Makua-Kaena State Park

Environmental Impact Statement

Dept. of Land & Natural Resources
Division of State Parks
State of Hawaii
REVISED
ENVIRONMENTAL IMPACT STATEMENT
FOR
MAKUA-KAENA STATE PARK

DIVISION OF STATE PARKS
OUTDOOR RECREATION AND HISTORIC SITES
DEPARTMENT OF LAND AND NATURAL RESOURCES
IN COOPERATION WITH THE
DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

FEBRUARY 1978

Prepared by:
ENVIRONMENT IMPACT STUDY CORPORATION

Based on:
THE MAKUA-KAENA STATE PARK CONCEPTUAL PLAN

By:
HAWAII DESIGN ASSOCIATES, INC.

W. Y. Thompson

Date
# TABLE OF CONTENTS

**SUMMARY**

<table>
<thead>
<tr>
<th>SECTION 1</th>
<th>PROJECT DESCRIPTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I. INTRODUCTION</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>A. Location</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>B. Purpose of the Park</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>C. Purpose of the Environmental Impact Statement</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>II. PROJECT GOALS AND OBJECTIVES</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td>A. The Goals of Selected Recreational Concepts</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td>B. Planning Process</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td>III. ACCEPTED PLAN</td>
<td>1-4</td>
</tr>
<tr>
<td></td>
<td>A. Coastal Sector</td>
<td>1-4</td>
</tr>
<tr>
<td></td>
<td>1. Makua and Keawaula</td>
<td>1-4</td>
</tr>
<tr>
<td></td>
<td>2. Leeward Coastline</td>
<td>1-7</td>
</tr>
<tr>
<td></td>
<td>3. Kaena Point</td>
<td>1-8</td>
</tr>
<tr>
<td></td>
<td>4. Windward Coastline</td>
<td>1-9</td>
</tr>
<tr>
<td></td>
<td>5. Areas Surrounding Camp Erdman</td>
<td>1-10</td>
</tr>
<tr>
<td></td>
<td>B. Upland Mountain Sector</td>
<td>1-11</td>
</tr>
<tr>
<td></td>
<td>1. Peacock Flats</td>
<td>1-11</td>
</tr>
<tr>
<td></td>
<td>2. Nike Site</td>
<td>1-12</td>
</tr>
<tr>
<td></td>
<td>3. Central Upland Sector</td>
<td>1-12</td>
</tr>
<tr>
<td></td>
<td>4. Remote Open Sector</td>
<td>1-13</td>
</tr>
<tr>
<td></td>
<td>IV. PROJECT PHASING AND FUNDING</td>
<td>1-13</td>
</tr>
</tbody>
</table>

**SECTION 2**

<table>
<thead>
<tr>
<th>DESCRIPTION OF THE EXISTING ENVIRONMENT</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. SITE LOCATION</td>
<td>2-1</td>
</tr>
<tr>
<td>II. ACCESS</td>
<td>2-1</td>
</tr>
<tr>
<td>III. CLIMATE</td>
<td>2-2</td>
</tr>
<tr>
<td>IV. GEOLOGY</td>
<td>2-7</td>
</tr>
<tr>
<td>V. HYDROLOGY</td>
<td>2-8</td>
</tr>
<tr>
<td>VI. TOPOGRAPHY</td>
<td>2-9</td>
</tr>
<tr>
<td>VII. SOILS</td>
<td>2-10</td>
</tr>
<tr>
<td>VIII. FLORA AND FAUNA</td>
<td>2-12</td>
</tr>
<tr>
<td>A. Flora</td>
<td>2-12</td>
</tr>
<tr>
<td>B. Fauna</td>
<td>2-16</td>
</tr>
<tr>
<td>C. Marine Life</td>
<td>2-18</td>
</tr>
<tr>
<td>1. Yokohama and Makua Beach Areas</td>
<td>2-18</td>
</tr>
<tr>
<td>2. Keawaula (Yokohama) to Kaena Point</td>
<td>2-19</td>
</tr>
<tr>
<td>3. Kaena Point to Dillingham Airfield</td>
<td>2-19</td>
</tr>
<tr>
<td>SECTION 2</td>
<td>IX. TSUNAMI FLOOD ZONE</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------</td>
</tr>
<tr>
<td>SECTION 2</td>
<td>X. OCEANOGRAPHY</td>
</tr>
<tr>
<td>SECTION 2</td>
<td>XI. WATER QUALITY (Near-Shore)</td>
</tr>
<tr>
<td></td>
<td>A. Class AA Waters</td>
</tr>
<tr>
<td></td>
<td>B. Class A Waters</td>
</tr>
<tr>
<td></td>
<td>C. Existing Water Quality</td>
</tr>
<tr>
<td>SECTION 2</td>
<td>XII. ARCHAEOLOGY</td>
</tr>
<tr>
<td></td>
<td>A. General</td>
</tr>
<tr>
<td></td>
<td>B. Makua</td>
</tr>
<tr>
<td></td>
<td>C. Kahanahaiki</td>
</tr>
<tr>
<td></td>
<td>D. Keawaula</td>
</tr>
<tr>
<td></td>
<td>E. Kaena</td>
</tr>
<tr>
<td></td>
<td>F. Kealia</td>
</tr>
<tr>
<td></td>
<td>G. Kawaihapal</td>
</tr>
<tr>
<td></td>
<td>H. Mokuleia and Waialua</td>
</tr>
<tr>
<td></td>
<td>I. Summary</td>
</tr>
<tr>
<td>SECTION 2</td>
<td>XIII. INFRASTRUCTURE</td>
</tr>
<tr>
<td></td>
<td>A. Roads</td>
</tr>
<tr>
<td></td>
<td>1. Farrington Highway</td>
</tr>
<tr>
<td></td>
<td>2. Satellite Tracking Station Road</td>
</tr>
<tr>
<td></td>
<td>3. FAA Road</td>
</tr>
<tr>
<td></td>
<td>4. Nike Road</td>
</tr>
<tr>
<td></td>
<td>B. Sewage</td>
</tr>
<tr>
<td></td>
<td>C. Water</td>
</tr>
<tr>
<td></td>
<td>D. Electricity</td>
</tr>
<tr>
<td></td>
<td>E. Communication</td>
</tr>
<tr>
<td></td>
<td>1. Canadian Overseas Telecommunication Corp</td>
</tr>
<tr>
<td></td>
<td>2. Hawaiian Telephone</td>
</tr>
<tr>
<td></td>
<td>3. Public Safety Radio Communication</td>
</tr>
<tr>
<td></td>
<td>4. Federal Aviation Administration</td>
</tr>
<tr>
<td></td>
<td>5. Hawaii Air National Guard</td>
</tr>
<tr>
<td></td>
<td>F. Public Services</td>
</tr>
<tr>
<td></td>
<td>1. Police</td>
</tr>
<tr>
<td></td>
<td>2. Fire</td>
</tr>
<tr>
<td></td>
<td>3. Medical Evacuation</td>
</tr>
<tr>
<td></td>
<td>4. Health Services</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

**SECTION 3**
RELATIONSHIP OF THE PROPOSED ACTION TO THE LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA... 3-1

I. INTRODUCTION... 3-1
   A. Historical Land Use... 3-1
   B. Existing Land Use and Ownership... 3-2
   C. Adjacent Land Use... 3-3
   D. Future Plans, Policies and Controls... 3-4
      1. General Plan... 3-4
      2. Special Management Area... 3-5
      3. Natural Area Reserves... 3-5

II. EXISTING CONTROLS AND POLICIES... 3-6
   A. State Land Use Designation... 3-6
   B. General Plan... 3-7
   C. Coastal Zone Management... 3-7
   D. SCORP Recommendations... 3-8
   E. State of Hawaii Comprehensive Open Space Plan... 3-8

**SECTION 4**
ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES TO MINIMIZE ADVERSE IMPACTS... 4-1

I. INTRODUCTION... 4-1

II. AREA 1 - MAKUA AND KEAWAULA (Yokohama Bay) BEACHES... 4-1
   A. Objectives... 4-1
   B. Primary Impacts... 4-2
      1. Short-Term... 4-2
      2. Long-Term... 4-2
   C. Secondary Impacts... 4-3
      1. Positive Impacts... 4-3
      2. Negative Impacts... 4-3

III. AREA 2 - LEeward COASTLINE... 4-3
   A. Objectives... 4-3
   B. Primary Impacts... 4-3
      1. Short-Term... 4-3
      2. Long-Term... 4-4
   C. Secondary Impacts... 4-4
      1. Positive Impacts... 4-4
      2. Negative Impacts... 4-4
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>SECTION 4 continued</th>
<th>IX. AREA 8 - CENTRAL UPLAND SECTOR</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Objectives</td>
<td>4-10</td>
</tr>
<tr>
<td></td>
<td>B. Primary Impacts</td>
<td>4-10</td>
</tr>
<tr>
<td></td>
<td>1. Short-Term Impacts</td>
<td>4-10</td>
</tr>
<tr>
<td></td>
<td>2. Long-Term Impacts</td>
<td>4-11</td>
</tr>
<tr>
<td></td>
<td>C. Secondary Impacts</td>
<td>4-11</td>
</tr>
<tr>
<td></td>
<td>1. Positive Impacts</td>
<td>4-11</td>
</tr>
<tr>
<td></td>
<td>2. Negative Impacts</td>
<td>4-11</td>
</tr>
<tr>
<td></td>
<td>X. AREA 9 - REMOTE OPEN SECTOR</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>A. Objectives</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>B. Primary Impacts</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>1. Short-Term Impacts</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>2. Long-Term Impacts</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>C. Secondary Impacts</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>1. Positive Impacts</td>
<td>4-12</td>
</tr>
<tr>
<td></td>
<td>2. Negative Impacts</td>
<td>4-12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECTION 5</th>
<th>PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. PRIMARY SHORT-TERM IMPACTS</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>A. Probable Impacts and Mitigative Measures</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>B. Reasons for Proceeding</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>II. PRIMARY LONG-TERM IMPACTS</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>A. Probably Impacts and Mitigative Measures</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>1. Water</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>2. Removal of Vegetation</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>B. Reasons for Proceeding</td>
<td>5-2</td>
<td></td>
</tr>
<tr>
<td>III. SECONDARY IMPACTS</td>
<td>5-2</td>
<td></td>
</tr>
<tr>
<td>A. Probable Impacts and Mitigative Measures</td>
<td>5-2</td>
<td></td>
</tr>
<tr>
<td>B. Reasons for Proceeding</td>
<td>5-3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECTION 6</th>
<th>ALTERNATIVES TO THE PROPOSED ACTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. NO ACTION</td>
<td>6-1</td>
<td></td>
</tr>
<tr>
<td>II. ALTERNATIVE SITES</td>
<td>6-1</td>
<td></td>
</tr>
<tr>
<td>III. ALTERNATIVE USE AND DEVELOPMENT CONCEPTS</td>
<td>6-2</td>
<td></td>
</tr>
<tr>
<td>A. Makua Beach and Keawaula</td>
<td>6-2</td>
<td></td>
</tr>
<tr>
<td>B. Leeward Coastline</td>
<td>6-3</td>
<td></td>
</tr>
<tr>
<td>C. Kaena Point</td>
<td>6-3</td>
<td></td>
</tr>
<tr>
<td>D. Windward Coastline</td>
<td>6-4</td>
<td></td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Areas Surrounding Camp</td>
<td>6-4</td>
<td></td>
</tr>
<tr>
<td>Erdman.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Peacock Flats</td>
<td>6-5</td>
<td></td>
</tr>
<tr>
<td>G. Nike Site</td>
<td>6-6</td>
<td></td>
</tr>
<tr>
<td>H. Central Upland Sector</td>
<td>6-6</td>
<td></td>
</tr>
<tr>
<td>I. Remote Open Sector</td>
<td>6-6</td>
<td></td>
</tr>
<tr>
<td><strong>IV. ALTERNATIVE TRANSPORTATION MODES.</strong></td>
<td>6-7</td>
<td></td>
</tr>
<tr>
<td>A. Shuttle bus or multifunctional people mover</td>
<td>6-7</td>
<td></td>
</tr>
<tr>
<td>B. Historically restored railroad.</td>
<td>6-7</td>
<td></td>
</tr>
<tr>
<td>C. Scenic parkway</td>
<td>6-7</td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THE RELATIONSHIP BETWEEN LOCAL SHORT-</td>
<td>7-1</td>
<td></td>
</tr>
<tr>
<td>TERM USES OF MAN'S ENVIRONMENT AND THE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAINTENANCE AND ENHANCEMENT OF LONG-TERM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRODUCTIVITY.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 8</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRREVERSIBLE AND IRRETRIEVABLE</td>
<td>8-1</td>
<td></td>
</tr>
<tr>
<td>COMMITMENT OF RESOURCES.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 9</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AN INDICATION OF WHAT OTHER INTERESTS AND</td>
<td>9-1</td>
<td></td>
</tr>
<tr>
<td>CONSIDERATIONS OF GOVERNMENTAL POLICIES ARE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFFECTS OF THE PROPOSED ACTION.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. ACCESS.</td>
<td>9-1</td>
<td></td>
</tr>
<tr>
<td>II. PARK USES</td>
<td>9-1</td>
<td></td>
</tr>
<tr>
<td>III. POTENTIAL RECREATIONAL CONFLICTS,</td>
<td>9-1</td>
<td></td>
</tr>
<tr>
<td>MILITARY USE OF THE AREA MAUKA OF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FARRINGTON HIGHWAY AND PUBLIC RECREATIONAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USES MAKAI OF FARRINGTON HIGHWAY.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 10</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUMMARY OF UNRESOLVED ISSUES.</td>
<td>10-1</td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 11</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NECESSARY APPROVALS</td>
<td>11-1</td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 12</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORGANIZATIONS AND PERSONS CONSULTED.</td>
<td>12-1</td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 13</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOTICE OF PREPARATION CONSULTATION PERIOD -</td>
<td>13-1</td>
<td></td>
</tr>
<tr>
<td>COMMENTS AND RESPONSES.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SECTION 14</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.I.S. REVIEW PERIOD - COMMENTS AND RESPONSES.</td>
<td>14-1</td>
<td></td>
</tr>
<tr>
<td><strong>APPENDIX</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REFERENCES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIGURE</td>
<td>DESCRIPTION</td>
<td>PAGE</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>1-1</td>
<td>REGIONAL LOCATION MAP</td>
<td>1-14</td>
</tr>
<tr>
<td>1-2</td>
<td>CONCEPTUAL PLAN</td>
<td>1-15</td>
</tr>
<tr>
<td>1-3</td>
<td>COASTAL PARK CONCEPTS</td>
<td>1-16</td>
</tr>
<tr>
<td>1-4</td>
<td>UPLAND MOUNTAIN CONCEPTS</td>
<td>1-17</td>
</tr>
<tr>
<td>2-1</td>
<td>CONCEPTUAL PLAN, EXISTING ACCESS</td>
<td>2-44</td>
</tr>
<tr>
<td>2-2</td>
<td>CONCEPTUAL PLAN, HYDROLOGY AND CLIMATOLOGY</td>
<td>2-45</td>
</tr>
<tr>
<td>2-3</td>
<td>CONCEPTUAL PLAN, GEOLOGY</td>
<td>2-46</td>
</tr>
<tr>
<td>2-4</td>
<td>CONCEPTUAL PLAN, SLOPE ANALYSIS</td>
<td>2-47</td>
</tr>
<tr>
<td>2-5</td>
<td>CONCEPTUAL PLAN, SOIL SUITABILITY FOR CULTIVATED AGRICULTURE</td>
<td>2-48</td>
</tr>
<tr>
<td>2-6</td>
<td>CONCEPTUAL PLAN, SOIL LIMITATION RATINGS FOR DEVELOPMENT</td>
<td>2-49</td>
</tr>
<tr>
<td>2-7</td>
<td>CONCEPTUAL PLAN, FLORA AND FAUNA AREAS</td>
<td>2-50</td>
</tr>
<tr>
<td>2-8</td>
<td>CONCEPTUAL PLAN, NEAR SHORE WATERS AND AREAS SUBJECT TO TSUNAMI AND FLOODS</td>
<td>2-51</td>
</tr>
<tr>
<td>2-9</td>
<td>CONCEPTUAL PLAN, ARCHAEOLOGICAL AND HISTORICAL SITES</td>
<td>2-52</td>
</tr>
<tr>
<td>2-10</td>
<td>CONCEPTUAL PLAN, INFRASTRUCTURE</td>
<td>2-53</td>
</tr>
<tr>
<td>3-1</td>
<td>CONCEPTUAL PLAN, LAND OWNERSHIP/TENURE</td>
<td>3-10</td>
</tr>
<tr>
<td>3-2</td>
<td>CONCEPTUAL PLAN, STATE LAND USE DISTRICTS AND COUNTY GENERAL PLAN</td>
<td>3-11</td>
</tr>
<tr>
<td>3-3</td>
<td>CONCEPTUAL PLAN, CITY AND COUNTY OF HONOLULU, ZONING AND SPECIAL MANAGEMENT AREA</td>
<td>3-12</td>
</tr>
</tbody>
</table>
I. PROPOSED ACTION

The proposed Makua-Kaena State Park will be located on the extreme western portion of the island of Oahu. The park will encompass both coastal and mountain areas, and has many recreational, natural, scenic and cultural resources.

The park is designed to preserve and enhance the area while providing for the recreational needs of the public. An area totalling 15,700 acres was studied in the initial stages of planning. Out of the total study area, the following portions were selected to be included in the Makua-Kaena State Park: Makua and Keawaula (Yokohama Bay) beaches, the leeward coastline stretching to Kaena Point, Kaena Point itself, the windward coastline extending to Camp Erdman, and the upland mountain areas including Peacock Flats and the abandoned Nike Site. The Central Upland Sector and the Remote Open Sector, although managed by other divisions of the Department of Land and Natural Resources, are included in this Environmental Impact Statement.

A conceptual plan for the park was accepted by the Department of Land and Natural Resources, Division of State Parks on October 14, 1977. The following is a brief summary of the actions presented in the conceptual plan:

A. Coastal Sector

The unauthorized residential structures presently found at Makua Beach (in violation of Building Code and Health Department Ordinances) will be removed.
There will be controlled clearing and grubbing of specified areas to provide picnicking facilities, parking areas and restroom facilities at several sites on both the windward and leeward coastal areas.

Maintenance will be provided through establishment of a trash removal program, irrigation of landscaping at high use areas (using native species whenever possible), providing a firebreak at Keawaula Bay, and removal of graffiti from Kaneana Cave.

A vehicular barrier will be installed beyond Keawaula Bay on the leeward side and Camp Erdman on the windward side; only emergency and maintenance vehicles will be allowed beyond the control points. Access to the general public beyond the control points will be allowed only through an improved foot and/or bike path system, which will connect Keawaula Bay to Camp Erdman.

Interpretive, regulatory, directional and warning signs will be posted throughout. An emergency communications system will be established.

Within the proposed Kaena Point Natural Area Reserve there will be only limited walkways created in order to protect the endangered flora habitat.

B. Upland Mountain Sector

Permanent access will be obtained through an easement via the Nike access road to Peacock Flats. Portable sanitary facilities, camping and picnic areas, and water will be provided. Specified areas will be cleared and grubbed, firebreaks will be established, and a resident caretaker's facility and an information kiosk will be built. The Nike site will be re-opened for public use.

Plans will be developed in conjunction with other division of DLNR for the management of the Central Upland Sector and Remote Open Sector. The existing trails and firebreaks will be maintained, maps and brochures printed, and a hunter's information program will be developed. Signs will be posted in the area.
II. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The proposed park area is accessible either from the Waianae or the Mokuleia Coasts. Vehicular access to the mountain region is by the Nike, Federal Aviation, and Satellite Tracking Station roads. Numerous trails also extend into the Waianae Range.

