CDUA No. SH-2/26/82-1459, associated with the creation of the Natural Area Reserve.

X. ENVIRONMENTAL ASSESSMENT PREPARATION INFORMATION

This Environmental Assessment was prepared by:

Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawai‘i
1151 Punchbowl St., Ste. 325
Honolulu, HI 96813
Tel: (808) 587-0166; Fax: (808) 587-0064

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APPENDIX A

Notable Species of Native Flora and Fauna Thought to Occur In or Near the Project Area or Potentially Affected by the Proposed Conservation Management

Birds
Laysan albatross (*Phoebastria immutabilis*)***
Wedge-tailed shearwater (*Puffinus pacificus*)
Black-footed albatross (*Phoebastria nigripes*)***

Plants
Achyranthes splendens var. *rotundata**
‘Āwiwi (*Centaurium sebaeoides*)**
‘Akoko (*Chamaesyce celastroides* var. *kaenana*)**
Pu‘uka‘a (*Cyperus trachysanthos*)**
Ma‘o hau hele (*Hibiscus brackenridgei*)**
Kulu‘ī (*Nototrichium humile*)*
Carter’s panicgrass (*Panicum fauriei* var. *carteri*)*
Dwarf naupaka (*Scaevola coriacea*)*
*Schiedea kealiae***
‘Ohai (*Sesbania tomentosa*)**
*Vigna o-wahuensis***

Mammal
Hawaiian monk seal (*Monachus schauinslandi*)*

Rare Natural Communities
Naupaka (*Scaevola coriacea*) Mixed Coastal Dry Shrubland

* = Federally listed Endangered Species
** = Endangered Species, Ka‘ena Point designated as Critical Habitat
***= Federal species of concern

APPENDIX B

PARTIAL INVENTORY OF FLORA AND FAUNA OF THE KA‘ENA AREA

Status:

USFWS
END Endangered
T Threatened
C Candidate species
SOC Species of Concern (unofficial designation)

WORLD CONSERVATION UNION (IUCN)
CR Critically endangered
EN Endangered
VU Vulnerable
NT Near threatened
LC Least concern

X Presumed extinct

Affinity:

N Non-native
P Polynesian introduction
I Indigenous
E Endemic

Family	Taxon	Common/Hawaiian name	Affinity	Status
I. Flora				
Pteridophyta (ferns and fern allies)				
Pteridaceae	*Doryopteris decipiens*	kumuniu	E	
Magnoliophyta (angiosperms)				
Liliopsida (monocots)				
Agavaceae	*Agave* sp.	century plant	N	
Poaceae	*Cenchrus ciliaris*	buffelgrass	N	
Poaceae	*Chloris barbata*	swollen fingergrass	N	
Poaceae	*Chloris radiata*	radiate fingergrass	N	
Poaceae	*Cynodon dactylon*	mānienie	N	
Cyperaceae	*Cyperus trachysanthos*	umbrella sedge	E	END
Poaceae	*Dactyloctenium aegyptium*	beach wiregrass	N	
Poaceae	*Dicanthium aristatum*	wilder grass	N	
Poaceae	*Digitaria ciliaris*	Henry’s crabgrass	N	
Poaceae	*Digitaria insularis*	sourgrass	N	
Poaceae	*Eragrostis variabilis*	kāwelu	E	
Cyperaceae	*Fimbristylis cymosa*	mau‘u ‘aki‘aki	I	
Poaceae	*Heteropogon contortus*	pili	I ?	
Poaceae	*Panicum fauriei* var. *carteri*	Carter’s panic grass	E	END
Poaceae	*Panicum maximum*	Guinea grass	N	
Poaceae	*Panicum torridum*	kākonakona	E	
Poaceae	*Setaria gracilis*	yellow foxtail	N	

Poaceae	*Setaria verticillata*	bristly foxtail	N	
Poaceae	*Sporobolus virginicus*	‘aki‘aki	I	
Magnoliopsida (dicots)				
Malvaceae	*Abutilon grandifolium*	hairy abutilon, ma‘o	N	
Malvaceae	*Abutilon incanum*	ma‘o, hoary abutilon	I ?	
Fabaceae	*Acacia farnesiana*	kolū	N	
Amaranthaceae	*Achyranthes splendens* var. *rotundata*	round chaff-flower	E	END, CR
Asteraceae	*Ageratum conyzoides*	maile hohono	N	
Asteraceae	*Artemisia australis*	‘āhinahina, hinahina kuahiwi	E	
Acanthaceae	*Asystasia gangetica*	chinese violet	N	
Chenopodiaceae	*Atriplex semibaccata*	Australian saltbush	N	
Asteraceae	*Bidens amplectens*	ko‘oko‘olau	E	C, VU
Nyctaginaceae	*Boerhavia coccinea*		N	
Nyctaginaceae	*Boerhavia glabrata*	alena	I	
Nyctaginaceae	*Boerhavia repens*	alena	I	
Capparaceae	*Capparis sandwichiana*	maiapilo	E	SOC, VU
Lauraceae	*Cassytha filiformis*	kauna‘oa pehu	I	
Casuarinaceae	*Casuarina equisetifolia*	common ironwood	N	
Gentianaceae	*Centaurium sebaeoides*	‘āwiwi	E	END, CR
Euphorbiaceae	*Chamaesyce celastroides* var. *kaenana*	‘akoko	E	END, EN
Euphorbiaceae	*Chamaesyce degeneri*	‘akoko	E	
Euphorbiaceae	*Chamaesyce hirta*	hairy spurge	N	
Chenopodiaceae	*Chenopodium oahuense*	‘āheahea, ‘āweoweo	E	
Menispermaceae	*Cocculus trilobus*	huehue	I	
Cuscutaceae	*Cuscuta sandwichiana*	kauna‘oa	E	
Asteraceae	*Emilia sonchifolia* var. *javanica*	Flora’s paintbrush	N	
Fabaceae	*Erythrina sandwicensis*	wiliwili	E	
Malvaceae	*Gossypium tomentosum*	ma‘o, huluhulu, Hawaiian cotton	E	
Boraginaceae	*Heliotropium anomalum* var. *argenteum*	hinahina, hinahina kū kahakai	E	
Boraginaceae	*Heliotropium curassavicum*	kīpūkai	I	
Malvaceae	*Hibiscus brackenridgei*	ma‘o hau hele	E	END, EN
Fabaceae	*Indigofera* sp.	indigo	N	
Convolvulaceae	*Ipomoea cairica*	koali ‘ai	I ?	
Convolvulaceae	*Ipomoea indica*	koali ‘awa	I	
Convolvulaceae	*Ipomoea pes-caprae*	pōhuehue	I	
Convolvulaceae	*Ipomoea tuboides*	Hawaiian moon flower	E	
Convolvulaceae	*Jacquemontia ovalifolia* subsp. *sandwicensis*	pā‘ū o Hi‘iaka	I	
Brassicaceae	*Lepidium bidentatum* var. *o-waihiense*	‘ānaunau	I	SOC
Fabaceae	*Leucaena leucocephala*	koa haole	N	
Campanulaceae	*Lobelia niihauensis*		E	END
Solanaceae	*Lycium sandwicense*	‘ōhelo kai	I	

Convolvulaceae	*Merremia aegyptia*	hairy merremia, koali kua hulu	N ?	
Myoporaceae	*Myoporum sandwicense*	naio	I	
Solanaceae	*Nicotiana glauca*	tree tobacco	N	
Amaranthaceae	*Nototrichium humile*	kulu‘ī	E	END
Amaranthaceae	*Nototrichium sandwicense*	kulu‘ī	E	
Piperaceae	*Peperomia leptostachya*	‘ala‘ala wai nui	I	
Asteraceae	*Pluchea indica*	Indian fleabane	N	
Asteraceae	*Pluchea symphytifolia*	sourbush	N	
Plumbaginaceae	*Plumbago zeylanica*	‘ilie‘e	I	
Portulacaceae	*Portulaca lutea*	‘ihi	I	
Portulacaceae	*Portulaca oleracea*	pigweed	N	
Portulacaceae	*Portulaca pilosa*	purslane	N	
Fabaceae	*Prosopis pallida*	kiawe, algaroba	N	
Rubiaceae	*Psydrax odorata*	alahe‘e	I	
Asteraceae	*Reichardia picroides*		N	
Asteraceae	*Reichardia tingitana*		N	
Santalaceae	*Santalum ellipticum*	‘iliahialo‘e, ‘iliahi, coast sandalwood	E	
Goodeniaceae	*Scaevola coriacea*	dwarf naupaka	E	END
Goodeniaceae	*Scaevola sericea*	naupaka kahakai	I	
Caryophyllaceae	*Schiedea kealiae*	ma‘oli‘oli	E	END
Fabaceae	*Senna gaudichaudii*	kolomona	I	
Fabaceae	*Sesbania tomentosa*	‘ohai	E	END
Aizoaceae	*Sesuvium portulacastrum*	‘ākulikuli	I	
Cucurbitaceae	*Sicyos pachycarpus*	kūpala, ‘ānunu	E	
Malvaceae	*Sida fallax*	‘ilima	I	
Asteraceae	*Sonchus oleraceus*	pualele	N	
Asclepiadaceae	*Stapelia gigantea*	giant toad plant	N	
Malvaceae	*Thespesia populnea*	milo	I ?	
Boraginaceae	*Tournefortia argentea*	tree heliotrope	N	
Zygophyllaceae	*Tribulus cistoides*	nohu	I	
Asteraceae	*Verbesina encelioides*	golden crown-beard	N	
Fabaceae	*Vigna marina*	mohihihi	I	
Fabaceae	*Vigna o-wahuensis*		E	END
Verbenaceae	*Vitex rotundifolia*	pōhinahina, kolokolo kahakai	I	
Sterculiaceae	*Waltheria indica*	‘uhaloa	I ?	
Asteraceae	*Wollastonia integrifolia*	nehe	E	
Asteraceae	*Wollastonia lobata* var. *lobata*	nehe	E	
Asteraceae	*Wollastonia remyi*	nehe	E	SOC
II. Fauna **Chordata** **Aves** **Charadriiformes**				
Sternidae	*Anous stolidus*	brown noddy, noio kōhā	I	LC
Sternidae	*Anous minutus*	black noddy, noio	I	LC
Scolopacidae	*Arenaria interpres*	ruddy turnstone, ‘akekeke	I	LC

Sternidae	*Gygis alba*	white tern, manu-o-Kū	I	LC
Sternidae	*Sterna fuscata*	sooty tern, ‘ewa ‘ewa	I	LC
Sternidae	*Sterna lunata*	grey-backed tern, pākalakala	I	LC
Charadriidae	*Pluvialis fulva*	kōlea, Pacific golden-plover	I	LC
Scolopacidae	*Heteroscelus incana*	wandering tattler	I	LC
	Columbiformes			
Columbidae	*Geopelia striata*	zebra dove	N	
Columbidae	*Streptopelia chinensis*	spotted dove	N	
	Galliformes			
Phasianidae	*Francolinus erckelii*	Erckel’s francolin	N	
Phasianidae	*Francolinus pondicerianus*	grey francolin	N	
	Passeriformes			
Sturnidae	*Acridotheres tristis*	common myna	N	
Fringillidae	*Carpodacus mexicanus*	house finch	N	
Mimidae	*Mimus polyglottos*	Northern mockingbird	N	
Emberizidae	*Paroaria coronata*	red-crested cardinal	N	
Pycnonotidae	*Pycnonotus cafer*	red-vented bulbul	N	
Pycnonotidae	*Pycnonotus jocosus*	red-whiskered bulbul	N	
Zosteropidae	*Zosterops japonicus*	Japanese white-eye	N	
	Pelecaniformes			
Fregatidae	*Fregata minor*	great frigatebird, ‘iwa	I	LC
Phaethontidae	*Phaethon lepturus*	white-tailed tropicbird, koa‘e kea	I	LC
Phaethontidae	*Phaethon rubricauda*	red-tailed tropicbird, koa‘e ‘ula	I	LC
Sulidae	*Sula dactylatra*	masked booby, ‘ā	I	LC
Sulidae	*Sula leucogaster*	brown booby, ‘ā	I	LC
Sulidae	*Sula sula*	red-footed booby, ‘ā	I	LC
	Procellariiformes			
Diomedeidae	*Phoebastria immutabilis*	Laysan albatross, mōlī	I	SOC, VU
Diomedeidae	*Phoebastria nigripes*	black-footed albatross, ka‘upu	I	SOC, EN
Procellariidae	*Puffinus pacificus*	wedge-tailed shearwater, ‘ua‘u kani	I	LC
	Strigiformes			
Strigidae	*Asio flammeus sandwichensis*	pueo, Hawaiian short-eared owl	E	
	Mammalia			
	Carnivora			
Canidae	*Canis lupus familiaris*	domestic dog, ‘īlio	P	
Felidae	*Felis silvestris catus*	domestic cat	N	
Herpestidae	*Herpestes javanicus*	Indian mongoose	N	
Phocidae	*Monachus schauinslandi*	Hawaiian monk seal, ‘īlioholoikauaua	E	END, EN

Rodentia				
Muridae	*Mus musculus*	house mouse	N	
Muridae	*Rattus exulans*	Polynesian rat, ‘iole	P	
Muridae	*Rattus rattus*	black rat	N	
Reptilia **Testudines**				
Cheloniidae	*Chelonia mydas*	honu, green sea turtle	I	T
Arthropoda **Insecta** **Hymenoptera (bees, wasps, and ants)**				
Colletidae	*Hylaeus anthracinus*	yellow-faced bee	N	
Colletidae	*Hylaeus longiceps*	yellow-faced bee	N	
Mollusca **Gastropoda (snails, slugs, etc.)** **Pulmonata**				
Achatinidae	*Achatina fulica*	East African land snail	N	
Succineidae	*Succinea caduca*	amber snail	E	
Stylommatophora				
Endodontidae	*Cookeconcha* sp.		E	
Spiraxidae	*Euglandina rosea*	cannibal snail	N	
Veronicellidae	*Laevicaulis alte*	black slug	N	

APPENDIX C

Summary of Known and Possible Historic Properties at Ka‘ena Point

Summary of Known and Possible Historic Properties at Ka`ena Point

Ka`ena Point Fence and Ecosystem Restoration Project

Ka`ena Point Natural Area Reserve and Ka`ena Point State Park
Ka`ena, Waialua and Keawa`ula, Wai`anae, Oahu
TMK: (1) 6-9-02: 4, 9, 13, 14 and 8-1-01: 6.

State of Hawai`i
Department of Land and Natural Resources

Summary of Known and Possible Historic Properties at Ka`ena Point

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Prepared by:
Holly McEldowney, Ph.D.
Archaeologist, Division of State Parks
Department of Land and Natural Resources

Prepared for:
Division of Forestry and Wildlife
Division of State Parks
Department of Land and Natural Resources

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Introduction

The Natural Area Reserve System (NARS), Department of Land and Natural Resources (DLNR) and its partners are considering a proposal to install a predator proof fence at Ka`ena Point Natural Area Reserve (Ka Lae Loa o Ka`ena[1]) and, once established, to pursue an ecosystem restoration project. The Division of State Parks (State Parks) has prepared the following report to assist NARS in the planning process for this project. The report is primarily a summary of known and potential historic properties at Ka`ena Point and, more particularly, those found within the potential project area. Also discussed are actions needed to determine how the project will affect these historic properties and how these effects can be avoided or minimized. As proof of compliance with federal historic preservation laws and regulations will be needed, the report also includes recommendations on fulfilling these requirements. At least one section of the proposed fence line, the southern extent of the alignment, would cross a portion of Ka`ena Point State Park.

This historic properties summary is based primarily on field inspections conducted on January 27 and June 30, 2007 and on a review of reports and other sources available in State Parks files. During the field inspections, State Parks staff was able to examine potential fence alignments with NARS staff and other parties involved in the project and to locate previously recorded historic properties. This allowed us to assess, at least to a preliminary level, the kinds of historic properties that need to be considered during the historic preservation review process and to propose potential fence alignments that would avoid or minimize damage to historic properties. Given the height of the fence and the materials being used, it will be a prominent feature in an otherwise open and scenic landscape and the visual effects of the fence on historic properties and their setting also needs to be taken into account. This could include properties located a considerable distance from the fence.

Information used in the following discussions was drawn initially from four primary sources. The first is a report of archaeological work conducted in the immediate vicinity of the beacon light near the point (Yent 1991a). This report complimented another study conducted at Keawa`ula, Wai`anae located southeast of the current project area (Yent 1991b). The second is the National Register of Historic Places Registration Form prepared in 1988 to support listing of "Kaena Complex" in the Hawai`i Register of Historic Places (Bath and Napoka 1988). A portion of the probable project area lies within the boundaries of the complex. In the third source, a member of the Coastal Defense Study Group, John Bennett, presents a historical overview of the Ka`ena Point Military Reservation and the various structures and buildings constructed by the U.S. Army within the reservation from the 1920s through 1945 (Bennett 2005). The fourth major source is the standard reference *Sites of Oahu* (Sterling and Summers 1978). Originally published in 1962, *Site of Oahu* is a compilation of information on archaeological sites and traditionally significant places culled from Bishop Museum files and records.

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[1] The point is called "ka lae loa o Kaena" in John S. Emerson's survey notes which were written in the Hawaiian Language (Emerson 1854).

Project Description

As currently conceived, the project entails the installation and maintenance of a fence that would create a 500-meter long (0.3 mile) and six-foot high barrier along the eastern edge of the point (Figs. 1, 2, and 3). To be effective it needs to run continuously along the lower edge the steep, western slope of Kuaokala Ridge from point's northern to southern shorelines. The fence would be constructed of closely-spaced aluminum posts and a stainless steel wire mesh with an aperture small enough to exclude potential predators of all age ranges. A rolled hood at the top of the fence prevents predators from crossing over the fence.

Installation of the fence would include ground disturbance, mostly grading, and the excavation of post holes along the chosen route. The alignment needs to be leveled and an earthen or gravel "platform" (4 to 5-meters or 13 to 16 feet wide) created to provide a secure base for the fence that can be maintained and kept free of vegetation. Posts would be buried to a depth of 3 feet (100 cm). The wire mesh skirt needs to be buried beneath the ground surface. An excavator and/or bulldozer would be used during fence installation.

If the Fish and Wildlife Service grant for this project includes other activities, then the potential effect of these actions on historic properties should also be considered in the planning process. One summary of the project indicates that funds remaining after fence construction would, in part, be used to remove or eradicate predators inside the fenced area.

Compliance Framework

As the project grant is from a federal agency and entails the expenditure of federal funds, the granting agency will probably ask to see proof of Section 106 compliance at some point in the grant oversight process. Section 106 of the National Historic Preservation Act and its implementing regulations require all federal agencies to consider the effects of a project on historic properties and to propose measures that will avoid or mitigate these effects. Generally federal law supersedes state law where the federal and state laws are comparable and both could apply. In this case, Section 106 compliance can be conducted in a manner that generally parallels that required under state law and regulations (§6E-8, HRS, and chapter 13-275, HAR).

Under the Section 106 regulations, the federal agency is to enter into a Memorandum of Agreement (MOA) with the State Historic Preservation Officer and project participants if a project will have an effect on significant historic properties. The MOA commits to measures that will avoid or minimize these effects. A MOA will probably be needed for this project. The entity within the U.S. Fish and Wildlife Service that will take on these signatory responsibilities needs to be identified and informed of this possibility. It is not always readily apparent which entity within an agency oversees historic preservation compliance when federal funds are distributed as grants through external programs or non-profit organizations.

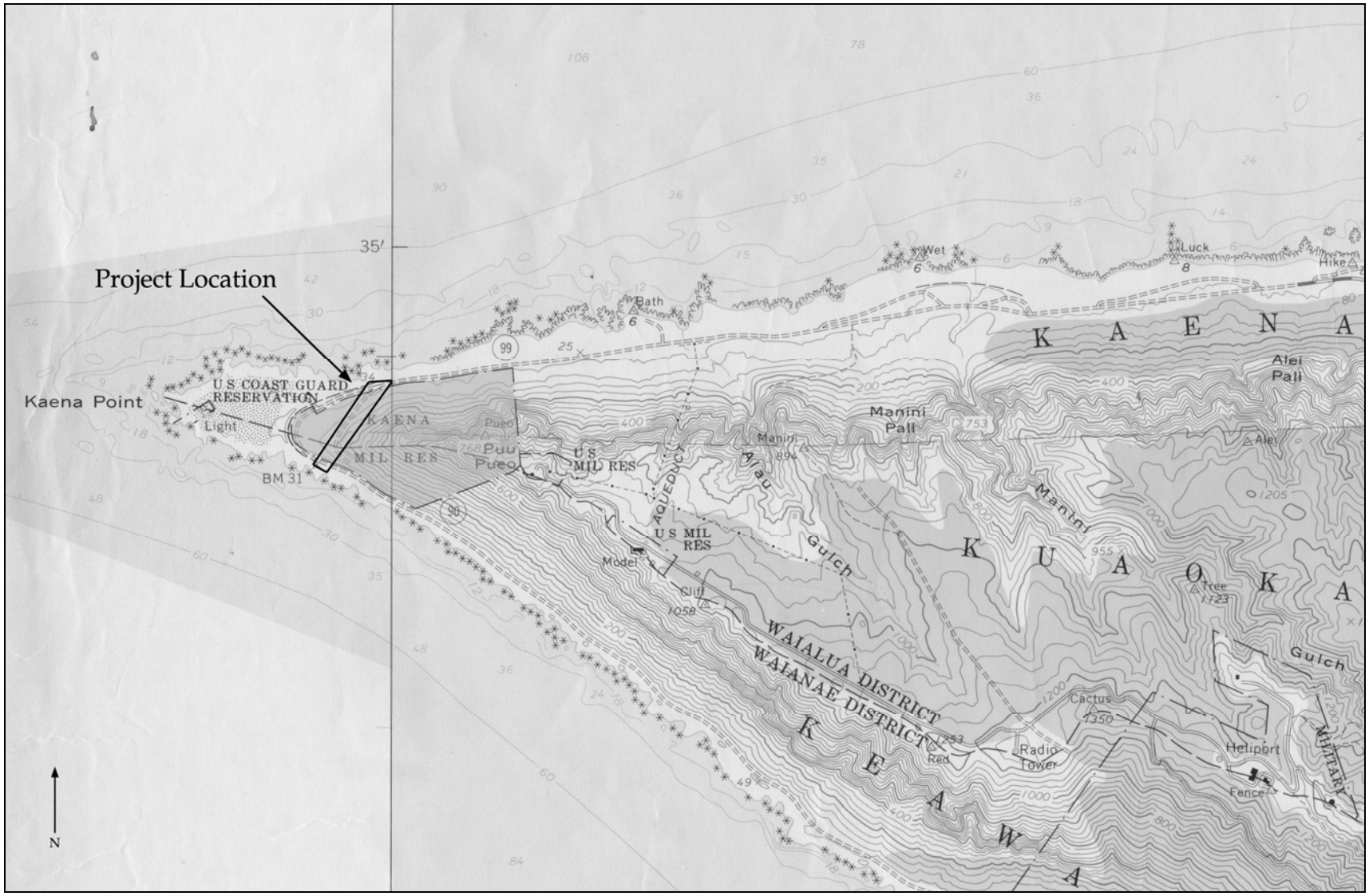

Fig. 1: General Location of Proposed Ka`ena Point Fence Project, Ka`ena and Keawa`ula on USGS Quadrangle (Scale 1:24,000 ft., Kaena, Hawaii Quad., 1983). Ka`ena Point Military Reservation is highlighted.

