

# Department of the Navy: Draft Supplement to the Final Environmental Impact Statement, 1977 October

Senator Daniel K. Inouye Papers  
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# **DEPARTMENT OF THE NAVY**



## **DRAFT SUPPLEMENT TO THE FINAL ENVIRONMENTAL IMPACT STATEMENT**

**KAHOOLAWE ISLAND TARGET COMPLEX  
HAWAIIAN ARCHIPELAGO**

**OCTOBER 1977**

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Update 10/31/77

DRAFT SUPPLEMENT 10-31-77

TO

FINAL ENVIRONMENTAL STATEMENT CONCERNING MILITARY USE  
OF THE KAHOOLAWA ISLAND TARGET COMPLEX IN THE  
HAWAIIAN ARCHIPELAGO  
(February 1972)

OCTOBER 1977

Prepared by the Pacific Division, Naval Facilities Engineering Command for the Commander, Third Fleet, in accordance with OPNAVINST 6240.3D of 24 April 1975 in compliance with Section 102 (2) (c) of the National Environmental Policy Act of 1969.

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PREFACE

It is the intent of this document to meet that portion of the requirements of the United States District Court for the District of Hawaii ruling of 15 September 1977 as follows:

"Defendants are ordered to file an environmental impact statement at least in draft form within 45 days and in final form within a reasonable period of time after the filing of the draft form."

This document is a Supplement proposed for the existing Final Environmental Impact Statement (EIS) filed by the U. S. Navy with the President's Council on Environmental Quality (21 March 1972).

The purpose of this document is as follows:

1. To update the Final EIS of 1972.
2. To provide a more complete table of contents to the 1972 EIS including the updated materials in a more useable outline format.
3. To update the 1972 6-step EIS format to the present 8-step format under Federal Regulations, requiring the addition of two new sections and one sub-section.
4. To provide such new and original information as could be provided within the 45-day time constraint.
5. To discuss any present plans which may be pertinent at this time.

This Supplement EIS is being forwarded to the Chief of Naval Operations, (OP-45), Environmental Protection Review Board, for filing with the President's Council of Environmental Quality and will be processed by that office under the existing OPNAVINST 6240.3D of 24 April 1975.

Correspondence may be directed to:

Chief of Naval Operations  
Attn: Environmental Protection Division  
OP-45  
Navy Department  
Washington, D. C. 20350

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TABLE OF CONTENTS  
(1972 FEIS with New Inserts Indicated)

Explanation. The original Table of Contents listed only the six major steps required in an Environmental Impact Statement and attached Appendices A through N. This minimal Table has been expanded to more thoroughly outline the material in the 1972 document and allow for addition of new material in the form of inserts.

Since 1972 the outline required under Federal Law for such an evaluation has lengthened, and several new sub-sections are now required. This revised outline is provided to indicate the breadth and depth of the earlier analysis and to provide for insertion of new information. This change is provided as a convenience and guide.

To facilitate insertion of new or revised material in the existing FEIS (1972), the use of an alphabetical sequence following a numerical page number has been utilized and shown in the Table of Contents. For example "Marine Ground Operations on Kahoolawe" follows page 7, and the two new pages are labelled 7-A and 7-B, shown as Pages 7-A/B. The slash represents "thru". The one change in the Appendices is to "Legends and Archeology" where the insertion, "Archeologic/Historic Sites" become Pages A-5 through A-9.



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1.A.(3)(a) MARINE GROUND TRAINING OPERATIONS ON  
KAHOOLAWE

The first Marine Brigade conducts ground training exercises on Kahoolawe. These exercises, which sometimes involve the firing of small arms, crew served weapons and/or artillery, may be held in conjunction with aerial and/or shore bombardment training.

Since the preparation of the Final EIS of February 1972, ground operations of the U.S. Marine Corps on Kahoolawe have increased, often as part of combined air-ground coordination operations. Marine elements have maintained a continuous presence on the island since February 1977. The size of the element has varied from four communications site personnel, a 30-60 man EOD (Explosives Ordnance Disposal) sweep force, up to a 350-400 man Battalion exercise unit.

During the coming twelve months, it is expected that Marine presence on the island for operations will be 85% of available time, with transportation by helicopter. Small amphibious landings at Smuggler's Cove will be conducted if conditions are suitable.

In May 1977, three new targets were placed within the boundaries of the current impact area. These targets are being used by infantrymen firing recoilless rifles, mortars machine guns, and rifles. The target designations and locations are as follows:

<u>Target</u>	<u>Composition</u>	<u>Universal Transverse Mercator</u>
G-1	Single Vehicle	465739
G-2	Numerous 50-gallon drums	468729
G-3	Two vehicles	469725

Before the targets were put in place, the surrounding areas were surveyed by the senior state archeologist and pronounced free of possible historic sites. The types of weapons, impact errors, maximum ranges, and direction and origin of fire were briefed on site.

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1.A. (4) (a) AIRCRAFT AND SHIP ORDNANCE ESTIMATES

The following estimates have been provided by the respective components of military service branches for the past Fiscal Year (1 Oct 30 Sep) and estimates for the present FY. Such estimates will vary according to the nation's defense posture and requirements for readiness, the extent of support for exercises, and the rotation of new units requiring familiarization with such targets, as well as other factors.

1. U.S. Air Force

FY77	FY78
2380 2.75 Inch White Phosphorus Rockets.	Same
580 White Rockets of same size.	
296 Flares.	

2. Naval Gunfire

FY77	FY78
High Explosives 1767	963
Illumination Rounds 107	Same
Puff Rounds 641	1445

3. Naval Aircraft

Ordnance is delivered against Kahoolawe targets by Naval aircraft from locally based squadrons and by carrier airwing (CAW) pilots whose ship is enroute to the Western Pacific or is partaking in fleet exercises in the midPacific area. The approximate amounts and types for FY77 and FY78 are as indicated:

	FY77	FY78
Local Squadron:	662 MK76 Practice and Bomb	Same
	24 MK45 Paraflares	Same
CAWs:	948 MK76	1000
	50 MK82 500 lb. bomb	75



1.A.(4)(b) USE OF NON-EXPLODING AMMUNITION ("PUFF ROUNDS")

The Navy has introduced on a trial basis the use of Non-Exploding Ammunition rounds in its Ship-to-Shore firing practice. Such rounds are designed to puff smoke created by chemicals but do not explode. The 25 to 30 ships, which yearly practice at the island, would use the dummy explosives 50 to 70 percent of the time. The rest of the firing would be "live". Five thousand "puff" rounds have been allocated to the Pacific Fleet, and the introduction of smoke rounds is part of the scaling down of live ordnance on Kahoolawe.

Navy research and development (R&D) efforts continue to work on development of "puff rounds" for the 3" and 8" guns to continue transition to non-exploding ordnance.

1.A.(4)(c) Total Ground Ordnance (Expended 1 November 1976-  
1 October 1977 by U.S. Marine Corps Units)

<u>Type Weapon</u>	<u>Rounds</u>
155 Howitzer HE	120
WP	16
4.2 MORTAR HE	486
ILL	175
WP	70
106 RECOILLESS RIFLE	2,347
105 HOW HE	1,690
ILL	465
WP	253
81MM MORTAR HE	4,055
ILL	661
WP	277
60MM MORTAR HE	2,782
ILL	634
WP	334
M-72 LIGHT ANTI-ARMOR WEAPON	125
M-202 MULTI-SHOT FLAME WEAPON	171
M-203 HE	746
ILL	120
ANTI-PERSONNEL	78
M-60 MACHINE-GUN	123,400
M-16 RIFLE	57,520

ABBREVIATION

HE = HIGH EXPLOSIVE

WP = WHITE PHOSPHORUS

ILL= ILLUMINATION

1.B. Existing Environment

(1) Unexploded Ordnance Located Off-shore

At various locations and at varying depths off-shore, unexploded bombs and shells have been discovered, which appear to date back to World War II. The use of shoreline targets for practice has been discontinued in favor of the inland targets. Use of inland targets minimizes ordnance contamination of near shore waters. With the current use of inland targets, the possibility of ordnance being introduced in shoreline waters exists only from a "short round" falling into the sea or an emergency jettison of ordnance from aircraft. There appears to be no conflict with the intent of Section 201 (a) of the Federal Water Pollution Control Act Amendments of 1972 or Executive Order No. 11752.