Temperatures at the coastline (Waianae) have ranged from 96°F to 50°F. The average decrease in temperature with elevation is approximately 3°F per thousand feet. Annual rainfall totals vary from under 20 inches along the Waianae Coast to 75 inches in the higher altitudes of the range.

Tradewinds blow in the area during most of the year. Wind speed average near the ground at Kaena Point is 12.5 miles per hour.

Geologic formations in the area are associated with the remnants of the Waianae volcano.

Water obtained from well sources are found along the coastline from Makua Valley and Mokuleia. The quality of water from wells is generally good except in near-shore areas where the major contaminant is sea water.

Vegetation in the study area includes coastal (strands), grasslands, dryland forest, wet forest and montane bog species. Rare and endangered species can be found in the native forest and in remote inaccessible areas.

Wildlife in the study area varies from mostly exotic species near urbanized areas to endemic forest species in the upland areas.

The shoreline and near-shore waters contain common marine species. Water quality is excellent.

The Kaena Point study area has great archeological and historical significance.

Sewer, water, electrical, communication and public services are presently unavailable in the remote coastal and mountain areas.

The most prevalent type of crime in the area has been burglary and theft from parked cars. Fire protection is available from Waialua and Waianae. Medivac and ambu-
lance services are also available. Health services are available at both Waianae and Waialua.

Communication facilities include the Canadian Overseas Communication Corp. cable, the Transpacific and Hilo cables, a microwave radio relay station for the Public Safety Radio Communication System, a satellite tracking station operated by the Federal Aviation Administration, and communication facilities operated by the Hawaii Air National Guard.

III. RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

A. General Plan

The majority of the land in the study area is Preservation, the remainder is Park, Military and Agriculture.

Zoning within the study area from Keawaula Bay south and west into Kahanahaiki and Makua Valleys is Agriculture (Ag-1). All other lands are classified Preservation (P-1).

According to the General Plan, Statement of Objectives and Policies (1977), the proposed project is compatible with policies designed to protect and preserve the natural environment of Oahu.

B. Special Management Areas (SMA's)

The Coastal Zone Management Act of 1977 requires the counties to amend their regulations within a two year period to conform to the objectives, policies and guidelines as enacted. Until that time, the City and County of Honolulu will continue to issue permits under established guidelines.

C. Natural Area Reserve

The natural coastline ecosystem at Kaena Point is nominated for inclusion in the Natural Area Reserve System of the State. Another area that might be included in the Natural Area Reserve System is the Kaala-Pahole area.

D. State Land Use Designations

The study area is classified by the State Land Use Commission as Conservation and Agriculture.
A park is a permissible use in an Agriculture District and according to the existing Regulation 4, a park would be a compatible use in a Conservation District.

E. SCORP Recommendations

The 1975 State Comprehensive Outdoor Recreation Plan divided the State into different planning areas. The boundaries of the Makua-Kaena State Park fall within two of these planning areas: numbers 24 and 25.

The coastal areas of the Makua-Kaena State Park are classified as having potential for medium intensity uses for recreation, while the uplands are proposed for low intensity use.

F. State of Hawaii Comprehensive Open Space Plan

The Kaena Point region is identified in this plan as having potential for conservation and preservation of natural resources, development of parks and recreational facilities, and opportunity for historic and scenic preservation, as well as a chance for promoting public health and welfare. This region was recommended for acquisition by the State in order to provide for open space uses.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES TO MINIMIZE ADVERSE IMPACTS

Primary short-term impacts are construction-related and limited to the duration of the construction period. Primary long-term impacts result from the operation of the park. Secondary impacts are indirect impacts on potential use conflicts and indirect benefits. Discussion of the anticipated environmental impacts is broken up into different geographical areas in the text, and briefly summarized below:

A. Primary Impacts

1. Short-Term:

Short-term positive impacts will result from cash infusion into the local economy by the construction of recreational facilities, communication system and landscaping work.

Short-term negative impacts are construction related. Construction will produce temporary
dust and erosion problems. To a great extent, dust can be controlled by water sprinkling. Potential erosion can be prevented by scheduling construction during the dry summer months and limiting the area to be graded and grubbed, as well as by immediately revegetating the exposed areas.

2. **Long-Term Impacts**

Providing recreational facilities in the area will increase recreational opportunities. Removal of unauthorized structures at Makua Beach will increase available beach area for public use.

Limiting access to most park areas to foot and bicycle traffic will reduce current erosion patterns, help protect sensitive flora and archaeological features, cut down on the amount of dust, and maintain ambient noise.

Planting and erosion control programs, as well as the establishment of firebreaks will help reduce dust, erosion, drainage, and fire hazard problems. Flora and fauna habitats should benefit by these improvements to the landscape.

Implementing the emergency communication system and maintenance programs will have a positive long-term impact on recreational activities by providing security and maintenance within the park area.

Distribution of information maps and brochures describing the Central Upland Sector and Remote Open Sector will alleviate conflicts and minimize hazards to recreational users of the area.

An anticipated long-term negative impact is the use of water for restroom facilities and irrigation, and the removal of existing vegetation for picnicking and other activities. However, the removal of scrub vegetation should not be a serious impact. Another long-term negative impact is the operational cost of park maintenance. Introduction of more people to the upland area may increase fire hazards and encourage distribution of exotic plants.
B. **Secondary Impacts**

1. **Positive**

Secondary positive impacts to recreational users will result from the posting of warning signs. The provision for firebreaks will also be beneficial by preventing potential fires from spreading.

2. **Negative Impacts**

Limiting access to only pedestrians and non-motorized vehicles will have a secondary negative impact on the convenience of users that now have motorized access to the site. Removal of the unauthorized structures on Makua beach will have a negative impact on the lifestyle of the people currently inhabiting these structures but will be necessary to provide additional beach area to the public and to prevent potential health hazards.

V. **PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED**

A. **Primary Short-Term Impacts**

Construction-related impacts include dust and erosion which can be mitigated by water sprinkling, incremental clearing and immediate revegetation of exposed areas, as well as scheduling construction during the dry summer months.

These impacts are minor and can be controlled by acceptable mitigative measures.

B. **Primary Long-Term Impacts**

Water is unavailable and a well will have to be developed adjacent to high use recreational areas. Continued monitoring of the well to make sure that the safe yield will not be exceeded is an acceptable mitigative measure.

Selective clearing and grubbing of the existing scrub vegetation will be required. Mitigative measures include selective clearing and immediate landscaping and revegetation. This action is necessary for the
implementation of the park and no significant adverse impacts are anticipated.

C. **Secondary Impacts**

a. No mitigative measures are available for the inconvenience to the recreational users in areas where vehicular access will be limited or prohibited.

This action must be taken to protect the sensitive Kaena Point area from further degradation. However, this would not preclude future implementation of other access modes which have been evaluated in order to meet future recreational needs.

It is anticipated that military activities mauka of Farrington Highway will not have an adverse impact makai of the highway, except for possible noise effects. To prevent future recreational-military conflicts in this area, the lands makai of Farrington Highway could be managed by the State as a buffer zone.

Removal of the unauthorized structures on Makua Beach will have a negative impact on the lifestyles of their occupants. These structures pose sanitary problems. Their removal will prevent serious potential health problems and open up the area to the public.

VI. **ALTERNATIVES TO THE PROPOSED ACTION**

A. **No Action**

The no action alternative would allow uncontrolled and conflicting uses of the area to continue. Litter is spoiling scenic views. Unrestricted use of motorcycles and four-wheel drive vehicles along the coastal dune areas is increasing erosion and threatening native vegetation. Cattle raising is destroying native plants and introducing undesirable species into a native forest. Uncontrolled use of firearms for target practice is a present hazard. Fires caused by people in the area have damaged existing flora.
B. Alternative Sites

Alternative park sites were not evaluated because there are no available areas remaining on the island of Oahu that offer both ocean and mountain recreation in proximity to each other.

C. Alternative Use and Development Concepts

Medium and maximum intensity development measures were considered. These concepts were not selected because of present needs, high cost, public opinion and adverse environmental impacts. Alternatives considered for the development of the park are shown in the text.

VII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed action will preserve and enhance the natural, scenic, and cultural resources of the Makua-Kaena area and provide diverse recreational opportunities for the residents of the State. It will not destroy or impair the features and values which are to be preserved. The proposed action will not involve trade-offs between short-term losses or foreclose future recreational options.

VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

State funds, human labor, construction and building materials, and fuel will be committed to the project. Maintenance and operation manpower and funds will be required. Landscaping and restroom facilities will require water. Using the land as a park will permanently remove it from the taxroll. Limiting the plan for park use will also prohibit urban developments.

IX. AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS OF GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

A. Access

The State Department of Transportation and the Department of Land and Natural Resources have worked together to establish basic policies and transportation requirements of the park. Construction of a parkway at
this time was not recommended. The decision not to construct the parkway around Kaena Point minimizes the potential impact on the communities in the Leeward and Windward sections.

B. Park Uses

Numerous community meetings and informal sessions were held in the development of the recreational uses for the area. It was the consensus of the people that minimum development be implemented to preserve the wilderness quality of the region.

C. Potential Recreational Conflicts

The potential recreational conflicts between civilian and military uses of the area near Makua Valley is of concern to both the Federal and State Governments. Therefore, the military is presently preparing an environmental impact statement for Makua Valley training area to evaluate the anticipated environmental impacts from their training activities.

X. SUMMARY OF UNRESOLVED ISSUES

Unresolved issues include joint civilian military use of Makua Valley, setting an exact date when the removal of the unauthorized structures of Makua Beach will commence, and providing access to the Kaena Point area for the handicapped and the elderly.
project description 1
SECTION 1

PROJECT DESCRIPTION

This section will provide the location and general setting of the proposed project as well as the purpose of the environmental impact statement. General project goals and objectives, specific objectives of each area within the proposed project area, and project phasing and funding will be discussed.

I. INTRODUCTION

A. Location

Kaena, or Lands End as referred to by the early Hawaiians, is a rugged semi-wilderness area of great natural and scenic beauty located on the extreme western portion of the island of Oahu (Figure 1-1). The study area encompasses approximately 15,700 acres of jagged coastline, varied mountain regions and deep valleys and offers a great diversity of recreational, natural, scenic and cultural resources (Figure 1-2).

The study area may be approached from two directions - either from the Waianae Coast, approximately 42 miles from Honolulu to the end of an improved road beyond Keawaula Bay, or via Waialua, approximately 37 miles from Honolulu along the Mokuleia Coast up to a point beyond Camp Erdman.

B. Purpose of the Park

The absence of an improved access route has, for many years, maintained the region in its natural, wilderness-like condition, conserving its resources and scenic beauty. Urbanization, which has encumbered other areas possessing similar qualities, essentially has not occurred in the project area. Recently, however, increasing numbers of people have been attracted to the area, subjecting it to various uncontrolled and conflicting uses and threatening its unique character and values. The region is a natural area in transition. Litter is spoiling scenic views. The unrestricted use of motorcycles and four-wheel drive vehicles along the coastal dune areas is increasing erosion and threatening native vegetation. Cattle
grazing is destroying native plants and is allowing introduction of exotic species into pristine native forests. The uncontrolled use of firearms for target practice exposes users to stray bullets. Fires caused by hikers, campers, motorcyclists and military activities within Makua Valley and adjacent areas have damaged flora and subjected areas to erosion. If present conditions are allowed to continue, the region's natural resources and potentials for recreational, interpretive and educational values could be lost forever. Proper guidelines and controls are needed for immediate enforcement, or Lands End could well be the end to the land.

In an effort to maintain the region's integrity and to provide for necessary controls, the Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites has developed a long-range Recreational Conceptual Plan for the Kaena region. Alternative concepts covering different levels of development were analyzed. After public input, research and analysis, the Division of State Parks, Outdoor Recreation and Historic Sites identified specific user concepts (as part of their Conceptual Plan) for selected areas. These concepts were selected based on present public needs and environmental considerations, and are subject to future modifications.

C. Purpose of the Environmental Impact Statement

This environmental impact statement (EIS) addresses the proposed action selected for the study area, explained in part III of this section. The preparation of an EIS, an informational document, is required under Chapter 343, Hawaii Revised Statutes and governed by the rules and regulations of the State Environmental Quality Commission. The Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites determined that the proposed action required the preparation of an EIS, and subsequently an Environmental Impact Statement Preparation Notice was filed with the Environmental Quality Commission and published in the March 23, 1977 bulletin. The deadline for comments was April 22, 1977 but a 30 day extension was added to the review period. Comments received during the review period were considered in the preparation of this environmental impact statement.
II. PROJECT GOALS AND OBJECTIVES

A. The goals of the selected recreational concepts are:

1. To preserve and enhance for present and future generations a natural, scenic and cultural resource of statewide significance.

2. To provide a wide range of resource-oriented recreational opportunities and related facilities for residents of the State that will not destroy or impair the features and values to be preserved.

B. Planning Process

The scope of the study involved three major phases. Phase I was the research and analysis phase. It was the process by which the consultant assembled, evaluated and correlated an extensive amount of biophysical, socio-economic, historic-cultural, and institutional data. Environmental, engineering, transportation and oceanographic specialists, public agencies, individuals and organizations were consulted and numerous on-site investigations were conducted. Public input along with reference material from published documents, drawings, maps, texts, and reports was also utilized.

Phase II, the planning and design phase, was an examination of design alternatives and development concepts. The development of alternative concepts based upon the identified recreation resource potentials, goals and objectives, needs and public desires, were submitted to the Board of Land and Natural Resources for review and acceptance. Upon approval, the October 1977 program for the Conceptual Plan was completed: identifying basic philosophy, goals, objectives and concepts. It also incorporated recommendations for implementation.

Phase III, the development of the Conceptual Plan and programs features detailed recommendations for the improvement and management of the proposed recreation area.

Phase III will involve detailed plans for the initial improvements, identify management procedures, phasing and cost estimates.
III. ACCEPTED PLAN

The following are recommendations proposed for specific areas within the 15,700 acre planning area selected to be included in the Kaena Point State Park.

Interim measures include providing restroom facilities, water source development and selected clearing of vegetation near recreational areas currently being used by the public.

A. Coastal Sector (Figure 1-3)
   1. Makua and Keawaula (Yokohama Bay) Beaches
      a. Farrington Highway provides access to this area from Honolulu. The improved 2-lane asphaltic concrete paved highway terminates at the U. S. Air Force Satellite Tracking Station Access Road. A 3/4 mile section of bituminous surface treated road continues from this point to a little past Keawaula (Yokohama Bay) Beach. Vehicular traffic beyond this point is discouraged because of hazardous road conditions.

      Recommendation - Access to both beaches to continue by way of the existing roads.

      b. Unauthorized structures are located on land owned by the State of Hawaii and have been constructed without the necessary approvals. The State of Hawaii agencies with jurisdiction over these lands have not given permission to occupy the area and the State Board of Land and Natural Resources has not received the required Conservation District Use Application. The structures violate State and City and County of Honolulu codes governing structural requirements, plumbing, sanitation, rubbish and sewage disposal.

      Recommendation - Remove all unauthorized residential structures.

      c. The Makua Protestant Cemetery is located mauka of Makua Beach between Makua Road, a dirt road which parallels the beach, and Farrington Highway. The cemetery is presently not being maintained.
Recommendation - Work with the community to help restore the Makua Protestant Cemetery.

d. There are no caretaker facilities at Makua Beach or Keawaula (Yokohama Bay) Beach.

Recommendation - Provide resident caretakers facilities for maintenance and security at Makua Beach and Keawaula Beach.

e. Present activities are not regulated, however, overnight use is limited because of the lack of security. According to the police, instances of theft are common at the Makua and Keawaula Beach areas.*

Recommendation - Allow day use activities with no overnight use permitted without necessary permits and until proper security is provided.

f. Water, designated parking areas and restroom facilities are unavailable at both beaches. Beach-goers must bring their own water and park along Farrington Highway or in any available space. The closest public restrooms are located at Keaau Beach Park, approximately 4 miles away.

Recommendation - Provide water, parking areas and restroom facilities at both beaches.

g. Areas specified for major use are presently overgrown with scrub vegetation or littered with trash and other debris.

Recommendation - Controlled clearing and grubbing of specified major use areas.

h. There are no established trash pickup routes or designated trash areas at either beach.

Recommendation - Establish a trash removal program as an ongoing maintenance program.

i. Interpretive, regulatory, directional and warning signs are needed.

*Honolulu Police Department, Waianae Sub-station 1-5
Recommendation - Post interpretive, regulatory, directional and warning signs.

j. Makua Road is an abandoned road makai of Farrington Highway which parallels Makua Beach. This road is presently used as an access road to reach the beach.

Recommendation - Maintain Makua Road and bridge, as secondary access route.

k. The Control Point is located approximately 1.7 miles from the satellite tracking station road. Motorcycles and four-wheel drive vehicles have unrestricted access to Kaena Point. The unrestricted use of motorcycles and four-wheel drive vehicles is threatening Kaena Point. Adverse effects along the coastal dune areas include increased erosion, damage to endangered native plant species and the destruction of possible historical and/or archaeological sites.

Recommendation - Provide a public vehicular barrier in vicinity of the Control Point.

l. Parking areas will be required for hikers, fishermen and weekenders desiring to walk past the vehicular barrier out towards Kaena Point.

Recommendation - Provide parking areas and interpretive facilities in the vicinity of the Control Point.

m. Access beyond the Control Point is presently a dirt and gravel road characterized by potholes and protruding rocks. The present vehicular access route circumventing the point is difficult due to the existing condition of the road. This area contains the sensitive sand dunes and endangered plants.

Recommendation - Access beyond the Control Point provided by an improved foot and/or bike path system connecting Keawaula Bay to Camp Erdman. Establish or designate a corridor for possible future public transportation access.

n. There are no picnic, camping and parking areas at either beach.
Recommendation - Develop picnic, camping and parking areas. Provide picnic tables/shelters and barbecue facilities.

o. High use areas are presently overgrown and development plans call for these areas to be cleared and grubbed.

Recommendation - Provide landscaping and irrigation for high use areas, utilizing native species where possible.

p. The development of Makua and Keawaula Beaches as high use areas with picnicking and camping facilities will increase the probability of fire that might spread to adjacent areas.

Recommendation - Provide a firebreak at Keawaula (Yokohama) Bay.

q. Well-defined trails connecting high use areas or leading to scenic, recreational and educational areas are lacking. These trails will be needed if the public is to fully utilize the park.

Recommendation - Develop loop trails to connect points of interest and use areas.

r. Kaneana Cave, located before Makua Beach, has been seriously defaced by vandals. Graffiti has greatly detracted from its value as a point of interest for visitors to the Waianae coast.

Recommendation - Remove graffiti from Kaneana Cave and maintain area.

2. Leeward Coastline

a. The following recommendations for the leeward coastline have been discussed in the previous section on Makua and Keawaula Beach.

Recommendations - Controlled access by foot and/or non-motorized bicycle.

Post interpretive, regulatory, directional and warning signs.

Establish a trash removal program.
Establish or designate a corridor for possible future public transportation access.

b. Near-shore and off-shore activities include fishing, diving, surfing, swimming and pleasure boating. There are no present restrictions on these activities.

Recommendation - Near-shore and off-shore activities will be allowed to continue, except for those identified to be in conflict with the overall recreational development of the park.

c. There are no emergency telephone services available past the Control Point. The closest emergency telephone is located at the satellite tracking station road.