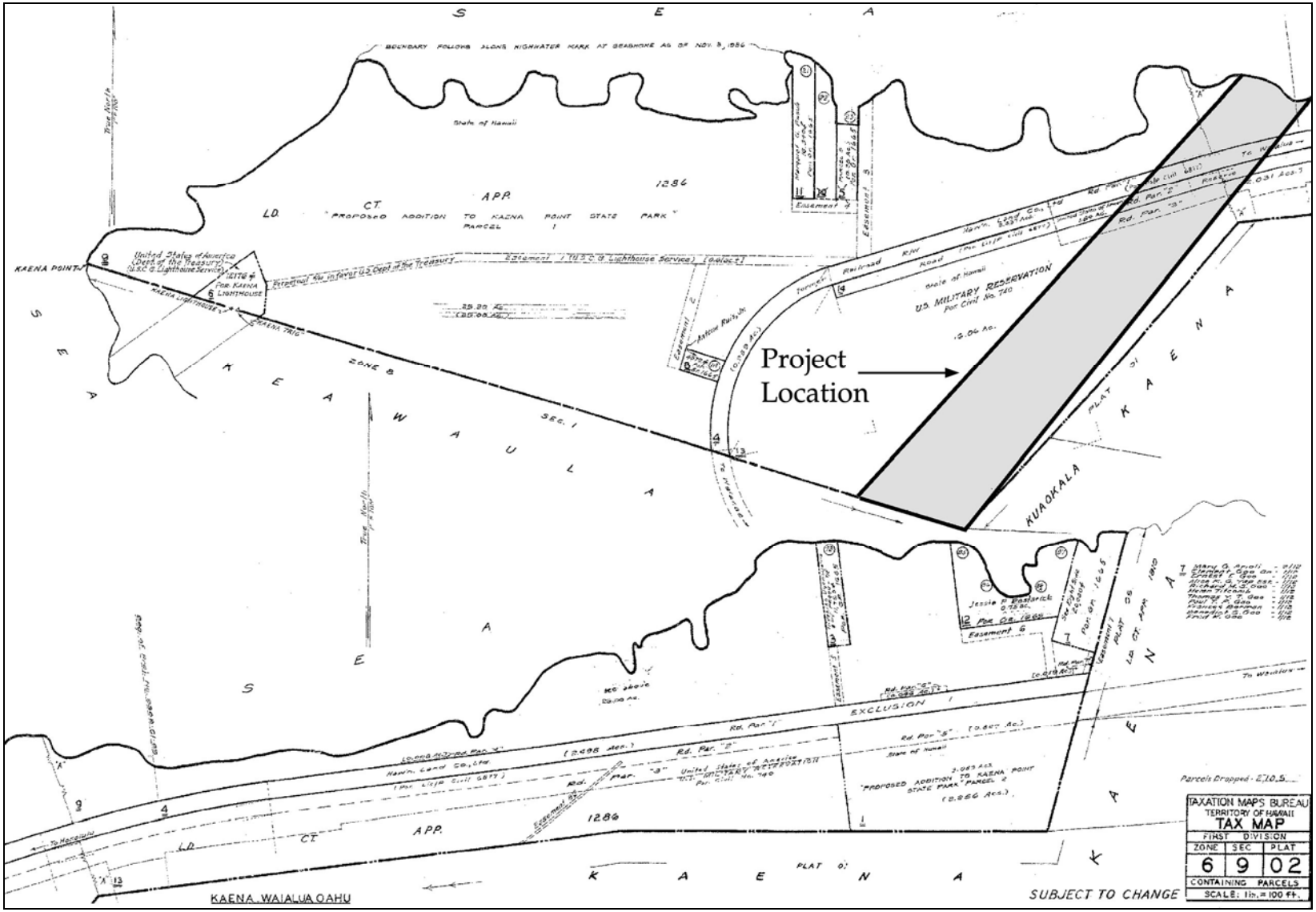

Fig. 2: General Location of Proposed Ka`ena Point Fence Project, Ka`ena, Waialua [TMK: (1) 6-9-02: 4, 9, 13, 14] on Realty Atlas, State of Hawaii, 32nd Edition, 1998.

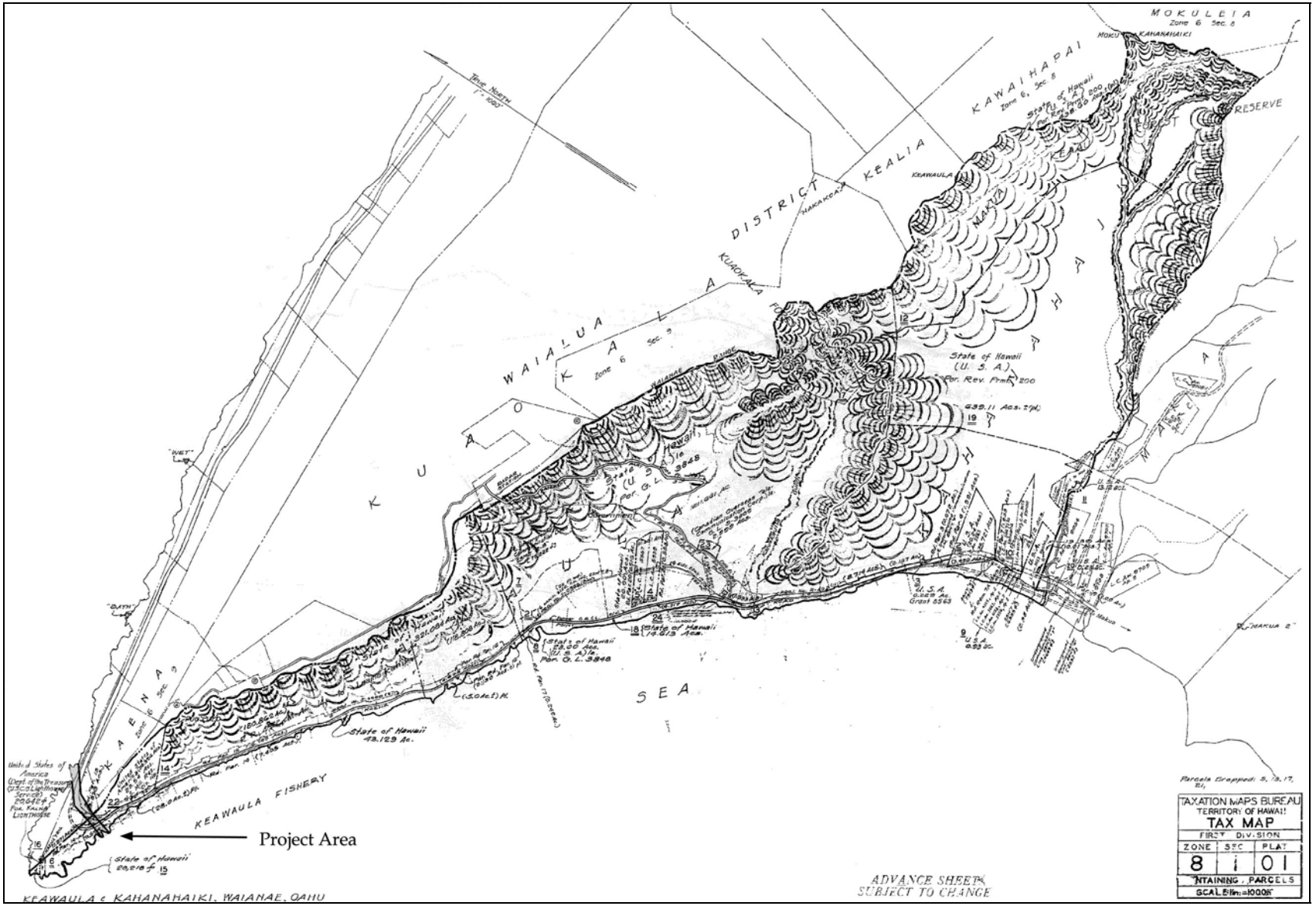

Fig. 3: General Location of Proposed Ka`ena Point Fence Project, Keawa`ula, Wai`anae [TMK: (1) 8-1-01: 6] on Realty Atlas, State of Hawaii, 32nd Edition, 1998.

Known and Possible Historic Properties at Ka`ena Point

Historic properties identified thus far at Ka`ena Point and within the probable project area represent one of the following three, and possibly four, major time-periods and uses:

- Native Hawaiian Subsistence and Cultural Uses: The earliest properties are associated with native Hawaiian subsistence and cultural uses and include pre-contact cultural deposits and burials sites, two stone features probably used for ritual purposes, and landscape features that are significant because of their association with known traditions.

- Pasturage and Ranching: The second grouping potentially reflects grazing or ranching activities that occurred in the area from the 1850s through the 1940s. To date, however, no structural features or other historic properties that could be uniquely or definitively tied to activities from this period were found during previous surveys or during the field inspections.

- Oahu Railway and Land Company (OR&L): The third grouping of historic properties includes those landscape modifications and stone features created during construction and use of the OR&L railway from 1897 to 1947.

- Ka`ena Point Military Reservation: The final grouping is associated with coastal defense facilities constructed by the United States military within the Ka`ena Point Military Reservation which was established in 1923. Constructed between 1923 and 1945, these facilities reflect technological changes in defense systems and strategies that were occurring between World War I and World War II and then the rapid escalation in defense constructed during World War II.

Native Hawaiian Pre-Contact and Early Historic Period Properties

To date, a total of five extant historic properties have been documented at Ka`ena Point which are considered native Hawaiian properties because they represent use of the area prior to Western contact or during the early historic-period (prior to 1850) when predominantly native Hawaiian cultural uses of the area prevailed.

Cultural Deposits and Features

The oldest of these properties may be the subsurface cultural deposits and burial sites located within the prominent sand-dune knoll near the point (Figs. 4 to 7). The cultural deposits were first documented in 1971 during the Statewide Survey of Historic Sites (Site No. 50-80-03-1183) (Bath and Napoka 1988; Yent 1991a: 8). Exposed deposits and remnant stone surface features were recorded in more detail during a 1982 recovery effort prompted by the obvious deterioration of the sand-dune knoll (Yent 1991a: 8). This deterioration was primarily attributed to off-road vehicle use (e.g., four-wheel drive, dune buggies, and motorbikes) which reduced vegetation cover and, in turn, prompted an

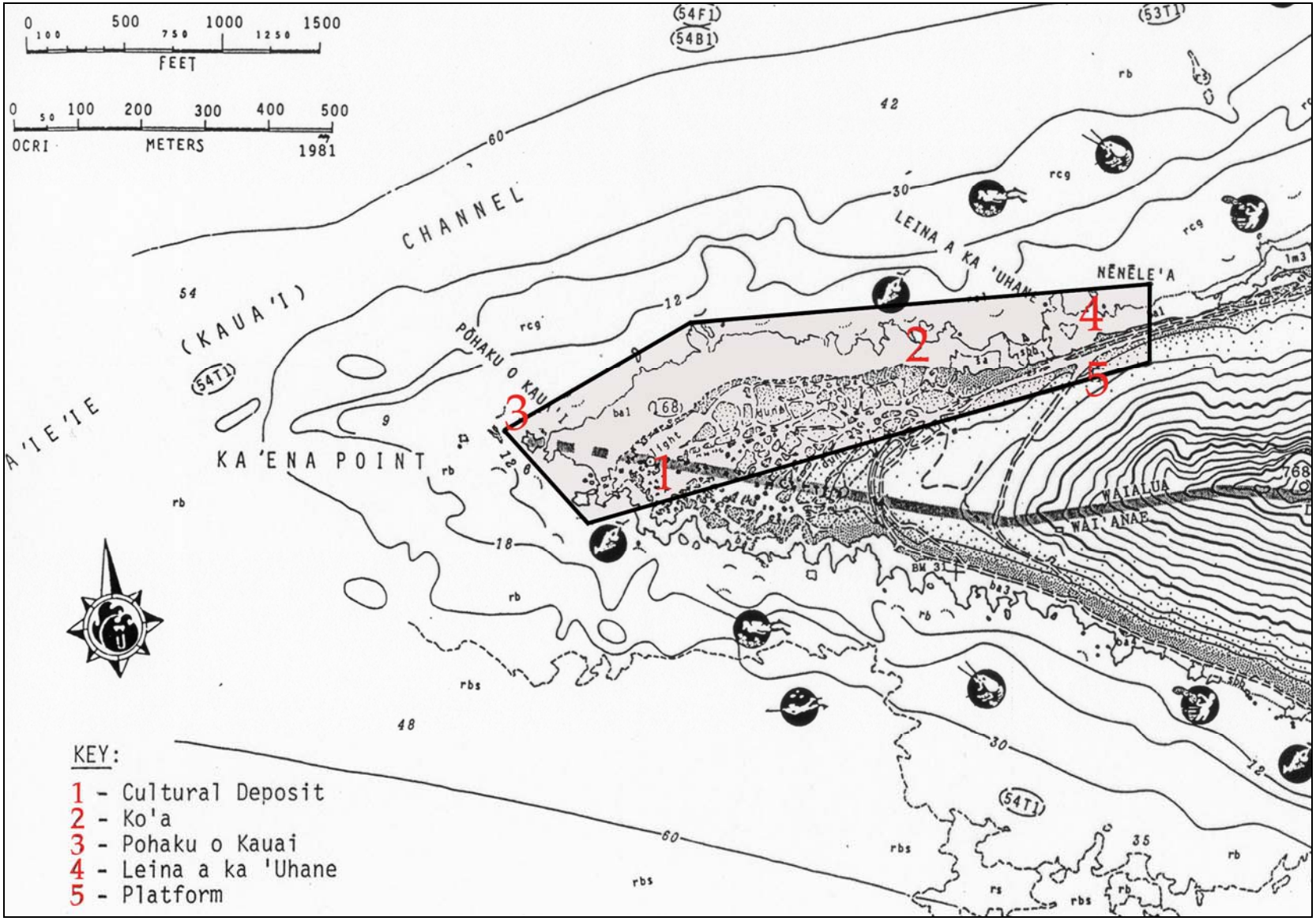

Fig. 4: Location of Ka`ena Complex (Site No. 50-80-03-1183) Boundaries and Major Contributing Features (adapted from Yent 1991a: 8).

Fig 5: Sand Dune Formation Covering West and North Portions of Ka`ena Point (Facing West). Note beacon light in distance.

Fig. 6: Raised Sand Dune Knoll Containing Cultural Deposits and 1989 Beacon Light. Note downed historic 1920 beacon tower to right of beacon (Facing West).

Fig. 7: Exposed Darkened Cultural Layer Near Beacon Light in Sand Dune (Facing South).

Fig. 8: Limestone Formation Named Leina a ka `Uhane or Soul's Leap (Facing West).

increase in wind erosion. Additional data recovery work was conducted in 1989 to mitigate the potential effects of installing the current beacon light and the continued deterioration of the dune remnant (Yent 1991a). The U.S. Coast Guard owns the parcel on which the lighthouse and most of the deposits are found.

Prior to 1989, the site was described as having remnant walls constructed of water-worn basalt stones and two distinct buried cultural layers exposed along the eroding faces of dune remnants (Yent 1991a: 8). The stone walls described on the north and east sides of the knoll in 1971 had been reduced to foundation alignments in 1982 and 1989. This also coincided with an increase in water-worn boulders scattered over the knoll by 1982. The two cultural layers were marked by dark, charcoal-stained sand containing coral and basalt *`ili`ili* (water-worn pebbles used as paving), pit features, a few artifacts (e.g., fishhook fragments, cut mammal bone, volcanic glass, coral and sea urchin files), and midden composed of bird and fish bone, crab, sea urchin, *kukui* nut fragments, marine shells, and charcoal pieces and flecks (Yent 1991a: 8, 12). In 1982, two partial burials exposed by erosion were removed and placed in a more stable reburial site for protection (Yent 1991a: 8).

When data recovery work was conducted in 1989, the upper cultural layer was no longer intact but excavation of the lower cultural layer provided a detailed description of the layer and its variability. An analysis of materials excavated from three test pits in this layer indicates the long-standing importance of fishing and marine resources in this dry, often wind-swept environment. The presence of habitation features in the cultural layer (e.g. living surfaces, *`ili`ili* paving, fire hearths, pits, and distinguishable levels) further suggests a sustained use of the area whether it be on a permanent or recurrent basis (Yent 1991a: 35, 37, 38).

Spatially, the primary cultural deposits on the knoll (Feature 1) extend over an area measuring approximately 30 by 50 meters (98 by 164 feet). Surface midden scatters and darkened sand exposures suggest that the deposits could extend an additional 300 meters (198 feet) to the east and 30 meters (98 feet) to the south of the primary knoll (Yent 1991a: Fig. 5, 12). While no similar deposits have been reported elsewhere in the dune system stretching along the western and northern shoreline of Ka`ena Point (Fig. 5), this site clearly establishes the possibility of cultural deposits and burials being in other sandy areas. This pattern of cultural deposits and burials in the surviving dune remnants, mostly stable knolls or raised, has been documented along the shoreline east and west of Mokuleia.

Stone Platforms

The two stone platforms included in the Hawai`i Register complex are thought to have been constructed for religious purposes (Fig. 4) (Bath and Napoka 1988, Yent 1991a: Fig. 4). Feature 2 was described in 1988 as a partially buried basalt boulder platform with coral pieces scattered among the boulder paving of the platform (Bath and Napoka 1988). The presence of coral and its location on distinct rise above the sand dunes suggested that it could be fishing *ko`a* (shrine or triangulation point). It was suggested that this could be

Fig. 9: Low Stone Platform Located on Rocky Knoll (Facing West). Site may be that labeled Feature 2 of Ka`ena Complex (Site No. 50-80-03-1183).

Fig. 10: Rocky Knoll with Stone Platform and Possible Fishing Shrine (Facing North). Site may be Feature 2 of Site No. 50-80-03-1183.

Fig. 11: Small Rectangular Platform and Possible Shrine Located on Slope above Leina a ka `Uhane (Facing West). Site is Feature 5 of Ka`ena Complex (Site No. 50-80-03-1183).

Fig. 12: View from Possible Shrine to Leina a ka `Uhane (Facing North). Gravel road and railway bed now separate the two features.

Alau`iki, a fishing shrine, recorded by McAllister in his 1930 survey of historic sites on O`ahu. He described Alau`iki as a "group of stones near the edge of the water, no different from other stones in the vicinity" (McAllister 1933: 127). Another map places Alau`iki farther east (Sterling and Summers 1978: 97). The feature shown in Figures 9 and 10 is in the general location of Feature 2 (Figs. 4).

The second stone feature, Feature 5, was described as a "small rectangular platform of basalt cobbles, with scattered coral on the surface" and as being 150 meters (492 feet) upslope (south) of the limestone formation called Leina a ka `Uhane (Soul's Leap) (Figs. 11 and 12) (Bath and Napoka 1988). Its possible religious function is suggested by its size, the presence of coral, upright stones along the edge of the platform, and its vantage point. The ritual nature of Features 2 and 5 are consistent with the prevalence of known fishing shrines in the area and the richness of its off-shore fisheries. McAllister recorded eight named *ko`a* between Keawa`ula and Mokule`ia (McAllister 1933: 124-129; Yent 1991a: 42).

Pohaku o Kaua`i and Leina a ka `Uhane

The two natural formations identified as part of the Hawai`i Register complex, Features 3 and 4 (Fig. 4), should be considered and treated as traditional cultural properties during the federal historic preservation review process. The identification and evaluation of these otherwise natural features rely entirely on known native Hawaiian traditions and beliefs. Feature 3 is a large, partially submerged rock outcrop named Pohaku o Kaua`i (*Lit.* Stone of Kaua`i) (Figs. 13 and 14) and the other a large limestone formation named Leina a ka `Uhane (*Lit*. Leaping Place of Ghosts) (Figs. 8 and 12).