1.B.(2) Endangered Species

Laws

The Endangered Species Act of 1966--Public Law 89-669, established Federal procedures for declaring species of wildlife to be "Rare" or "Endangered". This law did not include plants.

The Endangered Species Act of 1973--Public Law 93-205, made minor changes to nomenclature changing "Rare" to "Threatened", and established provisions for including plant species within the protection of the act.

In 1975, a state law (Act 65) was passed (Hawaii Revised Statutes, Chapter 195 D, "Conservation of Wildlife and Plants"). This law provided the Board of Land & Natural Resources with the authority to list species of wildlife and plants as Endangered or Threatened by Board Regulation.

Wildlife

No species of wildlife on the island of Kahoolawe, have been declared to be Endangered or Threatened under either Federal or State law.

Plants

The Endangered Species Act of 1973, directed the Secretary of the Smithsonian Institution, in conjunction with other affected agencies, to review species of plants which are now, or may become endangered or threatened, and methods of adequately conserving such species, and to report to Congress, within one year the results of this review including recommendations for new legislation or the amendment of existing legislation.

As directed, a list of some 3,000 plants was prepared. The list included some 1,000 Hawaiian species prepared by Dr. F. Raymond Fosberg of the Smithsonian Institution and Dr. Darrell Herbst, formerly of the University of Hawaii, H. L. Lyon Arboretum, currently of the U.S.D.I.-Fish and Wildlife Service.

This "review" list was published in the Federal Register Volume 40, Number 127, Part V, Pages 27824-27924 dated July 1, 1975.

A subsequent "proposed" list was published in the Federal Register Volume 41, Number 117, Part IV, Pages 24524-24572 dated June 16, 1976. This list contained a total of 1700 species of which 893 were Hawaiian.

Among the approximately 893 Hawaiian plants published in the proposed list are the five species listed in the Department of the Navy Final Environmental Impact Statement-Kahoolawe Island Target Complex, February 1972, pages C-8 and C-9. References to these plants are reprinted below as they appeared in the 1972 EIS.

"The five endemic species, which may be considered of botanical interest are as follows:

<u>Lipochaeta bryanii</u>	Collected only by Bryan in 1931
<u>Lipochaeta kahoolawensis</u>	Collected only by Remy in 1851-55
<u>Gouvania cucullata</u>	Collected only by Remy in 1851-55
<u>Gouvania remyi</u>	Collected only by Remy in 1851-55
<u>Neraudia kahoolawensis</u>	Collected only by Lydgate in the 1860's

The status of these endemic plants is unknown. If, however, some or all have disappeared from the island, a fact almost impossible to ascertain, it should be borne in mind that four of the five species were collected only by early collectors, in the period between 1851 and 1860, prior to the periods of prolonged overgrazing. The fifth species, which was collected only by Bryan in 1931, was collected from an area far from the target areas."

One plant from the Hawaiian list, the Hawaiian Wild Broadbean Vicia menziesii (Spreng.), has been technically reviewed and should be designated an Endangered Species within the next 60-90 days.

This plant is not endemic to Kahoolawe.

1.B.(3) Tree Planting and Erosion Control

Controlled experiments in revegetation and erosion control have been underway since 1970 in cooperation with the State of Hawaii, Department of Land and Natural Resources, Division of Forestry, in consultation with the U.S. Department of Agriculture Forest Service and the Soil Conservation Service. In cooperation with USDA and the State of Hawaii, the Navy established six experimental plots, fenced to exclude the goats (exclosures).

Three plots were situated on the western end of the island near Smugglers Cove. Three additional plots were located on the eastern end of the island. Of the six, the three located on the western end of the island were not productive due to competition with Kiawe trees (Prosopis chilensis) and in one instance due to exposure to salt water winds and beach wave action.

The three eastern plots, located on the high end of the island, have provided useful information in determining species suitable for revegetation in this area exposed to the effects of winds.

A total of 34 species of trees and shrubs and 11 species of grasses were planted within these exclosures. These species were selected for survival under the adverse conditions on Kahoolawe. These first plantings determined which species would be the most useful for plantings as windbreaks, since wind is the most significant factor in erosion on Kahoolawe.

Any further experimental plantings will be conducted inside these plots, which will be maintained as part of the continuing experiment. The fencing for these plots requires replacement every five years due to the effects of weathering.

Concurrently with the plantings, techniques for planting within areas contaminated by unexploded ordnance were developed by the U.S. Navy Explosive Ordnance Disposal Group One (EODGRUONE). The technique involves blowing holes in the ground using shaped explosive charges. The technique blows a hole approximately 4 inches in diameter and two feet deep. Subsequent detonation of explosives in this hole and re-blowing it provides a suitable depth for planting.

This method eliminates the need for hand labor with pick and shovel, or the use of heavy machinery in areas

contaminated with dud ordnance. The material cost is less than \$3.00 per hole. The Navy is continuing efforts to reduce the material cost, and to eliminate the time consuming requirements of hand packing of the shaped charges.

Plantings will be done on the eastern portion of the island where windbreaks will be most beneficial. These windbreaks will form squares which will later be revegetated with suitable species, with emphasis on plants endemic to the Hawaiian Islands.

Prior to planting, the areas will be inspected to insure that no archeologic sites are damaged. Blowing the planting holes will be accomplished by Explosive Ordnance Disposal (EOD) Mobile Unit One/Marine Corps EOD personnel. This will be a continuing operation. Blowing the planting holes will take place throughout the year. Planting will take place in the late winter, approximately February, to take advantage of the rainfall.

The initial findings from the planting tests indicate that the Tamarisk tree (Tamarisk spp.) is most suitable for windbreaks. However, the State Department of Land and Natural Resources-Division of Forestry (DLNR) shall, in consultation with the U.S. Forest Service and the U.S. Soil Conservation Service, determine what species will be planted and has agreed to provide and plant such species.

The continued cooperation of Navy/Marine Corps Commanders in transportation of men and materials to and from the island by helicopter, and in preparing sites for planting through the use of military shaped charges, together with the cooperation of the State of Hawaii, DLNR, Division of Forestry in providing technical advice, rearing of plants at the nursery and in planting operations, is vital to this conservation effort.

2. Relationship of Proposed Action to Land Use Plans,  
Policies and Controls for the Affected Area

Under Executive Order 10436 (February 25, 1953, 18 F.R. 1051) of February 20, 1953, the jurisdiction over Kahoolawe was placed under the Secretary of the Navy for naval purposes. This Order provides:

When there is no longer a need for the use of the area hereby reserved, or any portion thereof, for naval purposes of the United States, the Department of the Navy shall so notify the Territory of Hawaii, and shall upon reasonable request of the Territory, render such area, or such portion thereof, reasonably safe for human habitation without cost to the Territory.

As the present Navy need for training use will continue into the foreseeable future, any plans or programs for its use, other than military training, are conjectural only. There have been many suggestions and proposals over the years ranging from a thermonuclear plant to recreational purposes.

Under the existing U.S. Navy controls, entry to the island is prohibited. Fishing is not allowed in restricted waters surrounding Kahoolawe unless opened to the public by notice to Mariners. Furthermore, there are Federal Aviation Authority flight zone restrictions over the area. These controls are designed to prevent aircraft, ships, and people from entering a zone that might constitute a dangerous area.