Recommendation - Provide an emergency communications system.

3. Kaena Point

a. The uncontrolled use of four-wheel drive vehicles and motorcycles has destroyed much of the vegetation at Kaena Point. As a result, erosion is a serious problem. Vandalism of plants by trampling and uprooting is also a problem. Extremely critical flora habitats have been proposed as a Natural Area Reserve. Historical and/or archaeological sites are also threatened.

Recommendations - Access within the Point by designated foot paths only.

Post interpretive, regulatory, directional and warning signs.

Develop limited walkways and controlled access within the proposed Kaena Point Natural Area Reserve to protect endangered flora habitats.

Establish or designate a corridor bypassing the point for possible future public transportation access.

b. There is no emergency communications system at Kaena Point.
Recommendation - Provide an emergency communications system.

c. Under the proposed plan, vehicular access will be restricted; however, controlled access for emergency and maintenance vehicles is required.

Recommendation - Provide controlled access to the Point for emergency and maintenance vehicles only.

4. Windward Coastline

a. The windward coast is also used by the public as a recreational area. The misuse and degradation of the land is evident. Abandoned vehicles and trash litter the landscape. The uncontrolled use of firearms for target practice imperils recreators to stray bullets. The existing dirt road to Kaena Point is used heavily because it is generally in better condition than the Waianae segment. Serious erosion problems are evident.

Recommendations - Controlled access by foot and/or non-motorized bicycles.

Post interpretive, regulatory, directional and warning signs.

Establish a trash removal program.

Implement planting and erosion control programs utilizing native species where possible.

Establish or designate a corridor for possible future public transportation access.

Prohibit the use of firearms along the coastal sector.

Near-shore and off-shore activities will be allowed to continue, except for those activities identified to be in conflict with the overall recreational development of the park.

Allow day use activities with no overnight use permitted without necessary permits and until proper security is provided.
b. An emergency communications system is not available along the windward coastline within the proposed park boundaries. The closest telephone is located at Camp Erdman.

**Recommendation** - Provide an emergency communications system.

5. **Areas Surrounding Camp Erdman**

The Control Point, which will limit vehicular access, is located approximately one mile west of Camp Erdman. There are no designated picnicking or camping areas and the nearest public facility with restrooms, water and recreational areas is Mokuleia Beach Park. The existing problems are similar to those at Makua and Keawaula Beaches and along the windward coastal areas.

**Recommendations** - Improve existing access up to the Control Point.

Near-shore and off-shore activities will be allowed to continue, except for those activities identified to be in conflict with the overall recreational development of the park.

Implement planting and erosion control programs, utilizing native species where possible.

Controlled clearing and grubbing of specified major use areas.

Establish a trash removal program.

Post interpretive, regulatory, directional and warning signs.

Provide parking areas and interpretive facilities in the vicinity of the Control Point.

Access beyond the Control Point provided by an improved foot and/or bike path system.

Develop picnic, camping and parking areas.

Provide water, and restroom facilities.
Provide resident caretakers facilities.

Plant trees for wind breaks and screening.

Provide picnic tables/shelters and barbecue facilities.

Provide landscaping and irrigation for high use areas, utilizing native species where possible.

Develop loop trails to connect points of interest and use areas.

Realign existing road mauka of Camp Erdman to screen and preserve the integrity of the camp from park users.

B. **Upland Mountain Sector** (Figure 1-4)

1. **Peacock Flats**

a. Access to Peacock Flats is via the Nike road located approximately a mile west of the Federal Aviation Administration (FAA) road leading to Mt. Kaala. The lower portion of the road passes through Mokuleia Ranch lands and the remainder is within the State Forest Reserve boundaries. Public access is allowed only on agreement with Mokuleia Ranch and the State Division of Forestry.

**Recommendation** - Obtain controlled public access to be regulated by DLNR, via the Nike access road.

b. Peacock Flats is located in the dry upland forest of the Mokuleia Forest Reserve. Some areas have been cleared by the Division of Forestry; however, these improvements have been minimal. This area is of prime importance to hikers and campers because it is located close to pristine native forest areas containing spectacular views, native vegetation and rare, endemic birds.

**Recommendations** - Post interpretive, regulatory, directional and warning signs.

Provide water, sanitary facilities, camping and picnic facilities.
Control clearing and grubbing of specified areas.

Establish firebreaks.

Provide an information kiosk.

Provide resident caretakers facilities.

Establish a trash removal and maintenance program.

Authorized use of this area by permit only.

2. Nike Site

The Nike Site is an abandoned Army Nike Station which contains the necessary facilities for public use.

Recommendation - Minor renovation to the existing facilities and re-open for public use; area already has improvements for above minimum use.

3. Central Upland Sector - to be managed jointly with other divisions of DLNR.

The Central Upland Sector will be managed jointly with other divisions of the Department of Land and Natural Resources. The Division of Fish and Game and the Division of Forestry are two of the agencies that will participate in this effort. This sector includes hunting areas, forest reserves and hiking trails which are used by the public.

Recommendations - Develop coordinated plans with other Divisions of DLNR.

Maintain existing trails and firebreaks.

Provide general information maps and brochures.

Develop hunting information programs to prevent conflict and hazards to users of the area.

Post interpretive, regulatory, directional and warning signs.

4. Remote Open Sector - to be managed jointly with other Divisions of DLNR.
The Remote Open Sector also falls under the jurisdiction of several divisions of DLNR. Hunting areas, forest reserve and hiking trails are also found in this sector.

Recommendations - Develop coordinative plans with other Divisions of DLNR.

Provide general information map and brochure.

Develop hunting information programs to prevent conflicts and hazards to users of the area.

Post interpretive, regulatory, directional and warning signs.

IV. PROJECT PHASING AND FUNDING

State funding for land acquisition, construction, planning and design services was first appropriated in 1969. The majority of funds expended to date have been for land acquisition.

Recognizing the existing high usage and lack of sanitary facilities within the area, initial development for the construction of a permanent well site, reservoir, and restroom facilities at the Keawaula Bay area is presently planned.

Funding to date has been by State funds, with possible matching grants from the Bureau of Outdoor Recreation to be applied for at a later date.

Phasing of the construction has not been determined and will be determined in the future based on need and completion of land acquisition.

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$3,445,000
existing environment 2
SECTION 2

DESCRIPTION OF THE EXISTING ENVIRONMENT

This section will describe the biophysical setting as it exists before the commencement of the proposed action. Special emphasis will be given to the environmental resources that are considered rare or unique to the project site.

I. SITE LOCATION

Kaena Point is one of the last semi-wilderness areas remaining on the island of Oahu. The lack of easy access to the area has contributed to maintaining this characteristic. Nevertheless, the area has a wide range of active and passive recreational, educational, and institutional usages. The diversity of natural, cultural, and scenic resources found within the area has offered many different experiences. Proper management and regulation of this area will preserve the values the area possesses.

The study area is located on the extreme western end of the island of Oahu and encompasses approximately 15,700 acres. The area is unique because it offers an opportunity to experience a variety of physical and biological characteristics. The area proposed for park development encompasses both rugged lava shorelines, and large, white sand beaches, cliffs, gorges and valleys, and forested mountain regions, which can contribute to a variety of active and passive recreational potentials. The shoreline would offer a variety of water recreation. The great currents provide exceptional deep-sea fishing and other areas allow diving and surfing. There are unique botanical species found in this area of Oahu, which will be discussed later on in this section under Flora/Fauna.

II. ACCESS

The study area may be approached along Farrington Highway from two directions: 1) from the Waianae Coast, approximately 42 miles from Honolulu to the end of an improved road beyond Keawaula Bay; or 2) via Waialua, along the Mokuleia Coast and up to a point beyond Camp Erdman, approximately 37 miles from Honolulu (Figure 2-1). An unpaved dirt road extends from the end of Farrington Highway along the Waianae Coast approximately 2.5 miles to Kaena Point. The road is in poor condition and approximately 14 feet wide. It has been severely washed out...
by high waves in one section. Access beyond the end of
the existing paved road from Mokuleia is also by an unpaved
road which is eroded. Vehicular access to the mountain
region of the study area from the Mokuleia side is by
the paved Nike or the Federal Aviation Agency (FAA) roads,
and from the Waianae side by the Satellite Tracking Station
road.

Trails extend into the Waianae Range with access to
the trails over State, military and privately-owned lands.
Major trails are the Dupont (Kaupakuhale) Trail, Mokuleia
Trail, Peacock Flats Trail, Kealia Trail and Kuaokala
Trail (Figure 2-1). The recommended skill level for these
trails are moderate to difficult as given in Table 2-1.

Boat access is limited because of the rugged coastline
and surf conditions. Access from the sea is safest at
Makua and Keawaula Beaches.

III. CLIMATE (Refer to Figure 2-2)

The climate of Hawaii results from the interaction
of many physical parameters of different scales (Blumestock,
1967). In the Central North Pacific, the trade winds
blow from the northeast quadrant and represent the outflow
of air from the Pacific anticyclone. The Pacific high
pressure system and the trade wind zone moves north and
south with the sun, so that it reaches its northernmost
position in the summer half-year. This brings the heart
of the trade winds across Hawaii during the period May
through September, when the trades are prevalent 80 to
95 percent of the time. During the winter half year,
Hawaii often comes under the influence of mid-latitude
weather systems. This is the time of the year when most
of the precipitation falls in many areas of Hawaii. Large
scale precipitation is usually associated with the synoptic
scale weather systems, such as cold fronts, Kona storms
and upper level low pressure systems.

Hurricanes and tropical storms are very rare in
Hawaii. Only four hurricanes have affected the islands
during the past 73 years. Tropical storms, with winds
below 74 miles per hour, are more frequent. Unlike cold
fronts and Kona storms, hurricanes and tropical storms
are not limited to the winter season. They are most likely
to occur between July and November.

Most islands in the Hawaiian chain show dramatic differ­
ences in climate over short distances. This is a conse­
quence of the strong orographic relief of most of the
<table>
<thead>
<tr>
<th>Trail No.</th>
<th>Trail Name</th>
<th>Length (1-way)</th>
<th>Common Topographic Features</th>
<th>Recommended Skill Level</th>
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<td>4.0</td>
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1 Private access-permit required from Division of Forestry prior to approaching private landowner for access.

2 Exposure Hazard Coding=Possibility of falling straight down or down-slope without chance of stopping "in time."

1-Some exposure hazard (slight).
2-Considerable exposure hazard.
3-Extreme exposure hazard.

*Source: State Forest Hiking Trails, Island of Oahu. Dept. of Land and Natural Resources, Division of Forestry.
Hawaiian islands. Frequent and often heavy rains will usually occur at the windward coast of most islands under trade wind conditions, a result of the interplay of the mountain barriers with the steady stream of the trade winds. By contrast, the leeward coasts are much drier.

The configuration of the islands produce large variation in climatic conditions from one place to another. Air, passing through Hawaii as part of a large circulation system such as trade winds or synoptic scale low pressure systems, undergoes a complex three-dimensional flow, resulting in striking differences in wind speed, cloudiness and rainfall from place to place. Together with variations in the elevation of the land, this results in differences in air temperature. The climatic pattern, therefore, reflects not only such dynamic elements as the trade wind flow, large scale storms, and the seasonal rhythm of solar heating, but also static elements like topography.

Long-term climatic data for the Kaena region is quite limited. The only weather station in the area with substantial records is the U.S. Air Force Kaena Point Satellite Tracking Station, which is located at the top of the ridge at an elevation of 1,240 feet.

Temperature - In Hawaii, the difference between the coldest and the warmest months averages only about 6.5°F. This is the smallest difference of any State in the United States. At Miami, the difference is slightly over 13°F and at Salt Lake City, New York and Boston it is over 40°F. The steady temperatures result from the small variation in energy received from the sun from season to season. The surface waters of the open ocean around Hawaii have an average temperature that ranges from a minimum of 73 to 74°F during late February and early April to a maximum of 79 to 80°F during late September and early October. The mild temperatures of the ocean water give rise to mild temperatures in the lower layers of the atmosphere around Hawaii.

At most locations below 5,000 feet elevation in Hawaii, the average daily range in temperature is greater than the range of mean temperatures throughout the year. Ranges of 15° to 20°F are common on the Leeward coast. The nearest station with long-term temperature records is located at Waianae. The temperature extremes of that station have ranged from 96° to 50°F. Daily mean January temperatures range from 62.5° to 81.1° and daily August temperatures from 71.1 to 89.5°F. The temperature climate at Waianae can be taken as fairly representative of conditions in
the coastal sections of Kaena Point. The average decrease in mean monthly temperatures with elevation is about 3°F per thousand feet, but there are large differences due to local changes in cloudiness, effects of local winds and difference in exposure to the trades. At the Kaena Point Satellite Tracking Station for the period January, 1962 through June, 1966, the daily temperature means ranged from 63° to 70°F in January to 67° to 78° in August.

Winds - As in all mountainous areas, the wind conditions in Hawaii are quite complex. Although the trade winds are fairly constant in speed and direction, the trade wind flow is distorted and disrupted by local topography. There also are local wind regimes along many of the coasts and on the mountain slopes which either reinforce or oppose the general flow of air, depending on local circumstances. In some weather situations the trade winds are replaced by other general winds, some of which are not as uniform in direction or speed. The usual regime is to have upslope winds by day and downslope winds by night.

Over Oahu, the trade winds prevail during the summer and predominate during the remainder of the year. As they move over and around Oahu, the trade winds are subject to a variety of interacting influences. Three of the island corners are exposed to the trade winds which are "squeezed" as they sweep around them. Also, as the winds rise over the hilly terrain, they are further constricted and accelerated between the land surface and the trade wind temperature inversion. Speeds are somewhat greater around Kahuku than around Kaena Point. Local funneling often occurs through a notch in the mountain chain, the most notable example being the Pali lookout in the Koolaus. Kolekole Pass in the Waianaes is another such location.

Complex diurnal effects also operate in the wind pattern (Ramage et al, 1977). On terrains less than 2,000 feet, night cooling reduces the turbulence of the wind. During the day, turbulence increases and so does the wind. The sea breeze effect on Oahu is relatively minor. Over most of the islands, the diurnal variation of turbulent mixing overpowers the land breeze-sea breeze cycle. Only leeward of the Waianae Range is this cycle detectable.

As part of a preliminary wind power survey conducted by the University of Hawaii's Department of Meteorology (Ramage et al, 1977), wind measurements were taken at Kaena Point at three different elevations: 30 feet, 90 feet and 180 feet.
above sea level. The data period for Kaena Point was 18 months and the mean wind speeds recorded were as follows: 12.5 mph at the 30 foot elevation, 13.7 mph at the 90 foot elevation and 16.8 mph at the 180 foot elevation. There was a clearly defined diurnal pattern to the wind at Kaena Point. Minimum wind speeds averaging about 12 mph were recorded on the average between 3:00 and 9:00 A.M. Wind speeds picked up rapidly during the day and averaged about 16 to 17 mph in the early afternoon hours, gradually dying down in the late evening and nighttime hours. The wind rose for the Kaena Point station is shown in Figure 2-2. Numbers represent the percentage of the time the wind blows from the designated direction and speed.

Kaena Point's north coast is directly exposed to the trade winds. The south shoreline is protected from the trade winds by the Waianae mountains. Along most of the protected Leeward coast, the diurnal heating and cooling of the land mass causes local land-sea breezes. These breezes are independent of the trade wind system and have much lower average velocities of about 5-6 mph. This is a typical on-shore velocity at Lahaina, one of the few locations in Hawaii where the convective breezes have been measured.

Humidity and Cloudiness - In the lowland area and along the lower mountains, the relative humidity commonly averages between 70 and 80 percent in windward areas and 60 to 70 percent in leeward areas. The winter relative humidities are somewhat higher than summer ones, maximum values usually occurring with minimum temperatures on a daily basis.

Leeward locations that are well sheltered from the trade winds experience clear daylight conditions 30 to 60 percent of the time, and cloudy conditions less than 20 percent of the time. Unfortunately, there are no stations at the Kaena Point area that measure relative humidity or cloudiness.

Rainfall - Rainfall on Oahu is highly variable. Annual totals vary from under 20 inches along the Waianae Coast to over 300 inches at the highest elevations of the Koolau range. This large variability mainly is due to the interaction of the trade winds with local orographic features.

In the Kaena region, rainfalls vary from less than 20 inches along the semi-arid coastal areas to 75 inches in the higher altitudes near Mt. Kaala (Figure 2-2). During an average year, almost 90 percent of the days in the
lower regions have no rain. In the lowlands at all times of the year, rainfall is more likely to occur during the night or morning hours, and is least likely to occur during mid-afternoon. The more pronounced diurnal variations in the summer exist because most summer rainfall consists of trade wind showers, and these showers are most apt to occur at night. In winter, most of the rainfall in the lowlands occurs in large scale storm situations and these are as likely during the day as at night. Rainfall is highly variable between similar periods of the year and from year to year.

IV. GEOLOGY (Figure 2-3)

The geologic formations found within the study area consist of rugged lava structures, extensive calcareous sand deposits, towering cliffs, deep gorges, alluvial sands, dikes, mud flows, accumulations of basaltic outcappings and benchrock, consisting of rounded basalt boulders, some of which may have lithified in calcareous materials (Refer to Figure 2-3).

Due to the melting of polar ice caps and glaciers hundreds of thousands of years ago, much of the study area was inundated, evidenced by fossils of marine life found along the mountain slope. Fossiliferous conglomerate is found 89 feet above sea level at Kaena Point, and there are loose coral cobbles up to 100 feet elevation. These outcrops indicate a stand of the sea, the Kaena stand, about 95 feet above present sea level. A stand of the sea is the elevation at which former sea levels have been identified.

The Waianae Range is the older of two mountain ranges forming the island of Oahu, dating back about ten million years. Rainfall on the youthful Waianae was heavy. The Koolaus did not exist at that time so moisture from trade wind clouds was not taken up. For a while lava flows were so frequent that erosion could make little progress. The rain penetrated the porous lava instead of running off the surface. Ensuing lava flows poured down the eastern "Schofield" side of the range. High crater walls prevented flows to the west. Streams carrying runoff water down the western side carved the present deep valleys.

The Waianae shield volcano was built up by repeated fissure eruptions within three rift zones, which met at the central vent near the summit of the original dome. A rift zone of an active volcano is characterized by parallel to sub-parallel fissures and a line of cinder and
splatter cones. These features are absent or scarce in extinct volcanoes, such as the Waianae, where erosion has cut deeply into the dome and the rift zones are marked by exposed dikes. Dikes are major controls in the movement and storage of groundwater because they are less permeable than the rocks they intrude. Where dikes are few and mostly parallel, groundwater is channeled along their trend. Where they are numerous and intersect, compartments form which reduce lateral movement of groundwater. The height at which water is stored depends on the dike pattern and the ability of the dikes to retain water.

Dikes intrude most of the volcanic rocks in the Waianae district. They are sparse in the poorly permeable, massive, thick-bedded flows of the upper member, and are numerous in the highly permeable, thin-bedded flows of the lower and middle members of the Waianae volcanic series. A large portion of the ridge bisecting Kaena Point consists of lava flows of the upper members of the Waianae volcanic series. Lava flows in lower and middle members of the Waianae Volcanic Series are conspicuous in the Makua area, becoming less evident approaching Kaena point from both directions. Coastal areas along both sides of the point are comprised of broad strips of non-calcareous sedimentary materials. The shoreline along the Mokuleia side is composed of calcareous sedimentary materials.