Pohaku o Kaua`i marks the end of a series of partially submerged rock outcrops that form the westernmost extent of O`ahu Island (Fig. 14). As such, it is the westernmost piece of land on O`ahu and that which is closest to the Island of Kaua`i. According to two recorded traditions, this rock formation was once a part of Kaua`i (Bath and Napoka 1988). In one tradition, the heroic demigod Maui attempts to join the islands of Kaua`i and O`ahu by standing at Ka`ena Point and using his famous hook, Manaiakalani, to pull Kaua`i towards O`ahu (Sterling and Summers 1978: 92-93). When he pulled the hook, only a single, huge rock from Kaua`i falls at his feet. This rock then became known as Pohaku o Kaua`i.

In the other tradition, a Kaua`i chief named Ha`upu, a chief known for great feats of strength, hurled a huge boulder from Kaua`i towards O`ahu to forestall what he thought was a fleet of O`ahu warriors about to invade Kaua`i (Sterling and Summers 1978: 93-94). The group was, instead, driving fish towards nets laid off-shore of O`ahu. When the huge boulder fell, it killed the chief Ka`ena who was leading the fishing drive and many of his followers. From then on, the point bore the name of this chief and the large rock was called Pohaku o Kaua`i. Pohaku o Kaua`i is mentioned in other traditions but plays only an incidental role in their story lines (Sterling and Summers 1978: 93-94, 96). The fact that it is mentioned at all demonstrates that it was a commonly known landmark and one worthy of weaving into traditions with a broader scope.

Fig 13: Basalt Rock Formation Named Pohaku o Kaua`i (Facing West). The named rock is the most distant formation in the photograph.

Fig 14: Alignment of Partially Submerged, Rocky Outcrops Forming the Western Point of O`ahu with Pohaku o Kaua`i in the Distance (Facing West).

The limestone formation called Leina a ka `Uhane (Figs. 8, 12, 19, 36) is now the most recognizable and tangible representation of native Hawaiian traditions and beliefs that identify Ka`ena Point as a place where the fate of departing souls is determined as death nears. Departing souls would either pass into one of several spirit realms or be returned to the body to continue life. The fate of these souls often depended on the help or absence of friendly *`aumakua* (ancestral family or personal god) that would guide a soul to the appropriate realm. Such places were said to be on each of the islands (Kamakau 1964: 49).

The earliest reference to definitively associate these beliefs with this particular limestone formation appears in a 1933 newspaper article. It describes Leina a ka `Uhane as the "stratified and overhanging mass of granular limestone between the track and the sea, near No. 63 culvert as the railroad begins to straighten out after the bend" (Sterling and Summers 1978: 94). In another account, one that describes an 1899 trip to the Hale`iwa Hotel on the railway, the train whistle blows at Ka`ena Point and then the passengers saw "Leina-kahuna" (Laina-kauhane) (Sterling and Summers 1978: 94).

The most detailed account of a soul's progression towards spirit realms or a return to life is from S.M. Kamakau in two 1870 newspaper articles (Kamakau 1964: 47-49). He describes the "*leina a ka `uhane* on Oahu" as being "close to the cape of Ka`ena, on its right (or north, *`akau*) side, as it turns toward Waialua, and near the cutoff (*alanui `oki*) that goes down to Keaoku`uku`u." He also depicts this *leina a ka `uhane* as having boundaries. One boundary was at "Kaho`iho`ina-Wakea, a little below Kakahe`e" (probably somewhere within the vicinity of Camp Erdman and the Dillingham Airfield[2]) and the other at "the leaping place (*kawa-kai*) of Kilauea at Keawa`ula" (near the southwestern side of today's Yokohama Bay[3]). At these boundary places, the "helpful *`aumakua*" might bring the soul back to life or guide them to the realm of the *`aumakua*. Places "within these boundaries" were "where souls went to death in the *po pau `ole*, endless night." These boundaries, if correctly located, create an area stretching 4 miles east of the point along the northern shoreline and 3 miles to the southwest of the point along the southwestern shoreline.

Also describing these beliefs as a progression with thresholds of passage is Holokala, McAllister's informant, in 1930. As the soul wanders from an individual nearing death, it comes first to the fishing shrine named Hauone (Site 189; McAllister 1933: 57, 124, 126). At this point, the soul either returns to the body to fulfill its obligations on earth or

[2] The estimated location of Kakahe`e is based on the relative positions of four villages visited by the missionary Levi Chamberlain prior to 1849 (Sterling and Summers 1978: 89) and Emerson's 1896 map (Fig. 16). After turning O`ahu's western point, Chamberlain mentions four villages: Nenelea, Kahakahee, Aukuu, and Mokuleianui. Emerson's map shows a survey point called Nenelea and Mokuleianui probably corresponds to Mokule`ia Ahupua`a. If these settlements are proportionately spaced, Kakahe`e would be in the vicinity of Camp Erdman and the Dillingham Airfield. This also assumes that Kakahe`e is a contraction of Kahakahee.

[3] Two other references mention a Kilauea at Keawa`ulu. McAllister calls the exit of Poha Cave "Kilawea" which he locates at Yokohama Bay (McAllister 1933: 124; Site 184; Yent 1991b: Fig. 3). The "sea cove of Kilauea" is mentioned before the train reaches Ka`ena Point in an 1899 newspaper account of a trip to the Hale`iwa Hotel (Sterling and Summers 1978: 94).

wanders on to "Leina Kauhane at Kaena Point" where "two minor gods" throw the soul into a "pit known as Lua ahi a Kehena" (McAllister 1933: 126). Death occurred when the soul is thrown to the pit. The fishing shrine Hauone was located between Camp Erdman and the western end of Dillingham Air Field (Fig. 16). This coincides broadly with the northeastern boundary described by Kamakau as being at Kakahe`e. Neither Holokala nor McAllister mention the limestone formation and McAllister places the site number of "Leina Kauhane," Site Number 186, at the western extent of Ka`ena Point.

Potential Native Hawaiian Historic Properties

Based on historic accounts and recorded traditions, yet to be identified historic properties are most likely to reflect uses and customs associated with the area's rich fisheries and the lack of any other dominant land uses on a coastal flat consistently described as "waterless" and known for its stifling heat (McAllister 1933: 127). Such unidentified properties could include additional *ko`a* (fishing shrines), the remnants of shelters and settlements for fisherman, burials, canoe landings, and salt-making sites. Historic-period uses of the point have, however, significantly reduced the probability of these properties surviving on the flatter portions of the point or along lower ridge slopes. Much of this area was altered by construction of the railway in 1897 and military coastal defense structures beginning in 1923.

The routine importance of fishing and salt making for native Hawaiians of the region is captured by John .S. Emerson in his 1854 survey notes (Emerson 1854). The notes were submitted to verify the purchase of five government grants stretching from Ka`ena Point eastward along the north coast of Waialua (Figs. 15 and 16). Emerson asks that the government reserve "a right to fisherman & to land [and to] dry & mend nets & to all who wish to make salt as in former days" (Emerson 1854)[4]. He warns that "many persons may be vexed for a lack of a privilege" if it should be conveyed, exclusively, with the purchase of a government grant.

In addition to a right to fish, the survey note confirms the importance of other activities associated with fishing and a perception that access to places suited to these activities might be curtailed when privately-owned parcels were established along the coast. Fishing would be hampered if canoes could not land in customary locations, if fishermen could not use areas suitable for drying and mending nets, or if salt could not be made, in part, to salt and thus preserve fish and other marine resources. Favorable canoe landings might be identified today based on shoreline characteristics and knowledge of in-shore waters, but it would be more difficult to identify specific places where nets were dried and mended or salt was made. These activities would probably take advantage of natural features that did not necessarily require constructed features or landscape modifications.

[4] Under one grant Emerson wrote this requested reservation in Hawaiian: *"Koe i na kanaka lawaia kahi e komo ai na waa a e maloo ai na upena a me kahi e koau ai kapaakai ma na aa pohaku.*"

Fishing and Fisherman Camps and Settlements

The nature and value of the off and near-shore fisheries at Ka`ena Point are also conveyed in recorded traditions and customs. The origins of some of these rich fishing grounds are explained in the legend of Mikoha. One of the legend's characters, Kaihukoa, moves to Wai`anae where she marries a chief named Ka`ena and transforms herself into the fishing grounds located "directly out from the Kaena Point" (Sterling and Summers 1978: 87). She brings with her the "the *ulua*, *kahala*, and the *mahimahi*." Keawa`ulu, the *ahupua`a* of Wai`anae District which extends into the southern third of the point (Figs. 1 to 3), was known for its *aku* and *ahi* fishing grounds (Ii 1959: 98). The coastal fisheries were also noted as particularly productive when submerged, woven basket traps (*hina`i*) were used to catch *kala* and *hinalea*. When describing basket traps in general, Kamakau notes a particular pattern and size of basket trap that was made for *kala* fish at Ka`ena, O`ahu. He also states that Ka`ena was said to be "a land abounding in kala fishs" and describes in detail the methods, rituals, prohibitions, and communal effort involved in making and using basket traps fashioned specifically for *kala* (Kamakau 1976: 82). There were also "plenty of *hinalea* caught by setting traps from the water (*wai*) of Kumalaekawa to the cape of Ka`ena–so many that a stench arose from the racks where they were drying" (Kamakau 1976: 82). Basket traps for catching *hinalea* were also made in strict adherence to particular *kapu*.

Fisherman settlements and camps near Ka`ena Point were first described by the missionary Levi Chamberlain during his trip along the Wai`anae and Waialua coastline sometime prior to 1849 (Sterling and Summers 1978: 60, 89). He traveled northwest by canoe from the village of Keawa`ula (today's Yokohama Bay) to a "cove," presumably a canoe landing, at the southeastern side of Ka`ena Point. In "front of the little cove" was "a cave used by fishermen occasionally for a residence" which was about 30 feet high and had dimensions of 30 and 15 paces (Sterling and Summers 1978: 60). The cave is described as being at "nearly the west point of the island" and south of the Wai`anae and Waialua District boundary which dissects Ka`ena Point in an east-west direction (Fig. 1). He traveled from the cave "a short distance over a very rough path along the shore and came to the mokuna (boundary) of the large divisions of the island Wainai and Waiarua" (Sterling and Summers 1978: 60). This may be the cave called "Ke Ana Moe of Ka`ena" by an informant in 1954 which was said to be used by travelers from Makua to Waialua (Sterling and Summers 1978: 86). This cave may have been obscured by construction of the railway bed.

As Chamberlain heads east of Ka`ena Point, he describes passing "Nenelea a settlement of fisherman and a convenient place for hauling up their canoes" (Sterling and Summers 1978: 89). Based on a labeled survey point (Fig. 16) (Emerson 1896), Nenelea is probably about a mile east Ka`ena Point. Another indication of fishermen settlements may be the "few old house foundations" described by McAllister as being located inland of the railway at Ka`ena Point in 1930. They were rectangular and measured approximately 14 by 20 feet (McAllister 1933: 124). The population of Ka`ena, presumably the entire *ahupua`a*, was listed as 49 individuals for the year 1831 to 1832 (Yent 1991a: 5). This would include all those living on lands from the end of Dillingham

Field to Ka`ena Point (Fig. 16). The boundary between Waialua and Wai`anae Districts divides the point with Ka`ena Ahupua`a taking the northern three-quarters and Keawa`ula Ahupua`a the southern quarter (Figs. 1 to 3).

This emphasis on fishing suggests that additional *ko`a* (fishing shrines) could still be identified along the shoreline or upslope given their known prevalence in the area. McAllister's informants in 1930 identified at least eight named *ko`a* between Keawa`ula and Mokuleia (Yent 1991a: 42; 1991b: 7, Fig. 8). These shrines may not, however, be readily identified as some were no more than several, otherwise indistinct, stones (McAllister 1933: 127).

Salt-Making

A document other than Emerson's survey notes refers to Ka`ena Point as being an important source of salt. In discussing squid (probably octopus) caught off of Mokuleia, a 1905 article in Thrum's Annual notes that salt used in preparing squid likely came from Ka`ena Point "from salt water evaporation in the holes of rocks so plentiful on that stormy coast" (Sterling and Summers 1978: 96). Future surveys should try to identify any areas appearing to be particularly amenable to salt making or having a concentration of holes serving this purpose.

Trails

Other activities described at Ka`ena Point are those associated with the major trail that linked settlements along the Wai`anae coast with those of Waialua on O`ahu's north shore. In portraying the major trails on O`ahu in the early 1800s, John Papa Ii emphasizes the timing of travel at Ka`ena so that the worst of the region's heat can be avoided. He advises that if travelers arrived at Ka`ena in the morning, "they escaped the heat, for they were cooled by the Moae breeze" (Ii 1959: 98). They subsequently went on to Waiakaaiea where they rested "until afternoon, and then continued traveling along the level places of Kawaihapai and Mokuleia." Waiakaaiea is located approximately 1.7 miles east of Ka`ena Point and is also mentioned in the legend of Pikoi-a-ak-Alala as being a canoe landing[5] (Sterling and Summers 1978: 95).

Levi Chamberlain's account emphasized the roughness of the trails. That from Keawa`ula to the point was described as "three or four miles of very rough road laying along the base of the mountain and over rugged lava washed by the sea" and the segment from the canoe landing to the Wai`anae-Waialua District boundary was "a very rough path" (Sterling and Summers 1978: 60). Both accounts mention alternatives. Chamberlain's account demonstrates a preference for travel by canoe which avoids the rugged trail if sea conditions allow. Ii mentions routes that cross the mountain ridge and thus avoid the longer walk around the point and the heat. One route ran from Makua "up

[5] A survey point labeled Kawaiakaaiea on Emerson's 1896 map indicates the approximate location of Waiakaaiea. This is generally consistent with a 1954 informant who places it at a "dry stream past Camp Erdman" (Sterling and Summers 1978: 91).

the mountain and down to Kawaihapai" and the other from Mokule`ia to Makaha (Ii 1959: 98).

A subsequent account suggests that the trail had not improved much by 1880. The four miles between Kawaihapai and Ka`ena were described as "by no means pleasant riding" with the "barren tract, full of boulders large and small, and for the traveler on horseback the route is simply abominable." The "splendid view" at the point, however, did compensate for the "weariness of the barren and rocky road" (Bowser 1880: 490). The five mile stretch from Ka`ena to Makua was worse and deemed "one of the most rugged roads to be found in Oahu." Travel was described as being more "wearisome than dangerous" and proceeding at an "exasperatingly-funeral pace" as the trail "skirts the sea" (Bowser 1880: 490-01).

No remnants of this trail or associated features have been identified. In some sections, the railway and unpaved roads may have obliterated traces of earlier trails if they followed the same route. Features or places potentially associated with the early trail could include trail markers or curbstone alignments, named resting places (*o`io`ina*), shelters, or stone paving used to stabilize the trail. The 1929 and 1940 quadrangle maps of Ka`ena Point (Fig. 17) (Unites States Geological Survey 1929, Army Corps of Engineers 1940 ) and aerial photographs taken in 1939-1940 show a trail or unimproved road paralleling the railway alignment. Some trail segments visible upslope of the railway alignment in Keawa`ula could still be intact (Fig. 35).

Kuaokala Heiau

Another potential historic property to consider when assessing the project's visual effects is a *heiau* once located on the upper crest of the ridge west of Pu`u Pueo. A survey point on Emerson's 1896 map[6] is labeled, in pencil, "Kuaokala Heiau" (Fig. 16) (Hammatt, Shideler, and Borthwick 1993: 8-9). In his 1907 list of *heiau* on O`ahu, Thrum places "Kuokala" Heiau at "Waianae, overlooking Kaena Point" and attributes its construction to settlers from Kaua`i (Hammatt, Shideler, and Borthwick 1993: 10). He notes it was in "ruins." In 1906, Emma Nakuina identifies a *heiau* "at Kuaokala, Waianae" as one of two *heiau* dedicated to "sun-worshiping."

Two other sources reference a "temple at the top of the mountain" (Sterling and Summers 1978: 95) and "the remains of an old *heiau,* or temple of the *native* gods" on "top of a hill near Kaena Point" (Bowser 1880: 491). In first reference, the great fish Kumunuiakea, is dragged to this *heaiu* with its tail leaving a mark on the landscape. In the second, a 1880s guide for travelers, describes the temple as measuring 40 by 20 feet and having walls eight feet tall. It is not clear that all the sources cited refer to the same *heiau* or to that

[6] The 1896 Register Map (1784) is attributed J.S Emerson. This could refer to John S. Emerson or to his son, Joseph S. Emerson. John S. Emerson surveyed the boundaries of the government grants depicted on the map in the 1850s but died in 1867 (Sahlins 1992: 6). His son Joseph worked for the Hawaiian Government Survey from 1877 to 1904 (Moffat and Fitzpatrick 1995: 31).

located by Emerson[7]. Kuaokala is the name of the ridge forming the western terminus of the Wai`anae Mountain range and a land division that encompasses the relatively flat and broad crest of this ridge which is bounded by Ka`ena to the north, Keawa`ula to the southwest, and the *ahupua`a* of Kealia to the east (Figs. 1 and 2). This land division may be an *`ili* of Ka`ena *ahupua`a* as only Ka`ena, not Kuaokala, is listed when lands were divided among the chiefs during the 1848 Mahele. In many cases, *heiau* carry the name of the land on which they are located. The existence of this *heiau*, or any remnants of it, has not been confirmed. After reviewing available information, Hammatt, Shideler, and Borthwick (1993: 8-10) believed that McAllister in his 1930 survey mistakenly assumed that the "Kuakala heiau" mentioned in the literature was the same as Mokaena Heiau. Mokaena Heiau is located to the southwest and primarily overlooks Yokohama Bay.

Pasturage and Ranching (1850s–1922)

The first reference to lands at Ka`ena Point being used for pasturage appears in survey notes prepared by J.S. Emerson for Royal Patent Grants 1804, 1805, 1806, 1807 and 1665 (Emerson 1854) (Figs. 15 and 16). Grant 1665 covers most of the point and the project area. Emerson notes that individuals receiving these five government grants only wished to use the land for pasturage ("Pasturage is all they now profess to desire") and that the customary right to fish and make salt was "a privilege which these men have not paid for" when purchasing the grants.

These five government grants not only reflect a district-wide attempt by Waialua residents to secure land for pasturage, but they may also provide evidence that permanent settlements were absent along the western-most stretch of this coastline in 1850. These particular grants are five of 12 issued in Ka`ena Ahupua`a and five of 290 issued to native Hawaiians in the *ahupua`a* from Kamananui to Ka`ena (Emerson 1896, Sahlins 1992: 168-69). More government grants were issued to native Hawaiians in these *ahupua`a* than in all government-held *ahupua`a* on O`ahu combined.

Several factors contributed to these high numbers. First the *ahupua`a* of Kamananui, Mokule`ia, Kawaihapai, Kealia, and Ka`ena all became government lands in 1848 which made them eligible for sale after 1850. Chiefess Victoria Kamamalu, a granddaughter of Kamehameha I and sister of Kings Kamehemeha IV and V, inherited Waialua District from her mother Kinau in 1839 (Sahlins 1992: 46, 167; Alameida 2003: 40). Kamamalu then relinquished the lands from Kamananui to Ka`ena to Kamehameha III during the Mahele of 1848 and he subsequently designated them government lands. The second factor was John S. Emerson, the American Board of Commissioners for Foreign Missions (ABCFM) missionary assigned to Waialua, who was tireless in his attempts to help the mostly native Hawaiian residents of Waialua obtain fee-simple title to lands during the mid-1800s when customary land tenure was being converted to one of private ownership (Sahlins 1992: 168, Moffat and Fitzpatrick 1995:54-55, and Alameida 2003). The third factor centers on conflicts that became acute during the 1840s over the use of *ahupua`a*

[7] The location of the *heiau* described by Bowser is somewhat ambiguous. He says it is located on top of a hill near Ka`ena Point but only describes it after reaching Makua in the account of his travels. He does not mention it when describing Ka`ena Point or when passing through Ka`ena.