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3.A(17) Eradication of Feral Goats and Feral Sheep

In 1970, concerted efforts began to eliminate feral goats and feral sheep from the island of Kahoolawe.

Due to the nature of the terrain and the hazard from unexploded ordnance, it was determined that it would not be possible to capture significant numbers of these animals by driving or herding.

Since these animals do not require free water for drinking and since they eat every type of vegetation on island with the exception of tree tobacco (Nicotiana glauca and Tamarisk (Tamarix aphylla), it has not been successful to sterilize, capture or kill goats using baits.

Personnel from the NAS Barbers Point and EOD Mobile Unit One, together with personnel from the State of Hawaii, DLNR, Division of Fish and Game shot feral goats and sheep several times a year during target maintenance trips to the island. From 1970 to date, more than 16,000 animals have been destroyed. Feral sheep have been eradicated.

It has, however, become apparent that efforts to eradicate goats have been insufficient. Due to the extremely high reproductive rate of the goats, efforts to eradicate them will be intensified, and will include all areas of the island and take place over a very short period of time.

Such a plan, using selected personnel as shooters from Navy/Marine Explosive Ordnance Disposal and other special units and from the State of Hawaii, Department of Land and Natural Resources, is being developed and will be accomplished prior to implementation of large scale tree planting.

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#### 4. Alternatives

##### I. Comprehensive Review of the Hawaiian Islands for Possible Alternative to Kahoolawe Island

The State of Hawaii consists of eight major islands and 124 minor islands with a total land area of 6,425 square miles and a general coastline of 750 miles. The following is a chart review of 132 islands, islets, atolls or shoals by grouping or components. Size is given in acreage, ranging from Spit Island of the Midway Group (0.0 acres) to the Big Island of Hawaii (2,579,000.00 acres). This chart illustrates, visually, why it has not been possible to find a large suitable island alternative to Kahoolawe within the Archipelago. Many of the smaller islands are located in the Leeward chain, protected both by National Wildlife Refuge and Wilderness designation. Any small islet usually lacks sufficient varied terrain for providing target rings. Small target size increases the possibility of ordnance being dropped in the coastal waters because of a miss or deflection without explosion. While there has been volcanic activity and lava flow on the Big Island, the Hawaiian Islands, unlike Iceland, have had no new islets which might be suitable for use as a target area.

The major inhabited islands are Niihau, Kauai, Oahu, Molokai, Lanai, Maui and Hawaii (7). Midway Island is a Naval Station and French Frigate Shoals is a Coast Guard Station. Coconut Island in Kaneohe Bay is the home of the Hawaii Institute of Marine Biology Laboratory, as well as a private estate. Laulaunui (Monkey Island) is located in West Loch of Pearl Harbor near populated areas. Ford Island, Pearl Harbor contains Navy headquarters buildings, residences and air facilities. The populated islands are generally impractical for reasons of health and safety to the populace while many of the small islands are habitats for birds, seal and other marine life. On this list, there are four groups listing components:

1. Pearl and Hermes Atoll (8 components)
2. Midway Islands (4 components)
3. Kure Atoll (2 components)
4. French Frigates Shoal (12 components)

Update 10/31/77

From the standpoint of a Target Complex, a suitable island should be relatively large and contain flat areas, isolated from population and affording economical access (both time and fuel). For aircraft ordnance or ship shore bombardment practice it is necessary that spotting or scoring take place; consequently, spotters and fire direction should be capable of being placed ashore during practice. From the environmental standpoint, there should be minimal adverse impact on "virgin areas" containing archeological sites, birds, plants and animals of possible value and opportunity for both species and vegetation to propagate, despite the target practice.

On numerous occasions, the question of choosing another site within the Hawaiian Islands to replace Kahoolawe for Navy/Marine Corps training operations, has arisen.

Due to a general lack of public knowledge on the extent of the Hawaiian Islands and the factors which make Kahoolawe an ideal site for such operations, a table was prepared. This table lists the islands, proceeding generally from south to north, together with approximate acreages. (Since no single list of all these islands could be found, the list was compiled from numerous sources and acreage may vary slightly among published references.)

The columns to the right show in general terms some of the more obvious factors which make the island unsuitable as a replacement for Kahoolawe.

ISLAND	Acres	Inhabited	Too Close to Inhabited Island	Unsuitable Terrain/Climate	Too Small	Too Far	State Wildlife Refuge	Federal Wildlife Refuge			
Hawaii	2,579,000.00	X		X							
Wahine Maka Nui	0.18		X	X	X						
Mokuola (Coconut Is.)	3.1		X	X	X						
Mahikea	1.0		X	X	X						
Kaulainaiwi	0.35		X	X	X						
Pohakulua	0.09		X	X	X						
Mokupuku	1.50		X	X	X		X				
Paalaea	0.16		X	X	X						
Paoakalani	2.40		X	X	X		X				
Arched Rock	0.09		X	X	X						
Mokuokahailani Rock	0.90		X	X	X						
Keaoi	4.0		X	X	X		X				
Kahoolawe	28,000.00										
Maui	465,920.00	X									
Ahole Rock	0.15		X	X	X						
Alau	4.5		X	X	X		X				
Aluea Rocks	0.14		X	X	X						
Kauwalu	0.30		X	X	X						
Keopuka	1.7		X	X	X		X				
Makoloaka	0.39		X	X	X						
Malaeloa	0.09		X	X	X						
Moku Hala	0.18		X	X	X		X				
Moku Holua	0.20		X	X	X						
Mokulau	0.09		X	X	X						
Moku Mana	0.70		X	X	X		X				
Mokupala	0.18		X	X	X						
Moku Papa	0.09		X	X	X						
Mokupapa	0.18		X	X	X						
Mokupipi	1.08		X	X	X						
Papaloa	0.40		X	X	X						
Pohaku Manamana	0.09		X	X	X						
Manahoa Rock	0.35		X	X	X						
Puuku Island	1.50		X	X	X		X				
Twin Rocks	0.09		X	X	X						
Kaelua	0.90		X	X	X						
Kahalau	0.30		X	X	X						
Moku Huki	0.35		X	X	X						
Moku o Kau	0.18		X	X	X						
Molokini	18.5		X	X	X		X				
Papanui o Kane	3.13		X	X	X		X				

ISLAND	Acres	Inhabited	Too Close to Inhabited Island	Unsuitable Terrain/Climate	Too Small	Too Far	State Wildlife Refuge	Federal Wildlife Refuge			
Pohaku Paea	0.18		X	X	X						
Waiakapuhi	0.10		X	X	X						
Aawaiki	0.35		X	X	X						
Aawanui	0.09		X	X	X						
Hulu Island	1.50		X	X	X		X				
Kaemi Island	2.5		X	X	X						
Mahinanui	0.6		X	X	X						
Mokeyhia Island	4.5		X	X	X		X				
Lanai	90,000.0	X									
Kaneapua	0.09		X	X	X						
Nanahoa	1.6		X	X	X						
Poopoo	0.50		X	X	X						
Puupehe	1.10		X	X	X						
Molokai	166,400.00	X									
Kanaha Rock	1.20		X	X	X		X				
Kukuipalaoa	0.36		X	X	X						
Mokohola	0.36		X	X	X						
Mokolea	0.46		X	X	X						
Mokuhooniki	10.60		X	X	X		X				
Mokumanu	2.87		X	X	X		X				
Mokupapapa	0.72		X	X	X						
Pauonuakea	0.72		X	X	X						
Huelo	3.1		X	X	X		X				
Mokapu	2.6		X	X	X						
Namoku	0.09		X	X	X						
Okala	2.15		X	X	X		X				
Oahu	386,500.00	X									
Kahakuaulana Island	3.3		X	X	X						
Mokauea	16.5		X	X	X						
Mokuoeo	9.0		X	X	X						
Anuenue (Rainbow/Sand Is.)	641.27		X	X	X						
Ahu O Laka	3.1		X	X	X		X				
Kaohikaipu	11.0		X	X	X		X				
Kapapa	7.00		X	X	X		X				
Kekepa	1.90		X	X	X		X				
Manana (Rabbit Is.)	67.00		X	X	X		X				
Mokualai	0.74		X	X	X		X				
Mokolea Rock	0.35		X	X	X		X				
Mokolii Island	4.00		X	X	X						
Moku o Loe (Coconut Is.)	23.8		X	X	X						
Mokulua Islands (2)	24.10		X	X	X		X				