V. HYDROLOGY (Figure 2-2)

Most of the fresh groundwater supply in the Waianae district occurs in flows of the lower and middle members of the Waianae Volcanic Series. Flows of the upper member are mostly above the water table and contain only a small perennial supply. Some fresh groundwater occurs in sedimentary materials, but development of this supply is generally limited by the low permeability of alluvium, the restricted storage available in talus or by sea water intrusion in coral or coral rubble.

The groundwater reservoir in the volcanic rock is large. The top of the reservoir extends from an altitude of a few feet near the coast to more than 1,800 feet near the crest of the range at Kaala. Although the reservoir seems to be continuous, it is far from being homogeneous (having a uniform water level gradient). Instead, the gradient is steplike, reflecting the damming effects of local changes in permeability, caused by variations in dike density and in number of dike intersections. Groundwater also occurs in highly permeable coral and coral rubble near sea level.
Water obtained from well sources is found along the coastline fronting Makua Valley and Mokuleia. Aqueducts serving installations atop the Waianae range are presently drawing water from the Mokuleia area. An abandoned aqueduct is also located within the military impact area of Makua Valley.

The quality of water from wells tapping the volcanic aquifer is generally good except in near-shore areas and areas abutting landward edges of the coralline aquifer, where the major contaminant is sea water. Other contaminants result from leaching of hydrothermally altered volcanic rock above or adjacent to the volcanic aquifer. Most of the coralline aquifer is intruded by sea water, so the volcanic aquifer is highly susceptible to sea water intrusion where it is in conflict with the coralline aquifer. The low overall lateral permeability of volcanic rocks, which is mostly caused by dike intrusion, is the principal deterrent to sea water encroachment.

VI. TOPOGRAPHY

The study area is dominated by the Waianae range extending northwest from the highest peak in Oahu, Mt. Kaala (4,025 feet) down to Kaena Point at sea level. The range has a series of large deep valleys cut by wind and water erosion and nearly vertical cliffs up to 1,600 feet in height. On the leeward side of the range, two precipitous ridges extending from the main spine to the ocean define the gently sloping Makua Valley. On the windward side, the slopes are not as uniformly steep and there are many valleys extending out toward the flat Waialua plain.

Although slope is often a controlling factor in development considerations, it is not necessarily a major factor in considering recreational usage. Although the majority of the study area is rugged, with slopes over 30 percent (see Figure 2-4), land suitable for active recreational areas are located at Makua Beach, Keawaula Bay, along the Mokuleia coast from Kaena Point to Camp Erdman, the Kuaokala and Peacock Flats area.

The following is a general slope breakdown on lands found in the study area:
SLOPE | AREAS (ACRES) | PERCENT OF TOTAL AREA
--- | --- | ---
0-10% | 1,260 acres | 8%
10-20% | 3,320 acres | 21%
20-30% | 2,840 acres | 18%
30% | 8,280 acres | 53%
TOTAL ACREAGE | 15,700 acres | 100%

VII. SOILS

The topography and soils found within the study area are a result of gradual weathering of the geological formations of the island. The U.S. Soil Conservation Service completed a survey of Hawaii in 1972. Forty-three different soil types were identified within the study area. Rock land makes up the majority of the southern slopes of the Waianae range and ridge itself, while only a few fertile soil types are found within Makua Valley and the plateau of Kuaokala. However, in areas adjacent to the study area, particularly in the low valleys to the north, the soils are well suited for agriculture and have been cultivated in the past.

Soil Capability for Agriculture (Refer to Figure 2-5)

The ability of the land to support agriculture is dependent upon the character of the soil, the availability of water, and climatic conditions. Although almost any soil can be modified to grow many crops, certain questions regarding the specific conditions found at the study area exist:

1. What crop could be grown within the study area that could be grown elsewhere with different soils, climate, yield, markets, etc.?

2. From the standpoint of agronomy, are those crops which could be grown an economically viable crop in that particular situation?

3. Where will irrigation water be drawn from and at what cost?

Soils use ratings here were based upon simplified interpretations of the "capability groupings" and "description of the soils" in the soil survey provided by the
Soil Conservation Service. Criteria used in the ratings were slope, soil texture, depth, stoniness, salinity, water retention capacity and climate. Because the combination of little available water and the high cost of providing irrigation systems in the study area limit irrigation feasibility, the non-irrigated classification was used to determine suitability for cultivated agriculture.

Based on the criteria developed by the Soil Conservation Service, soils are classified as well suited (Class I and II), moderately suited (Class III and IV), poorly suited (Class V and VI), unsuited (Class VII and VIII) and unclassified. Soils classified as unsuited for agriculture comprise more than 85% of the study area. The soils moderately suited, poorly suited and best suited for agriculture comprises a remaining 15% of the study area (Figure 2-5). There are no soils located within the proposed park boundary classified by the State Department of Agriculture as being "prime" or "unique" for agriculture. Lands having the best ratings for agriculture are found within Makua Valley and at the plateau of Kuaokala. Usage of the study area presently is agronomically limited and economically unsound.

**Soil Capability for Development**
(Refer to Figure 2-6)

Developing the land to support structures: roads, buildings, septic tanks, parking lots and recreational uses depends upon the capability and compatibility of the soil for each use.

Soil limitation ratings for community development and recreational use, developed by the Soil Conservation Service in May 1974, were used to identify soil limitations for certain uses. Criteria to establish soil limitation ratings for specific uses vary with each use (Figure 2-6).

Based on these criteria, soils located within the study area were rated according to the degree of limitations on development. Each soil was given the rating of severe, moderate or slight. By examining these ratings, critical soil areas can be determined. If they are located in areas where specific use is planned, detailed studies of the specific locale are necessary. Ratings of moderate to severe do not necessarily prohibit specific use of the land, for with proper design, engineering and technology, many of the soil limitations may be overcome.

Since this study is concerned with recreational pursuits, the major concern is the presence of soil limitations for the development of paths and trails, campsites, playgrounds and picnic areas. Beach areas are also included.
As shown in Figure 2-6, the location of major soils classified suitable for development occur along the windward coast, Kuaokala plateau, Keawaula, Makua beach and valley. Other major areas are the fingers of land along the northern boundary which were included as possible access points to the upland area.

Although the majority of soils within the study area have been classified as not being suitable for cultivated agriculture and development, they are suitable for forest, pasture, wildlife habitat, beach and mountain-recreational pursuits.

VIII. FLORA AND FAUNA

The biological study of the Makua-Kaena State Park encompasses the general areas delineated in Figure 2-7. The information contained in this study is based on literature reviews, general area surveys and personal communications with people familiar with the project area. The following descriptions are brief summaries of various areas included within the upland, coastal and valley areas. A more detailed species list for terrestrial flora and fauna is provided in the Appendix.

A. Flora

Uplands - This region can be subdivided into grassland, dry upland forest, wet upland forest and montane bog. The grasslands are located at Kuaokala and are composed of grasses and shrubs with isolated pockets of native and exotic dryland species. Major grass species are molasses grass (Melinis minutiflora), lovegrass (Eragrostis sp.), broomsedge (Andropogon virginicus) and guinea grass (Panicum maximum). Dominant shrubs include koa-haole (Leucaena leucocephala), guava (Psidium guajava) and lantana (Lantana camara). Eastward, the grasses and shrubs change to a dry upland forest.

The dry upland forest is located primarily within the Mokuleia Forest Reserve. The upper two-thirds of the dry upland forest parallel to the Waianae Range is predominantly native with pockets of exotic species established throughout the forest. Koa (Acacia koa), 'ohi'a-lehua (Metrosideros collina subsp. polymorpha), olopua (Osmanthus sandwicensis), 'ohi'a-ha (Eugenia sandwicensis), tama (Diospyros ferrea) and papala kepau (Pisonia sandwicensis) are some of the endemic trees found here. Undergrowth species include maile
(Alyxia olivaeformis), and awikiwiki (Canavalia galeata). Endangered species recorded from the dry upland forest include Ochrosia compta, Cyanea superba, and Pleomele forbesii. The lower third of the project area is still considered a dry forest, however, these areas contain more exotic species because they are less isolated. Ranchlands are located nearby and accessibility is not as restricted as at the higher areas.

The State Division of Forestry has reforested areas located in portions of the grassland and dry upland forest. Plantings on Oahu are designed to provide erosion control, timber resources, watershed protection, recreation habitats and wildlife habitats. Common species used in forestry plantings include species of Eucalyptus, silk oak (Grevillea robusta) and Norfolk Island pine (Araucaria heterophylla).

The wet upland forest receives more than seventy inches of rain per year and is located high in the Waianae Mountains below the Mt. Kaala bog. The dominant tree is the 'ohi'a-lehua. It is commonly accompanied by 'ohi'a-aha and kalai (Elaeocarpus bifidus). Other common species are the kolea-lau-nui (Myrsine lesser-tiana), pelea (Pelea sanwicensis) and hame (Antidesma platyphyllum). In deep gulches the kukui (Aleurites moluccana) and strawberry guava (Psidium cattleianum) are abundant. Alsinodendron trinerve and Dubautia plantaginea var. plantaginea are examples of species usually found in wet forests that are on the proposed federal list of endangered species.

The montane bog is located at the summit of Mt. Kaala, the highest point on Oahu. Climatic conditions permit runoff to be exceeded by rainfall, thus creating conditions permitting the bog to form. The Mt. Kaala bog is characterized by extremely damp conditions, mud and small pockets of standing water. Bright sunshine alternates with misty showers and the nights are cold. Common species include 'ohi'a-lehua, pukiawe (Styphelia tamaeiae) and Cheirodendron platyphyllum. Gunnera kaalensis, Gunnera makahaensis, Astelia veratroides and Schiedea kaala var. kaalae are some of the species listed on the proposed Federal Register of endangered species.

Valleys - The major valley in the study area is Makua Valley which is part of the Makua Military
Reservation. The Makua Military Reservation is actually comprised of Makua Valley, Kahanahaiki Valley and Koiahi Gulch. Makua Valley is presently used as a firing range and training area. Fires have been common occurrences and grasses have established themselves as the dominant species after the natural vegetation was destroyed. The valley floor of Makua is predominantly grassland with dominant species including molasses grass and guinea grass. Large koa-haole stands cover portions of the valley floor with fingers of lush vegetation most noticeable along the streambeds. Vegetation along the streambeds include Christmas berry (Schinus terebinthifolius), pride of India (Melia azedarach) kukui, Java plum (Eugenia cuminii), and guava.

Portions of the rim and sides of Makua Valley are dominated by dry forest species. The dominant cover consists of 'ohi'a-lehua, lama, 'ohi'a-ha, kukui, koa and papala kepau. Shrub cover in the understory include maile, a'ali'i (Dodonaea eriocarpa), 'akia (Wikstroemia sp.) and 'ilima (Sida fallax). The northern side of the valley has been burnt by fires and molasses grass is the dominant vegetative cover.

Coastal Areas - Much of the coastal area can be subdivided into four major vegetation zones influenced primarily by the geological make-up and climatic conditions of the area. The major vegetation zones are the windward talus slopes and gulches, the windward coastal zone, the sand dunes, and the leeward slopes and coastline.

The windward talus slopes, cliffs and gulches are located at the northern base of the Waianae Mountain Range. The slopes are formed from an accumulation of rock debris from the steep cliffs above. A significant number of endemic species are found on the talus slopes and cliffs probably because of the rough terrain which minimizes any man-induced impacts. Some of the endemic species found on the talus slopes, cliffs and gulches are: 'aheahea (Chenopodium oahuense), kupala (Sicyos microcarpus), aulu (Sapindus oahuensis) and naio (Myoporum sandwicense). Representative indigenous species include alahe'e (Canthium odoratum), pili (Heteropogon contortus) and hilie'e (Plumbago zeylanica). Examples of common exotic species are koa-haole, Achyranthes indica and Java plum.
Endemic species that are on the proposed endangered species list include ili-ahi-a-lo'e (Santalum ellipticum var. litorale), ma'o (Gossypium tomentosum), pua-pilo (Capparis sandwichiana var. sandwichiana), 'akoko (Euphorbia celastroides var. kaenana) and Nototrichium humile var. subrhomboideum. Four varieties of nehe are also on the proposed endangered list and include Lipochaeta integrifolia var. megacephala, Lipochaeta lobata var. hastulata, Lipochaeta lobata var. leptophylla, and Lipochaeta remyi.

The windward coastal zone is located below the talus slopes and extends down to the ocean. Included in this area are pasture and beach sites. Endemic species include pa'u-o-hi'i-aka (Jacquemontia sandwicensis), kakonakona (Panicum torridum), naio and 'ihl (Portulaca cyanoisperma). The ma'o (Hawaiian cotton), listed on the proposed list of endangered and threatened plants, also can be found in this zone. Common indigenous plants include akulikuli (Sesuvium portulacastrum), koali-'awania (Ipomoea congesta), and naupaka kahakai (Scaevola taccada). Prevalent exotic species are sourgrass (Trichachne insularis), ironwood (Casuarina equisetifolia), swollen fingergrass (Chloris inflata), koa-haole, kiawe (Prosopis pallida) bristly foxtail (Setaria verticillata) and klu (Acacia farnesiana).

At Kaena Point, large sand dunes and rock outcroppings are the predominant geological feature of the area. Representative endemic species include pa'u-o-hi'i-a'aka, nehe (Lipochaeta integrifolia var. integrifolia) and 'akoko (Euphorbia degeneri). Endemic species listed as rare and endangered include 'ohai (Sesbania tomentosa var. tomentosa), pua-pilo (Capparis sandwichiana var. sandwichiana) and ili-ahi-a-lo'e. Indigenous species include alena (Boerhavia diffusa), and 'ilima (Sida fallax). Exotic plant species such as koa-haole, Australian saltbush (Atriplex semibaccata), and radiate fingergrass (Chloris radiata) are common in this area.

The leeward slopes are formed from rock outcrops and rock debris. Most of the land is fairly steep with traces of coral and shells, indicating a much higher sea level in the past. In contrast, the windward portion of Kaena consists of talus slopes and flat coastal areas. The leeward area slopes sharply to the sea. Some of the rare and endangered species recorded from the leeward slopes include 'akoko.
(Euphorbia celastroides var. kaenana), ma'o, ili-ali'a-lo'eo, Achyranthes splendens var. rotundata and Lipochaeta lobata var. lobata. Major indigenous plant species include the beach morning glory (Ipomoea brasiliensis), 'ohelo kai (Lycium sandwicense), and hi'aloa (Waltheria americana). Dominant exotic species found on the leeward slopes include kiawe, koa-haole, prostrate spurge (Euphorbia prostrata), and swollen fingergrass (Chloris inflata).

B. Fauna

At the lower elevations major avifauna include the barred dove (Geopelia striata), lace-necked dove (Streptopelia chinensis), Kentucky cardinal (Richmondena cardinalis), Brazilian cardinal (Paroaria coronata), house sparrow (Passer domesticus), house finch (Carpodacus mexicanus frontalis), ricebird (Lonchura punctulata), Japanese white-eye (Zosterops japonica), mynah (Acridotheres tristis) and mockingbird (Mimus polyglottos). As the elevation increases, the barred dove is partially replaced by the lace-necked dove, and the Brazilian cardinal, house sparrow, ricebird and mynah become uncommon.

Migratory seabirds and waterfowl may include plover (Pluvialis dominica fulva), 'ulili (Heteroscelus incanus), 'akekeke (Arenaria interpres), huna kai (Calidris alba), wedge-tailed shearwater (Puffinus pacificus chlororhynchus), white-tailed tropicbird (Phaethon lepturus dorotheae), red-footed booby (Sula sula rubripes) and great frigatebird (Fregata minor palmerstoni).

The pueo or Hawaiian owl (Asio flammeus sandwichensis) is an endangered species that possibly could be found within the study area. It inhabits dry forests and wet forests but prefers grasslands.

In areas associated with dry forests, numerous endemic bird species have been recorded. These include the 'elepaio (Chasiempis sandwichensis gayi), 'apapane (Himatione sanguinea) and 'amakihi (Loxops virens chloris). Japanese white-eye, bush warbler (Horeites cantans) and shama thrush (Copsychus malabaricus) are some of the exotic species found in the dry forest. The peafowl (Pavo cristatas) is found in the Mokuleia Forest Reserve.

Game birds commonly found along the grass slopes and grasslands include Erckel's francolin (Francolinus
erckelii), ring-necked pheasant (Phasianus colchicus
torquatus), barred dove, lace-necked dove, Japanese
quail (Coturnix japonica) and chukar (Alectoris
chukar).

The major avifauna in Makua Valley are the barred
dove, lace-necked dove, ricebird, Erckel's francolin,
ing- necked pheasant, Japanese white-eye, Kentucky
cardinal, Brazilian cardinal, bush warbler and mocking-
bird. The side gulches and dry forests on the rim
of the valley probably contain most of the dry forest
species previously mentioned.

Endemic avifauna are dominant along the Waianae
summit at the wetter parts of the study area, where
native vegetation is predominant. Introduced species
are generally restricted to the lower elevations,
however, some species have adapted to high elevation
areas. Exotic bird species that have been recorded
previously along the Waianae ridgeline include house
finch, Kentucky cardinal, Japanese white-eye, bush
warbler, red-billed leiothrix (Leiothrix lutea)
and melodious laughing thrush (Garrulax canorus).
Endemic species include 'elepaio, 'amakihi, 'apapane,
i'iwi (Vestiaria coccinea) and Oahu creeper (Loxops
maculata maculata). The i'iwi and Oahu creeper
are rare and endangered species.

Mammalian wildlife in the mountainous regions
include pig (Sus scrofa) and goat (Capra hircus).
In some areas dogs (Canis familiaris) were seen which
were probably lost hunting dogs. Rats (Rattus spp.)
are present in all sections of the project area.
In the coastal areas and lower elevations mongoose
(Herpestes auropunctatus), mouse (Mus musculus),
rat, cat (Felis catus), dog and cattle (Bos taurus)
are the major species present. The Hawaiian bat
(Lasiurus cinereus semotus), an endangered species,
has been observed in the study area on occasion.

Hawaiian land snails are found in the project
area and geographical isolation as well as preferences
for particular host trees have made them increasingly
rare. Two pairs of families (Achatinellidae-Tornitel-
linidae and Amastridae-Cochlicopidae) contain the
majority of Hawaiian land snails. The major genera
that may be found in the project area include Achatin-
ella and Amastra. Achatinella is a genus nearly
limited to Oahu and variability within species is
considerable. Species such as Achatinella lymanina,
A. mustelina, A. concavospira and A. sordida can be
found in the Waianae Mountains. Species of Amastra
found in the Waianaeas include Amastra rubens and A.
cornea.
Endemic Hawaiian insects have not been studied and documented in detail as much as the Hawaiian flora. Native Hawaiian fruit flies (Drosophilidae) seem to be the best known species. More than two hundred and fifty species of Drosophila have been described for the Hawaiian Islands but the total number is expected to double as further studies are conducted. Hawaiian drosophilas live on decaying leaves of araliads such as Cheirodendron and Tetraplasandra, and also on lobeloids such as Clermontia and Cyanea. Plants greatly influence native insects because many insect species are host specific. The distribution and large number of species of fruit flies and Hawaiian insects make surveying difficult. Many species are distributed over a small range and in some cases, in a single valley. Color pattern and food sources are the prime reasons why Hawaiian insect groups are so diverse. The presence of certain species of plants indicates that Drosophila and other native Hawaiian insects can be found in the project area.

C. Marine Life

In 1976, marine biological observations were carried out at several locations along the northern and southern coastlines of Kaena Point.