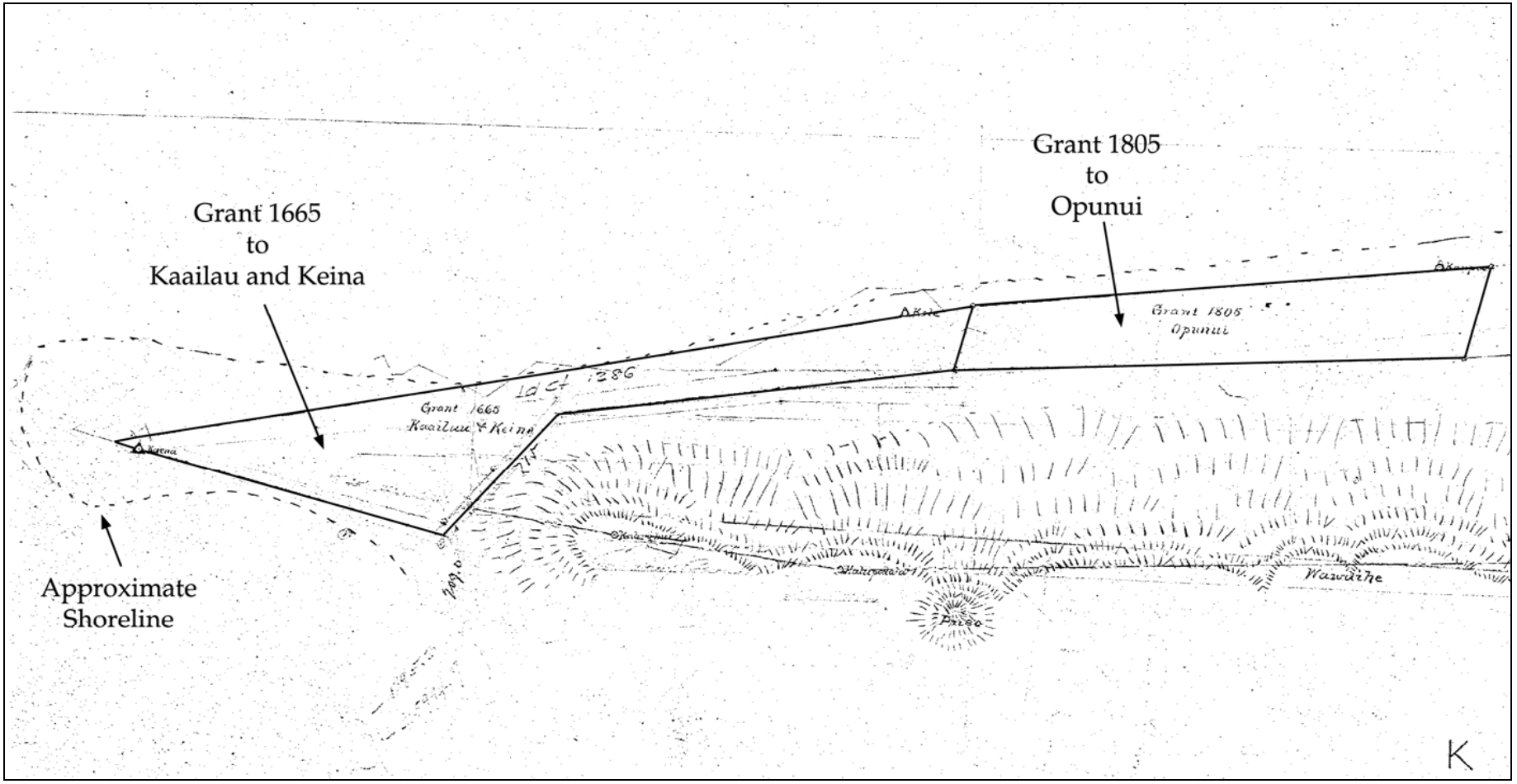

Fig. 15: Location of Grants 1665 and 1805 as Shown on 1896 Map Surveyed by J.S. Emerson (Emerson 1896). Grant boundaries and shoreline were darkened. Grants were obtained primarily for pasturage.

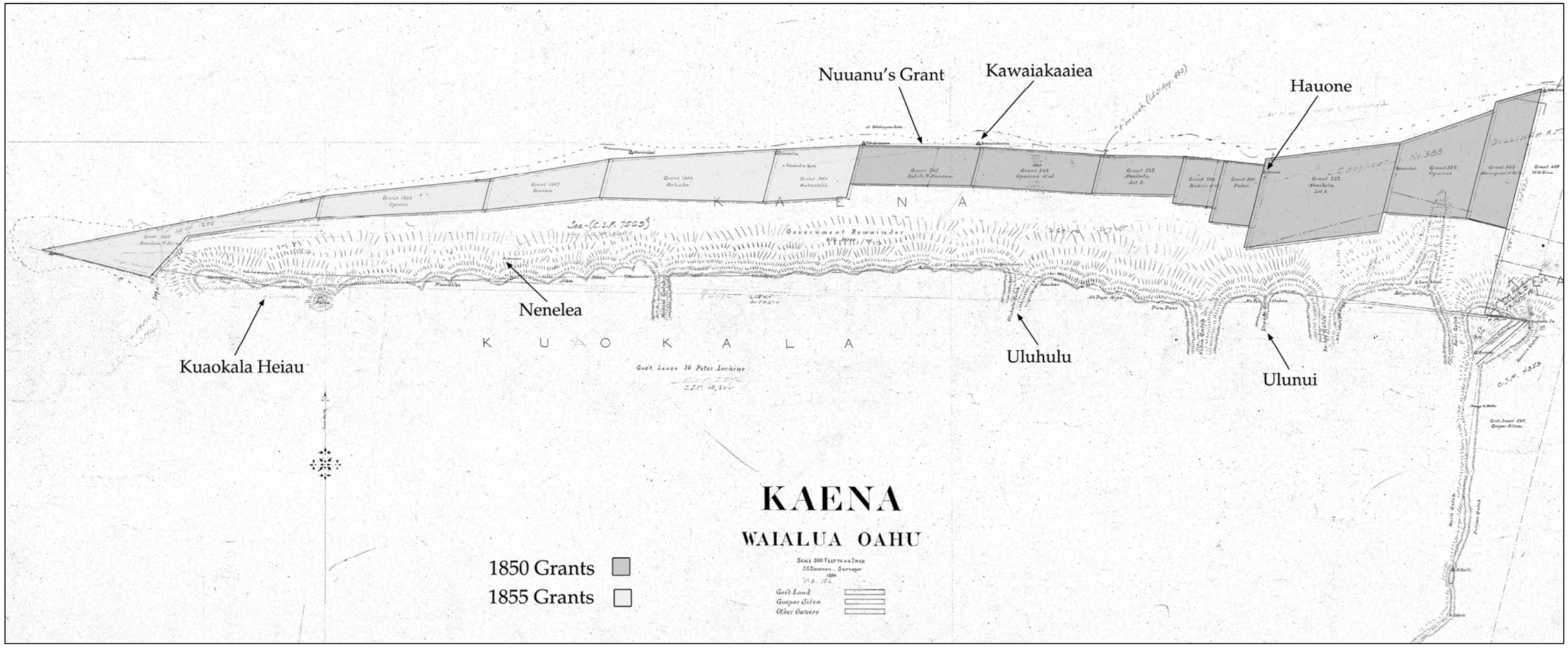

Fig. 16: Location of Government Grants Surveyed and Mapped by J.S. Emerson between 1850 and 1855 as shown on 1896 Map (Reg. Map 1784). Shading distinguishes grants issued in 1850 from those issued in 1855. Annotated places names are discussed in the text.

grasslands and uncultivated lands for pasturage. The *ali`i* who controlled the large *ahupua`a* began to use these lands to graze large herds or to lease them to foreigners for pasturage. Uncontrolled herds were entering cultivated fields of the residents and damaging their crops and were also depleting their source *pili* grass which was essential for thatching (Sahlins 1992: 136, 148-49, 167, and 168). The residents of Waialua also complained that the *ali`i* landholder or agents were denying them use of uncultivated grasslands for grazing as the residents themselves began to acquire their own animals. Access they formerly had to grasslands and other resources of an *ahupua`a* was gradually being denied or diminished.

There were two mechanisms by which *ahupua`a* residents could obtain fee-simple title to land at that time. They could submit claims to the Board of Commissioners to Quiet Land Titles (Land Commission) between 1848 and 1854 and they could purchase government lands which were called Royal Patent Grants (Sahlins 1992: 9, 14, 136, 168; Alameida 2003: 42-43). Lands claimed by native tenants before the Land Commission could only be those that were in active use as house lots or were under cultivation. There were no such restrictions for government grants which allowed the acquisition of much larger parcels and, in some cases, parcels the grantee had not been using or did not previously possess. Emerson actively encouraged tenants of Kamananui, Mokule`ia, Kawaihapai, Kealia, and Ka`ena to withdraw claims made before the Land Commission and to purchase, individually or in a *hui* (a collective), government grants which would be much larger and of sufficient size to compensate for the pasturage and other resources they were being denied in the *ahupua`a* as a whole (Sahlins 1992: 168; Alameida 2003: 42-43). At least 73 claims before the Land Commission were withdrawn in these *ahupua`a* (Sahlins 1992: 168; Alameida 2003: 32). Emerson asked to be and was appointed the government land agent for the district to help process the purchase and mapping of the grants.

The 12 government grants sold in Ka`ena Ahupua`a broadly conform to these generalizations. A significant number were purchased collectively by multiple individuals. Five of the 12 grants in Ka`ena were purchased by two, three or four individuals (Table 1). At least one individual, Nuuanu, withdrew claims submitted to the Land Commission in 1848 and subsequently purchased, along with Kahili, a grant in Ka`ena (Fig. 16). This 30-acre grant appears, in part, to encompass inherited lands which were therefore probably in his possession prior to 1848. His Land Commission claim included six dispersed parcels that were all within Ka`ena (Board of Commissioners to Quiet Land Titles 1848: Vol. 4: 543). One parcel was for a house lot, three were for *lo`i* (irrigated taro patches), one included a single *lo`i* and small piece of *kula* (non-irrigated land), and one was a small piece of *kula.* As the house was from his parents and he calls the parcel with 10 *lo`i* "ancient," use of these lands extends, at a minimum, back to the late 1700s or early 1800s. Some ties between his Land Commission claims and his grant can be traced through place names. Four of the five places named in his Land Commission claims can be matched to names on Emerson's 1896 map (i.e., Kaaiea is probably Kawaiakaaiea; Wehulu is Uluhulu; and Ulunui is identical to Ulunui) (Fig. 16). Emerson's bench mark named Kawaiakaaiea is immediately seaward of Nuuanu and

Kahili's grant and probably confirms that his grant encompassed at least two of his claims[8]. The other two named areas are within a mile of the grant to the east.

The five western-most grants at Ka`ena, Grants 1804, 1805, 1806, 1807 and 1665, are likely examples of grants purchased in Waialua primarily for pasturage and ones that were not in the grantee's possession prior to 1848 (Fig. 16). This is most strongly supported by Emerson's explicit statement that the grantees only wished to use the parcels for pasture (Emerson 1845) and by the fact that he did not mention house lots (*pahale*) or cultivated fields in his survey notes although he clearly raises the issue of customary rights. No 1848 Land Commission claims for house lots or cultivated plots were recorded in this area as occurred farther east along the coast. The rates these grantees paid for the lots also indicate their use for grazing. The rates for these five parcels ranged from 48 to 74 cents per acre with the average rate being 59 cents. According to Emerson's correspondence, the going rate for good, cultivatable lands was $2 per acre; 37½ cents for good *kula* in which the grantee had a previous right; 25 cents for poor *kula* in which the grantee had a previous right; and 50 cents per acre for *kula* in which the grantee had no previous right (Sahlins 1992: 168). The five parcels appear to fall within this last category in which the purchaser had no specific or previous rights to the purchased *kula* lands.

These five western grants were also purchased five years after the seven grants covering the eastern half of the Ka`ena coastline (Table 1). The 1850 grants probably encompass areas in which grantees, such as Nuuanu, had ancestral ties and were using the land for residential and agricultural purposes (Fig. 16). In the 1930s, 20 *lo`i* with stone facings below Uluhulu Gulch were still evident in the eastern half of Ka`ena Ahupua`a as was the spring providing water for irrigated *lo`i* (Handy and Handy 1972: 467). Sweet potato had been the principle crop cultivated along the narrow strip of land between the shoreline and the abrupt cliff faces of the ridge. The agricultural potential of the land diminished westward towards the point.

Most of the government lands and private lands at Keawa`ula and Ka`ena were leased for ranching during the second half of the 1800s and first half of the 1900s. A major portion of Keawa`ula became government land after Laamaikahiki[9] relinquished "½" of the *ahupua`a* to the King during the 1848 Mahele and the King then designated it government land (Yent 1991b: 5; Barrère 1994: 395). The 218.75 acres Laamaikahiki received (R.P. 4522) was hardly half of the *ahupua`a* and also seems to have been some

[8] Nuuanu's 1848 claim was for: A "house lot, which is an old one, from the makuas;" ten *lo`i* at Keokuukuu which was from ancient times; one *lo`i* at Kaaiea 1; one *lo`i* at Kaaiea 2; one *lo`i* and a small *kula* at Wehulu, and a small *kula* at Ulunui (Board of Commissioners to Quiet Land Titles, Native Register Vol. 4: 543).

[9] Little is known about Laamaikahiki although he was of sufficient status to be one of the 252 "Konohiki" to be in possession of large land divisions in 1848. This was the only *ahupua`a* he held (Barrère 1994: 395).

Table 1: Summary of 13 Royal Patent Grants Issued to at Least 18 Individuals, Ka`ena, Waialua. Grants are listed in order from Ka`ena Point west. Names from condemnation papers may indicate families with ancestral ties to Ka`ena.

Grant Number	Grantee	Year Granted	Acres	Place Names Potentially Associated with Grant Based on 1896 Map	Names Listed in Court Condemnation Papers
1665	Kaailau Keina	1855	32	Kole (benchmark); Pueo (hill, inland); Haliipalaia (survey point inland);	
1805	Opunui	1855	26	Wawaihe (inland); Kaupoo (benchmark)	Annie Maunalaahia Billsborough; Kahakauwila; Kauakahiakua
1807	Kauwa	1855	23.10	Nenelea (survey point inland); Alau (inland)	Amia (k)
1806	Kahuhu	1855	43	Keekee (inland); Manini Gulch; Maninikai (benchmark); Maniniuka (survey point inland)	Kekuawae
1804	Kahunalii (k)	1855	25	Koleakaahia (survey point inland)	
247	Kahili Nuuanu[10]	1850	30	Aleu (inland); Kawaiakaaie (benchmark); Holoihonuamea Rocks (inland); Pohakumana (benchmark and rocks)	
248	Opunui Moa Mokunanea Kama	1850	30	Mailekiekie (survey point inland); Uluhulu (inland); Kauhao (inland)	Kahakauila; Kahaule, Gaspar Sylva; Kaiohema; Nailima; Kahuhu; James Finney; Henry Opunui; Daniel Pohakahi; Kenneth K. Hann
232 (Lot 2)	Naaihelu Wahinaemaikai Maili	1850	89 (part)	Na Puu Kipe (inland)	John Ii
246	Kahili	1850	12	Puu Pueo (inland)	Kahanana; Mahaoe; Gaspar Sylva; Opunui, Kahau; Kanewahine
244	Puaki	1850	16	Nihoa Gulch (inland)	Kahiwa; Luhea; Kuahu; Laioha; John Kahuakai; Gaspar Sylva
232 (Lot 1)	Naaihelu Wahinaemaikai Maili	1850	89 (part)	Ulunui Gulch (inland); Keekee Gulch (inland); Aeakukui (survey point on boundary)	
228	Opunui	1850	43	Aeakukui (survey point on boundary)	
243	Hoonapuni Kila	1850	34	Halii Gulch (inland); Kalehu (benchmark)	

[10] Nuuanu submitted a claim to the Land Commission in 1848 (LCA #10360) but later withdrew his claim.

of the least accessible and usable land in the *ahupua`a*[11]. His parcel spanned the rocky slope and shoreline northwest of Yokohama Bay to the Waialua-Wai`anae District boundary that divides Ka`ena Point. In 1873, Samuel Andrews leased both Laamaikahiki's and the government's lands at Keawa`ula for ranching (Yent 1991b 6; Hammatt, Shideler, and Borthwick 1993: 15). He transferred the lease in 1901 to L.L. McCandless who continued to lease the government lands until 1925 when he lost a bid for the lease to Frank Woods. Woods, however, signed the lease over to McCandless after only two years and McCandless continued ranching these lands until his death in 1940 (Yent 1991: 6). At some point, McCandless acquired Laamaikahiki's portion of Keawa`ula.

On the Ka`ena side, Peter Larken began leasing Kuaokala for ranching in 1868 but turned over the lease to Samuel Andrews in 1873 (Hammatt, Shideler, and Borthwick 1993: 15). In the 1880s, Mrs. Kamealani received a government lease for the "Kaena Palis" but did not hold the lease for more than 10 years (Hammatt, Shideler, and Borthwick 1993: 16). McCandless had acquired the lease to Kuaokala as well by early the 1900s. When the privately-owned lands along the coast were acquired by the State of Hawai`i in the 1970s to create Ka`ena Point State Park, all were owned by ranching interests or by families with ranching interests in the area. The Keawa`ula section of the point was owned by Elizabeth Marks who inherited McCandless Ranch and the Ka`ena section was owned by three Dillingham Family heirs (Mary-Mae Wild Bond, Walter Frear Wild, and Urban Earl Wild, Jr.). Mokule`ia Ranch had gained clear or partial title to most of the government grants along the Ka`ena coastline.

Despite references to Ka`ena Point and adjacent lands being used for pasturage, none of the stone features or sites generally associated with grazing or ranching have been identified at the point or within the project area (Yent 1991: 6). There are no stone wall enclosures or corals nor do the perimeters of the 1855 grants appear to have been walled to contain and control grazing cattle or horses. This could indicate that grazing animals in the area were free-roaming despite mapped grant boundaries or that areas were fenced. The only stone wall features found appear to be directly associated, mostly by proximity, with construction of the railway.

Oahu Railway and Land Company (OR&L) (1897-1947)

The former alignment and remnant features of the OR&L railway are among the most visible historic properties at Ka`ena Point (Figs. 17). Given the railway's continuous alignment, the proposed fence and project area must, at some point, cross its former route. When completed in 1898, the new railway provided an important means of transporting passengers, goods, equipment, and produce to and from its many stops along the route from Honolulu to Kahuku by way of Wai`anae and Waialua (Yent 1991a 5-6). It was meant primarily to serve plantation towns and ranches but it also became

[11] The richness of this off-shore fishery may have compensated for the apparent poverty and inhospitable terrain of Laamaikahiki's awarded land. In 1905, a 1570-acre Konohiki Fishery was officially recognized for Laamaikahiki's portion of Keawa`ula (Judgment C.C. No. 5166; Land Office Deed No. 1493). It extended one mile from the shoreline.

celebrated as a scenic tour ending at the Hale`iwa Hotel which was also built by Benjamin F. Dillingham, the founder and owner of the OR&L. The segment around Ka`ena Point to Hale`iwa was completed in 1897. Constructing the railway entailed acquiring a predominately 40-foot right-of-way that was sufficient for the 3-foot wide, narrow gauge rail line and to provide areas for sidings (i.e., auxiliary track permitting trains to pass on the main line) and stations. Services ceased and the railway was abandoned in December 1947. Railroad use waned after World War II when heavy use by the military during the war and post-war periods began to decline and use of the railway was eclipsed by motorized vehicles and improved public roads. Another contributing factor was damage caused by the 1946 tsunami (Yent 1991a: 6). Damage to the tracks and supporting infrastructure were particularly severe at Ka`ena (Fig. 18).

Alignment of the main railway bed is still visible throughout its route as it crosses Ka`ena Point and takes a major turn to round the point (Fig. 17). No traces of the tracks or railroad ties remain. Most of the distinct remnant features of the railway bed were constructed to maintain the shallow or level grade of the railway. In some sections the bed was raised with earth and coral fill (Fig. 19) while in other sections the ridge slope was cut and the fill faced with stone retaining walls (Figs. 27 and 28). Another major feature is a deep cut excavated through the lower slope of the ridge where the railway alignment bends to round the point (Fig. 23). Tailings from this excavation are still visible, either spread or heaped, along the *makai* side of the cut (Fig. 24). Also remaining intact are several sections that were paved with stones or limestone slabs to help stabilize the bed and support the tracks (Fig. 26). Culverts or small bridges, some with stone-work facings, were also constructed along raised sections of the railways bed where it crossed natural drainages.

A number of stone walls also line segments of the railway alignment. Some appear to serve as retaining walls and were variously constructed of water-worn stones taken from the beach (Fig. 21), talus boulders (Fig. 20), or angular stones that could have been extracted from the excavated trench (Fig. 22). A low, free-standing wall parallels some fairly lengthy stretches of the railway alignment both at Ka`ena Point and west of the point (Fig. 25). The function of these walls is not clear. Alone they are not high enough to exclude cattle, horses, or goats that may have been grazing near the track. They may have simply defined the edge of the right-of-way.

In addition to the main railway line, a 15-car siding track once ran from the northern side of the bend towards the point. It is depicted on the 1929 and 1940 topographic maps of Ka`ena (Figs. 17) (U.S. Geological Survey 1929, Army Corps of Engineers 1940) and was presumably used as a supplemental track to allow trains to pass or to temporarily park railroad cars. No physical evidence of this siding was apparent during the field inspection nor can a route resembling it be found on recent aerial photographs. The bed for the siding and any associated features may have been obscured by use of a similar easement that provided access to the Coast Guard Reservation established for the point's beacon light.