ISLAND	Acres	Inhabited	Too Close to Inhabited Island	Unsuitable Terrain/Climate	Too Small	Too Far	State Wildlife Refuge	Federal Wildlife Refuge			
Moku Manu	16.60		X	X	X		X				
Popoia	3.67		X	X	X		X				
Kiheiawamoku	3.30		X	X	X		X				
Kukuihoolua	1.7		X	X	X		X				
Kukaimanani	0.5		X	X	X						
Mokuauia	12.5		X	X	X		X				
Mokualai	0.74		X	X	X		X				
Pulemoku	1.0		X	X	X		X				
Wananapaoa	0.09		X	X	X						
Mokuiki	0.09		X	X	X						
Mokunui	0.36		X	X	X						
Moku Umeume (Ford Is.)	345.0	X		X	X						
Laulaunui	5.75		X	X	X						
Kauai	355,000.00	X									
Mokapili Rock	0.72		X	X	X						
Mokuaeae	3.00		X	X	X		X				
Kalanipua Rock	0.09		X	X	X						
Niihau	47,100.00	X		X							
Kuakamoku	1.1		X	X	X						
Lehua Island	250.		X	X	X		X				
Kaula	108.			X	X						
Nihoa	190.7			X	X	X		X			
Necker Island	58.2			X	X	X		X			
French Frigates Shoal	56.3		SEE BELOW								
Disappearing Island	( 1.3 )			X	X	X		X			
East Island	( 2.6 )			X	X	X		X			
Gin Island	( 0.6 )			X	X	X		X			
La Perouse Pinnacle	( 0.6 )			X	X	X		X			
Little Gin Island	( 1.9 )			X	X	X		X			
Mullet Island	( 1.3 )			X	X	X		X			
Round Island	( 1.3 )			X	X	X		X			
Shark Island	( 3.2 )			X	X	X		X			
Skate Island	( 0.6 )			X	X	X		X			
Tern Island	( 32.6 )	X		X	X	X		X			
Trig Island	( 2.6 )			X	X	X		X			
Whale Island	( 7.7 )			X	X	X		X			
Gardner Pinnacles	2.6			X	X	X		X			
Maro Reef	0.0			X	X	X		X			
Laysan	839.7			X	X	X		X			
Lisianski	432.0			X	X	X		X			





4. Alternatives (Insert)

J. Alternatives to Kahoolawe (March 1976)--Taken from "A Report on the Island of Kahoolawe" provided by Commander in Chief U. S. Pacific Fleet to Chief of Naval Operations for briefing members of U. S. Congress and its Committees.

This analysis is more detailed and current than the one prepared in 1972. While there is no contradiction, it is presented in somewhat different format. Some of these factors have been used in the matrix review of all the Hawaiian Islands.

OUTLINE--ALTERNATIVES TO KAHOO LAWE

A. General

B. Requirements for a Target Site

1. Target Site Size
2. Target Site Location
3. Target Site Terrain
4. Climate
5. Cost Factors
6. Comment

C. Examination of Alternative Target Sites

1. Kaula Rock
2. PMRF Barking Sands
3. Schofield Barracks Range Complex
4. Makua Valley Impact Area
5. Pohakuloa Training Area
6. Artificial Target Island
7. Floating Target Area
8. Southern California Operating Base
9. Western Pacific Operating Base
10. U.S. Air Force/U.S. Coast Guard/U.S. Marine Corps Target Areas

J. Alternatives to Kahoolawe. (Excerpt from March 1976 CINCPACFLT "A Report on the Island of Kahoolawe")

Note: Certain figures and nomenclature have been adjusted in October 1977 to make information current.

A. General.

Current usage and the requirements for continued usage of a target site such as Kahoolawe have been discussed. It is clear that a target site is required, and that a continuing need for a target site such as Kahoolawe is recognized. The question arises as to whether there are suitable alternatives to the use of Kahoolawe.

The question of suitable alternatives is examined in two parts. The first part sets forth the various requirements for a site, such as size, location, climate, and so forth. The second part takes each of the alternatives and examines whether, in view of the various requirements, that alternative is acceptable.

B. Requirements for a target site.

1. Target site size.

a. Target impact area.

The target site must be large enough to accommodate an impact area which contains the necessary variety of point targets, area targets, and ringed targets. On Kahoolawe this area encompasses 7,750 of the total 28,777 acres.

b. Troop safety area.

In addition to the target impact area, the target site must also contain a troop safety area where troops may safely maneuver during close air support exercises, which involve live firing on the target impact area by aircraft. On Kahoolawe the troop safety area is more than adequate to provide the necessary area to accommodate 300-400 troops.

c. Artillery firing range.

There must be sufficient room to emplace artillery pieces outside the target impact area so that full-charge projectiles, when fired, will land within the target impact area. The projectiles cannot be accurately spotted and scored unless they land in a target area. If projectiles are fired from land into the water, accurate spotting is impossible, thus negating the training benefit by the Army or

Marine Corps unit involved. For 155 MM projectiles, with a full-charge, minimum down-range distance of 8140 yards is necessary.

d. Spotter locations.

Sufficient area must be available outside the target impact area to locate observation posts manned by personnel who visually spot ship-to-shore, artillery, and air-to-ground weapon impacts (such an area may be the same as the troop safety area). These personnel may be called umpires, observers, shore fire control parties (SFCP), spotters or forward air controllers (FAC), depending on type of exercises and units involved.

Spotter training serves a multiple function. The primary function of the spotter is to locate the target and direct fire to the specific target (that is, the aircrew, artillery, or ship does not know the target in advance, but responds, on a few seconds notice, to the location given by the spotter). The spotter also scores the accuracy of the hits and enables the aircrew, artillery, or ship to "correct" delivery technique on subsequent firings (for example, in combat situations, a ship cannot see the impact area 90% of the time, therefore, training in spotting is fundamental to combat effectiveness). These personnel may be called Umpires, Observers, Shore Fire Control Parties (SFCP), Spotters or Forward Air Controllers (FAC), depending on the type of fire being directed and the units involved.

e. Aircraft firing range.

The target site must be large enough to accommodate the various types of targets for air-to-ground exercises. These exercises include attack techniques that involve strafing, rocket/missile firing, and bombing. The dropping of ordnance on targets is usually directed by a Forward Air Controller who assigns the target or targets to the delivery aircraft and clears the delivery of ordnance on the target. Some of the exercises must be conducted at night. Some require built up targets (group of vehicles, buildings, so forth). Some exercises require three different targets, with the aircraft making a run on each target, and/or shifting targets as directed by the Forward Air Controller (FAC). Airborne FACs are also required to train in naval gunfire spotting (used in addition to ground spotting by shore fire control party personnel of naval gunfire).

f. Naval gunfire firing range.