1. Keawaula (Yokohama) and Makua Beach Areas

The first area observed consisted of the region located between Keawaula (Yokohama) Beach and Makua Beach. The substrate was dominantly sand with periodic rocky areas that were usually flat although some small ledges were seen. Coral heads of the species Pocillopora meandrina were observed on some of the rock areas but it was not in abundance. Dead coral of the same species was also observed in a few areas, those corals showing evidence of sand abrasion.

Other benthic organisms seen in the area were sea urchins (Tripneustes gratilla) and fish, the dominant family being Acanthuridae. Few urchins were observed and they were normally on or near rocky regions of the substratum. The fish also were concentrated in the rock and coral areas although some fish of the family Mullidae were observed in the sand areas. Also seen were fish of the families Scaridae, Labridae,
Pomacentridae, Chaetodontidae, Cirrhitidae, Monacanthidae, Scombridae, and Tetradontidae.

2. Keawaula (Yokohama) to Kaena Point

The shoreline from Keawaula (Yokohama) to Kaena Point is predominantly rocky. The substratum at the 30-foot depth is irregular with large blocks of basalt rising to within 10-15 feet of the surface. The blocks support varied coral fauna, dominant species being Porites lobata and Pocillopora meandrina. Other corals include Leptastrea purpurea, Pavona varians, Cyphastrea ocelli, Montipora flabellata, Montipora verrucosa, and Palythoa tuberculosa. In some areas, the substratum consisted of eroded coral blocks (old reef areas) that protruded 3-5 feet above the bottom. Both the basalt and coral blocks provide habitat space for many organisms. The hard surfaces are occupied by sessile (corals, algae, sponges, tunicates, bryozoans, etc.) and sedentary (sea cucumbers, sea urchins, mollusca, etc.) organisms. The many holes, ledges, and crevices offer protection for the more active organisms such as fish, crabs, and lobster.

Near Kaena Point, the bottom is strewn with basalt and coral boulders up to 5 feet in diameter. More sand and fewer corals are present here, suggesting sand abrasion during periods of strong wave surges.

3. Kaena Point to Dillingham Millitary Reservation

The Kaena Point area consisted primarily of basalt rock with many cracks and ledges. Neither coral nor sand was observed in the area, but visibility was poor and it would be premature to conclude that none existed in the area. Fish of a few families were seen, the dominant one being Acanthuridae. Also observed were fish of the families Scaridae, Labridae, Balistidae, and Mullidae.

Checks at different stations along the north-facing coast showed gradual changes in the substratum. The rock ledge type of bottom flattened out to a smoother rock bottom. Fish were noticeably absent. The only benthic organism
observed along the western half of this sector was algae.

The eastern half of this sector showed no change in the bottom topography but the coral *Porites lobata* was observed, abundance increasing eastward. Visibility was also poor and it would be premature to conclude that none existed in the area. Fish of a few families were seen, the dominant one being *Acanthuridae*. Also observed were fish of the families *Scariidae, Labridae, Balistidae,* and *Mullidae*.

Checks at different stations along the north-facing coast showed gradual changes in the substratum. The rock ledge type of bottom flattened out to a smoother rock bottom. Fish were noticeably absent. The only benthic organism observed along the western half of this sector was algae.

The eastern half of this sector showed no change in the bottom topography but the coral *Porites lobata* was observed, abundance increasing eastward. Also present were algae of different types including the coralline algae *Porolithon*. A few fish of the families *Labridae, Monacanthidae,* and the *Myllobatidae* were observed.

A station at the eastern boundary consisted of a flat rocky substratum with abundant patches of *Porites lobata* and a few very small heads of the coral *Pocillopora meandrina*. Sand was found in small pockets and channels and then the bottom changed abruptly to all sand. Algae was also observed and very few fish, the only families being *Labridae* and *Monacanthidae*. Along the entire coast the water was very choppy with medium swells. Visibility was poor in all areas.

IX. TSUNAMI/FLOOD ZONES

The Hawaiian Islands are affected by tsunamis generated in the Pacific, especially those from the northwest rim of the basin (Kamchatka-Aleutian) and the South American coast. Since 1820 eight tsunamis have caused moderate to severe damage on Hawaiian shores.
Tsunamis take one of two forms when entering shallow water: 1) oscillation of the water level, much like rapid tidal cycles; or 2) bores which are breaking walls of water.

There have been five tsunamis in recent years occurring in 1946, 1952, 1957, 1960 and 1964. The 1946 tsunami was the most destructive, in terms of loss of life and property, ever to hit Hawaii. Recorded runups within the project area during the tsunamis mentioned above varied from 8 to 34 feet, the high value of 34 feet being observed at the Point and at Makua during the 1946 tsunami.

Tsunami inundation zones for the project area are shown in Figure 2-8. This zone extends to the 50 foot contour, generally covering a narrow strip of land along the leeward coast and a much wider area along Kaena Point and the windward coast.

The areas subject to flooding (Figure 2-8) are generally found near the mouths of streams that drain the area, especially in the leeward coastline. The largest such area covers Makua Beach and some distance inland from it.

X. OCEANOGRAPHY

The windward (Mokuleia) coast from Dillingham Military Reservation to Kaena Point is approximately 20,000 feet long. The eastern sector consists of an 8,000 foot long beach in the vicinity of Camp Erdman. The beach is partially protected by a fringing reef but is still exposed to wave action. The remainder of the windward coast is rugged coralline rock. In this region, access to the water is difficult due to the irregular rock, offshore benches and frequent severe wave action. At Kaena Point, the shoreline changes abruptly to basalt boulders and shallow interconnected tide pools.

The windward coastline is exposed to large winter waves and tradewind generated waves resulting in significant wave action most of the time. This severe wave action limits water recreation of the windward shoreline by making access into the water difficult and often dangerous. Prevalent wave action also suspends fine sediments, making water turbid in the nearshore areas, further limiting the recreational possibilities.

The dominant characteristic of the leeward (Waianae) coast from Kaena Point to Kaneana Cave, is the presence
of two long beaches, Makua Beach and Keawaula Beach. These beaches provide easy access to the water and are popular for swimming, snorkeling, surfing and other ocean related activities. Wave action is much less intense on this side, being sheltered from the persistent tradewinds. However, long swells approach from the south and southwest during the summer months and from the northwest during the winter months. The water is generally much clearer along this coast than on the north side. The remainder of the leeward coast consists of basalt and coralline rock projections forming numerous small coves. Offshore from the beaches the bottom is primarily scoured rock and sand. The remaining offshore area is characterized by irregular bottom with rock and coral ledges which provide excellent diving and snorkeling.

XI. WATER QUALITY (Near-Shore)

Waters found along the coastlines of the project area are classified as either Class AA or Class A (Figure 2-8). Class AA waters include the near-shore waters along Kaena Point for a distance of 3.5 miles towards Mokuleia and 3.5 miles towards Makua. The remainder of the coastal waters along the project area are classified as Class A.

A. Class AA waters

The uses to be protected in this class of waters are oceanographic research, the support and propagation of shellfish and other marine life, conservation of coral reefs and wilderness areas, compatible recreation, and aesthetic enjoyment.

It is the objective of this class of waters that they remain in as nearly their natural, pristine state as possible with an absolute minimum of pollution from any source. To the extent possible, the wilderness character of such areas shall be protected. No zones of mixing will be permitted in these waters.

The classification of any water area as Class AA shall not preclude other uses of such waters compatible with these objectives and in conformance with the standards applicable to them.

B. Class A waters

The uses to be protected in this class of waters are recreational (including fishing, swimming, bathing, and other water-contact sports), aesthetic enjoyment, and the support and propagation of aquatic life.

2-22
It is the objective for this class of waters that their use for recreational purposes and aesthetic enjoyment not be limited in any way. Such waters shall be kept clean of any trash, solid materials or oils, and shall not act as receiving waters for any effluent which has not received the best degree of treatment or control practicable under existing technology and compatible with the standards established for this class.

C. Existing Water Quality

Near-shore water quality of the study area was monitored by the State Department of Health until 1975. The monitoring program was discontinued because of the excellence of the waters.

XII. ARCHAEOLOGY

A. General

Kaena Point is a region rich in old Hawaiian legend and myth about both gods and men. Its stark, desolate beauty, its geographical location as the westernmost point of the island of Oahu, and its rich fishing grounds, have contributed to numerous descriptions of the area, stories of exploits along its shore, and after-death beliefs.

Although legends and chants concerning Kaena Point have survived, little remains to indicate the area played a part in the lives of the old-Hawaiians. This is due, in part, to both natural and man-made actions: tsunamis may have destroyed many heiaus or fishing shrines that were once located along the shoreline. Some archaeological sites have been destroyed by recent activities, including the railroad construction around the Point in the late nineteenth century and the construction of cattle fences during the mid-nineteenth and early twentieth centuries, which may have used heiau and fishing shrine rock materials.

Thorough archaeological surveys have not been conducted within the region, except for a study conducted along a portion of the Waianae coast shoreline (Boucher, 1970). McAllister charted all the known sites in the area in 1933, relying primarily on informants living in the area. He was not able to definitely locate several of these sites, as their
existence was based solely on tales passed down through generations. In 1962, Sterling and Summers provided an updated listing of all sites known to exist or thought to have existed and had been destroyed.

The following account used the above sources and other literature on the subject to describe the historical and cultural significance of the Kaena Point region and to delineate known archaeological sites or remnants.

**Ahupua'a Divisions**

The project site, shown in Figure 2-9, was divided into the old Hawaiian ahupua'a of Makua, Kahanahaiki and Keawaula on the Waianae coast. The site also encompasses the inland ahupua'a of Kuaokala. Under the ancient form of land holdings, all land on an island was held by a supreme chief or mo'i, who was trustee for the lands for the gods, Kane and Lono, the nature gods who caused the land to be fruitful. The supreme chief partitioned the land into districts and appointed high chiefs (ali'i) to supervise each district. The ali'i, in turn, subdivided the districts into ahupua'a for the purposes of taxation, and appointed an administrator, or konohiki, to supervise the ahupua'a. The ahupua'a ideally were parcels of land running from the mountains to the sea, and were meant to provide all materials necessary for the self-sufficiency of the inhabitants. Each ahupua'a had defined boundaries: the seaward boundary of each district was marked by an altar in which were placed the yearly taxes of the ahupua'a for the ali'i and mo'i; inland boundaries usually consisted of natural demarcations, such as ridges, rock outcropings, or a stream channel. By ancient custom, each ahupua'a that extended to the coast included fishing rights for a distance of a mile outward from that coast.

The ahupua'a was divided into ili (strips) which were allotted to commoner families (maka 'ainana) who lived on them and cultivated them. Each ili was farmed by an 'ohana, or extended family, that had permanent dwelling rights on the land, although the proprietorship of the ahupua'a could change from generation to generation, depending on the accession of a new mo'i, who could redistribute land rights among the ali'i.
The ahupua'a of the Kaena Point region were generally among the poorest in land resources on the island of Oahu, possessing little water, poor soil, and hot, dry climate. This was particularly true of the ahupua'a on the Waianae coast, which were subject to periodic drought conditions (Handy and Handy, 1972). It is likely that the Hawaiians did not consider these ahupua'a to be very desirable, as water (wai) was a prime determinant in a "rich" ahupua'a, and was equated with wealth (waiwai). With abundant water taro, the dietary staple of the Hawaiians, could be irrigated and cultivated. Sweet potato was the poor man's taro, and grown only when taro cultivation was not possible.

What the ahupua'a of the Kaena Point region lacked in agricultural potential was compensated for in marine resources, the area possessing exceptional deep-sea fishing off and beyond Kaena Point. Because of these conditions, and following general settlement patterns, the ancient Hawaiians who inhabited the Kaena Point area made their livelihood in fishing, settling in small coastal communities and scattered homesteads along the shoreline. When the English Captain Vancouver sailed up the Waianae coast in 1793, he described the region as follows:

. . . From the commencement of the high land to the westward of Opooroah (Puuloa) was . . . one barren rocky waste, nearly destitute of verdure, cultivation or inhabitants, with little variation all the way to the west point of the Island. Not far from the southwest point is a small grove of shabby cocoanut trees, and along these shores are a few straggling fishermen's huts (Handy, 1940).

Vancouver observed only one village along the entire Waianae coast, which was located in the vicinity of the present town of Waianae. Behind the village, he noted areas of cultivation within the Waianae Valley, which were the most fertile and possessed the best water resources of the west coast.

B. Makua

Of the Waianae district ahupua'a encompassed by the project site, Makua may have possessed the largest population, a result from more favorable terrain, water, and soils that provided agricultural potential.
Settlements in Makua may have been similar to those in the neighboring Makaha Valley, where extensive archaeological research has been conducted. Such research indicates that the valley supported an extensive agricultural community. According to a study (Hommon, 1969), three-quarters of the inhabitants of Makaha Valley may have lived and worked more than a kilometer from the seashore, at the time when Vancouver sighted just a few houses along the coastal section of Makaha. Makua may also have supported an inland community of some type, although it was probably much less extensive than that of Makaha, due to the lack of constant streams (Handy and Handy, 1972). It is likely these Makua settlements subsisted primarily on sweet potato, supplemented by fish, abundant off the coast. In his journals (1822-1849), Levi Chamberlain, noted that there were no trees in Makua, "a few clusters of sugarcane here and there" and potatoes were cultivated but not taro (Sterling and Summners, 1962). Makua was known, however, for its maile (maile laulii), a small-leafed type grown in Koiahi, and considered to be the finest of any on Oahu. Makua was also known as a pleasant way station where travellers could spend the night before passing on through to Kaena.

In legend, Makua was famous for its olohe, professional robbers and cannibals who would prey on the unwary traveler. They were skilled in wrestling and bone-breaking and were said to have removed all the hair from their bodies and oiled their skins so no hold was given to their opponents (Beckwith, 1940).

McAllister, in his 1933 island-wide survey of archaeological sites, listed several sites along the shore of Makua. As shown in Figure 2-9, these sites consisted of Kumuakuio Heiau (Site 178) and a fishing shrine (Site 179). Kaneana Cave also was reported by McAllister to be "the dwelling place of a shark goddess who held sway from Kaena Point to Kepuhi Point.

Fishing shrines were prevalent along both the Waianae and Waialua coasts, indicating the prominence of fishing during the times of the old Hawaiians. Fishing shrines were usually dedicated to the fish god Ku-ula, and the first such shrine was said to have been built by Ai-ai, the son of Ku-ula. It was Ai-ai who taught the art of fishing to the people, how to make various lines and nets. He established...
ko'a ia, or fishing grounds or stations, where abundant fishing could be had. He also left the Hawaiians ku-ula, or fish stones named after the god, which had the power to draw fish to its spot and thereby provide good fishing (Beckwith, 1970).

C. Kahanahaiki

The ahupua'a of Kahanahaiki shared many characteristics with Makua. The inhabitants of Kahanahaiki subsisted on fish and sweet potato, as did those who lived in the neighboring ahupua'as. It is probable that fishermen located close to shore exchanged seafood with their kin for cultivated crops grown inland. Some fishermen may also have been farmers cultivating both sweet potato during the growing season, and fishing during other periods. Water for Kahanahaiki was obtained from intermittent streams that flowed during the rainy season, and from hillside springs.

McAllister listed three archaeological sites for Kahanahaiki. Site 181, Ukanipo Heiau, apparently was the principal heiau for Kahanahaiki. The heiau was used as a place of burial, but not in the sense of a cemetery. The bodies of ali'i were said to have been placed on the lele or flat stone, until the kahuna-nui was informed by the gods to remove the bodies to their final resting place in some designated cave. They were actually "buried" in the cave, that is, placed with the appropriate ceremonies and offerings. Site 182 was said to have been a swimming pool on the makai side of the Ukanipo heiau, which was used exclusively by the ali'i. Site 183 was the Puuakanobao fish shrine, a platform that was "10 feet square and built up from 3 to 4 feet of large rough stone" (McAllister, 1933).

D. Keawaula

Keawaula ahupua'a was given its name meaning "red harbor" because of the great schools of muhe e (cattle fish) that came into the bay, giving the water a reddish appearance. The Hawaiians living at Keawaula were primarily fishermen, but they also cultivated both sweet potato and small sections of wet taro beneath the upper slopes of the region (Handy, 1940). Water for the area came from springs, gullies that channeled water during the wet season, and from a pool within Poha Cave (Site 184). According to
McAllister, the cave was said to contain nine courses of water, usually fresh, which were carried through the ground to the middle of Kaieiewaho channel, between Oahu and Kauai.

... when out fishing, the Hawaiians would obtain drinking water by diving down a certain distance with empty calabashes, and then, turning them over, would fill them with fresh water by letting the air escape.

An opening or exit to Poha Cave, called Kilawea, is located under the water at the end of the reef off Keawaula. The cave is also said to be connected with the cave in Kaawa... (McAllister, 1933).

In historic times, Keawaula was used as grazing land for cattle. An archaeological study of a portion of Keawaula (Boucher, 1970) found many high coral walls, probably used as cattle pens. The report noted that koa haole trees, which densely covered the study area, were introduced to the islands around 1888, and was grown for cattle fodder. The presence of dense koa haole growth and cattle pens indicates that cattle grazing may have been prevalent in the area. The study also uncovered historic house foundations, and numerous C-shaped structures and mounds. The uses of such structures are not known, though Hommon (Hommon, 1969) has suggested that the mounds were used as platforms on which vines with an affinity for sunlight, such as gourds were grown. Since the Waianae coast was known for the quality of its gourds and as a prime sweet potato area, this conclusion seems reasonable.

Other archaeological surveys have not been conducted at Keawaula, although McAllister listed several other archaeological sites. These include the Puaakanooahoa Fishing Shrine (Site 183) which no longer exists and Poha Cave (Site 184).

E. Kaena

The ahupua'a of Kaena means "red-hot", and according to various legends, was named either after one of the relatives of Pele who came with her from Kahiki or after a young chief named Kaena. According to the story, Kaena was out fishing with his followers one night and the noise and lights from the canoes
awakened a chief sleeping on the shores of Kauai. This chief (Haupu) was so angered at the disturbance that he threw over a large boulder, killing Kaena and his followers. The impact of the falling boulder caused huge waves which "... swept sand upon the shore until in time a long point of land was formed" (Sterling and Summers, 1962). This point was named after the dead chief, and the boulder which caused his death, the Pohaku o Kauai.

The Kaena ahupua'a according to Handy, (Handy, 1940) was probably the poorest ahupua'a in terms of arable land resources on Oahu. It is likely that Kaena was devoted exclusively to sweet potato, except for about 20 taro patches, terraced with rock facings, on the slopes below Uluhulu Gulch. These were irrigated from a spring on the hillside west of the gulch. Between these terraces and Kaena Point no taro was grown, although there were clearings presumably used for sweet potato.

Water was scarce in Kaena, as at other Waianae coast ahupua'a, although there were several springs perched among the pali cliffs. Legend says that when Hiiaka passed through Kaena on her way to Kauai, the natives of the region refused to tell her the location of highly treasured water:

I drink of the water distilled by the dripping pali walls, Led forth in a hollowed log. The rustic denies it and hides it: Four water-streams has Kaena; And the summer sun is ardent. (Emerson, 1915).

In other arid areas of Hawaii, there were springs whose existence was kept secret by the area's inhabitants to conserve an important resource (Handy and Handy, 1972). This was evidently the situation in this chant of Hiiaka, although the "Hidden Waters" referred to may be located in the ahupua'a of Kawaihapai, rather than in Kaena.

Although very poor in terms of land, Kaena faced out onto very rich deep sea fishing grounds. Family groups fished along the shore for sustenance, and Chamberlain, in his journals written between 1822-1849, noted one such group:
we passed Nenelea, a settlement of fishermen and a convenient place for hauling up their canoes . . . (Sterling and Summers, 1962).