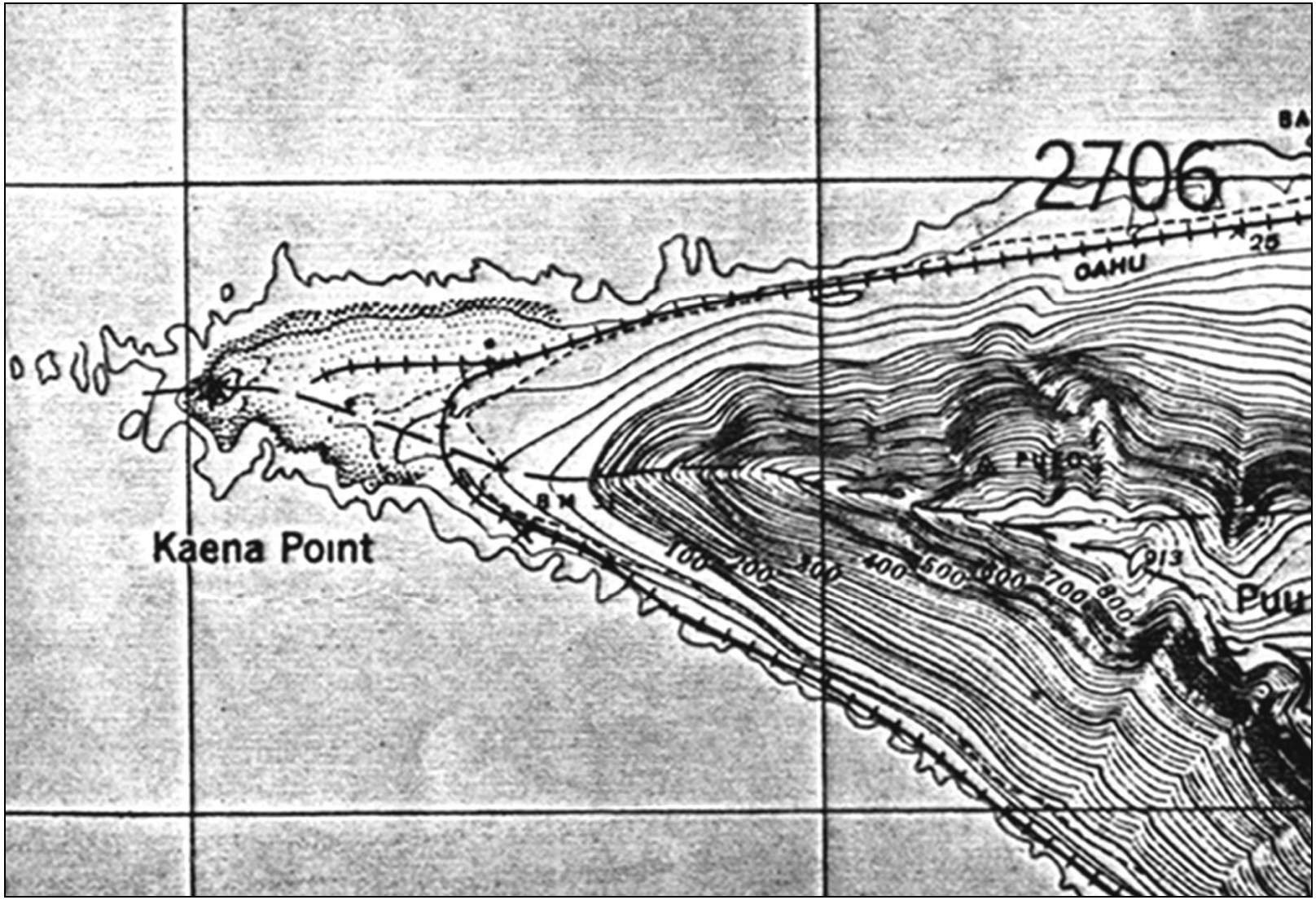

Fig. 17: Route of OR&L Railway as Shown on 1940 Kaena Quadrangle (Army Corps of Engineers 1940). Note siding track extends west of the primary railway alignment and a trail or unimproved road parallels the railway. Depiction of railway and trail are almost identical to that shown on the 1929 Kaena Quadrangle (U.S. Geological Survey 1929).

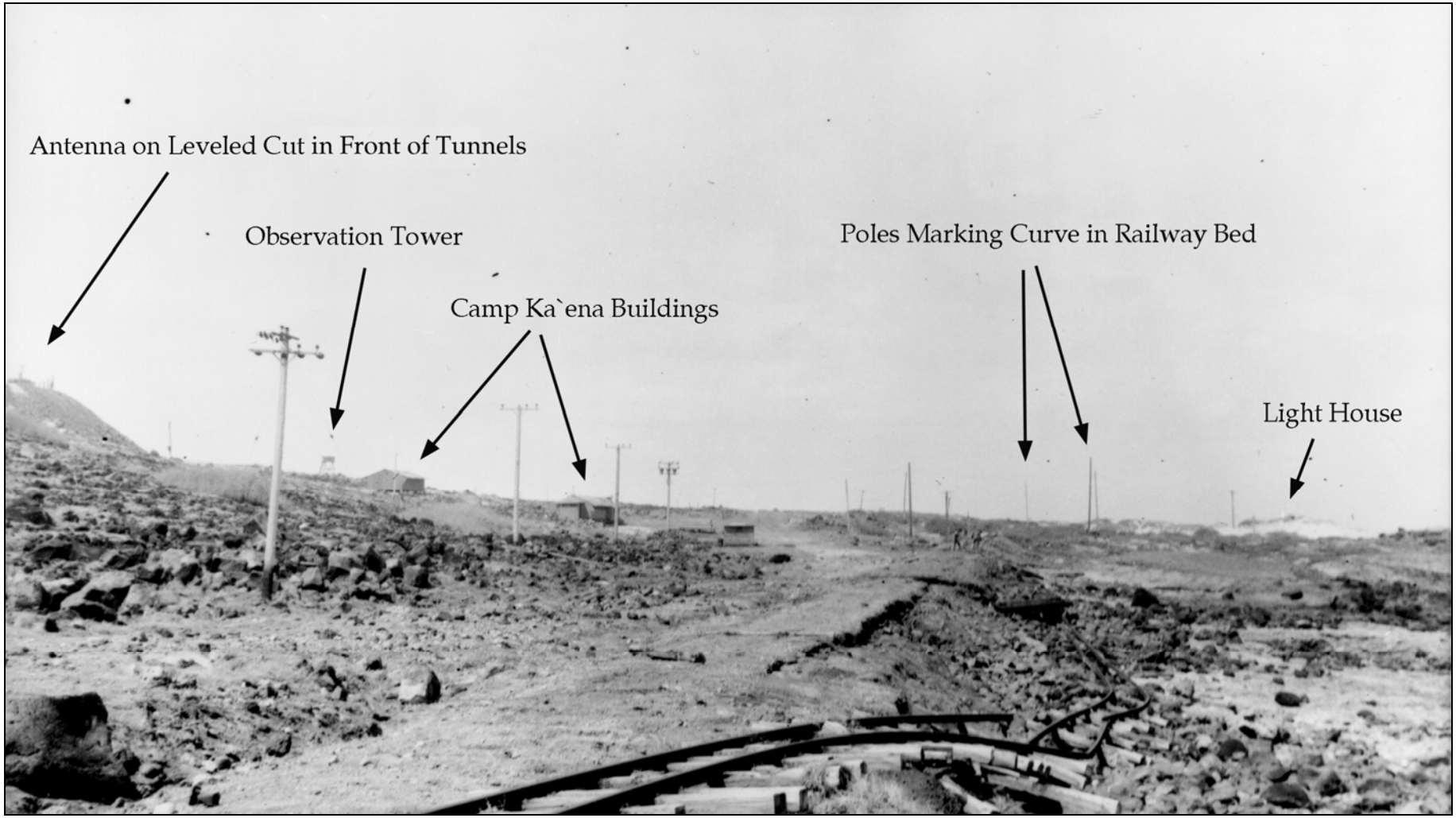

Fig. 18: 1946 Tsunami Damage to Railway at Ka`ena Point (Facing Southwest). Photograph by Kent W. Cochrane (Bishop Museum Neg. No. CN47052). Annotations identifying various features added.

Fig. 19: Raised Railway Bed Alignment near Northeastern Extent of the Project Area (Facing Northeast)

Fig. 20: Low Rock Wall Paralleling Railway Alignment near Southern Extent of Project Area (Facing Southeast). Note gravel tailings from tunnel construction upslope and white gunite coating the BCN-409 Southern Tunnel entrance.

Fig. 21: Rock-Faced Retaining Wall for Railway Bed Southeast of the Project Area (Facing Northwest)

Fig. 22: Close-Up of Rock Retaining Wall for Railway Bed (Facing Southeast).

Fig. 23: Railway Bed Cut at Major Bend in the Right-of-Way (Facing North).

Fig. 24: Tailings from Railway Alignment Cut (Facing North).

Fig. 25: Limestone Slab Pavement on Railway Bed near Southern Extent of Project Area (Facing Southwest).

Fig. 26: Rock Retaining Wall along *Mauka* Edge of Railway Bed near Northern Bend in the Alignment (Facing Northwest). Note use of water-worn stones.

Fig. 27: Rock Retaining Wall along Edge of Railway Alignment near Northeastern Extent of the Project Area (Facing Southeast).

Fig. 28: Rock Retaining Wall along *Makai* Edge of Railway Bed near Northern Bend in the Alignment (Facing North). Note use of angular stones.

At least one individual, Robert L. Meyer, was living at Ka`ena Point after the railway began operating in 1897. He, his wife, and son were said to live "in a shack he built near a rock called Leina Kauhane" (McGrath, Brewer, and Krauss 1973: 84; Hammatt, Shideler, and Borthwick 1993: 17). An expert throw-net fisherman, Meyer would give the railroad engineers fish in exchange for water or other necessities. No remnants of his house site have been found to date but it remains a possibility.

Ka`ena Point Military Reservation (1923 to 1964)

The greatest and most lasting impacts on Ka`ena Point's landscape can be attributed to construction of military defense facilities beginning in 1924 and continuing through 1946 (Bennett 2005). The strategic location of the island's western-most point and its well-positioned promontories were recognized as coastal defense plans were being prepared after World War I and when defense outposts were rapidly intensified and expanded after the 1941 attack on Pearl Harbor. The remnant military structures and altered landscape features at Ka`ena Point represent both major phases in the development of O`ahu's defense infrastructure. Of these, four complexes of structures and associated features still exist within or near the project area and a fifth might be identified with additional inspections. These include fire control and base end stations built on a ridge knoll in 1924 and 1934; a search light position established in 1942; an early-warning radar station that was in operation by 1942; a cantonment established in 1942 for military personnel manning the various operations, and a battery begun in 1943. These complexes are a testament to advances made in defense technologies and strategies over a 22-year period and to their sometimes rapid obsolescence. Use of what became the Ka`ena Point Military Reservation declined after World War II when it was used primarily for "squad and company-sized maneuvers" (Bennett 2005: 100). In 1984, a portion of the Reservation was declared excess property and deeded to the State of Hawai`i for park purposes.

Fire Control Station "S"

The first defense feature constructed at Ka`ena Point was the fire control station designated Station "S" (Figs. 29 and 30). Built in 1924, this reinforced-concrete station with observation slits (8 feet wide; 13 feet deep) was located below Pu`u Pueo at an elevation of 573 feet (Bennette 2005: 75). Station "S" was part of a network of artillery fire control stations established around O`ahu on various ridges and promontories. Observations from these stations were used to triangulate and plot the position of enemy ships which would then be conveyed to the assigned Coast Artillery battery for firing. As part of the Coast Artillery District's Coastal Defense of Pearl Harbor, position data from Station "S" were transmitted to Battery Williston, Fort Weaver, on the west side of Pearl Harbor's entrance channel (Bennette 2005: 75). Telephone communication wires, probably buried within the railway easement, were used to transmit data from Station "S" to Battery Williston and to other stations within the system. Mules were used to haul construction materials to the site given the absence of suitable roads.

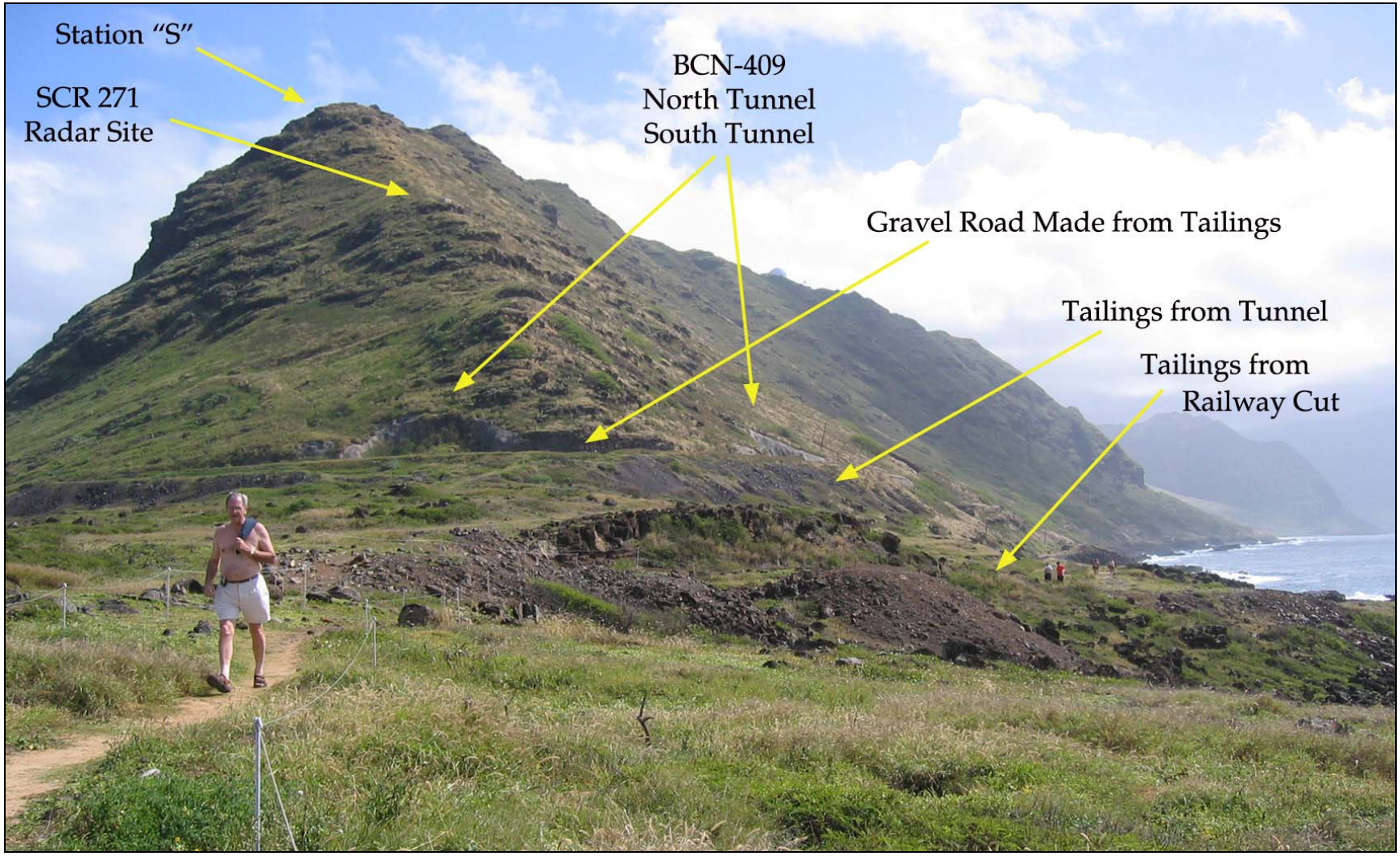

Fig. 29: Major Military Structures and Landscape Modifications and Tailings from Railway Cut (Facing East).

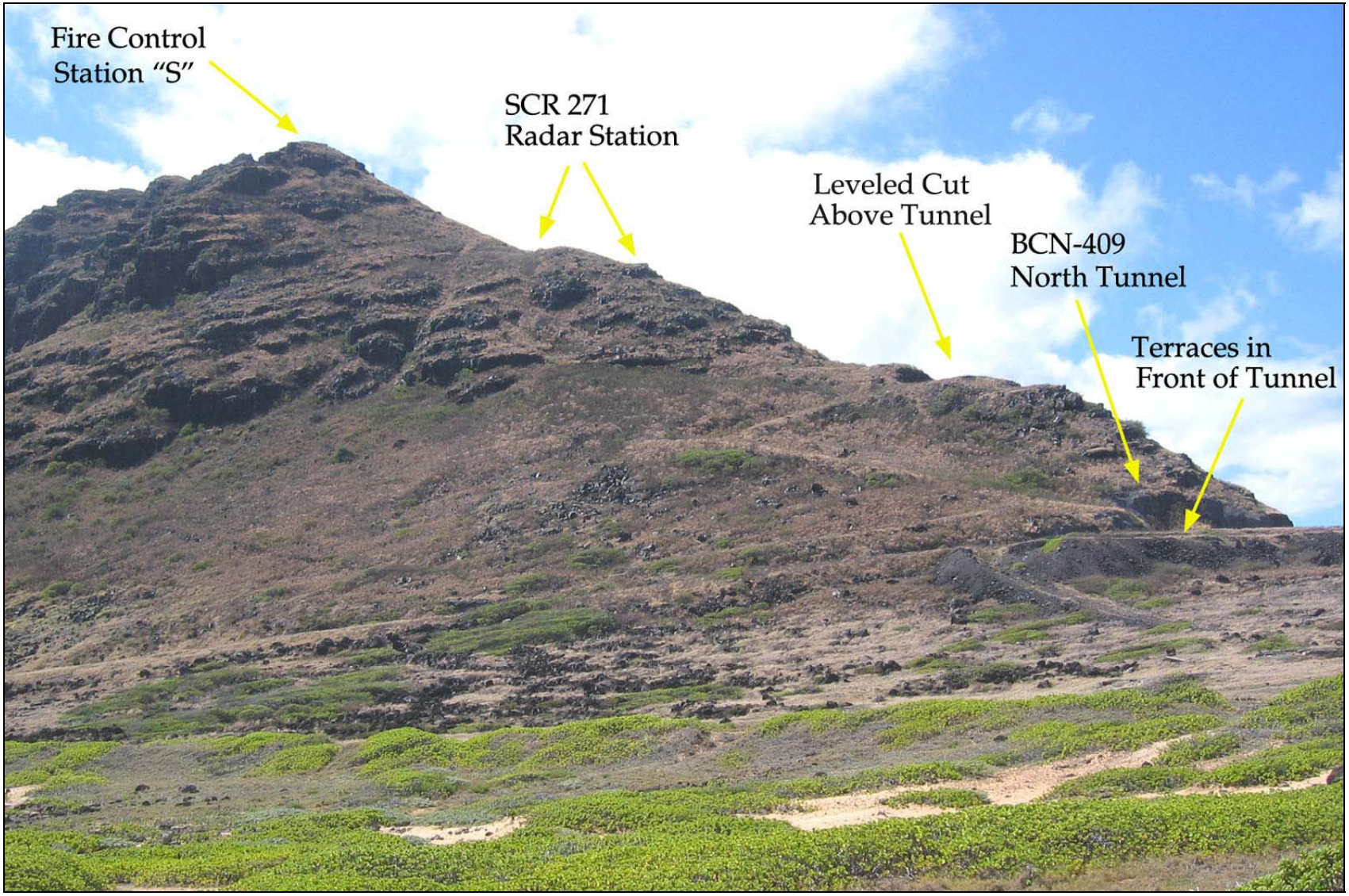

Fig. 30: Locations of Major Military Structures and Landscape Modifications (Facing Southeast).

Construction of Station "S" was part of a larger plan to expand and upgrade O`ahu's coastal defense systems prompted by accelerated technological advances in armament and firepower made during World War I (Thompson 1980: 71). As with earlier defense systems, some constructed on O`ahu as early as 1907, these plans focused primarily on protecting Honolulu Harbor and Pearl Harbor and were conceived to defend from attacks by sea (Dorrance 1995). These harbors were viewed as vital to the United States military presence in the Pacific and, given Hawai`i's relatively new status as a Territory, were considered potentially vulnerable to attack. This plan also included establishing a Ka`ena Point Military Reservation in 1923 (Bennette 2005: 75). After being expanded in 1924, the 114-acre Reservation included that portion of the point that lies between the railway easement and a ridge promontory (approximately 800-feet above sea level (Fig. 1).

Station "S" was expanded in 1934 when a double base end station was constructed directly below the original Station "S" fire control station (Bennette 2005: 76). This single story, reinforced-concrete station (16 feet wide, 15 feet deep) was built below ground and housed two observing instruments (i.e., depressed position finders) positioned to operate through three narrow observation slits under the roof overhang. Similar observing instruments and bunks were added to the original fire control station in 1936. The 1934 base end station was to send position data to the artillery unit at Battery Hatch, Fort Barrette, on Pu`u Kapolei until 1942 when it was reassigned to artillery positions at Batteries Brodie and Opaeula located inland of Hale`iwa. The concrete structures of the 1924 control station and the 1934 base end station apparently remain intact.

Camp Ka`ena

After the attack on Pearl Harbor on December 7, 1941 and the commencement of World War II, military personnel were almost immediately stationed at Ka`ena Point to man gun and searchlight positions (Bennett 2005: 79-82, 93-100). Defending the beaches from invasion and anti-aircraft defense became a priority in addition to supporting artillery fire aimed at off-shore vessels. In 1942, the initial military encampments became a more formalized cantonment (i.e., temporary or semi-permanent military quarters) with the construction of wooden structures and a water tank. Called Camp Ka`ena, the cantonment was located on the northeast side of the point in a relatively flat area inland of the railway (Figs. 18, 31, 35). At least four sets of concrete slab foundations from these buildings are still intact (Fig. 31) as is the foundation of a cylindrical, wooden water tank located upslope on the ridge (Bennett 2005: 79-80). Water was piped into the tank from the east along the OR&L easement. The cantonment supported not only detachments assigned to searchlight and gunnery positions, but housed infantrymen patrolling the beaches.