A target site must be large enough to accommodate the various targets required for Naval gunfire

practice. In general, naval gunfire support exercises are designed to train combatant ship's personnel in the delivery of accurate fire on shore targets and to allow an evaluation of the performance by those personnel. The target site must be large enough to accommodate several targets and have sufficient room to seaward (see discussion under "Target site location" which follows this subsection). The majority of ship-to-shore bombardment is conducted indirectly (indirect - ship cannot see target due distance, terrain, or both), with the shore fire control party (SFCP) or the Forward Air Controller directing the fire and reporting the results. Some of the exercises require fire on a pre-arranged target area. Some require fire on a SFCD directed target, followed by the shifting of fire to a new directed target. Other exercises require indirect fire on the target. Still other exercises require direct fire on both non-opposing and simulated opposing shore positions, coupled with simulated air and/or surface threats, all while maneuvering at high speed (it should be noted that most of the ship-to-shore bombardment at Kahoolawe is conducted at a slow speed (3-4 knots) or from a fixed position). Naval gunfire support is conducted anywhere from 1,000 yards to 25,000 yards offshore, depending on navigational safety and the nature of the target and exercise being conducted.

## 2. Target site location.

### a. Adjacent to the sea.

A target site must be adjacent to the sea in order to be useful to ships firing naval gunfire support. It is not desirable for ships to fire over populated areas to an inland target site because of the possibility of a round falling short of the target area. Ships must also have seaward maneuvering room to permit positioning anywhere from 1,000 to 25,000 yards offshore as well as room for high speed maneuvers.

### b. Distance from operating base.

A target site should be located within reasonable radius from the operating naval bases and airfields.

(1) For fighter and attack type aircraft the distance should approximate about 100-150 nautical miles, which is a typical distance a fighter or attack fighter would be from a target if flying from an aircraft carrier. Time and fuel constraints are a major consideration for carrier type aircraft. Excessive distance to a target requires additional fuel, thus reducing the amount of time available for training at the target.

(2) For surface ships the operating base (or homeport of the ship) should be located within a few hours steaming time of the target site. Such close proximity enables ships to make a number of visits to the target site during the course of the training cycle, while at the same time conserving fuel and making the best use of available training time. Several visits may be necessary to train new crewmembers, adjust equipment and requalify (annual requirement).

c. Proximity to populated areas.

A target site should be located sufficient distance from areas of civilian population to ensure:

(1) the use of live ordnance does not represent, in any way, a safety hazard to local residents.

(2) the noise level from live ordnance drops does not represent a noise hazard to the local populace. The present target impact areas on Kahoolawe are of sufficient distance that, except under unusual atmospheric conditions, the noise from live ordnance drops is of such low level that it cannot be measured on a sound level meter located in the nearly populated areas. During adverse atmospheric conditions firing exercises are curtailed.

d. Surrounding terrain.

It is desirable that, in the training situation, the terrain within 8 to 10 miles of the target area be approximately the same altitude as the target impact area for optimum safety of aircraft operating over the target area at night or in inclement weather conditions. Surrounding terrain that is more than a few hundred feet higher than the target site represents a hazard to aircraft on night ordnance deliveries over the target area while recovering from diving attack runs.

3. Target site terrain.

There are specific terrain requirements for the target site and target impact area.

a. Level terrain.

The target impact area must be made up of a variety of terrain features, including a level area approximately 2,000 feet long and 100 feet wide to simulate a runway. Two such areas exist at the Kahoolawe target site.

b. Uneven terrain.

The target impact area must include hills and valleys, with a minimum rise of 100 feet over a 180 foot run, in order that artillery and ships may practice defilade (defilade is defined as: "protection or shielding from hostile ground observation and flat projecting fire provided by an artificial or natural obstacle, as a hill") firing.

c. Variety of terrain.

The target impact area should contain a variety of terrain features to provide the various users practice in locating targets, firing at hidden targets, and to provide objects, hills, or so forth, which afford practice in terrain avoidance by either the delivery vehicle (such as aircraft) or the weapon (shell, missile, and so forth).

4. Climate.

There are climatic conditions which make one target site more desirable than another target site.

a. Cloud cover.

Cloud cover over the target site, and particularly over the target impact area, which obscures visual recognition of the site and impact area by aircraft pilots, artillery and ship-to-shore gunfire spotters renders the site unusable while that condition exists. Kahoolawe has approximately fifty out of 250 working days a year when such conditions exist. Thus usage of Kahoolawe as a target site, which is scheduled for five days a week and four nights a week is limited by cloud cover (and precipitation) only 20% of the time. Any appreciable increase in loss time from cloud cover necessitates cancelling or diverting of scheduled ordnance deliveries with a resultant increase in cost and interruption of the training cycle for the particular aircraft squadron, unit, or ship involved.

b. Inclement weather.

In the instances where the cloud cover may be high enough to permit visual approach under the clouds, but where precipitation reduces the visibility to less than ten miles, the use of the target is curtailed. The visibility on Kahoolawe exceeds ten miles 81% of the time. It ranges from five to ten miles 12% of the time. Overall visibility on the island exceeds five miles 99% of the time. Although accurate measurements of rainfall on Kahoolawe are unavailable, annual rainfall

is estimated to be about twenty inches per year. Compared to Kahoolawe, only target sites located in desert areas such as in the State of Nevada are clear from cloud cover and precipitation a greater percentage of the time.

#### 5. Cost Factors.

The various cost factors involved are a consideration whenever a particular target site is discussed.

##### a. Target development.

The target site at Kahoolawe is a developed target site. That is, the targets have been built and are in place (this includes piling up rocks for point targets, painting and laying out rocks or tires for ring targets/simulated SAM sites/simulated airfields, positioning vehicles for simulated convoys, and so forth). The terrain is suitable, thus no further grading or terrain modification is necessary. Structures, such as spotter towers, are in place at Kahoolawe.

##### b. Target maintenance.

The costs of target maintenance include accessibility to the target site (that is, are helicopter landing sites and boats landing areas available or must they be constructed?) and structures for a base camp to serve maintenance personnel who must remain at the target site for several days.

##### c. Target user costs.

The transportation costs of the user (aircraft, artillery, ships) to and from the target are a consideration. The fuel cost for an F4J aircraft for one hour of flight operations is approximately \$600.00, and the cost of a Fast Frigate for one day is approximately \$3,100.00. Any lengthening of the enroute distance raises the costs, as well as decreasing the training time at the target.

#### 6. Comment.

Any inability to meet these basic requirements for a target site has a resultant degradation of combat readiness.

#### C. Examination of Alternative Target Sites.

The examination of alternatives to the use of Kahoolawe as a target site includes targets within the local area of the



State of Hawaii, target sites outside of the immediate area of the State of Hawaii, as well as artificial and floating targets. These alternatives are each examined in view of the various requirements listed in part B. of this section, to determine if the alternative is acceptable.

1. Kaula Rock.

Kaula Rock is located 18 miles southwest of Niihau Island, State of Hawaii. The Rock is a 108 acre island that protrudes sharply from the sea to a height of approximately five hundred and fifty feet above the sea and is seven-tenths of a mile long by one-third of a mile wide, at its widest point. Kaula Rock is used as a target by aircraft, only, for the practice of certain maneuvers (such as multi-plane attacks) and weapons deliveries which are restricted from use on Kahoolawe (multiple bombs on one run or bombs larger than 500 pounds). Kaula Rock is well suited as a point bombing target. Kaula Rock is unsuitable as an alternative to Kahoolawe:

a. Target size.

Small size provides insufficient target impact area; provides no room for troop safety zone; artillery fired full-charge projectiles would land in the sea, with no accurate spotting (preparation of artillery emplacements would require blasting an area in the rock); no spotter locations are available; only one single point target is available for aircraft firing; and height, lack of target area, and lack of spotter locations preclude use as naval gunfire range.

b. Target site location.

Only disadvantage in target site location is the distance from the operating bases. Kaula Rock is approximately 55 nautical miles further from Oahu than Kahoolawe.

c. Target site terrain.

In addition to insufficient size Kaula Rock lacks a level area that could be used for an area target, such as a simulated airfield.

d. Climate.

Not a significant factor.

e. Cost factors.

Target development would require massive blasting and leveling of major portions of the Rock to convert it

into a multiple target site. Addition of targets and target maintenance, under present conditions, would be difficult since the only access to the island is by helicopter and no structures are available for target maintenance crews.

f. Comment.