Little is left of these scattered habitations along the shore, except, according to the State Historic Preservation Office, the remains of a fishing camp located at Kaena Point beneath the lighthouse. This fishing camp site is listed on the Hawaii Register of Historic Places, and is one of three open dune middens sites known for Oahu. The site is considered valuable, due to the scarcity of such sites and to the research potential it contains. It is dated back to pre-contact days, before the European visitors arrived, and existed in some form up to and including the nineteenth century.

McAllister listed several other sites in Kaena, including a few old house foundations, inland from the old railroad, and Ponuahua, "a fishing shrine near the point, though it is not known which group of rocks was so designated," (McAllister, 1933), Alauiki fishing shrine (Site 187), "a group of stones near the edge of the water, no different from other stones in the vicinity," (Ibid), and Ulehulu Heiau (Site 189):

"Many scattered piles of stone give little indication of the extent or features of the structures. Stones from the heiau were probably used to construct the modern stone walls in the vicinity" (Ibid).

The abundance of fishing ko'a along the shoreline testifies to the rich fishing available off the coastline, and because of this, Kaena was the scene of famous legendary fishing exploits. It was at Kaena Point that the hero Maui attempted to unite Kauai and Oahu by casting:

... his wonderful hook, Mana-ia-ka-lani, far out into the ocean that it might engage itself in the foundations of Kauai. When he felt that it had taken a good hold, he gave a mighty tug at the line. A huge boulder, the Pohaku o Kaua'i, fell at his feet. (Ibid).

The Pohaku o Kaua'i may be found today, and is thought to be one of two large boulders found at
the Point: the Pohaku o Kaua'i is said to be the boulder nearest Kauai, the Pohaku Oahu the boulder nearest the Point (Sterling and Summers, 1962). Maui is also said to have caught a huge red fish here which he dragged up the point, leaving a trail from Pohaku o Kauai to the Mokaena Heiau (Site 188), which formerly could be followed (McAllister, 1933). He placed this fish, a kumu, on the heiau where menehunes found it and cut it into small bits. When the sea covered the land, the pieces of fish went back to the ocean, and since then, the kumu have been small.

The Mokaena (Kuaokala) Heiau, where Maui dragged his fish, was said to have been built by Kauaians who settled Oahu (Ibid). Situated on a ridge above Kaena Point, it was the highest heiau on the island, and may have been one of the two temples on Oahu built by sun-worshippers and dedicated to the sun (Sterling and Summers, 1962). It is said to have been destroyed by the army during World War II (Ibid).

Kaena is best known, however, for the part it played in the after-death beliefs of the Hawaiians.

Hookalal tells that when an individual lay on the deathbed, his soul left the body and wandered about, first going to a fishing shrine (ko'a) named Hauone (Site 189). If all earthly obligations had been fulfilled, the soul continued wandering, otherwise it was returned to the body. In its continued wandering it then approached Leina Kauhane (soul's leap) at Kaena Point. Here it was taken by two minor gods . . . and thrown into a pit . . . It was at the time that the soul was thrown into this pit that death actually came upon the body. The soul then went to Na ake o le'i walo . . . on the boundary between Ewa and Honolulu districts. Here the road divided, the clean, good soul went to the right, and the other to the left (McAllister, 1933).

According to Kamakau (Ibid), Leina Kauhane (Soul's Leap) on Oahu is located:

. . . close to Kaena Point on the Waialua side near the dividing road descending to Keaokuku, which is said to be its boundary . . . the Soul's Leap is a sea furrow, a leaping place into endless night.
The exact location of the rock is not known though many speculate that it is a large white rock, near Kumakau's described location. The Kaena Point leaping place, however, was not unique, and other Leina Kauhane are named at different points about the island coasts (Beckwith, 1970).

F. Kealia

The ahupua'a of Kealia was named after the shallow depressions found in the shoreline lava in which salt collected. Kealia means "salt pan", and was an area that was good for little else. The arable land area in Kealia was exceedingly narrow, between elevated coral and sheer cliff. According to Handy and Handy (1972), there was some ground where sweet potatoes would have flourished, and near the cliff, sugar-cane, bananas, and awa. Terraces from the neighboring ahupua'a of Kawaihapai extended into Kealia, and in these taro was grown. Little is known about Kealia, because according to literature surveys there are no significant legends or archaeological sites associated with the area.

G. Kawaihapai

The ahupua'a of Kawaihapai was named after several perched springs located among the pali cliffs of the area, as Kawaihapai means "lifted water." The portion of Kawaihapai located within the project site is restricted to the mountain area, of which little is known either about legend and mythology or about archaeology and cultural history. Lowland areas, however, were known to support extensive terraces of taro, surrounded by sugarcane, and watered by Kawaihapai Stream. The area was known to be rich, as it was said that there existed a life of plenty until trouble came and all the water of the region disappeared. Then an omen was perceived by the people and water started pouring out of the cliffs. The spring in the cliff gave the name to the district and as no one knew the source of the water, it was called Ka-wai-kumu-ole-i-ka-pali (Sterling and Summers, 1962).

Several archaeological sites in the lowland area of Kawaihapai, north of the study area boundary, were listed by McAllister. These included the Puu o Hekiki (Site 190), a fishing shrine, Kawaihoa Heiau (Site 191), "Hidden Waters" (Site 192) from which Hiiaka is said to have drank, and Kuakea Fishing
Shrine (Site 194). None of these sites exist except for "Hidden Waters" spring (Ibid).

H. Mokuleia and Waialua

The project site also encompasses parts of the mountain regions of the ahupua'a of Mokuleia and Waialua. Mokuleia and Waialua were rich ahupua'a possessing fertile soil and abundant water, which supported taro, sweet potatoes, bananas, and awa (Handy, 1940). McAllister listed several archaeological sites within this area, including a possible heiau site (Site 194), the Kolea fishing shrine (Site 195), and a village site (Site 196) which is listed on the Hawaii Register of Historic Places. The Kalakiki Heiau (Site 197) is also listed on the Hawaii Register of Historic Places.

Located within the study area according to McAllister are a burial cave (Site 198), piles of stones (Site 199) and a cave (Site 200). The burial cave was one in which skeletal material had been found:

Powdered skeletal material was noticed on the side of a cliff beneath several very small caves. Upon examination portions of two skeletons were found in a lava tube whose entrance was so cleverly sealed that the material would not have been discovered had there not been a hole into a lower cave larger than a man's head. From the inside, light was noticed through the cracks of the rocks, and the entrance then discovered. No mortar had been used, but sharp-edged rocks had been carefully fitted together. There were no artifacts with the burial. The bones had probably been bundled together, but had evidently been disturbed by animals, as several had been recently gnawed. There was one skull but no mandible, one humerus, one radius, two ulnas, four femurs, three tibiae, and many fragments (McAllister, 1933).

The piles of stones (Site 199) were probably random piles created when the land was cleared for agricultural purposes (Ibid). Of Site 200, a cave located in Kaumoku Gulch, McAllister wrote the following:

At present one can squirm about 200 feet into the interior but comes in contact with large stones which obstruct the passage. It is believed that in
the construction of the water tunnel just above, the blasting dislocated these stones. Water also constantly drips from the roof making shallow pools in the passageway. Twenty years or more ago the cave is said to have contained skeletal material, though there is no evidence now of such remains, which undoubtedly would have decayed with so much moisture.

I. Summary

Of all the ahupua'a encompassed by the project site, that of Kaena is dominant because of the place it occupies in the legends and religion of old Hawaii. It is probable that Makua Valley may have been the most populated ahupua'a, possessing an inland community that may have been similar to the extensive agricultural community that lived in Makaha Valley. Little is known of the mountain ahupua'a of Kuaokala, or of the other mountain sections encompassed by the project site. However, the prevalence of caves within the mountainous regions makes it likely that many burials may have been conducted in these areas.

XIII. INFRASTRUCTURE

A. Roads

1. Farrington Highway

Farrington Highway is the major roadway which circumvents Kaena Point, approximately 5 miles of which, beginning just beyond Keawaula (Yokohama) Bay and continuing around the point, is virtually impassable by conventional vehicular traffic (Figure 2-1). Oahu Railway and Land Company operated trains along this general route from around the turn of the century, until 1948. After the railroad system was abandoned, a vestigial dirt maintenance road which went along the tracks, provided the only access to private landholdings in this area. Repeated wash-outs by storm waves and floods, and the absence of upkeep over the past 20-plus years have rendered this road extremely hazardous.

The following description of the existing roadway conditions commences from the Makaha extremity.
Farrington Highway approaches Kaena Point along the Waianae Coast, allowing access to this region from Honolulu. The improved 2-lane A.C. paved highway terminates at the U.S. Air Force Satellite Tracking Station Access Road.

A short, approximately 3/4 mile, section of BST (Bituminous Surface Treatment) continues from this point, to a point just past the sand beach, commonly referred to as Yokohama Bay. Vehicular traffic beyond this section is discouraged by signs posting warning of hazardous road conditions and advising motorists to proceed at their own risk.

This marks the start of the 5 mile segment which is extremely rugged, narrow, winding, full of depressions, protruding rocks, soft sand, and washouts, generally regarded as hazardous.

A short section of recently improved, A.C. (asphaltic concrete) paved road (22' wide), approximately 1.12 miles long, extends past Camp Erdman from the terminus of the dirt road to the Quarry.

Farrington Highway reverts at this juncture, once again to a rugged, unimproved road filled with potholes, and classified by the Department of Transportation as a dirt road for the next mile.

The stretch of road fronting the Dillingham Military Reservation, approximately 2 miles, is described by the Department of Transportation as BST, though in need of improvement, poses no great difficulty for motorists.

An improved 2-lane, A.C. paved road is resumed for Farrington Highway. This corridor continues either around the North Shore of Oahu, or though Central Oahu, ultimately arriving in Honolulu.

Actual traffic counts for June 1975, prepared by the Department of Transportation, Planning Section, indicates the following flow levels at specific points.
Farrington Highway at Makua Cave  
ADT = 1572

Farrington Highway at Kapalaa  
Bridge (near Waialua)  
ADT = 1889

1998 Projection  
ADT = 3900

2. Satellite Tracking Station Road

The U.S. Air Force Satellite Tracking Station Access Road which is operated and maintained by the U.S. Air Force diverges from Farrington Highway at the end of the improved length, on the Waianae side. Because of the classified missions and operations of the facilities it serves, the use of this road is restricted to the general public, except for those with a valid hunting license or those belonging to a recognized organization such as the Sierra Club, Boy Scouts, Girl Scouts, etc. All others are prohibited from entry according to the terms of the existing lease. The Canadian Overseas Tele-communication Corporation offices and ground facilities are situated approximately a quarter of a mile up this road from Farrington Highway.

3. FAA Road

Entry is through a private ranch located approximately 1 mile west of Waialua town. This is a single laned, A.C. paved road characterized by steep grades, and sharp turns enroute to the summit of Mt. Kaala.

Use of this road is restricted to official business for security and safety reasons. The FAA, Hawaii Air National Guard, Hawaiian Telephone Co., and City and State public safety agencies have facilities requiring use of this road. The State Department of Land and Natural Resources is also allowed access for routine checks of the Forest Reserve areas.

A permanent FAA work crew maintains this hazardous road year-round.

4. Nike Road

The entrance to the Nike road is located roughly a mile west of the FAA road entrance
along Farrington Highway. This road was developed to provide access to an Army Nike Station atop the ridge, which is presently abandoned. The lower portion of the road passes through Mokuleia Ranch lands, and the remainder is within the State Forest Reserve boundaries.

The road is used primarily by hunters, and campers wishing to utilize the Peacock Flats campsites. Public access is allowed only on agreement with Mokuleia Ranch, and the State Division of Forestry. A permit must be obtained from the Division of Forestry, in order to use the campsite.

B. Sewage

A sewage treatment plant exists in Waianae, and serves the urbanized areas between Nanakuli and Makaha. Construction is presently underway to extend the interceptor line along Farrington Highway to Kili Drive in Makaha Valley. The City and County Sewer Division's master plan envisions only a short extension (less than 1 mile), to Kepuhi Point, to complete future service to this area. The Waialua region depends on cesspools and septic tanks to accommodate sewage disposal. A sewage treatment plant is planned for Waialua, pending availability of construction funds. When this occurs, the City and County Sewers Division master plan shows the extent of service to terminate at Camp Erdman.

C. Water

The City and County Board of Water Supply provides service along the Waianae Coast as far north as Kepuhi Point, just past Makaha Valley. Along the Waialua Coast, the Board of Water Supply extends service as far as Mokuleia Beach Park, across from the Dillingham Airfield.

Three private water systems presently serve specific areas in the Mokuleia vicinity:

* The Mokuleia Water System owned by Mokuleia Properties, Ltd., services a residential area (88 consumers) along Crozier Drive and Crozier Loop.
* The Mokuleia Ranch and Land Company Water System - Kawaihapai serves a limited area along Farrington Highway (52 consumers) including the polo field.

* The source of the Camp Erdman Water System is the U.S. Army well at the nearby Dillingham Military Reservation.

The Department of Land and Natural Resources, Division of Water and Land Development is planning to refurbish an existing well above Keawaula Beach to provide water for irrigation and the restroom facilities at Keawaula Beach.

D. Electricity

The existing overhead electric line around Kaena Point was originally installed before World War II and is still used (Figure 2-10). It connects the Waialua and Makaha substations and insures the necessary overall system reliability along the North Shore (Mokuleia) and the Waianae Coast. In the event of a failure in the power line from Makaha, this segment provides Hawaiian Electric Company power to the Canadian Overseas Telecommunication Facility via the Waialua feeder. Presently energized at 12kv, this line will eventually be a combined 56kv/12kv circuit. This line is covered by several perpetual grants of easement, including State Land Board approval within TMK 6-8-02: 17 on June 10, 1971, and the grant within TMK 8-1-01 dated February 11, 1966.

Other major lines which exist in the area include the two overhead 12kv feeders to the Air Force Kaena Point Tracking Site—one from the Mokuleia side, and the other from the Waianae side over former McCandless lands pursuant to CDUA (Conservation District Use Application) approval by the Land Board (OA--1/29/73--406) on July 27, 1973.

The Hawaiian Electric Company, with the cooperation of the State Department of Planning and Economic Development and the City and County of Honolulu, has been selected to sponsor one of 17 sites for the possible test of a large one megawatt wind turbine. If Hawaii is selected for the actual test of this large wind turbine, it may be erected within the Kaena Point State Park study area boundaries. The site is on the ridge line about 250 yards above the Satellite Tracking Station in the Kuaokala Forest Reserve.
E. Communication

1. Canadian Overseas Telecommunication Corp.

The Canadian Overseas Telecommunication Cable, located in the (Keawaula) Yokohama Bay area, occupies a 10 ft. wide easement extending roughly a quarter of a mile inland (Figure 2-10). A steel pipe buried approximately 3 feet underground presently houses the cable, and crosses the existing coastal road enroute to the terminal facility located on the access road to the Satellite Tracking Station.

2. Hawaiian Telephone Company

Hawaiian Telephone Company operates and maintains two underground communication cable systems within the study region (Figure 2-10).

Transpacific Cable - This cable approaches Kaena Point from both the Makaha and the Waialua directions, buried at depths varying from 4-6 feet along the improved length of Farrington Highway. These underground cables continue up the mountainsides, and both terminate atop the ridge at the U.S. Air Force Satellite Tracking Station.

Hilo Cable - The Hilo cable, buried at a depth of approximately 30 inches along the Waianae length of Farrington Highway, terminates at the Kaena end of Makua Valley.

The U.S. Signal Corps Cable extends north along the Waianae Coast following the Farrington Highway alignment. Hawaiian Telephone Company is presently under contract to maintain this cable which branches just about midway past Makua Valley. One segment continues along Farrington Highway to the Tracking Station Access Road, and the other extends up through Makua Valley, over the Waianae Range, past Peacock Flats above Mokuleia, and terminates at the Dillingham Military Reservation.

The recently abandoned U. S. Signal Corps Cable, below the natural ground, still occupies the old railroad right-of-way around Kaena Point.
Presently, the furthest extent of Hawaiian Telephone Company's service is to Camp Erdman along the Mokuleia Coast, and to the Canadian Overseas Telecommunication Corporation on the Waianae side. All the facilities of various agencies situated atop the Kaena Point Ridge (Kuaokala), are serviced by Hawaiian Telephone Company's cables. An emergency telephone is located at Mokuleia Beach Park, and on the Waianae side at the Tracking Station Access Road along Farrington Highway.

3. **Public Safety Radio Communication**

A microwave radio relay station, referred to as the Mokuleia Station, is located atop the Kaena Point ridge and is utilized by the State Civil Defense Unit, City and County Police Department and the City and County Fire Department.

4. **Federal Aviation Administration**

The FAA maintains and operates the Satellite Tracking Station located on the ridge. The area is restricted to the general public.

5. **Hawaii Air National Guard**

Communication facilities are also maintained and operated by the Hawaii Air National Guard atop the ridge near Mt. Kaala.

**F. Public Services**

1. **Police**

Law enforcement in the Waialua-Haleiwa area is provided by the Wahiawa Police Station. Their jurisdictional area encompasses the area on the Waialua side of the Waianae Mountain Range to Wailee Stream near Sunset Beach (District II). Patrolmen from the Wahiawa Station have eleven beats in this area with four beats located between Mokuleia and Sunset Beach. The boundaries of Kaena Point State Park fall within beat 227 of District II on the windward side. One motor patrolman is assigned to each beat. The most prevalent type of crime in the Waialua-Haleiwa area has been burglary and theft (auto and from parked cars). Beat 227 reported 72 instances of burglaries and 37 auto thefts in 1976 (1976 Statistical Report, HPD).
Most crime involves beach-going visitors who park their vehicle along the road, venture to the beach, and return to find their valuables missing. Theft from parked cars occurs primarily at Mokuleia Beach Park and the area between Mokuleia Beach Park and Kaena Point.

The Waianae area is serviced by the Waianae Police Station whose jurisdiction extends from the Kaena Point lighthouse to Kahe Point (District III). The Waianae Mountain Range also serves as a jurisdictional border. One officer is assigned to each of the six beats in the Waianae area. The leeward side of Kaena Point State Park falls within beat 319 of District III.

The most prevalent type of crime in beat 319 has been burglary, vandalism, and theft from parked cars. As in the Waialua-Haleiwa area, beach-going visitors are the victims of theft from parked cars. High incidents of theft have been reported at Keawaula (Yokohama) Bay and Makaha Beach areas (by the police). There were 145 burglaries, 29 car thefts and 103 vandalisms reported in beat 319 in 1976.

Assaults (1st and 2nd degree) and other assaults numbered 50 for beat 319 and 29 for beat 227 in 1976. These figures placed these beats 7th out of 10 and 4th out of 11 among all beats in their respective districts in the assault category.

2. Fire

Waialua-Haleiwa is served by the Waialua Fire Station. Fifteen men are assigned to the station with five men on duty at all times. Their primary equipment is a 1,250 gallon per minute pumper. Sea-rescue equipment consists of a 17-foot Boston Whaler, surfboards, fins, and goggles. A City and County ambulance is stationed there during the day on weekends only. On weekdays an ambulance must be dispatched from Wahiawa or Kahuku.

Response time from the Waialua Fire Station to Kaena Point is approximately 10 minutes. If the truck is unable to proceed, firefighting or rescue must be done on foot. The estimated time varies according to traffic, weather and
time of day. Back-up help comes from Engine Company 11 (Sunset Beach) and Engine Company 16 (Wahiawa). The fire department also receives assistance from the military and the Waialua Sugar Company in the event of large uncontrolable brush fires.