Searchlight Positions

A searchlight position was manned at Ka`ena Point between January 1942 and January 1945 by three sequentially assigned battery detachments (Bennett 2005: 93). During World War II, searchlights were primarily installed in case of night attacks by enemy aircraft. They also provided fire control data during night attacks by sea or could

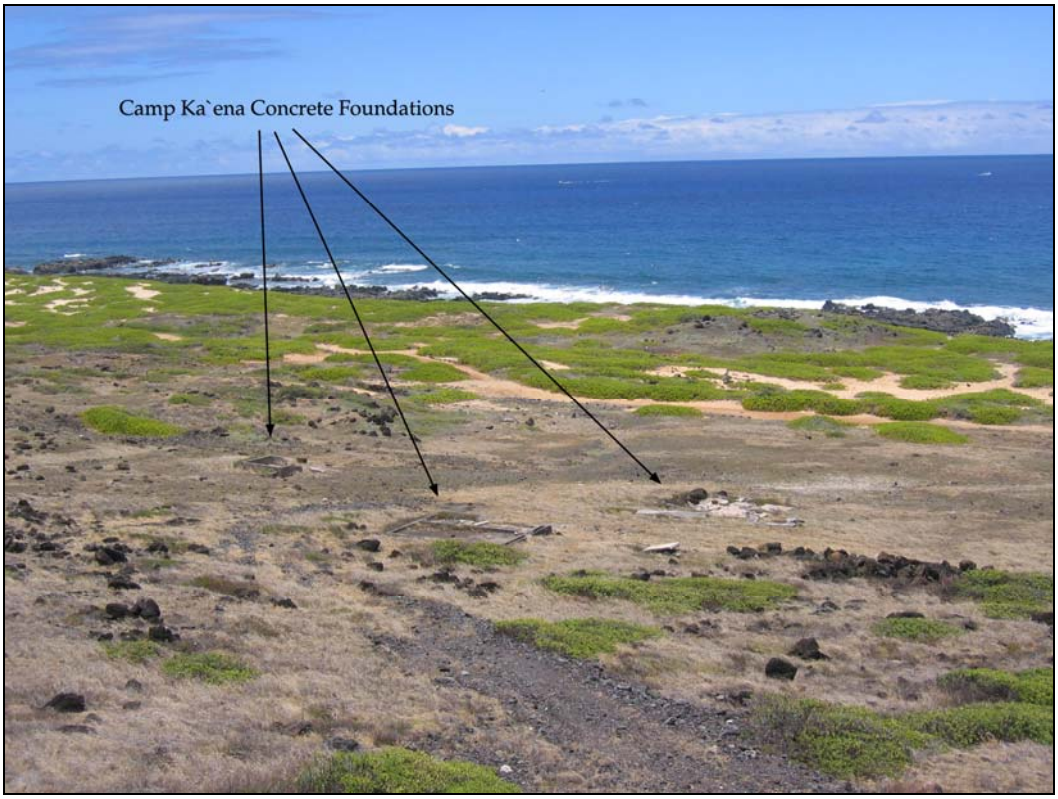

Fig. 31: Concrete Foundations for Camp Ka`ena Structures First Established in the 1920s (Facing Northwest).

Fig. 32: Sealed Entrance to BCN-409 Northern Tunnel (Facing Northeast). Note Ridge Cuts Stabilized with Pressure-Sprayed Gunite.

Fig. 33: Edge of Terraced, Cut and Fill Road Bed Stabilized with Pressure-Spray Gunite (Facing Southeast).

Fig. 34: Gunite-Coated Retaining Wall along Cut and Fill Gravel Road Beyond BCN-409 Southern Tunnel (Facing Northwest).

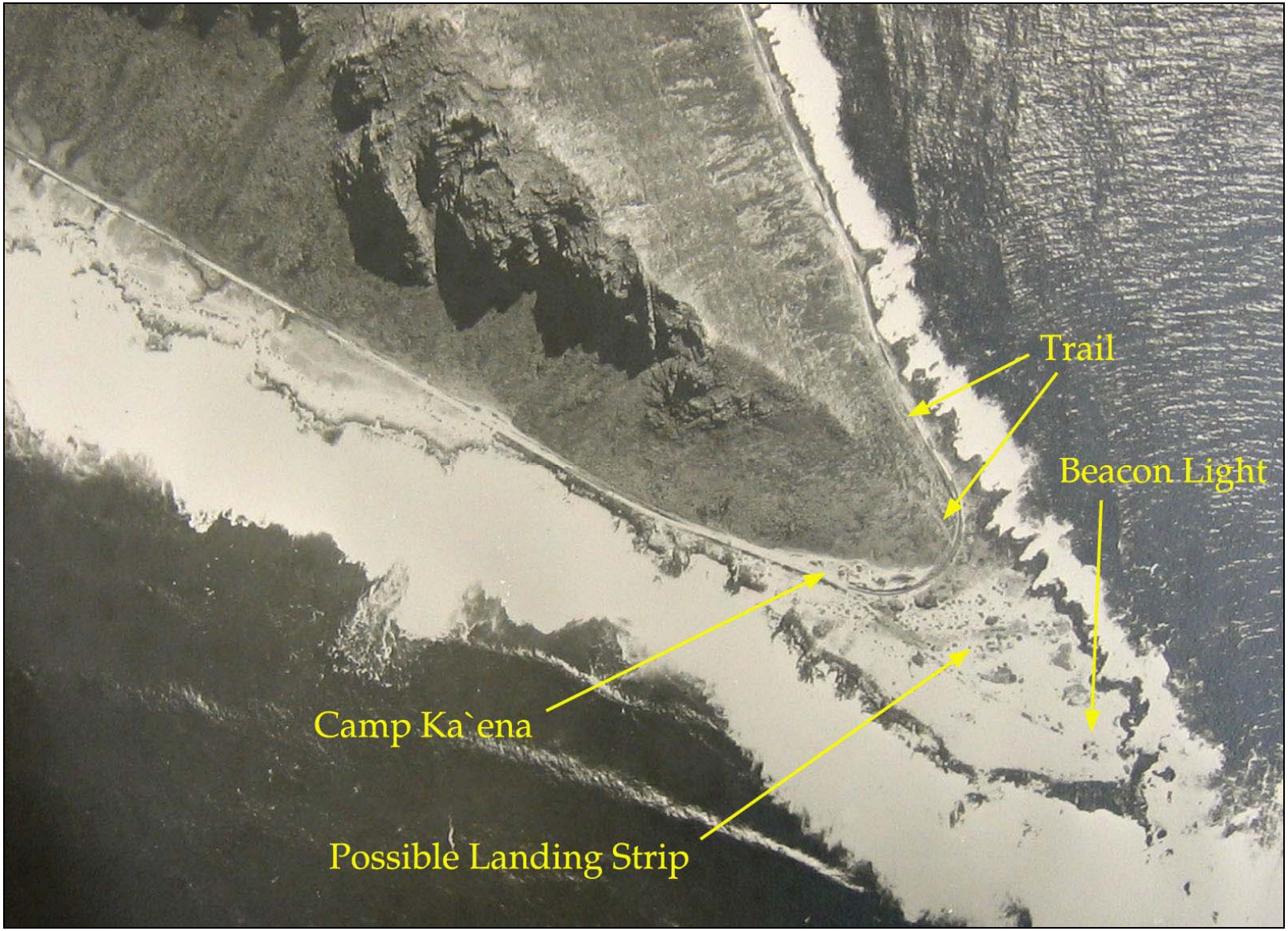

Fig. 35: Location of Possible Landing Strip, Trail, Camp Ka`ena and Beacon Light on 1939-1940 Aerial Photograph of Ka`ena Point.

artificially light areas during night battles. The positions of incoming plans or ships could be determined through triangulation when pairs of searchlights were spaced at known distances from each other. Plans were prepared in 1940 for a "Searchlight Position Trail" at Ka`ena Point, but it isn't clear that the "Trail" was constructed as designed. The "Trail" was to be 750 feet long and 10 feet wide with two shelves (21 by 21 feet) for the mobile 60-inch, 800 million-candle power lights (Bennett 2005: 93). When in position, the searchlights were placed in concrete slabs bound by low walls.

Two ancillary buildings were also planned. One was to be "a single, story; two room reinforced-concrete controller booth" and the other a concrete shelter for the generator powering the lights (Bennett 2005: 93). The "Trail" was to be located at an elevation of 100 feet. Additional field work is needed to determine if any altered areas or remnant features matching these descriptions can be found between the railway and the BCN-409 tunnels and gravel road.

Radar Stations

A temporary radar station (SCR-268 radar set) was established at Ka`ena Point soon after the attack on Pearl Harbor. The 14 man-crew assigned to the station stayed in "a makeshift rock shelter built with a 6 by 12 inch beam as a ridge pole and corrugated iron roof paneling, covered with sand and rock" (Bennett 2005: 94). An additional hut was erected for the commanding 1st Lieutenant. Radar sets generally operated along side antiaircraft searchlights and gunnery positions. The unit was moved to Fiji by May 1942.

By October 1942, a permanent early-warning radar station had been constructed into the ridge approximately midway between Station "S" and the future site of the BCN-409 Battery (Figs. 29 and 30). Bomb proof tunnels were constructed to house the SCR-271A fixed radar and other equipment needed to run the station (Bennett 2005: 94-100). The primary operations tunnel (15 ft wide; 10 ft high; 100 ft long) was reached by an access tunnel (6 ft wide; 6 ft high; and 50 ft long) and was ventilated by a vertical shaft (4 feet square; 50 feet high). Communications cables were run through the vertical shaft to the radar antenna placed on top of a "100-foot latticed-steel tower affixed to four large reinforced-concrete piers" (Bennett 2005: 95) and to external communications equipment. The reinforced concrete housing unit and its pyramid-shaped roof that protects the vertical shaft are still visible along the ridge line from the northeastern side of the point. Also part of the complex is a 120 square feet, reinforced-concrete structure used for the station's communications equipment. As access to the station was difficult, a steel cableway was installed to carry materials and equipment to the site. The station was manned at least to 1949.

Battery Construction No. 49 (BCN-409)

By far the most ambitious and complex project undertaken at Ka`ena Point was construction of a battery designated "Battery Construction No. 409" (BCN-409) (Bennett 2005: 89-92). Begun in mid-1943, the facility was designed to support two 8-inch naval guns and army M1 barbette carriages. In general, these guns were intended to strengthen

coverage of coastal defense positions along the north and west shores of O`ahu. In particular, they were to defend against coastal landings and to provide additional protection for the Lualualei Ammunition Depot and Mokule`ia Airfield. BCN-409 was only 60% complete when the project was abandoned in 1945. A May 31, 1945 study of seacoast battery requirements determined that batteries of this type could not withstand attack by "modern" air or naval bombardment. Given technological advances made during World War II, the design of these batteries did not provide sufficient overhead protection for the guns and they were therefore unable to meet the needs of a seacoast defense system of the time (Bennett 2005: 91).

The design of BCN-409 called for construction of two gun emplacements; a tunnel complex excavated into the ridge at an elevation of 125 feet; a gravel access road and level work areas; and a battery commander's station. The tunnel complex, designed to house all support operations, powder magazines, and electrical generators and compressors, was composed of two access tunnels connected internally by two traverse tunnels. All chambers were 15 feet high and 15 feet wide. The northern access tunnel was the longest at 200 feet; the southern access tunnel extended underground for 40-50 feet; and the two traverse tunnels were 75-85 and 100 feet long (Bennett 2005:89-90). The tunnel entrances were spaced 300 feet apart and were accessed by an 18 foot-wide, 2,483 foot long gravel road that approached the tunnels from the northwest (Figs. 29, 30, 32, 36 and 37).

Given the elevation of the tunnel entrances on the ridge slope, a substantial amount of cut and fill was needed to create an appropriate grade for the access road and to provide a level maneuvering area in front of the tunnel entrances (Fig. 29 and 30). This resulted in an artificial terrace being formed along much of the ridge face and a second, lower terrace just northwest of the north tunnel entrance (Fig. 33). Tailings from tunnel excavations were used as fill for the road and terrace. Some terrace segments were faced with stone retaining walls coated with gunite (Fig. 33 and 34) and gunite was pressure-sprayed over the ridge cuts at each tunnel entrance to stabilize the exposed faces and minimize rock fall (Fig. 32).

According to the plans, the two guns were to be placed on open concrete pads at an unknown distance from the tunnel entrances (Bennett 2005: 89-90). The concrete gun aprons were apparently completed before suspension of the project but construction was never started on the reinforced-concrete underground magazines needed to support each emplacement. The battery commander's station, located "some distance above BCN-409's tunnels," was also not completed although the floor and walls of the station were installed (Bennett 2005: 90).

Most of the completed project components of BCN-409 are still recognizable and basically intact. The tunnel entrances have been sealed and the gunite coating on the slope cuts at the tunnel entrances is deteriorating and beginning to crumble (Bennett 2005: 100). The access road and terrace features created to provide access to the tunnels and level working areas near tunnel entrances are intact as are the piles of tailings that also form the sloping faces of the terrace (Figs. 29 and 33). Additional field inspections

would be needed to locate the concrete gun aprons for the 8-inch guns and the completed floor and walls of the battery commander's station.

Emergency Landing Strip and Other Activities

Bennett's document review of military activities at Ka`ena Point also indicates that significant portions of the point could have been altered by activities that did not leave clearly identifiable or facility specific features. This was particularly true just before and during World War II. One example is an emergency landing strip apparently staked out prior to World War II (Bennett 2005: 78). Construction was not completed but a cleared strip on 1939-1940 aerial photographs may represent these initial efforts (Fig. 35). This strip and the once clear easement to the beacon light have been obscured over time by sand and vegetation. Most of the ground disturbing activities at Ka`ena Point can probably be attributed to activities associated with camps and the routine operations of troops stationed at the point to run established defense facilities or to work on construction projects.

Beacon Light

In 1920, three years before the Ka`ena Point Military Reservation was established, the U.S. Lighthouse Service installed a beacon light at Ka`ena Point (Yent 1991a: 1). Also called a "Passing Light," the rotating beacon was placed on top of a 65-foot, reinforced concrete, white pyramidal tower that was constructed on the elevated sand knoll near the point (Yent 1991: 1; Bennett 2005: 100). It was replaced in 1990 by a new beacon placed on top of a 30-foot steel pole. The concrete tower supporting the original beacon was toppled and now lies directly north of the new beacon (Fig. 6). Being 77 years old, the toppled concrete tower is a historic property. The United States Coast Guard maintains the beacon and has jurisdiction over the one-acre parcel on which it sits (TMK: 6-9-02: 9) (Fig. 2 and 3).

Recommendations

Available information and the field inspections clearly demonstrate that there are significant historic properties within or near the proposed predator control fence and within the probable "area of potential effect" [36 CFR 800.4(a)(1)]. It was also clear during field inspections that the initially proposed fence alignment does avoid many of the identified historic properties at Ka`ena Point and could be routed to minimize its effect on other properties (Tables 2, 3 and 4). This assessment, however, can only be finalized after consultation with those individuals and organizations that may better understand the significance of these historic properties and can help determine which mitigation measures, if any, are appropriate.

The following is intended to provide guidance for determining the final fence alignment, for identifying those agencies, organizations and individuals that should be consulted, and for addressing two particularly critical steps in the federal historic preservation

Table 2: Summary of Identified Native Hawaiian Historic Properties and Project Identification and Mitigation Measures

Known Native Hawaiian Historic Properties		**Known and Potential Locations**	**Project Identification and Mitigation Measures**
Cultural Deposits or Scatters (midden, artifacts)		Known: Sand dunes near point Possible: Sand dunes and sandy soils Scattered deposits could be on rocky flats and slopes	Project avoids sandy areas Survey project area for cultural deposits or scatters Determine mitigation if found (e.g., avoid, record, data recovery)
Burials		Known: Sand dunes near point Possible: Sand dunes and sandy soils Burials in platforms and small caves on rocky slopes	Project avoids sandy areas Survey project area for platforms or caves inland Avoid if found (contingent on §6E-43, HRS)
Stone Wall Foundations		Known: Sand dunes near point Possible: Sandy areas or on rocky slopes	Survey project area for walls Determine mitigation if found
Fishing Ko`a (stone platforms)		Known: Rocky knoll near shoreline and inland on rocky slope Possible: Along shoreline or on slopes May be difficult to identify without knowledgeable individuals	Survey project area for small platforms or upright stones Avoid if found Minimize project's visual and cultural effects
Pohaku o Kaua`i (traditional cultural property)		Known: Partially submerged off-shore rock forming western-most point of O`ahu	Probability of property being affected by project low given distance from project area
Leina ka `Uhane (traditional cultural property)		Known: Limestone formation near shoreline	Near proposed fence line Avoid visual and cultural effects to extent possible

Table 3: Summary of Potential Native Hawaiian Historic Properties and Project Identification and Mitigation Measures

Potential Native Hawaiian Historic Properties		Potential Locations	Project Identification and Mitigation Measures
Fisherman Shelters and Caves		Known: Historic accounts (*See* house foundations; cultural deposits) Possible: Along shoreline or inland; particularly near canoe landings	Survey project area to identify evidence of shelters and settlements Determine mitigation if found (e.g., avoid, record, data recovery)
Canoe Landings		Known: Historic accounts Possible: Along shoreline where topography and in-shore conditions favorable	Identify potential landings by examining shoreline topography and user knowledge Avoid if definitively identified
Salt-Making Areas		Known: Historic accounts Possible: Rocky shoreline areas amenable to salt collection and drying (within range of sea spray; cluster of crevices and depressions)	Identify rocky areas suited to salt collection with knowledgeable users Avoid if definitively identified
Net Mending and Drying Areas		Known: Historic accounts Possible: Possibly flat, open areas along shoreline near canoe landings or areas suited to net fishing	Identify potentially used areas with knowledgeable fisherman Difficult to identify with certainty
Fishing Basket Locations		Known: Historic accounts Possible: Submerged areas on rocky off-shore bench suited to basket traps and *kala* and *hinalea* habitat	Identify suitable areas with knowledgeable fisherman Probably outside project area
Trails		Known: Historic accounts Possible: Routes parallel coastline along ridge slope or cross point to link desired destinations; may be obscured by subsequent uses (roads, railway, modern trails)	Survey project area to identify trail segments and associated features Probability low given subsequent uses of similar routes Determine mitigation if found
House Foundations		Known: 1930 account places foundations inland of railway Possible: Lower ridge slopes; areas subsequently modified by military use	Survey project area to identify house site remnants Probably destroyed by military use Determine mitigation if found
Heiau (Kuaokala)		Known: Historic documents place on knoll along high ridge overlooking Ka`ena Point; it may no longer exist	Low probability of being affected by project given distance and height above project area

Table 4: Summary of Known and Potential Post-1850 Historic Properties and Project Identification and Mitigation Measures

Associated Historic Period or Use		Known and Potential Historic Properties or Component Feature	Project Identification and Mitigation Measures
Pasturage and Ranching (1850-1940s)		Known: None; historic accounts Possible: Walls, walled enclosures, corrals Fences, fence posts, fencing wire, gates	Survey project area for remnant ranching structures and objects Determine mitigation if found (e.g., avoid, record, data recovery)
OR&L Railway (1897-1947)		Known: Continuous railway bed alignment and siding Raised railway bed (rock, earth or coral fill) Retaining walls (on slope cuts or fill embankments) Stone and limestone slab paving Trenched railway bed cut and tailings from excavation Ridge cut and fill formations Rock wall paralleling railway Possible: Culverts Bridge foundations Railway ties or rails Shack (Meyer residence near railway)	Project sited to cross railway alignment where character-defining structures or modifications are absence Survey project area to verify absence of railway features
Ka`ena Point Military Reservation (1923-1965)		Known: Fire Control Station ""S" and back end station (concrete structure; fixtures) Camp Ka`ena (concrete foundations) SCR 271 Radar Station (concrete structures; excavated tunnels) BCN-409 Battery Excavated tunnels and fixtures Tunnel entrances with gunite coating Gravel access road made of tailings and fill Terraced operations areas by tunnel entrance Tailings from tunnel excavation Bulldozed tracks and leveled areas Passing Light (beacon, concrete pyramidal tower) Possible: Searchligh positions Various camp sites Miscellaneous operations sites, maneuver areas Landing strip	Most known historic military features are outside the proposed project area Project will affect BCN-409 Battery directly and indirectly Survey final fence alignment to determine features affected Document gravel access road, tailing slopes, and terraced features if crossed by the fence prior to installation Provide interim protection for tunnel entrances and terrace features during construction Minimize visual effect on BCN-409

review process. Both steps are important to generate a record demonstrating compliance with Section 106 of the National Historic Preservation Act.

Recommended Fence Alignment and Mitigation Considerations

In preliminary project proposals, the preferred alignment for the predator control fence primarily follows the broad gravel road constructed between 1943 and 1945 to provide access to the BCN-409 battery tunnels (Figs. 36 and 37). This road is convenient for several reasons. It already provides a level, previously-disturbed foundation for the fence line and its position on the lower, rocky slope of the ridge avoids the sandy deposits and soils where the sea birds nest. Its relatively straight north-south alignment along the lower ridge slope would effectively cutoff most of the point for predator control purposes (Fig. 1 and 3).

In terms of historic properties, this alignment is also advantageous because much of it was highly disturbed during World War II and it avoids the sand dunes and sandy soils in which subsurface cultural deposits and burials are a higher probability. Construction and use of the road from 1943 to 1945 would have destroyed other sites or features associated with preceding periods or uses. The following historic preservation issues, however, need to be addressed if this preferred alignment, or a modified version of it, is to be used.

- Leina a ka `Uhane: The limestone formation named Leina a ka `Uhane is located near the northern end of the gravel road where the road turns east (Fig. 36). While the formation itself can be avoided, increasing the distance between the fence line and the formation will be constrained by the steep slope immediately inland (Figs. 8 and 12). The fence line will have a visual effect on this traditional cultural property and its setting and may also affect cultural beliefs and practices associated with Leina a ka `Uhane. These effects need to be considered during the review process. Another constraint is posed by the possible shrine located upslope of the formation (Feature 5, Site No. 50-80-03-1183) (Figs. 11 and 12).

- OR&L Railway Bed: The fence line needs to cross the OR&L Railway bed near the shoreline at its northern and southern extent. At both ends, sections of the railway bed were found that can be crossed without altering any of the character-defining features constructed to create the desired grade of the bed (e.g., raised railway bed, trenches, stone retaining walls) or any of the segments with paving slabs (Fig. 38). Using these identified segments would minimize the effect of the fence on the historic integrity of the railway bed and its associated features.

- Stone Wall Paralleling Railway Bed: On the southern end of the proposed alignment, the fence would need to breach a low stone wall which parallels the railway (Fig. 39). The length of the wall and its location make it impossible to avoid. The breach would, however, only remove one, relatively small section of the wall and not a segment that is particularly unique or exemplary. The wall should be mapped and photographed as a mitigation measure if breached.

Fig. 36: Gravel Road Constructed during World War II to Provide Access to BCN-409 Tunnels (Facing Northeast). Proposed fence would follow road bed. Note Leina a ka `Uhane in the background.