Kaula Rock is inhabited by thirteen species of sea birds with an estimated population of one hundred thousand birds. Modification of the island to create an acceptable target would probably disrupt this bird population.

2. PMRF Barking Sands.

The Pacific Missile Range Facility, Barking Sands, Kauai, State of Hawaii, is an underwater weapons testing range that is currently being expanded from 50 square miles of open ocean to 1,000 square miles of open ocean. The range is instrumented for weapons testing and fleet training exercises. PMRF, Barking Sands, is unsuitable as an alternative to Kahoolawe:

a. Target site size.

Although not a land target, but rather an open ocean range, the size of the PMRF, Barking Sands, is sufficient.

b. Target site location.

Other than distance from operating base, which is approximately 35 nautical miles further from Oahu than Kahoolawe, there are no disadvantages to the target location.

c. Target site terrain.

Unsatisfactory in all respects. No terrain features are available. This aspect, in itself, precludes use of PMRF, Barking Sands, as a suitable alternative to Kahoolawe.

d. Climate.

Not a significant factor.

e. Cost.

Development of PMRF, Barking Sands as a usable alternative would be comparable to creating an artificial target island. Refer to the discussion below on an artificial target island.

f. Comment.

PMRF, Barking Sands cannot provide the terrain features that are necessary for certain aspects of the air-to-surface and surface-to-surface weapons training environment. PMRF, Barking Sands is designed primarily for underwater weapons testing, realistic testing of long-range weaponry and maneuvering of vessels as they would move in the open ocean.

3. Schofield Barracks Range Complex.

The Schofield Barracks Range Complex, located on Oahu, State of Hawaii, is a U. S. Army range. The ranges are used for troop maneuvers and artillery firing areas. The range complex is unsuitable as an alternative to Kahoolawe:

a. Target size.

Suitable in all respects, with regard to size, however as discussed below under target site location, it is not suitable as an aircraft firing range nor as a naval gunfire range, for reasons other than size.

b. Target site location.

The range is located several miles inland. Use of the range by aircraft would require flying over inhabited areas of Oahu, carrying service ordnance enroute to the target area, thus creating a potentially hazardous situation. Likewise, use of the range as a naval gunfire support range would require firing over inhabited areas and at a minimum distance of five miles which would preclude the carrying out of those naval gunfire exercises that require the ship to be less than 20,000 yards from the target. Noise from naval gunfire and aircraft delivered weapons would be unacceptable to inhabitants who live close to the target area. Aircraft are also precluded from operating at night on the range because the surrounding terrain is several hundred feet higher than the range.

c. Target site terrain.

The terrain on the Schofield Barracks Range Complex meets the requirements for such a site.

d. Climate.

Use of the range would be limited by inclement weather and cloud cover about 48% of the time.

e. Cost factors.

No additional cost factors are involved in using the Schofield Barracks Range Complex as an alternative to Kahoolawe.

f. Comment.

The primary reason this range cannot be used as an alternative to Kahoolawe is that it is not suitable as an air-to-ground and ship-to-shore target site.

4. Makua Valley Impact Area.

The Makua Valley Impact Area, located near the northwestern tip of Oahu, State of Hawaii, is a U. S. Army Range. It is used for troop maneuvers and firing of small explosive ordnance. The largest piece of explosive ordnance permitted on the Makua Valley Impact Area is the shell from a 106 mm. recoilless rifle. The impact area is unsuitable as an alternative to Kahoolawe:

a. Target site size.

The Makua Valley Impact Area contains 4,922 acres, less than the 7,750 presently used as the target site on Kahoolawe. Unlike Kahoolawe, the surrounding land is unavailable for artillery firing sites as are troop safety areas.

b. Target site location.

The range is located approximately 3 miles inland from the coast. Use of the range by aircraft would require flying over inhabited areas of Oahu, carrying live ordnance enroute to the target area, thus creating a potentially hazardous situation. Likewise, use of the range as a naval gunfire support range would require firing over inhabited areas. Noise from naval gunfire and aircraft delivered weapons would be unacceptable, both from a comfort and a safety aspect, to the nearby population. The range is located on a mountain side, thus creating a hazard to aircraft operating at night on the range.

c. Target site terrain.

Insufficient level terrain exists for laying out a simulated airfield.

d. Climate.

Although Makua Valley Impact Area has more inclement days than Kahoolawe, it is not considered a major limitation.

e. Cost factors.

Target development costs cannot be adequately determined since the area does not contain sufficient level ground for development of certain types of targets.

f. Comment.

The major reasons for the unsuitability of Makua Valley Impact Area is the inland location, coupled with the unsuitable terrain, and the proximity to an inhabited area.

5. Pohakuloa Training Area.

The Pohakuloa Training Area, located in the central portion of the island of Hawaii, State of Hawaii, is a U. S. Army Range. The range, which covers 166,498 acres, provides an area for both heavy weapons firing and brigade-size maneuver exercises. The Pohakuloa Training Area is unsuitable as an alternative to Kahoolawe:

a. Target site size.

The Pohakuloa Training Area is more than adequate in terms of size as an alternative to Kahoolawe.

b. Target site location.

The Pohakuloa Training Area is located 21 miles inland, beyond the range of most naval guns. Because of the size of the range, and the relatively small nearby population, noise is not considered an excluding factor. The range has an artillery impact area that has been used occasionally by Marine aircraft from MCAS Kaneohe Bay. Caution must be used in the approach to the target over land with externally carried service ordnance onboard. The terrain, which is sloping and at a level of approximately 6,000 feet, has mountains on either side which rise to over 13,000 feet which prohibit the use of the range at night or in inclement weather by aircraft. In addition, consideration must be given to the fact the range is 75 nautical miles further from Oahu than Kahoolawe.

c. Target site terrain.

The terrain at Pohakuloa meets all the terrain requirements for a target site, except a simulated runway would have to be laid out on a hillside instead of level ground. Such a site is not realistic for an airfield target.

d. Climate.

The Pohakuloa Training Area is characterized by low lying cloud cover. The range would be unusable, due to low cloud cover, during the day (night operations are precluded because of surrounding mountains) by aircraft approximately 36% of the time, with 57% unusable time during optimum training period (from noon to early evening). Thus a severe handicap is presented to the maintaining of scheduled aircraft training.

e. Cost factors.

Considerable target development work would have to be done at Pohakuloa since there are no permanent targets (such as built up targets - vehicles, building, etc., simulated SAM sites, simulated airfields, and so forth) for air combat missions. The targets presently there for close air support mission are large cheesecloth air panels laid on an accessible hillside. These panels lack permanency and are subject to easy obliteration. Cost estimates on target development would be based on the number of man days/equipment time required to develop the targets. Such estimates have not been computed, since the target is otherwise unsuitable. The target maintenance costs and target user costs are not deemed to be significantly different from those costs for Kahoolawe.

f. Comment.

The Pohakuloa Training Range is unsuitable as an alternative for Kahoolawe primarily because (1) it is not usable as a naval gunfire support range, and (2) it is limited in use as an aircraft firing range because of low lying cloud cover and high surrounding mountains.

6. Artificial Target Island.

The construction of an artificial target island, with a variety of terrain features, such as hills, valleys, and level areas, and of comparable size to the target impact area on Kahoolawe, is not considered economically practical. No formal studies have been prepared, but rough estimates of the cost of creating an artificial island from a reef or shoal area range from approximately \$270,000,000 to \$450,000,000. Such cost

estimates were based on an artificial island of only about 300 acres in size, much smaller than the Kahoolawe target impact area. It has been suggested that perhaps Kahoolawe should be made available to the State of Hawaii for recreation purposes. To put this into context, consider that in 1974 the State of Hawaii operating expenditures for recreation were \$4,351,000. The median estimate for building an artificial island as an alternative for Kahoolawe would cost about \$360 million (not including the Ordnance Clearance Costs if the island is to be rendered safe). If such an expenditure were invested (conservatively) at 6% a year it would provide an annual revenue of \$21.6 million; more than five times the 1974 operating expenditures for recreation.