The Waianae area is serviced by the Waianae Fire Station at Maili Point and the Nanakuli Fire Station in Nanakuli. Fifteen men are assigned to each station with five men on duty at all times. The stations are equipped with a 1,250 gallon per minute pumper and the Waianae Fire Station has an additional 400 gallon tanker and Nanakuli has a 1,500 gallon water tanker.

Sea rescue equipment consists of surfboards, fins, and goggles. The nearest sea rescue unit is located across Pier 39 in Honolulu. A City and County ambulance is stationed at the Waianae Station.

Response time from the Waianae Fire Station to the end of Farrington Highway near Kaena Point is 7-12 minutes, varying according to traffic, weather, and time of day. Back-up assistance is provided by the Nanakuli Fire Station.

3. Medical Evacuation

Medical evacuation assistance is available to the City and County of Honolulu from the military. If necessary, ambulance units may call helicopter assistance from Wheeler Air Force Base in transporting emergency cases to hospitals. Military personnel are transported to Tripler Army Medical Center and civilian evacuees are generally taken to Queen's Medical Center or to other outlying hospitals.

4. Health Services

Health facilities located near the Kaena Point area include Kaiser-Maili Clinic and Waianae Comprehensive Health Clinic in Waianae, and Waialua Outpatient Clinic in Waialua. Hospitals and clinics close to the project area include Fronk Clinic (formerly Leeward Hospital), Wahiawa General Hospital and Kahuku Community Hospital.
Two public health nurses in Waialua-Haleiwa and seven nurses in the Waianae area provide field services to the public. These nurses stress preventive medicine and public education. Some of the services provided include immunizations, nutrition guidance, well baby clinics, vision testing and tuberculin testing.
MAKUA - KAENA STATE PARK
CONCEPTUAL PLAN
SOIL SUITABILITY FOR CULTIVATED AGRICULTURE

- Well Suited
- Moderately Suited
- Poorly Suited
- Unsuitable
- Unclassified

- Windward Coastline
- Leeward Coastline
- Kaawaula (Yokohama) Bay
- Keawaula (Yokohama) Bay
- Makua Beach
- Kahana Valley
- Mail Facilities
- Pu'u Pana
- Mtn. Kaena

Figure 2-5
land use plans 3
SECTION 3

RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

This section will describe how the proposed action conforms or conflicts with objective and specific terms of approved or proposed land use plans, policies and controls.

I. INTRODUCTION

A. Historical Land Use

Historically, the land divisions (ahupua'a) within the study area have been relatively poor land resources. Existing climatic and physical features largely limited the agricultural use of the land to sweet potato cultivation. Taro could only be grown in a few isolated areas where enough fresh water could be found to satisfy its need for extensive irrigation. A few scattered clusters of sugar cane and an abundance of maile laulii grew in Koiahi Gulch adjacent to Makua Valley. During the mid 1800's, white settlers arrived and introduced a few vegetables and fruits not previously grown in the area. By the 1870's, ranching had begun in the area, with the valleys used as grazing lands. With the completion of the railroad around Kaena Point in 1898, ranching soon became the dominant industry.

The relative meagerness of the area's land resources was compensated by an abundance of marine resources. The early Hawaiians derived flourishing livelihoods from the sea, with family groups fishing the shores. There was also deep sea fishing nearby. Evaporating water left numerous salt deposits on the rocky coastline, which were harvested for use and barter. The coast was dotted with scattered camps, villages, and fishing shrines.

With the advent of World War II, the United States Government declared martial law and confiscated Makua Valley for military purposes. It has since been under control of the United States Army.
Little recorded history of early Hawaiian activities exists about the upland mountain areas. However, the development of Makua and Kahanahaiki Valleys in the early 1900's for ranching caused cattle and horse grazing to overflow from the valleys into the upland areas especially at Kuaokala. Pineapple cultivation was also attempted at the plateau of Kuaokala.

Recently the Kaena Point Satellite Tracking Station and other communication facilities have been constructed along the ridgeline of the Waianae Range. A Nike facility was also constructed in the Mokuleia Forest Reserve near Peacock Flats, which has been abandoned and control turned over to the Department of Land and Natural Resources. Communications Facilities are also operational atop the ridge at Mt. Kaala.

There are four Forest Reserves found within the study area and include the Kuaokala, Mokuleia, Makua-Keaau and the Waianae-Kai. Bird and mammal hunting is permitted within the Kuaokala Game Management Area, the Mokuleia Game Management Area, and portions within the Waianae-Kai Forest Reserve.

B. Existing Land Use and Ownership

All of the state owned land not occupied by tenants is open to the general public for recreational purposes. This includes both Kuaokala and Mokuleia Forest Reserves. Most of the shoreline from Mokuleia to Kaena Point has been condemned by the State, but purchase by the State is pending (Figure 3-1). Hunting and hiking are the principal activities on the forest reserve lands while fishing, educational walks, picnicking, camping, surfing, motorcycling and hiking all are popular along the shoreline. Figure 3-1 shows land ownership and tenure in the study area.

State land is leased to two primary tenants, Mokuleia Ranch and Land Company and the U. S. Government. Lands leased until 1994 to the ranch company, include pali lands and lands in the upland mountain areas at Kuaokala above Kaena Point which are used for pasture. Hunting is also permitted here because the leased land is part of the Kuaokala Game Management Area. The Federal Government has also leased the coastal lands fronting Makua Valley and mauka of Keawaula Bay for military training purposes, bivouacs, command post exercises, and tactical problems involving units no larger than company size. The shoreline
within those boundaries is open to the public for recreation. Other lands are also leased from the state under a revocable permit and are used for quarrying, communication, pasture and military purposes.

The largest parcel of federally owned land within the study area was ceded to the United States in 1964 and is defined as the Makua Valley Training Area. This area is divided into a major maneuver area and a heavily used impact area for live fire exercises, aerial helicopter gunnery, and is the sole facility for the disposal of approximately one hundred fifty to two hundred ten tons of explosives and unserviceable ordnance annually. The impact area is closed to the public and is heavily contaminated with unexploded ordnance varying from aerial bombs to artillery projectiles covering several generations of air force, naval, and infantry weapons. The quantity and location of any undetonated material is unknown and has created an area of potential hazard for future public recreational use or development.

Other military owned or leased parcels can be found scattered around or within the Kaena Point area. Atop the ridge above this area, the lands are used primarily in connection with the United States Air Force Satellite Tracking Station which is situated there. At Kaena Point, the United States Coast Guard has responsibility for the operation and maintenance of an automatic battery operated lighthouse. The Kaena Point Military Reservation located east of the point has been declared as excess to the needs of the United States Army in Hawaii. However, the House Armed Services Committee has not approved this action and has ruled that the U. S. Government is not in favor of relinquishing control at this time. Radar, radio, visual defense, and television relay uses are also located at Mt. Kaala, Oahu's highest peak.

Privately owned and leased land in the valleys along the Mokuleia Coast and at Kuaokala are used by Mokuleia Ranch as pasture for grazing cattle and horses. Although recreational activities occur within these lands, permission for any use on, or access through these lands should be obtained from the owners.

C. Adjacent Land Use

The major land use of territories abutting the northern boundary of the study area is, essentially,
agricultural in nature. This includes the communities of Mokuleia, Waialua, and Haleiwa, which are all classified as rural and share unique homogenous characteristics. Extensive sugar cane cultivation exists in Waialua on lands owned by Castle and Cooke. In Mokuleia, the Mokuleia Ranch and Land Company currently use their lands for horse and cattle grazing. Dillingham Military Reservation is used as a general aviation airport by both civilian and military aircraft and quarrying operations exist nearby. Mokuleia is also a popular recreation spot. Camp Erdman operates recreational facilities along the beach on the western end and the United States Army maintains a beach park. Local residents enjoy the good fishing and surfing and it is here we also find the annual Hawaiian Polo matches where local teams host both mainland and international games. Haleiwa serves primarily as the center of commerce for the north shore communities and along with poultry, dairy and egg farming, an attractive commercial fishing industry is enjoyed.

Land uses for communities bordering the southern boundary of the study area are also agricultural in nature. Communities of Makaha, Waianae, Nanakuli and Maili are located along the major access route, Farrington Highway. Their agricultural activities are diverse and include lands for grazing, dairying, egg, poultry, and pig farming, vegetable growing, floriculture and horticulture. Commercial fishing is plentiful within these communities and they also serve the tourist industry with several resort facilities in and around Makaha. Makaha Valley is highly valued for its recreational uses such as golf which is available at the Makaha Country Club and trail riding out of the local stables. Makaha Beach has some of Hawaii's best surfing featuring both local and international surfing championships.

D. Future Plans, Policies and Controls

1. General Plan

A new General Plan for the City and County of Honolulu was adopted by Resolution No. 238, on January 18, 1977. The General Plan is based on statements of Objectives and Policies. The Department of General Planning is presently preparing specific detailed Development Plans for the various regions of the island, which will not be completed until 1979. Until the
plans are completed and adopted by Ordinance, the existing General Plan Map of 1964, Detailed Land Use Maps, and Zoning will remain in force and provide guidelines for land use decisions.

2. **Special Management Areas (SMA's)**

The Coastal Zone Management Bill (House Bill 122) was passed by the State legislature on April 4, 1977. The approved bill (Act 188) was sent to the Governor for his approval. It was signed on June 8, 1977.

Each county is required to amend their present SMA's as necessary to conform with the policies and objectives set forth by the Coastal Zone Management Act. The signing of the Coastal Zone Management Act requires the counties to amend their regulations and boundaries within a two year period to conform to the objectives, policies and guidelines as enacted. Until that time the City and County of Honolulu will continue to issue permits under established guidelines set out by the Shoreline Protection Act which was incorporated in the Coastal Zone Management law.

3. **Natural Area Reserves**

At this time there are currently 12,683 acres of land officially in Natural Area Reserve Systems throughout the State.* Within the project study area, one site has been nominated and is awaiting final approval pending acquisition of private land within the designated area. This is the natural coastline ecosystem at Kaena Point, which includes all the area of the promontory itself up to the original railroad grade (Figure 2-7). It is the first of its kind to be nominated for inclusion in the system. The Kaena sand dunes provide critical habitats for a number of endangered endemic coastal plants and associated insects. These features have made this area suitable for inclusion in the Natural Area Reserve System.

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*The Natural Area Reserve System was established by state law, Act 139 in 1970 to "preserve in perpetuity" specific land and water areas.
Another system of possible natural area reserves within the study area is presently referred to as the Kaala-Pahole Natural Area Reserve (Figure 2-7). The Commission has not yet submitted a formal nomination, but the process of drafting the proposal is underway. This ecosystem has notable associations of predominantly native flora as well as native insects and land snails. The reserve is planned to be relatively large, 2,700 acres, because the plants and animals display marked local endemism. It would occupy three sections—Pahole Gulch, the north slopes of Mt. Kaala, and the western slopes of Puu Pane. These include four basic types of vegetation:

- Semi-deciduous Seasonal Forest or Dryland Sclerophyll Forest
- Evergreen Seasonal Forest or Mixed Mesophytic Forest or Moist Forest
- Submontane Rain Forest
- Montane Bog

II. EXISTING CONTROLS AND POLICIES

A. State Land Use Designation

The study area is classified by the State Land Use Commission as Conservation and Agriculture (Figure 3-2). Lands within the Conservation District include the Mokuleia, and Kuaokala Forest Reserves, Makua Valley, coastal areas from Keawaula around Kaena Point to the north, an area adjacent to Camp Erdman and the Dillingham Quarry. Along the northern portion of the study area are lands currently owned or leased by Mokuleia Ranch and Land Company and lands on the upland areas of Kuaokala which are presently classified Agriculture and are used for grazing.

Those portions of the study area that are in the Conservation District are in an area subzoned General Use. According to the existing Regulation 4, a park would be a compatible use in this subzone. A park also would be compatible in an Agriculture classification area.
B. General Plan

The majority of the land in the study area is generally planned Preservation, the rest of the acreages being generally planned Park, Military and Agriculture (Figure 3-2). Those areas generally planned as Preservation include portions of Makua Valley, the Mokuleia and Kuaokala Forest Reserves, the uplands of Kuaokala and the Pali areas of Keawaula of Mokuleia. Lands generally planned as Agriculture are found within Makua Valley and lands planned for Military use are located at Kaena Point (Coast Guard Facility and Kaena Military Reservation) and area northeast of Keawaula Bay and Kahanahaki and Makua Valleys. The coastline from the southern boundary of the study area at Kaneana Cave around Kaena Point toward Camp Erdman is designated as Park and is compatible with the City's concept of a green park for the island. An area surrounding Camp Erdman is classified as residential. Zoning within the study area is classified as Agriculture (Ag-1) from Keawaula Bay south and west into Kahanahaki and Makua Valleys. All other lands are classified as Preservation (P-1) (Figure 3-3).

According to the General Plan, Statement of Objectives and Policies (1977), the proposed project is compatible with policies designed to protect and preserve the natural environment of Oahu.

C. Coastal Zone Management

The Hawaii Shoreline Protection (HSP) Act of 1975 was passed to help protect and manage Hawaii's Coastal Resources. Special interim controls authorized by this Act have been adopted and implemented by each county until Hawaii's Coastal Zone Management Program for the State is developed and implemented. All of the shoreline within the study area, approximately ten miles, is presently within the area designated as a Special Management Area by the City and County of Honolulu (Figure 3-3).

The management area within the study site includes all of the coast from the quarry to Kaena Point extending 1,000 feet inland; all of Kaena Point up to Puu Pueo; south of Kaena Point from the coast to the top of the Waianae Range, including all of Keawaula and Kahanahaki Valleys, and Makua Valley from the shore inland 3,500 feet. All development in the Special Management Area is processed through the
D. SCORP Recommendations

The 1975 State Comprehensive Outdoor Recreation Plan divided the State into different planning areas to comprehensively study the recreational needs of the people of Hawaii, to inventory presently available recreational facilities and to pinpoint areas of urgent need for more recreational outlets.

The boundaries of the Makua-Kaena State Park fall within two of these planning areas: No. 24 (Waianae-Nanakuli) and No. 25 (Waialua-Punalu'u). There are particularly high needs in planning area 24 for beach camping, inland picnicking and boat launching facilities. The Makua-Kaena State Park should help meet this planning area's needs for picnicking, fishing, surfing, diving and hiking.

The coastal areas of the Makua-Kaena State Park are classified as having potential for medium intensity uses for recreation, while the uplands are proposed for low intensity use.

Planning area 25 has high present and projected needs for swimming, tennis, beach camping, beach park picnicking, golf and boat mooring facilities. The Makua-Kaena State Park should help meet demands for beach picnicking, inland picnicking, hiking, fishing, surfing, diving and beach swimming and sun bathing. As in planning area 24, coastal areas of the Makua Kaena State Park that fall in this planning area are slated for medium density use while the uplands are planned for low density uses.

E. State of Hawaii Comprehensive Open Space Plan

In 1972 the State Department of Planning and Economic Development conducted an open space study for Hawaii that encompassed elements that affect environmental quality, such as population policies, urbanization patterns, resource uses, transportational alternatives and other man-engineered growth factors. Among the goals of the study was the development of an Open Space Plan to provide guidelines to help the State achieve the highest objectives for land and water resources for the long range future of the State.
The Open Space Plan for Hawaii identified and mapped those lands that are valuable in one or more of the following categories:

1. Conservation and preservation of natural resources
2. Agriculture
3. Parks and recreation
4. Historic and scenic preservation
5. Public Health and Welfare
6. Shaping urban growth

The plan is based on criteria, compatible with statewide goals, and can serve as a basis for future statewide quality growth. In this plan, the Kaena Point region is identified as an area that has potential for four of these six criteria, namely, conservation and preservation of natural resources, development of parks and recreational facilities, an opportunity for historic and scenic preservation, as well as a chance for promoting public health and welfare. The Kaena Point region is identified as one for high priority for state acquisition for open space uses.
environmental impacts 4
SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES TO MINIMIZE ADVERSE IMPACTS

This section will summarize and discuss the probable impacts of the proposed action on the environment.

I. INTRODUCTION

The proposed actions will generate environmental impacts which can be categorized as primary and secondary impacts. Primary impacts are those directly resulting from the implementation of the proposed actions, while secondary impacts are indirect impacts resulting from the project.

Primary short-term impacts are construction related and limited to the duration of the construction period. Generally, compliance with County and State Regulations and incorporation of specific appropriate mitigative measures minimizes these impacts. Primary long-term impacts result from the implementation and operation of the park. (These impacts include direct impacts on man's health and welfare, and on other forms of life.)

The secondary impacts are indirect impacts on potential use conflicts and indirect benefits.

The seventy (74) individual actions for the nine (9) sites of the proposed park were subjectively evaluated against various parameters. Please refer to the Impact Analysis Worksheets for each area.

The Impact Analysis was based on the park conceptual plan, thereby limiting discussion to specifics of the project.

Discussion of the anticipated environmental impacts will be by areas, summarizing anticipated potential environmental impacts and mitigative measures.

II. AREA 1 - MAKUA AND KEAWULA (YOKOHAMA BAY) BEACHES (Refer to Table 4-1)

A. Objectives

Actions developed for the two beach areas are to improve the recreational opportunities by providing
parking, restrooms, camping, hiking and picnicking facilities. Maintenance programs such as clearing of undergrowth, removing graffiti from Kaneana Cave, providing trash removal, and maintaining Makua Road and bridge also should improve recreational opportunities. Providing for vehicular barriers, resident caretaker's facilities and removal of unauthorized structures from Makua Beach will improve security, help regulate park use and open this additional sandy beach area to the public.

B. Primary Impacts

1. Short-Term

The short-term positive impact will result from the cash infusion in the local economic sector by the construction of the caretaker's facilities, vehicular barrier, removal of unauthorized structures, and establishment of picnicking areas, camping sites, trails, and restroom facilities.

Short-term negative impacts are construction related. Construction of parking areas, restroom facilities, picnicking areas, and resident caretaker's facilities will produce temporary dust and erosion problems. To a great extent, dust can be controlled by water sprinkling. Potential erosion can be mitigated by scheduling construction during the dry summer months, limiting the area to be graded and grubbed and immediately revegetating exposed areas.

2. Long-Term

Numerous positive long-term impacts are anticipated from the proposed actions. Using the existing access and maintenance of Makua Road will improve access to police, fire, and maintenance vehicles for emergency and security purposes.

Providing parking areas, water, restroom facilities, picnicking areas, camping sites and hiking trails will increase the recreational opportunities of the area. Removal of the unauthorized structures at Makua Beach will increase available beach area for public use.
Some of the anticipated long-term negative impacts are: (1) use of water for restroom facilities and irrigation of landscaped areas, and (2) removal of existing vegetation for picnicking, camping, parking, and firebreak areas. However, removing scrub vegetation should not be a serious impact.

C. Secondary Impacts

1. Positive Impacts

Secondary impacts on recreational uses will result from posting interpretive, regulatory, directional and warning signs by designating specified park uses and warning of dangerous areas. The provision of a firebreak at Keawaula will be beneficial to picnicking and camping areas by preventing potential fires from spreading.

2. Negative Impacts

Potential negative secondary impacts are anticipated on the convenience of present recreational users of the area beyond the beaches by limiting access to only foot and non-motorized vehicles. Removal of the unauthorized structures on Makua Beach will have a negative impact on the lifestyle of the people currently inhabiting these structures but will be necessary to provide additional beach area for the public.