Fig. 37: World War II Gravel Road near Northeastern Extent of Proposed Fence (Facing Southwest). Note Leina a ka `Uhane to the left of photograph

Fig. 38: Down-Slope View of Potential Fence Alignment on Southern Shoreline (Facing Southwest). Crossing the railway at this point avoids modified railway bed.

Fig. 39: Up-slope View of Potential Fence Alignment on Southern Shoreline (Facing North). Installation would require breaching of low stone wall.

Battery BCN-409: The gravel road is itself a historic property in that it is over 50 years old and is part of the Battery BCN-409 complex which is the dominant expression of Ka`ena Point's military history. The fence, however, would not irreparably alter the integrity of this complex if installed in a manner that does not disturb the complex's significant components (e.g., the tunnel entrances, gunite-coated facings, terrace retaining walls) and does not alter the fundamental formation or foundation of the road which is made of excavated fill and tailings. Where disturbance is unavoidable, road sections or features should be documented as a form of mitigation. Ideally, the fence should be installed in a way that allows the road's general appearance to be readily restored if the fence is removed at sometime in the future.

Consultation

Regulations implementing Section 106 of the National Historic Preservation Act (36 CFR Part 800) require an agency (or those acting on its behalf) to consult with a number of parties concerning the potential effects of a project on historic properties. Recommendations concerning consultation for this project are outlined below:

- Hawai`i State Historic Preservation Office (SHPO): The SHPO needs to be consulted throughout the Section 106 review process. At this stage, a letter should be sent to SHPO inviting it to comment on the project and on historic properties in the area. This summary report could be submitted with the letter as background.

- Native Hawaiian Organizations: In Hawai`i, federal agencies are required to consult with any Native Hawaiian organization that "attaches religious and cultural significance to historic properties that may be affected by an undertaking" [36 CFR 800.2(c)(2)(ii)]. As with the SHPO, a letter inviting comment or participation in the process should be sent to the Office of Hawaiian Affairs and any other appropriate native Hawaiian organization identified during the project outreach effort. This summary report could be submitted with the letter as background.

- Knowledgeable and Concerned Parties: Consultation should also occur with a range of individuals, organizations, or agencies that may have knowledge of the project area and its history. The current outreach effort being undertaken for this project provides a good opportunity to identify such parties. A record of your outreach efforts and the historic preservation issues raised during this process will help characterize the consultation effort.

- Hawaiian Railway Society: The Hawaiian Railway Society should be contacted for their expertise on the history of Hawaii's railways and any insight members may have on the function or uniqueness of features associated with the railway at Ka`ena Point.

- Coastal Defense Study Group: John Bennett, a member of the Coastal Defense Study Group and author of the article summarizing Ka`ena Point Military Reservation's history, should be contacted. His assessment of the significance or uniqueness of the remaining military features at Ka`ena Point would be invaluable. He may also know other individuals that are interested in the point's military history or have specific expertise to offer.

Inventory Survey and Memorandum of Agreement

If the project proceeds, the following two steps in the historic preservation process are of particular importance when planning the overall project. They broadly encompass many, but not all, of the technical steps needed to complete the Section 106 compliance process.

- Conduct Inventory Survey of Final Alignment: Once the final preferred alignment is determined, a historic properties inventory survey should be conducted of that alignment and all areas that will or could be disturbed during installation of the fence. This includes all ground disturbing activities needed to create the fence foundation, to install the fence, and to stage equipment and machinery. The survey should verify which historic properties will be directly affected by these construction-related actions and should provide sufficient information on these sites to evaluate their significance and propose appropriate mitigation measures (e.g., avoidance, documentation, monitoring, stabilization, etc.).

- Section 106 Memorandum of Agreement: Under the regulations that implement Section 106 (NHPA), the agency is to enter into a MOA with the State Historic Preservation Office and other parties involved in the project if that project will adversely affect significant historic properties. Other interested parties or organizations may be included as concurring parties. Such adverse effects appear to be unavoidable in this case because the most feasible route for the fence, at a minimum, runs through a historic military complex and passes near a significant traditional cultural property. Stipulations in the MOA define what steps will be taken to avoid or reduce these effects and to document those properties or features of a complex that will be altered. In this case, it is particularly important to address what measures will be taken to address the visual impact of the fence because altering the setting of a historic property or interrupting associated view plans can diminish the historic integrity of the property.

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APPENDIX D

Brochure: Ka‘ena Point Natural Area Reserve Ecosystem Restoration Project

How can I help?

There are a number of ways you can help:

- Keep pets at home when visiting the reserve
- Stay on the trail
- Keep motorized vehicles out of the reserve
- Pack all trash out
- Respect cultural sites
- Volunteer on service projects for trail maintenance and weed pulling
- Give us your input and ideas about a predator-proof fence to kaenapoint@yahoo.com

Black-footed Albatross and Red-tailed Tropicbirds are two species that could return to Ka`ena

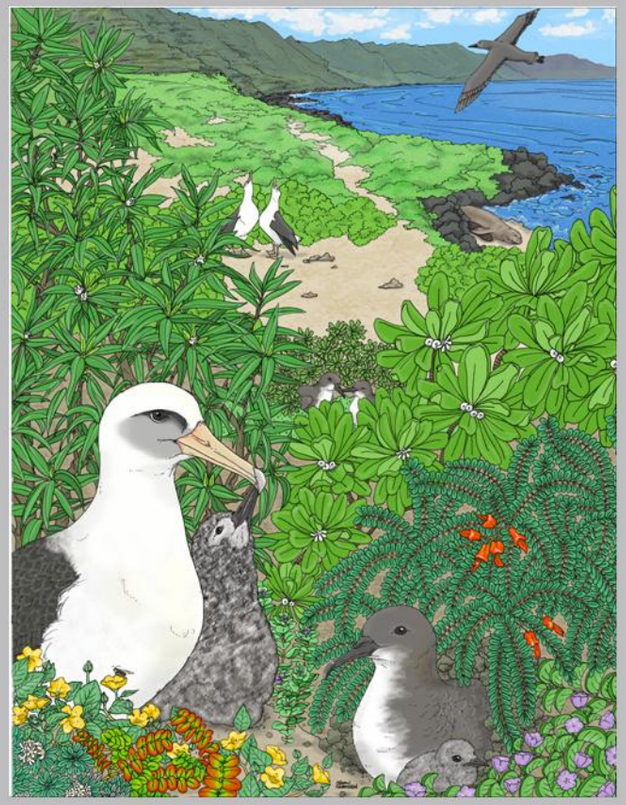
For more information on this project please e-mail:
kaenapoint@yahoo.com
Or Write:
DLNR Natural Area Reserves System
1151 Punchbowl St
Honolulu, HI, 96813

Cover Drawing: Naomi Swenson

Photo Credits: Lindsay Young, Eric VanderWerf, Norine Yeung, Pat Aldrich, Xcluder Pest Proof Fence company and Google Earth.

KA`ENA POINT
Natural Area Reserve

Ecosystem Restoration Project



DIVISION OF FORESTRY AND WILDLIFE
1151 Punchbowl Street, Room 325
Honolulu, Hawaii 96813
Phone : (808) 587-0166 | Fax : (808) 587-0160

U.S. Fish and Wildlife Service
Pacific Islands Field Office
Honolulu, Hawai`i

THE WILDLIFE SOCIETY
HAWAII CHAPTER

Forever Ka`ena

Ka`ena Point is located at the very northwest tip of the island of O`ahu. It is about 10 miles west of Waialua on the North Shore and 10 miles north of Wai`anae on the leeward coast. Within this area is the 59-acre Ka`ena Point Natural Area Reserve, owned and managed by the Hawai`i Department of Land and Natural Resources.

Ka`ena Point Natural Area Reserve as seen from above

Island of O`ahu, Hawai`i

A cultural resource

People have been a part of Ka`ena Point for generations. Many trace their ancestors to this special place. Within the reserve is leina a ka `uhane (Spirit Leap), which is considered to be a wahi pana, a celebrated legendary place. Early Hawaiians used Ka`ena Point for fishing and feather collecting. Today, people of various cultures visit Ka`ena Point for fishing, hiking, bicycling, and other recreational and educational activities.

The wildlife of Ka`ena

Ka`ena Point is an excellent example of the type of ecosystem that can be found in Northwestern Hawaiian Islands. The difference is that anyone on O`ahu can drive to Ka`ena Point to see this spectacular display of plants and animals.

- It is home to nesting seabirds, monk seals, and other native coastal species.
- One of the largest seabird colonies in the eight main Hawaiian Islands is found here. Recent surveys have estimated approximately 2,000 seabirds use Ka`ena Point as their breeding grounds, and many more than that use the area as a place of refuge.
- With adequate protection, it has the potential to become a safe haven for many more species of Hawai`i's seabirds, plants, and insects that cannot survive elsewhere.

Threats to wildlife at Ka`ena

What is threatening the wildlife at Ka`ena?

Rats and Mice: Observations from Hawai`i and around the world have shown that rats will eat seabird eggs and chicks, and even attack adult birds. Scientists estimate that rats have caused 40-60% of all bird and reptile extinctions on islands worldwide. Rats and mice also eat native plants and seeds.

Sandalwood seeds eaten by Rodents at Ka`ena Point

Shearwater chick killed by rats

Mongoose, Cats, and Dogs: At Ka`ena Point in 2006 15% of Wedge-Tailed Shearwater chicks were killed by these predators, and in 2007 13% of Laysan Albatross chicks were also killed. These birds nest on the ground and are extremely vulnerable, especially if they cannot yet fly.

Over 100 Wedge-tailed Shearwaters killed by dogs and cats in 2006 at Ka`ena Point

Despite intensive efforts to control predators such as rats, mice, mongoose and others they continue to threaten nesting seabird populations. Without our help, seabird and native plant communities at Ka`ena Point will continue to be attacked by these alien predators.

Plants and Animals of Ka`ena

Nesting seabird species:

- Laysan Albatross (Moli)
- Wedge-Tailed Shearwater (`Ua `u kani)
- White Tailed Tropicbird (Koa`e `ula)
- Hawaiian Short-eared Owl (Pueo)

Other seabirds observed:

- Black-footed Albatross
- Great Frigatebird (`Iwa)
- Red-footed, Brown and Masked Boobies (`A)
- Red-tailed Tropicbird (Koa `e`ula)
- Grey-backed (Pakalakala), Sooty (`Ewa `ewa) and White Terns (Manu-o-kū)
- Black Noddy (Noio)

Migratory shorebirds:

- Wandering Tattler (`Ulili)
- Ruddy Turnstone (`Akekeke)
- Pacific Golden Plover (Kōlea)

Other animals:

- Hawaiian Monk Seal (`Īlioholokiauaua)

Native Plants:

- Many coastal plants such as naupaka, `ilima & naio
- Eleven federally endangered species such as `ohai and `akoko (a species found only at Ka`ena Point)

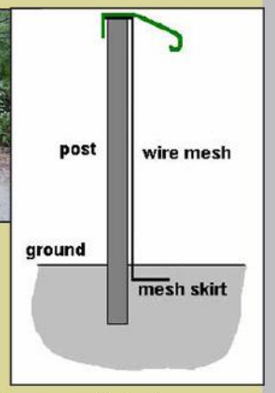
Is there a solution to predation?

Ecosystem restoration through fencing

The goal of ecosystem restoration is to provide a safe place for Hawai`i's native seabirds, plants, and insects by removing destructive alien species and allowing the native species to rebound. New technology in pest-proof fencing holds promise. A pest proof fence could effectively keep out all kinds of mammalian pests- from large animals such as pigs and dogs, to small animals such as mongoose and rats.

A fence with a combination of features– built approximately 6.5 feet high with a rolled hood at the top, fine mesh between the fence posts, and a skirt buried underground -- prevents animals from jumping, climbing, squeezing through or digging their way around the fence and into the protected area. This type of pest proof fence was developed in New Zealand and has been used very successfully.

An example of a pest proof fence in New Zealand



If this method were used, there would be two steps: first fence construction followed by predator removal. Compared to the current cost of protecting native seabirds and plants from alien species at Ka`ena Point, a fence would start to save money by eliminating the need to constantly remove alien species.

If constructed, this will be the first pest proof fence not only in Hawai`i, but in the United States. It would be a great example of the people of Hawai`i showing leadership in protecting and restoring their unique natural resources.

How could the project affect me?

How would a fence affect

Access?

People would still be allowed to visit the reserve both during and after construction. There would be unlocked gates that would allow people on foot and on mountain bikes to enter the reserve at the existing entrances on both the North Shore and West side.

Views?

The fence would run along the base of the Wai`anae Mountains following the existing upper roadbed. It would come down to the high tide line at either end where the existing entrances to the Natural Area Reserve are, but will not fully encircle the reserve. The fence would be designed to blend into the hillside.

What a pest proof fence may look like at Ka`ena

The future of Ka`ena Point?

By removing alien species from Ka`ena Point, two main things would happen.

- existing populations of seabirds and native plants would increase.

- species that could use the Ka`ena Point ecosystem, but were unable to when predators were present, would start to return, or would be transplanted there.

As a result, larger populations, and more types of plants and wildlife would be found within the reserve. By removing alien species from Ka`ena Point we have the opportunity to restore this rare ecosystem to its natural state and preserve a precious piece of Hawai`i for future generations.

APPENDIX E

Comments Received During Pre-Consultation

Pre-consultation for this project began with the formation of an outreach team. The outreach team gave presentations to community organizations and met with individuals connected to the Ka‘ena Point area (both the Mokulē‘ia and Wai‘anae sides), including the North Shore Neighborhood Board, the Wai‘anae Neighborhood Board, and the Mokulē‘ia Community Association. The outreach team also conducted user surveys at Ka‘ena Point on three weekends during the fall of 2007, to get input from actual users of Ka‘ena Point about why they visit Ka‘ena and what they think about the proposed fencing. Finally, the outreach team prepared a brochure and poster display for the Hawai‘i Conservation Conference and other similar events. A unique email account was established for the project, kaenapoint@yahoo.com, to create an easy-to-remember way for the public to communicate their thoughts about the project. In conjunction with the community outreach, the Department sent a scoping letter to over 90 government agencies, organizations, and individuals that were identified as potential stakeholders for the project. Follow-up meetings occurred with regulatory agencies to discuss permitting requirements. During the pre-consultation period, written comments were received from the following:

- NOAA
- U.S. Army Environmental staff
- U.S. Coast Guard
- Office of Hawaiian Affairs
- City and County of Honolulu Department of Planning and Permitting
- Councilmember Donovan Dela Cruz
- American Bird Conservancy
- Historic Hawaii Foundation
- Mokulē‘ia Community Association
- North Shore Neighborhood Board
- Michele Bachman
- John Bennett
- David Bremer
- Randy Ching
- Rich Greenamyer
- Tom Lenchanko
- Keona Mark
- Reed Matsuura
- Cynthia Rezentes
- Steve Rohrmayr

Jennifer Metz
<Jennifer.Metz@noaa.gov>
11/05/2007 08:57 AM

To Christen.W.Mitchell@hawaii.gov
cc
bcc
Subject comment for Kaena EA

History: This message has been replied to.

Aloha Christian,
I passed the EA to one of my colleagues, David Schofield, who is our Marine Mammal Strandings Coordinator. He does a lot of work with the Hawaiian monk seal. Please view his comment below regarding the monk seal in the draft EA. Thank you.

Aloha Jen,

I am happy with the mention of the Hawaiian monk seal in this document. It adequately notes the importance of the habitat to the monk seal and mentioning the 2006 pupping event is very appropriate.

It is a sound document but one suggestion might be to add that the monk seal would benefit from the predator fence not just to prevent disturbance but also to prevent disease transfer. The recently published Hawaiian Monk Seal Recovery Plan states as one of the threats the the survival of this species is disease transfer. Specifically diseases caused by morbilli virus (distemper), toxoplasmois, and leptospirosis are of high concern and can be shed by some of the named predators the project is working to eradicate.

Thanks for letting me review and I look forward to having the opportunity to further the partnership to raise awareness of monk seal issues at Kaena Pt.

Mahalo,
David

--
Jen Metz
Outreach and Education Specialist
Protected Resources Division
NOAA Fisheries, Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814-0047
Tel # (808) 944-2268

"Kawelo, Kapua H Ms CIV USA USARPAC" <kapua.kawelo@us.army.mil>

11/06/2007 04:46 PM

To <Christen.W.Mitchell@hawaii.gov>

cc "Ching, Susan N Ms CTR USA USARPAC" <susan.ching@us.army.mil>, "Mansker, Michelle L Mrs CIV USA USARPAC" <michelle.mansker@us.army.mil>

bcc

Subject Kaena Point Predator Fence Comments (UNCLASSIFIED)

Classification: **UNCLASSIFIED**
Caveats: NONE

Aloha Christen,
Got your flier about Kaena. We have been in the loop on some of this but felt we should formally convey our concern/support/interest in participating.

We are excited about this fence because it will be the first real test of this technology to protect a natural area in Hawaii. As you may know, Island Conservation is developing implementation plans for some predator fencing on DOD lands in Hawaii. Two sites of ours are included in possible pilot project sites. We are interested in what you learn and in learning from you.

Our major concern is the Chamaesyce celastroides var. kaena which will not be included in the fence. We have not observed rat damage to plants in the past at Kaena or at any other wild population sites where we work with this taxon. We are concerned that the fence may concentrate rats on the outside where the C. celastroides are and they may incur damage due to local rat number increases.

We are interested in any monitoring that is planned in conjunction with this project and since we work regularly at the C. celastroides would love to be involved in reviewing plans and in site visits for this aspect of the project.

Thank you for the opportunity to comment. Good luck with the project.

Mahalo Kapua

H. Kapua Kawelo
Biologist, Environmental Division
Directorate of Public Works, USAG-HI
Phone: (808) 656-7641
Fax: (808) 656-7471

Classification: **UNCLASSIFIED**
Caveats: NONE

"Shepardson, Dale LCDR" <Dale.V.Shepardson@uscg.mil>
Sent by: Dale.V.Shepardson@uscg.mil

10/02/2007 06:49 AM

To <christen.w.mitchell@hawaii.gov>
cc
bcc
Subject FW: Ka'ena Point EA

Good Morning: We received your letter last week regarding "Pre-consultation on Environmental Assessment for Predator-Proof Fencing at Ka'ena Point Natural Area Reserve ..." The Coast Guard maintains a light on the Point that we will need to access in order to service the light. Will the location of the fence restrict access to the light and if so may we ask that the gate be large enough to allow access to the light? Thank you.

LCDR Dale Shepardson
Chief, D14 Waterways Management
(808) 541-2320

-----Original Message-----
From: Garrett, David BMC
Sent: Tuesday, October 02, 2007 6:28 AM
To: Shepardson, Dale LCDR
Subject: RE: Ka'ena Point

Sir,

This will not be a problem as long as we have access when ever we need it, and we can put one of our locks on it. We do a chain, lock to lock setup with other agencies on other light as well.

Thanks,

BMC Dave Garrett
Officer in Charge
Aids to Navigation Team
400 Sand Island Access Road
Honolulu, Hawaii 96819
(808) 842-2851
-----Original Message-----
From: Shepardson, Dale LCDR
Sent: Monday, October 01, 2007 4:21 PM
To: Garrett, David BMC
Subject: Ka'ena Point

Chief: The state wants to put up a fence at the Ka'ena Point Natural Area Reserve. The fence would run from the washout on the Wai'anae side to the boulder barricade. The fence would be 6.5 feet tall. Is that going to interfere with your ability to get out there?

LCDR Dale Shepardson
Chief, D14 Waterways Management
(808) 541-2320

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

HRD07/3231

September 28, 2007

Christen Mitchell, Planner
Division of Forestry and Wildlife
State Department of Land and Natural Resources
1151 Punchbowl St. Rm. 325
Honolulu, HI 96813

RE: Pre-Consultation on Environmental Assessment for Predator-Proof Fencing at Ka'ena Point Natural Area Reserve and Ka'ena Point State Park, O'ahu, TMKs: 6-9-02: 4, 9, 13, 14; 8-1-01: 22.

Dear Christen Mitchell,

The Office of Hawaiian Affairs (OHA) is in receipt of your September 20, 2007, request for comments on the above proposed project, which calls for the erecting of a two-meter fence that will prevent predators from entering into the Natural Area Reserve. OHA offers the following comments.

OHA appreciates that the project will protect the populations of area seabirds and enhance the regeneration of native plants. OHA also appreciates that human access to the reserve will not be changed due to the fence. We do, however, request the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the fence, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

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

HRD07/3231 B

November 2, 2007

Christen Mitchell, Planner
Division of Forestry and Wildlife
State Department of Land and Natural Resources
1151 Punchbowl St. Rm. 325
Honolulu, HI 96813

RE: Pre-Consultation on Environmental Assessment for Predator-Proof Fencing at Ka'ena Point Natural Area Reserve and Ka'ena Point State Park, O'ahu, TMKs: 6-9-02: 4, 9, 13, 14; 8-1-01: 22.

Dear Christen Mitchell,

On September 28, 2007, the Office of Hawaiian Affairs (OHA) sent a letter containing our comments on the above proposed project, which calls for the erecting of a two-meter fence that will prevent predators from entering into the Natural Area Reserve. After further consulting with our beneficiaries, we would like to submit additional comments on the project.

OHA requests that the path for the fence be positioned in such a way that excludes the Leina-a-ka-'uhane from the fenced-off area. Members of the Hawaiian community have concerns that including the leina in the fenced area would disturb the spiritual atmosphere surrounding the sacred site.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

C: William Ailā Jr.
86-630 Lualualei Homestead Road
Wai'anae, HI 96792

NOV 2 7 2007

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

HRD07/3231C

November 20, 2007

Chris Swenson
Craig Rowland
U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd., Rm. 3-122
Box 50088
Honolulu, HI. 96850

RE: Initiating consultation for predator-proof fence at the Ka'ena Point Natural Area Reserve and Ka'ena Point State Park, O'ahu, TMKs: 6-9-02: 4, 9, 13, 14 and 8-1-01:22.