## 7. Floating target area.

Two types of floating target areas should be examined as possible alternatives to Kahoolawe. One is the sea-towed sled, which is presently in use for certain types of exercises, and the other is the construction of what essentially would be a floating island, covering several acres.

### a. The sea-towed sled.

Sea-towed targets (usually towed by a tug) are used in naval gunnery exercises when attacks are simulated on other ships or on PT boat type targets. They are also used by aircrews for attacks on the same type of simulated targets. Sea-towed sleds are unsuitable as an alternative for Kahoolawe:

#### (1) Target site size.

Only a few hundred square feet. Does not meet the requirements for target impact area, troop safety area, artillery firing range, nor spotter locations. Cannot provide a variety of targets.

#### (2) Target site location.

A sea-towed target may be placed anywhere desired in the ocean. This is not a limiting factor.

#### (3) Target site terrain.

A sea-towed target fails to provide any terrain features whatsoever. It is impossible to conduct any training exercises which require terrain features on such a target.

(4) Climate.

Due to the mobility of the sea-towed target climate is not a factor.

(5) Cost factors.

A sea-towed target is a relatively inexpensive target site.

(6) Comment.

Because of its very small size, lack of variety and complete absence of terrain features, a sea-towed target is not a suitable alternative for Kahoolawe.

b. The floating island target.

The construction of a floating island target of several acres and with terrain features, such as valleys, hills, and level areas, would involve costs approaching the costs of the artificial island discussed above. In addition, the construction of a floating island target that would be sufficiently strong to withstand repeated impacts of all types of live ordnance is not currently feasible. Such an island would also be vulnerable to inert ordnance, thus requiring extensive repair on a regular basis. Costs and impracticality of such a project preclude the use of a floating island as a suitable alternative to the use of Kahoolawe as a target site.

8. Southern California Operating Areas.

There are operating areas in Southern California. The U. S. Navy maintains targets on the island of San Clemente, located sixty-three miles off the coast of California. San Clemente is used frequently by the Navy as a shore bombardment target. Unfavorable weather conditions prevent the unrestricted use of the island. San Clemente is primarily unsuited as an alternative to Kahoolawe for Hawaii based units because of the distance from Hawaii. Ships based in Hawaii would have to travel roughly 2,500 miles one-way (minimum of 5 to 7 days steaming time) to conduct their training exercises there. In addition to the time and fuel required, delays in availability of the target areas due to weather and competition with Southern California based units would result in local units being displaced for lengthy periods of time. Steaming to Southern California would result in highs and lows in training and readiness. Because of the distance involved San Clemente is not a suitable alternative to Kahoolawe.



Likewise, the use of Southern California target sites by Hawaii based aircraft is precluded because of the great distance involved. It has been estimated that to move a Marine Corps squadron the equivalent distance of from Hawaii to Southern California costs approximately \$1.6 million (1972 estimate). To do this on a routine basis for aircraft firing exercises is not economically practical.

#### 9. Western Pacific Operating Areas.

The U. S. Navy and the other services do have training areas in the Western Pacific. The use of these areas by Hawaii based units is unsuitable for the same reasons as use of the Southern California areas are unsuitable. In the case of the Western Pacific Operating Areas, the steaming time one-way, for a ship is increased from 4 or 5 days, to 12 or 14 days. The greater distance would involve increased costs, as well as additional time. In addition, Western Pacific operating areas are on foreign soil and subject to reversion to host governments. An increase in their use could jeopardize their availability to ships and squadrons deployed to or homeported in the Western Pacific. It must be concluded that Western Pacific operating areas are not a suitable alternative to Kahoolawe as a target site.

#### 10. U. S. Air Force/U. S. Coast Guard/U. S. Marine Corps target areas.

These three services do not have any target areas in the vicinity of the State of Hawaii. They use the U. S. Navy and U. S. Army target sites discussed previously.

#### D. Conclusion.

It is concluded that U.S. Navy, in conjunction with the other users, has no suitable alternative to the use of Kahoolawe as a target site. Until such time as naval shore bombardment, carrier based aircraft bombing, and close air support of ground troops are no longer an integral part of modern warfare, the U. S. military forces will require the use of Kahoolawe Island. There will be a continuing requirement to use the island for the foreseeable future for bombing and gunnery practice in order to maintain combat readiness of military units. Therefore, in view of the requirement to maintain ready military forces, utilization of Kahoolawe Island target complex fulfills a most vital need.

In the event Kahoolawe should become unavailable there are currently two courses of action open to the users of the target site.

##### a. Decrease in readiness.

One choice is to curtail weapons training, with the resultant decrease in combat readiness, which directly impacts on the ability to meet the National Security needs of the United States. Such a choice is not desirable.

b. Shift bases.

The other choice is for the users to shift the homeports of the ships and the bases for the aircraft to another location, either on the mainland, or in the Western Pacific. This choice is not desirable for three reasons:

(1) The costs of shifting homeport and airbases to the military services would be in the tens of millions of dollars.

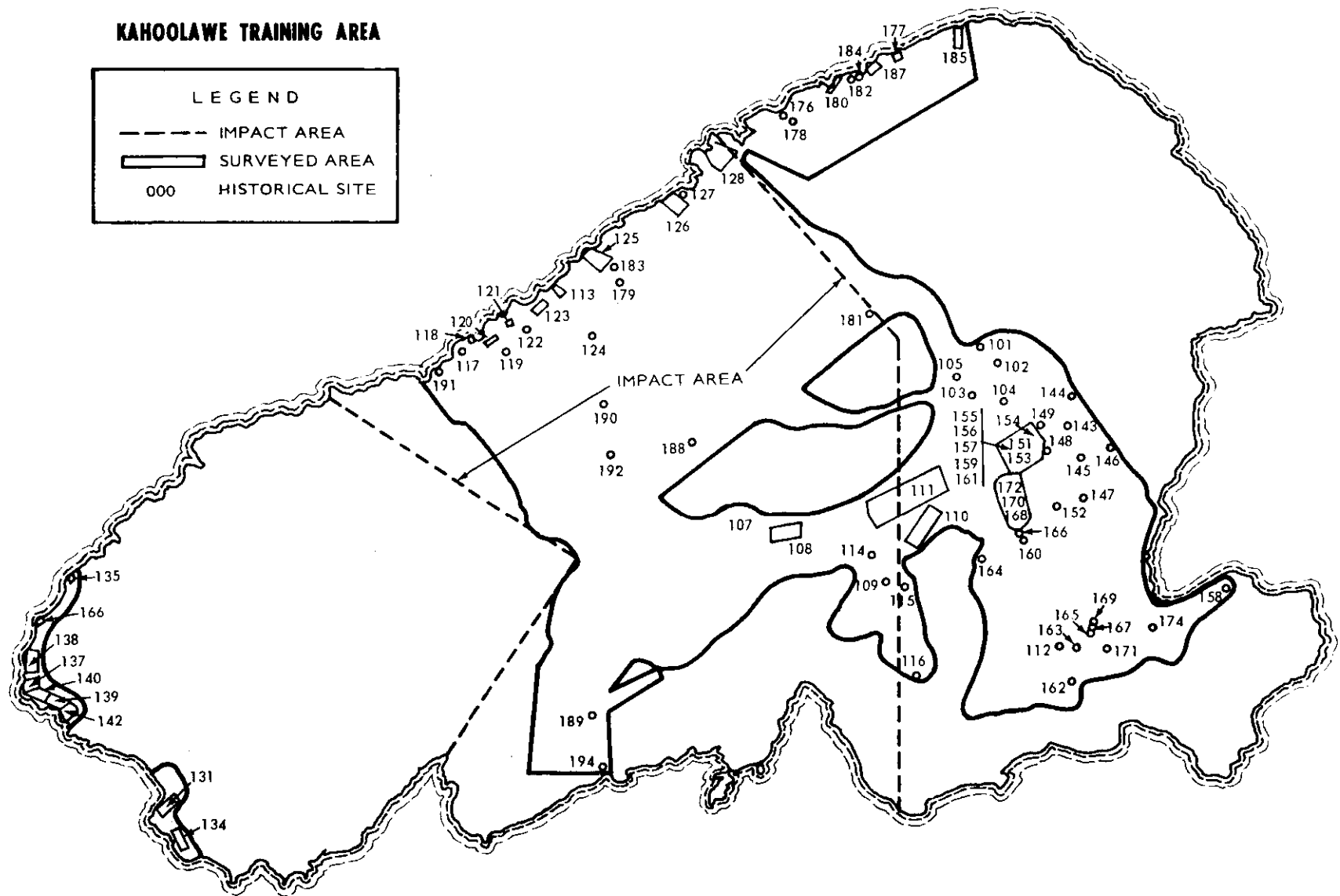
(2) The availability of usable targets in other areas is limited.

(3) The economic impact upon the State of Hawaii from the loss of the military bases could very well be several hundred million dollars annually, depending on the extent of the base relocation.

# KAHOOLAWE TRAINING AREA

## LEGEND

- IMPACT AREA
- ▭ SURVEYED AREA
- 000 HISTORICAL SITE



8. Considerations that Offset Adverse Environmental Effects (Insert)

Department of Defense operations in Hawaii are a major economic factor in the State economy. Just as the tourism, sugar and pineapple industries have certain requirements, the U. S. Navy, which has its principal Hawaii location on Oahu, requires constant training in areas close by. During a period of high fuel costs and energy conservation, it is increasingly important that there be a target complex in the State.

Because of possible human or mechanical error during training, it is essential that such targets be as isolated as possible to insure human safety. For this reason, the U. S. Navy does not maintain a target complex on any populated Hawaiian island. The island of Kahoolawe is not populated. It has belonged to the Federal Government continuously since 1898. Therefore, no acquisition of privately owned real property was necessary to enable the military to commence ordnance training in 1941. Miles of water provide a natural barrier, rendering trespass difficult. There is no similar island of sufficient size to accommodate this function.

The beginning of large scale military operations in the early days of World War II necessitated the closure of ranching operations on Kahoolawe. Domestic cattle, which had been grazing on the island under numerous previous lessees, were removed by the then current lessee, Kahoolawe Ranch Company, with military assistance. Although conservation efforts had been made by Kahoolawe Ranch Company, this complete removal of domestic cattle eliminated one source of erosion.

Military efforts have eliminated the feral sheep population, which was another factor in erosion, and continuing efforts are being made to eliminate the goats.

A continuing project to determine species of plants and techniques for planting is being conducted. This project, in progress for the past seven years, has determined the species, techniques and location most suitable for windbreaks, and has provided information on species to be planted once the windbreaks are established. The research phase of this study had been largely completed in 1976 when preparations for large scale plantings were begun.

Update 10/31/77

The U.S. Navy has funded a study by the State of Hawaii, aimed at the preservation of these archaeologic sites. After three wars and more than 35 years of use as a military target, the archaeologic sites on the island caused Dr. Robert Hommon of the State Historic Preservation Office to write:

"More significant, however, is the fact that the degree of preservation is greater on this island (Kahoolawe; Ed.) than on any other, since urban and agricultural development has seriously depleted the archaeological resources elsewhere."

Although many of the above mentioned efforts have been in cooperation with State and Federal Conservation Agencies, these efforts would not have been feasible without military support, occasioned by military use of the island.

In conclusion, the proficiency of military forces in Hawaii must be continually maintained to insure that defense is possible. The island of Kahoolawe has proved eminently suitable for such operations and it is the U. S. Navy's intent, with appropriate consideration for environmental values, to continue such economical training operations in the future.

## Archeologic/Historic Sites

Executive Order 11593, "Protection and Enhancement of the Cultural Environment" of May 13, 1971, calls for the location, inventory and nomination of all sites, buildings, districts and objects under Federal Control that appear to qualify for listing on the National Register of Historic Places.

At the time the Draft Environmental Impact Statement for Kahoolawe was written (September 1, 1971), the only published source of information concerning the archeology of Kahoolawe was:

McAllister, J.G. 1933, "Archeology of Kahoolawe," B. P. Bishop Museum Bulletin 115, published by the Museum, Honolulu, Hawaii.

Excerpts from this book were printed in the Final Environmental Impact Statement dated February 1972 (Appendix A, pages 1-4), portions of which are reprinted here as follows:

The evidence of the remains and artifacts establishes these former inhabitants of Kahoolawe as Hawaiians of the time of discovery (1778). Two structures resemble the Hawaiian heiau form. They are smaller than the usual type, but not unusual, and are probably fishing heiaus. The fishing shrines (ko'a) are typical of those found on any of the other inhabited Hawaiian islands. Similarly, the dwelling sites do not differ from the Hawaiian forms....

It is evident, however, that though Hawaiian culture is not fully represented, the fishing phase is highly developed.

The lack of traditions for Kahoolawe is mute evidence of the unimportance of the island. A transient population, without taro patches and permanent abodes, with a paucity of material objects, was of little interest to avaricious chiefs and priests and the island consequently escaped most of the interisland warfare.

....No remains were found other than those of a fishing phase of the Hawaiian culture of the eighteenth century.

In accordance with OPNAVINST 6240.3 of 24 April 1975, Chapter 10, Part 7, CINCPACFLT (Commander in Chief U.S. Pacific Fleet) through PACNAVFACENGCOM (Pacific Division, Naval Facilities Engineering Command) contracted with the State of Hawaii, Department of Land and Natural Resources, Historic Sites Branch to conduct a survey of archeologic sites on Kahoolawe. (Contract No. N62742-77-C-0054) This survey will include, where appropriate, nominations for inclusion in the National or the State Register of Historic Places.

As of 31 October 1977, approximately 75% of the designated impact area, located in the center third of the island, as well as numerous areas on the eastern and western ends of the island, have been surveyed for archeologic sites.

In consultation with State archeologist, in those instances where archeologic sites have been found near a target, the target has been closed to operations, or in a single instance, the archeologic material has been recorded and removed.

Military control of Kahoolawe has been an advantage in the preservation of archaeological sites, as stated in "Kahoolawe Survey Background Information"<sup>1</sup> which accompanied each of the recently received nomination forms.

"More significant, however, is the fact that the degree of preservation is greater on this island than on any other, since urban and agricultural development has seriously depleted the archaeological resources elsewhere."

In accordance with the Navy/State contract, the State of Hawaii, Department of Land and Natural Resources-Historic Sites Branch, has begun to submit material to PACNAVFACENGCOM as contracting Command for the Navy.

This material is in the form of nominations to the National Register of Historic Places. As of October 31, 1977, fifty-six nominations had been received.

Each site nomination includes:

1. National Register of Historic Places-Inventory Nomination Form.
2. National Register of Historic Places-Inventory Nomination Form-Appendix A. Kahoolawe Background Information.
3. Sketches of the site (not included in all nominations.)

4. Black and white 5x7 photograph(s) portraying each site.

These are being reviewed by PACNAVFACENGCOM and will be forwarded in accordance with OPNAVINST 6240.3D via Navy channels to the U.S. Department of Interior.

Consultation has taken place between the Department of the Navy and the Department of the Interior on the potential for the entire island having eligibility.

<sup>1</sup> National Register of Historic Places Appendix A. Kahoolawe Survey Background Information, Page 3.



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