Dear Chris Swenson and Craig Rowland,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-referenced request for comments on a project that calls for the installation of a two-meter high fence that will prevent predators from entering into the Natural Area Reserve. OHA appreciates the opportunity to provide input into the project and offers the following comments.

The fence alignment that OHA favors is "Option 2," which is positioned in such a way that excludes the Leina-a-ka-'uhane from the fenced-off area. Members of the Hawaiian community have concerns that including the leina in the fenced area would disturb the spiritual atmosphere surrounding the sacred site.

OHA appreciates that the project will protect the populations of area seabirds and enhance the regeneration of native plants. OHA also appreciates that human access to the reserve will not be changed due to the fence. In addition, we will rely on the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the fence, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

C: William Ailā Jr.
86-630 Lualualei Homestead Road
Wai'anae, HI 96792

✓ Pauline Sato
The Nature Conservancy of Hawai'i
923 Nu'uanu Avenue
Honolulu, HI 96817

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 527-6743
INTERNET: www.honolulu.gov • DEPT. WEB SITE: www.honoluludpp.org

MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2007/ELOG-2693(AM)

September 26, 2007

Ms. Christen Mitchell
Division of Forestry and Wildlife
Department of Land and Natural Resources
1151 Punchbowl Street, Room 325
Honolulu, Hawaii 96813

Dear Ms. Mitchell:

Subject: Pre-Assessment Consultation
Predator-Proof Fencing
Kaena Point Natural Area Reserve and Kaena Point State Park
Tax Map Keys: 6-9-2: 4, 9, 13, 14; 8-1-1: 22

This responds to your request, received September 20, 2007, for comments on the state's proposal to install a 6.5-foot-high "predator-proof" fence at Kaena Point Natural Area Reserve and Keana Point State Park. We have the following comments.

The project site is located in the Special Management Area (SMA). The proposed fence constitutes "development," as defined by the Revised Ordinances of Honolulu Chapter 25 (the "SMA Ordinance"). Hence, it requires approval of a SMA Use Permit. If the project's valuation is less than $125,000, then it may qualify for an SMA minor permit, which is administratively processed by our department. However, if its valuation exceeds $125,000, then a SMA major permit will be necessary. SMA major permits require the processing of an environmental assessment in accordance with the procedural steps set forth in HRS Chapter 343; involve public hearings; and, are granted by the City Council.

It appears from the attached rendering that the fence is located near the shoreline. In order for us to determine whether the project will be subject to city's shoreline regulations, enumerated in ROH Chapter 23 ("Shoreline Setbacks"), a drawing depicting the fence type and its location relative to the shoreline will be required. If any part of the fence will be located within 55 feet of the shoreline, then a current certified shoreline survey will also be needed.

We note that the proposed fence will be located in the State Land Use Conservation District; therefore, the proposed fence is not subject to the city's Land Use Ordinance.

We would like an opportunity to review the Draft Environmental Assessment when it is circulated for comments. If you have any questions, please contact Ann Matsumura of our staff at 768-8020.

Very truly yours,

Henry Eng, FAICP, Director
Department of Planning and Permitting

HE:cs

doc569385

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII 96813-3065 / TELEPHONE 547-7000

DONOVAN M. DELA CRUZ
COUNCILMEMBER, DISTRICT 2
CHAIR, COMMITTEE ON PUBLIC HEALTH,
SAFETY AND WELFARE
TELEPHONE: (808) 547-7002
FAX: (808) 527-5737
EMAIL: dmdelacruz@honolulu.gov

October 8, 2007

Department of Land and Natural Resources
Department of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813
Attn: Christen Mitchell, DOFAW Planner

Dear Ms. Mitchell:

RE: Predator-Proof Fencing at Kaena Point Natural Area Reserve & Kaena Point

This pristine area is the last remaining undeveloped area on Oahu and protecting the fauna and wildlife is a necessity. Already too many of Kaena Point's wildlife and plants have been affected by human encroachment, especially by motorized dirt bikes and atv's.

As development brings people and their pets closer to this area, this fence will serve to keep these domestic predators out. The world is losing many of its species of birds and plants everyday and this is mainly caused by the lack of futuristic planning.

I support the installation of this predator-proof fencing and the protection of this important Hawaiian cultural site.

Mahalo for bringing this issue and solution forward and thank you for this opportunity to testify.

Sincerely,

Donovan M. Dela Cruz
Councilmember
District II

DMD: rhm
(kaena pt. testimony)

AMERICAN BIRD CONSERVANCY
CONSERVING WILD BIRDS AND THEIR HABITATS THROUGHOUT THE AMERICAS

Christen Mitchell
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl St
Room 325
Honolulu, HI 96813

October 5, 2007

Dear Ms. Mitchell;

We were pleased to learn of the Predator-Proof Fencing project for Ka'ena Point Natural Area Reserve and Ka'ena Point State Park, O'ahu, and look forward to supporting the project in any way we can. The American Bird Conservancy is the only 501(c)(3) organization that works solely to conserve native wild birds and their habitats throughout the Americas. ABC acts to safeguard the rarest bird species, using the best science available to determine the highest priorities and the best solutions. Protecting seabird nesting habitat from predators is clearly one of the highest priorities to ensure the long term stability of seabird populations and offers one of the most efficient opportunities to have a positive impact.

Throughout the world, non-native animals pose a grave threat to seabird nesting grounds and sometimes even the viability of entire seabird populations. We have followed the successful fencing and eradication projects in New Zealand with interest and continue to encourage a wider use of these methods to protect seabirds. We anticipate a measurable improvement in nest success as a result of the fencing and look forward to seeing the plans for your evaluation of the action. Such demonstrable results are of value to future project development and in compiling best practices and lessons learned.

If you have any questions, please feel free to contact Jessica Hardesty, Seabird Program Director at American Bird Conservancy (jhardesty@abcbirds.org).

Thank you for this opportunity to comment.

Sincerely,

Jessica Hardesty
Seabird Program Director

P.O. Box 249 ♦ The Plains, VA ♦ 20198
Phone: 540-253-5780 ♦ Fax: 540-253-5782 ♦ www.abcbirds.org

HISTORIC HAWAI'I FOUNDATION

October 12, 2007

Christen W. Mitchell
Planner, Department of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawai'i
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

RE: Pre-Consultation on Environmental Assessment for Predator-Proof Fencing at Ka'ena Point Natual Area Reserve and Ka'ena Point State Park, O'ahu

Dear Ms. Mitchell:

Thank you for including Historic Hawai'i Foundation in the consultation process for the proposal to install Predator-Proof Fencing at Ka'ena Point Natual Area Reserve and Ka'ena Point State Park on O'ahu.

Since 1974, Historic Hawai'i Foundation (HHF) has been the statewide leader for historic preservation. HHF's mission is to preserve and encourage the preservation of Hawai'i's historic buildings, places, objects and communities.

Historic Hawai'i Foundation supports your efforts to protect the flora and fauna of Ka'ena Point by excluding predators that impact seabird colonies and other native species. We look forward to reviewing the Environmental Assessment.

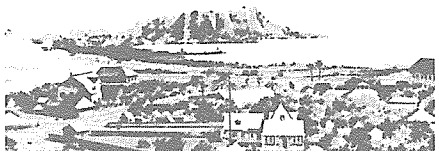
In general, we will are concerned about impacts to historic and cultural sites, both in the finished condition and during construction. Appropriate avoidance, minimization and mitigation actions should be considered in the EA. We are also concerned with potential visual impacts from the two-meter fence and would like to see schematic design and photo simulations of the fence from various viewpoints.

Please let me know if you have any questions. I can be reached at 523-2900 or via email to Kiersten@historichawaii.org.

Very truly yours,

Kiersten Faulkner

Kiersten Faulkner, AICP
Executive Director



680 Iwilei Road, Suite 690 / Honolulu, Hawai'i 96817 / Tel (808) 523-2900 / Fax (808)523-0800
Email preservation@historichawaii.org / Web www.historichawaii.org

MOKULE'IA COMMUNITY ASSOCIATION
68-703 Crozier Drive
Waialua, HI 96791

November 7, 2007

Laura H. Thielen
Director
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, HI 96813

Aloha Director Thielen,

Best congratulations on your confirmation as Director. That's great news!

At its October 20, 2007 meeting, the Mokule'ia Community Association (MCA) received a presentation on the Ecosystem Restoration Project for the Ka'ena Point Natural Area Reserve (NAR). The project proposes to erect pest-proof fencing to prevent alien feral predators, as well as loose non-feral animals, from entering the NAR and killing its native fauna and flora, particularly its albatross and shearwaters, but also other seabirds, migratory shorebirds, monk seals and native plants.

The rust-proof, fine-meshed, hooded fencing, with a buried skirt was developed in New Zealand and has proven successful in its use there.

After numerous questions and discussion of the project and its benefits, the Mokule'ia Community Association expressed strong support for the project and recommends your and DLNR's support for the initiative.

Sincerely,

Michael Dailey
President

Copies to:
Governor Linda Lingle
Senator Bobby Bunda
Representative Michael Magaoay
Christen Mitchell, DOFAW Planner
North Shore Neighborhood Board No. 27
Hawai'i Chapter, The Wildlife Society

North Shore Neighborhood Board No. 27
P. O. Box 577
Haleiwa, Hawaii 96712
November 12, 2007

Laura H. Thielen, Chairperson
DLNR Natural Area Reserves System
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Chairperson Thielen,

At the October 23, 2007 North Shore Neighborhood Board No. 27 Meeting, Lindsay Young and Ati Jeffers (DLNR Natural Reserves System) made a presentation on Ka'ena Point Natural Area Reserve Ecosystem Restoration Project – restoration through fencing. They provided Board members with brochures that were very explicit in delineating the threats to the wildlife at Ka'ena, the solution to the predation, the affect the fencing will have on the community and the community's responsibility to take care of the "aina." It is imperative that this natural area reserve be a safe haven for Hawaii's native plants, seabirds and animals.

Ms. Young and Mr. Jeffers asked the North Shore Neighborhood Board No. 27 for their support of the project, a request that was unanimously affirmed. The Board members were also informed that public comments were welcome and contact information was provided.

Sincerely,

Geraldine "Gerry" Meade, Secretary
(808) 638-8386

From: MicheleB (bachmanm001@hawaii.rr.com)
To: kaenapoint@yahoo.com
Date: Tuesday, October 23, 2007 3:52:09 PM
Subject: Can I help?

While visitning Kaena point this weekend I met some of your representatives and recieved an educational broucheur. I have lived near to, and visited this area many times. I think what is happening out there is GREAT!. What a difference after being nearly run out by the weekend ATV.group, and the often present "scary" coalition I am excited by what you are doing. I think the fence looks like a great idea, too bad we need it, but we do.
I would also like to help if I can. I work Saturday and SUnday, but may have other ways of helping. I can type, file, phone, design, mail...let me know how I can get involved. We need to protect Kaena Point as well as many of our other open space.
Michele Bachman
bachmanm001@hawaii.rr.com

John D. Bennett
45-340 Mokulele Dr.
Kaneohe, HI 96744-2245
E-Mail: bennettj009@hawaiiantel.net

September 23, 2007

Christen W. Mitchell
Dept. of Land & Natural Resources,
Div. of Forestry & Wildlife
1151 Punchbowl St., Rm. 325
Honolulu, HI 96813

Re: Kaena Point Natural Area Reserve, proposed predator-proof fence

Dear Christen:

My interest in the Kaena Point Natural Reserve is chiefly in its recent military history, and I am mainly concerned with preservation of the extant structures that are found on the slopes of Puu Pueo that were used in conjunction with Oahu's coast artillery, and the early warning radar station built during World War Two.

As a historian and preservationist, I feel that a predator-proof fence would greatly assist in preserving the albatross colonies from wild dogs, cats, and the mongoose. Man is one of the greatest hazards to native plants by stepping on them and running them over with mountain bicycles.

Having well-defined trails in the preserve would greatly assist in preserving the nesting birds and native plants, however, the remoteness of the area precludes having a ranger or other enforcement type of officer present at all times.

Sincerely Yours,

John D. Bennett

YAHOO! MAIL Classic

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From: "Bremer" <bremerd001@hawaii.rr.com>

To: kaenapoint@yahoo.com

CC: greenamyr001@hawaii.rr.com

Subject: Kaena Point restoration

Date: Fri, 5 Oct 2007 08:35:35 -1000

Ati Jeffers-Fabro
Outreach Coordinator
Kaena Point Ecosystem Restoration Project

Hello,

Along with Rich Greenamyer, who recently wrote to you in support of your efforts to control predators at Kaena Point, I also enjoy mountain biking with Rich around Kaena Pt every month or so. We appreciate the signs and marking of the paths to assist bikers in staying on the trail and off the fragile plants and dunes. Perhaps we could assist in monitoring if we knew how to report dog owners who walk dogs unleashed in the area or cyclists who may stray off the marked trails. We usually try to remind such individuals of the need to protect the area, and it may be difficult to do more than that since DLNR obviously lacks resources to regularly patrol such a remote location. But let us know if you have any suggestions or would like us to report on any violations we might observe.

We would also support any efforts to further restrict motor vehicles from entering beyond the parking lot on the Mokuleia side. We've noticed recent increased erosion and denuding of the dunes that appears to be the result of 4-wheel drive trucks using the area for recreational racing or mud wallowing. That's another very difficult activity to prevent, and there may be legitimate access needs of fisherman who travel in to reach shoreline fishing spots. My impression is that the fisherman tend not to be the source of major abuse of the ecosystem, though some may tend to leave rubbish on the beaches.

Also if there is anyway to construct a pedestrian bridge across the washed out trail on the Waianae side of point, that would enhance legitimate recreational access to the point. I think it's important to keep the region open to responsible users to maintain public awareness of and support for your conservation efforts.

We very much appreciate your work in protecting and restoring the area. It's nice to see the native plants and seabirds thriving beyond the gated area.

Aloha,

David Bremer

randy ching
<oahurandy@yahoo.com>
09/25/2007 10:36 AM

To christen.w.mitchell@hawaii.gov
cc
bcc
Subject Kaena Pt fence project

Aloha Christen. Pauline Sato of The Nature Conservancy gave the Sierra Club, Oahu Group a presentation on the project. It looks great! I hope it happens soon. If you need volunteers to help with the project, the Oahu Group would be willing. Let me know.

Randy Ching
Sierra Club, Oahu Group chair

From: Rich Greenamyer (greenamyr001@hawaii.rr.com)
To: kaenapoint@yahoo.com
Date: Tuesday, September 25, 2007 3:02:35 PM
Subject: Kaena Point

As a frequent mountain biker at Kaena Point, I am in favor of protecting the unspoiled environment of the area. I am in favor of installation of a pest proof fence as long as it allows hikers and mountain bikes to traverse.

However, I have other recommendations. One is to keep the area unspoiled by not extending paved roads any further than they already are. A real parking lot should be built at the existing dirt lot on the Moluleia side with restroom facilities (like that on the Waianae side) and allow access to hikers and bikers. The other is to repair the washout on the Waianae side by putting in a reinforced wall like other areas of the path (old railroad bed) on that side.

Rich Greenamyer

Smvl520@aol.com
10/30/2007 10:29 PM

To [redacted]
cc [redacted]
bcc
Subject Kaena...

October 29, 2007

Christen W. Mitchell
DOFAW Planner

Re: Request for a Traditional Cultural Properties (TCP) model - assessment, study and report - for your organization's proposed undertaking that may adversely affect our Ohana/families sites under the protection
and recognition of 'Aha Kukaniloko/Koa Mana lineal descendants and those lineal descendants that we represent...

aloha mai e:

Thank you for considering a recommendation from 'Aha Kukaniloko/Koa Mana lineal descendants and those
lineal descendants that we represent:

* substantive consultation with 'Aha Kukaniloko/Koa Mana spokesperson
* why do we see different boundaries
* to know, to follow, to support protection law... [NHPA Section 106 TCP model law] the significance of interpretation for the "meaning of place" is critical to the spirit and intent of protection law and we understand that TCP law is hidden within the environmental law of the State of Hawaii
* those identified sites and those sites that are not, are protected and recognized as national treasures by 'Aha Kukaniloko/Koa Mana and Ohana and we request that these sites and our traditional practices of care
be protected to the utmost of the spirit and intent pursuant to domestic and international law
* Ohana obligation to protect prior and continued traditional practices of care, sacred historic sites and inheritance upon Kaena, Oahu and all other like kind traditional cultural properties, connect [traditionally connect] to the "piko" Kukaniloko through published and verified documentation and Ohana cultural education programs and workshops
* Following our programs and workshops, kupuna asks, "Now that you have learned about our connections,
kuleana and concerns, what are we going to do to help us preserve, protect and perpetuate the right and kuleana for those Ohana/kanaka mauli yet to come?"

'owau no me ka ha'a ha'a

Tom Lenchanko
kahuaka'i ola ko laila waha olelo 'Aha Kukaniloko/Koa Mana
mea ola kanaka mauli
349-9949

Response to The Kaena Point Fence Project by DLNR

Keona Mark
P.O. Box 2
Haleiwa, HI 96712
673-2778

This is in response to your handout regarding the proposed Fence Project at Kaena Point.

I am the 7th generation of my family who have been gathering pa'akai, limu, opihi, pipipi, lole, and I'a in Waialua Moku, from Waimea Valley to Kaena Point.
Any fencing at Kaena point will be detrimental to humans, birds and plants. By installing a fence you will not "preserve a precious piece of Hawai'I for future generations", you will be changing that piece of land forever. It will be an eyesore and it will not stop predatory dogs who are "brought by their owners" because "access will remain the same". The fence will "run along the base of the Waianae Mountains..and come down to the high tide line." How can you possibly say that it will not be an eyesore. No fence, especially at Kaena Point, can be "painted to blend into the background". Have you seen sunsets at Kaena? Have you been there at the break of day to see the changing colors of the ocean and the mountains?
The Laysan Albatross are some of the biggest and clumsiest birds who frequent Kaena. Although they are graceful in flight, their takeoff's and landings are influenced by the gusty winds of Kaena. Any fence will be harmful to these birds.
Almost every time DLNR tries to introduce measures (a fence in this case) that supposedly will compensate for threats to the survival of native species (tampering with Mother Nature) it backfires.
Is this fence the best alternative or the cheapest alternative you found? It won't keep out predatory dogs or cats. Have you thought of having personnel at Kaena Point and having access hours? Have you thought of leaving Mother Nature alone?
The challenge is not to build fencing at Kaena Point, it is to manage the people that frequent the area with no regard to plants, animals, or other people. I have been out there to see all the rubbish, road ruts, plows through native vegetation to create new 4wd paths, fireworks, pistol and rifle target practices, and fishing debris that people leave on the beaches and reefs. This fencing project is not the way to protect the area. It will irreparably harm the very uniqueness of Kaena you talk about.
I strongly oppose this fence project.

Reed H. Matsuura
P.O. Box 11
Waialua, HI 96791
rmatsuura@honolulu.gov - phone – 223-1808

Ms. Christen Mitchell
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

Dear Ms. Mitchell:

RE: Predator-Proof Fencing at Ka`ena Point Natural Area Reserve and Ka`ena Point State Park, Oahu.

Being a lifetime resident of Mokuleia, Kaena Point has been my fishing and salt gathering area for years. I support the fencing as long as it does not prevent the users like myself from entering the area. The preservation of the fauna and wildlife must be a mandate for this last remaining pristine area of Oahu.

Kaena Point, was known as the jumping off point for Hawaiians. This sacred area must be protected. I have witnessed dirt bikes and atv's that have just torn up the area and have total disregard of the fauna or bird nesting areas.

Thus, I am in total support for this fencing and the protection of this area. Mahalo for accepting this testimony!

Sincerely,

Reed Matsuura

Cynthia K.L. Rezentes
87-149 Maipela Street
Wai`anae, HI 96792-3154
E-mail: rezentesc@aol.com

October 15, 2007

Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

Attn: Christen Mitchell

RE: Pre-Consultation on Environmental Assessment for Predator-Proof Fending at Ka`ena Point Natural Area Reserve and Ka`ena Point State Park, O`ahu, TMKs: 6-9-02:4, 9, 13, 14; 8-1-01:22

Aloha,

Thank you for the opportunity to provide comments regarding the proposed project for the Ka`ena Point Natural Area Reserve and Ka`ena Point State Park.

In general I do not support fencing of public natural areas which are accessible to the public.

In this case, due to the tremendous pressures being placed upon the natural resources of the area and the destruction that is occurring due to natural predators of the ground nesting birds and vegetation, I would reluctantly agree to a predator-proof fence in the area.

Of the options presented in your letter, I would support Option 2, which allows free access from both the Mokuleia and Wai`anae sides to *Leina a Ka Uhane,* a recognized significant cultural site.

In addition, I would recommend consultation with Native Hawaiian elders and organizations from both the Mokuleia and Wai`anae sides of Ka`ena Point to determine the impacts on any further cultural sites, e.g. the Night Marchers Path that is known to many, burials, ect.

This fence would benefit the natural resources at Ka`ena Point and also protect a little bit of what can be found in the Northwestern Hawaiian Islands for the residents of O`ahu who do not have the opportunity to experience that unique resource.

Sincerely,

Cynthia K.L. Rezentes
Wai`anae Resident

From: Steve Rohrmayr (crider2-2@hotmail.com)
To: kaenapoint@yahoo.com
Date: Wednesday, September 26, 2007 7:21:57 PM
Subject: Fence

I hope when this fence is constructed you will take into consideration the FACT that there is a trail going up the end of the Wai`anae Mt. range to various WW 2 pill boxes. Please DO NOT block this trail with any less access than the point in general.