III. AREA 2 – LEEWARD COASTLINE (Refer to Table 4-2)

A. Objectives

The actions planned for this area are designed to limit vehicular access and to preserve and protect the sensitive natural resources found along the Leeward coastline. Access around Kaena Point from the Leeward side will be limited to foot and/or nonmotorized bicycles.

B. Primary Impacts

1. Short-Term

The short-term positive impact will result from the cash infusion into the local economic sector by construction of the communication system, interpretive signs, and landscaping work.
2. **Long-Term**

Numerous long-term impacts are anticipated from the proposed actions planned for this area. Limiting access to foot and bicycle traffic will reduce current erosion patterns, cut down on the amount of dust, and maintain ambient noise by prohibiting vehicular access. Restriction of motorized vehicles will also protect sensitive flora.

Implementing the emergency communication system and the trash removal program will have a positive long-term impact on all the recreational activities and scenic qualities by providing security and maintenance for the area.

The primary long-term negative impact will be the operation cost of the trash removal program.

C. **Secondary Impacts**

1. Positive Impacts

Secondary positive impacts resulting from posting interpretive, regulatory, directional and warning signs will be on recreational uses. These signs should warn people of dangerous areas, regulate uses and thereby aid in the overall enjoyment of park users.

2. Negative Impacts

Secondary negative impacts will result from limiting accessibility around Kaena Point to people currently driving around the point.

Limiting motorized accessibility, however, will not prevent recreational use of the area.

IV. **AREA 3 - KAENA POINT** (Refer to Table 4-3)

A. Objectives

Actions developed for this area are to limit vehicular access to the Point and to protect the sensitive area from further degradation. Access within the Kaena Point area will be by footpaths only.
B. Primary Impacts

1. Short-Term Impacts

Development of footpaths may require some grading which would generate some dust and minor erosion problems. The dust can be controlled by water sprinkling and erosion alleviated by scheduling construction during the dry summer months.

2. Long-Term Impacts

Positive long-term impacts include protection of the endangered flora, archaeological features, and prevention of further degradation of the sand dunes. Access to the area by security and maintenance vehicles will provide security and emergency services, which will better serve the recreational use of the area.

C. Secondary Impacts

1. Positive Impacts

Posting interpretive, regulatory, directional and warning signs will indirectly have a positive impact on the recreational and educational uses of the area by warning people of potential hazards, as well as indicating unique aspects of the area to be preserved.

2. Negative Impacts

Secondary negative impacts will result from limiting the accessibility of the area to the people currently driving up to the Point. There is no way of protecting this area from further man-induced degradation by allowing continued vehicular access to this area.

V. AREA 4 - WINDWARD COASTLINE (Refer to Table 4-4)

A. Objectives

Actions planned for this area are designed to limit vehicular access for the protection of the sensitive Kaena Point area. Access around Kaena Point from the Windward side will be limited to foot and/or non-motorized bicycles, except for emergency and maintenance vehicles.
B. Primary Impacts

1. Short-Term

Short-term positive impacts will result from the cash infusion into the local economic sector through construction of the communication system, interpretive signs, and landscaping work.

2. Long-Term

Numerous long-term impacts are anticipated from the proposed actions developed for this area. Limiting access to foot and bicycle traffic will alleviate some of the current erosion patterns of the area, cut down on the amount of dust, and maintain ambient noise by prohibiting vehicular access. Restriction of motorized vehicles will also protect the sensitive flora. The regulation of firearms and permit system will enhance safety in the park.

Planting and erosion control programs will reduce dust, erosion, and drainage problems and will help provide areas protected from the trade-winds. Flora and fauna habitats will benefit by the improvements to the landscape and recreational uses will be enhanced.

Implementing the emergency communication system and the trash removal program will have a positive long-term impact on all recreation activities by providing security and maintenance for the area.

Primary long-term negative impacts will be the cost for the operation of the park program and the water required for irrigating the planted areas.

C. Secondary Impacts

1. Positive Impacts

Secondary positive impacts resulting from posting interpretive, regulatory, directional and warning signs will be on recreational uses. These signs should warn people of dangerous areas, regulate uses and thereby aid in the overall enjoyment of the park users.
2. Negative Impacts

Secondary negative impacts will result from prohibiting motorized access around Kaena Point to people currently using off-road vehicles. Curtailing motorized accessibility to all but emergency vehicles, however, will not prevent recreational uses of the area.

VI. AREA 5 - AREAS SURROUNDING CAMP ERDMAN
(Refer to Table 4-5)

A. Objectives

Actions planned for the area surrounding Camp Erdman are designed to prevent potential recreational conflicts between public use of the State area and private use of Camp Erdman. They include providing parking and sanitary facilities, developing landscaping and irrigation, creating picnicking areas, realigning the road and buffering the area around Camp Erdman, constructing a resident caretaker's facility, and limiting vehicular access beyond the Control Point to foot and non-motorized bicycles.

B. Primary Impacts

1. Short-Term

The short-term positive impact will result from the cash infusion in the local economic sector by the construction of the caretaker's residence, vehicular barrier, landscaping and irrigation, picnicking areas, road realignment, trails, and restroom facilities.

All of the short-term negative impacts are construction related. Construction of parking areas, road realignment, restroom facilities, picnicking areas, and resident caretaker's facility will produce temporary dust and erosion problems. To a great extent, dust can be controlled by water sprinkling. Potential erosion can be prevented by scheduling construction during the dry summer months, limiting the area to be graded and grubbed and immediately revegetate exposed areas.

2. Long-Term

Many long-term positive impacts are anticipated from the proposed actions. These include
improved access to recreational areas by emergency, security and maintenance vehicles, thereby provid­ing security and maintenance for park users.

The addition of picnicking and camping areas, restroom facilities and parking areas, will have a positive impact on the recreational use of the area by providing facilities currently not available in the area.

Some of the anticipated long-term negative impacts are use of water for restroom facilities, irrigation of landscaped areas, removal of existing vegetation at the proposed picnicking, camping, parking and firebreak areas. However, removal of scrub vegetation should not be a serious impact.

C. Secondary Impacts
1. Positive Impacts

Secondary positive impacts on recreational uses will result from posting interpretive, regulatory, directional and warning signs by designating specified park uses and warning of dangerous areas.

2. Negative Impacts

Potential negative secondary impacts are anticipated on the convenience of recreational users of the area beyond the beaches by limiting access to only foot and non-motorized vehicles.

VII. AREA 6 - PEACOCK FLATS (Refer to Table 4-6)

A. Objectives

Actions proposed for this area are designed to enable users to safely engage in upland activities. These actions will provide recreational, health and safety facilities for the public.

B. Primary Impacts

1. Short-Term Impacts

Positive short-term economic impacts will be generated from the construction and establish­ment of signs, picnic facilities, recreational areas, sanitary facilities, firebreaks, an informa­tion booth and caretaker's facilities.
Controlled clearing and grubbing of specified areas will generate some dust and create minor erosion problems. Dust generation can be mitigated by water sprinkling. Erosion problems can be controlled by scheduling construction during the dry summer months and immediate re-vegetation of exposed areas.

2. **Long-Term Impacts**

A permanent easement via the Nike access road will have a positive long-term impact on public service agencies and users enjoying the various mountain-oriented activities. Water, sanitary facilities, camping and picnic areas will also benefit the users. Clearing and grubbing of specified sites will provide additional picnicking and camping areas. A trash removal program and maintenance program will be beneficial to the area. Firebreaks will have a substantial positive effect on the flora and fauna of the region, especially considering the everpresent threat of fire from military, or other activities in the area. Resident caretaker facilities will enhance security of the area for the park visitors. A permit system will provide additional controls to regulate park use and prevent abuse.

Long-term negative impacts on water supplies will occur by providing water services to park users. Clearing and grubbing activities will also have negative impacts due to the destruction of some vegetation.

C. **Secondary Impacts**

1. **Positive Impacts**

Posting interpretive, regulatory, directional and warning signs will have a positive secondary impact on the recreational users. Signs will increase safety by providing information for hunters, picnickers, campers and hikers. Firebreaks which will ultimately enhance the recreational uses of the upland region will provide a barrier from the spread of brushfires. A proposed information kiosk will educate park users about the natural environment as well as inform them on how to best enjoy these natural treasures. Flora and fauna should benefit from increased awareness by park users and in turn, they should gain more insight about the importance of preserving the remaining natural resources of the mountain region.
2. **Negative Impacts**

Secondary negative impacts resulting from the proposed actions are not anticipated.

VIII. AREA 7 - NIKE SITE (Refer to Table 4-7)

A. **Objectives**

The Nike site is presently abandoned and not open to public use. The site already has improvements suitable for recreational uses. Plans call for the facility to be renovated and opened for public use.

B. **Primary Impacts**

1. **Short-Term Impacts**

   Short-term impacts are not anticipated because there will be no construction activities at the Nike site except for interior renovation.

2. **Long-Term Impacts**

   Positive long-term impacts will result when the facility is opened to public use. Hunters, picnickers, campers and hikers will benefit from the use of the facility.

C. **Secondary Impacts**

   Secondary impacts are not anticipated from public use of the Nike site.

IX. AREA 8 - CENTRAL UPLAND SECTOR
(Refer to Table 4-8)

A. **Objectives**

   Present activities in the central upland sector will continue, however, better use coordination and provisions for safety will increase by implementing the proposed actions.

B. **Primary Impacts**

1. **Short-Term Impacts**

   Positive short-term impacts on the region's economy will result from the maintenance of trails and firebreaks, the distribution of informational
maps and brochures, and posting of signs. These activities will generate jobs and infuse capital into the local economy.

2. **Long-Term Impacts**

Positive long-term impacts on the biological elements as well as on local recreational activities will occur when coordinated plans are developed with other divisions of the Department of Land and Natural Resources. Maintenance of existing trails and firebreaks will have a positive effect on flora and fauna, and facilitate fire fighting activities. Information maps and brochures will increase public awareness of the area and recreational activities should increase. Development of hunting information programs and defining boundaries will alleviate conflicts and minimize hazards to users, thus enhancing the desirability of the area for all mountain-oriented recreational activities.

Negative long-term impacts will result from the maintenance of existing trails and firebreaks. Slight erosion problems may occur along the length of the trails and firebreaks. The trails and firebreaks may also affect the natural aesthetics of the area. Introduction of more people to the area will increase fire hazards and may encourage distribution of exotic plants.

C. **Secondary Impacts**

1. **Positive Impacts**

Maintenance of existing trails and firebreaks and posting interpretive, regulatory, directional and warning signs will have positive, secondary impacts on all users of the area. Safety will increase indirectly as the trails will furnish well defined pathways for hikers and firebreaks will provide barriers to the spread of fire. Signs will also increase safety by informing the public about hazards, rules and regulations.

2. **Negative Impacts**

Secondary negative impacts are not anticipated from the proposed action.
X. AREA 9 - REMOTE OPEN SECTOR (Refer to Table 4-9)

A. Objectives

Present activities in the remote open sector will continue, however, user coordination and safety will improve with implementation of the proposed actions.

B. Primary Impacts

1. Short-Term Impacts

Positive short-term economic impacts will occur when maps, brochures and signs are prepared and posted. These activities will result in more jobs and the infusion of capital into the local economy.

Negative short-term impacts are not anticipated.

2. Long-Term Impacts

Positive long-term impacts on the biological elements as well as recreational activities will occur when coordinated plans are developed with other DLNR divisions. Information maps and brochures will increase public awareness of the available recreational activities. The development of hunting information programs will prevent conflicts and hazards to users of the area.

Negative long-term impacts are not anticipated from the proposed actions.

C. Secondary Impacts

1. Positive Impacts

Posting interpretive, regulatory, directional and warning signs will have positive, secondary impacts on the users of the area. Safety will increase indirectly as a result of users being more informed about hazards, rules and regulations.

2. Negative Impacts

No secondary negative impacts are anticipated from the proposed actions.
## IMPACT ANALYSIS WORKSHEET

Table 4-1

MAKUA/ KEAWULA (Yokohama Bay) BEACHES

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### RECOMMENDED ACTION

1. Access to both beaches by way of the existing roads.
2. Remove all unauthorized residential structures and relocate "squatters" from Makua Beach.
3. Assist community in restoration of the Makua Protestant Cemetery.
4. Provide resident caretakers' facilities at both beaches.
5. Allow day use activities with no overnight use permitted without necessary permits and until proper security is provided.
6. Provide water, parking areas and restroom facilities at both beaches.
7. Control clearing and grubbing of specified major use areas.
8. Establish trash removal program.
9. Post interpretive, regulatory, directional and warning signs.
10. Maintain Makua road and bridge as a secondary access route.
11. Provide parking areas and interpretation facilities in the vicinity of the Control Point.
12. Provide a public vehicular barrier in vicinity of the Control Point.
13. Access beyond the Control Point provided by an improved foot and/or bike path system connecting Keawula Bay to Camp Erdman.
14. Remove graffiti from Kamehameha Cave and maintain area.
15. Develop picnic, camping and parking areas.
16. Provide picnic tables/shelter and barbecue facilities.
17. Provide landscaping and irrigation for high use areas utilizing native species where possible.
18. Provide firebreak at Keawula (Yokohama Bay).
19. Develop loop trails to connect points of interest and use areas.
# Impact Analysis Worksheet

Table 4-2

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**Key:**
- ○ No Impact
- ● Primary short-term, positive
- ■ Primary long-term, positive
- □ Primary short-term, negative
- ▲ Secondary, positive
- △ Secondary, negative

1. Controlled access by foot and/or non-motorized bicycles.
2. Near-shore and off-shore activities will be allowed to continue, except for those identified to be in conflict with the overall recreational development of the park.
3. Provide an emergency communications system.
4. Post interpretive, regulatory, directional and warning signage.
5. Establish a trash route removal program.
**IMPACT ANALYSIS WORKSHEET**

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**RECOMMENDED ACTION**

1. Access within the Point by designated foot paths only.
2. Provide an emergency communications system.
3. Post interpretive, regulatory, directional and warning signs.
4. Develop limited walkways and controlled access within the proposed Kaena Point Natural Area Reserve to protect endangered flora habitats.
5. Provide controlled access to the Point for emergency and maintenance vehicles only.
## IMPACT ANALYSIS WORKSHEET

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### Key:
- O No Impact
- ● Primary short-term, positive
- ○ Primary short-term, negative
- ▲ Secondary, positive
- ▲ Secondary, negative

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### Recommended Action

1. Controlled access by foot and/or non-motorized bicycles.
2. Near-shore and off-shore activities will be allowed to continue, except for those identified to be in conflict with the overall recreational development of the park.
3. Provide an emergency communications system.
4. Post interpretive, regulatory, directional and warning signs.
5. Establish trash removal programs.
6. Implement planting and erosion control programs utilizing native species where possible.
7. Prohibit the use of firearms along the coastal sector.
8. Allow day use activities with no overnight use permitted without necessary permits and until proper security is provided.
## IMPACT ANALYSIS WORKSHEET

### Table 4-5

**AREAS SURROUNDING CAMP ERDMAN**

| CATEGORY         | PARAMETERS               | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------|--------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| **AIR QUALITY**  | CO Concentration         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Dust                     | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Erosion                  | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Drainage                 | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **WATER QUALITY**| Groundwater              | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **NOISE**        |                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| **LAND**         |                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| **BIOLOGICAL**   |                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| **ARCHAEOLOGICAL**| Water                   | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Wastewater               | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Power                    | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **PUBLIC FACILITIES** | Communication       | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Emergency Access         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Police                   | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Fire                     | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Refuse                   | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **VISUAL**       |                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| **RECREATION**   |                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                  | Hunting                  | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Fishing                  | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Picnicking               | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Boating                  | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Swimming                 | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Surfing                  | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Camping/Hiking           | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **SOCIAL**       |                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                  | Life Style               | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                  | Economic                 | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |

**RECOMMENDED ACTION**

1. Improve existing access up to the Control Point.
2. Near-shore and off-shore activities will be allowed to continue, except for those activities identified to be in conflict with the overall recreational development of the park.
3. Implement planting and erosion control programs utilizing native species where possible.
4. Provide parking areas and restroom facilities.
5. Control clearing and grubbing of specified major use areas.
7. Post interpretive, regulatory, directional and warning signs.
8. Provide parking areas and interpretive facilities in the vicinity of the Control Point.
9. Provide vehicular barrier in vicinity of the Control Point except for emergency and regulatory vehicles.
10. Access beyond the Control Point provided by an improved foot and/or bike path system.
11. Develop picnic, camping and parking areas.
12. Provide water, and restroom facilities.
13. Provide resident caretakers facilities.
15. Provide picnic tables/shelters and barbecue facilities.
16. Provide landscaping and irrigation for high use areas, utilizing native species where possible.
17. Develop loop trails to connect points of interest and use areas.
18. Realign existing road ma'uka of Camp Erdman.

**KEY:**
- O No Impact
- • Primary short-term, positive
- ▲ Primary long-term, negative
- ▲ Secondary, positive
- ▲ Secondary, negative
### IMPACT ANALYSIS WORKSHEET

**Table 4-6**

**PEACOCK FLATS**

| CATEGORY          | PARAMETERS      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|-------------------|-----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| **AIR QUALITY**   | CO Concentration| O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Dust            | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Erosion         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Drainage        | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Groundwater     | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **WATER QUALITY** | Land Use        | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Alteration      | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **NOISE**         | Flora           | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Fauna           | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **ARCHAEOLOGICAL**| Water           | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Wastewater      | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Communication   | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **PUBLIC FACILITIES & SERVICES** | Emergency Access | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Power           | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Police          | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Fire            | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Refuse          | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **VISUAL**        | Hunting         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Fishing         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Picnicking      | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Boating         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Swimming        | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Surfing         | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Camping/Hiking  | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| **RECREATION**    | Life Style      | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
|                   | Economic        | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |

**KEY:**
- O No impact
- < Primary short-term, positive
- ▲ Primary short-term, negative
- ▲ Primary long-term, positive
- ▲ Primary long-term, negative
- ▲ Secondary, positive
- ▲ Secondary, negative

1. Obtain controlled public access, to be regulated by DLNR via the Mike access road.
2. Post interpretive, regulatory, directional and warning signs.
3. Provide water, sanitary facilities, camping and picnic areas.
4. Control clearing and grubbing of specified areas.
5. Establish firebreaks.
6. Provide an information kiosk.
7. Provide resident caretakers facilities.
8. Establish a trash removal and maintenance program.
9. Authorize use of this area by permit only.
**IMPACT ANALYSIS WORKSHEET**

**Table 4-7**

NIKE SITE

| CATEGORY            | PARAMETERS       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------------|------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| AIR QUALITY         | CO Concentration | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Dust             | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| WATER QUALITY       | Erosion          | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Drainage         | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Groundwater      | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| NOISE               | Land Use         | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| LAND                | Alteration       | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| BIOLOGICAL          | Flora            | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Fauna            | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| ARCHAEOLOGICAL      | Water            | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Wastewater       | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Power            | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Communication    | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Emergency Access | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Police           | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Fire             | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Refuse           | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| PUBLIC FACILITIES & SERVICES | Water | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Wastewater       | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Power            | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Communication    | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Emergency Access | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Police           | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Fire             | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                      | Refuse           | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| VISUAL              | Hunting          | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Fishing          | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Picnicking       | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Boating          | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Swimming         | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Surfing          | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Camping/Hiking   | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| RECREATION          | Life Style       | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
|                     | Economic         | 0 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |

1. Minor renovations to the existing facilities and re-open for public use, already has improvements for above minimum intensity use.
### IMPACT ANALYSIS WORKSHEET

**Table 4-8**  
**CENTRAL UPLAND SECTOR**

| CATEGORY            | PARAMETERS     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------------|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| AIR QUALITY         | CO Concentration | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Dust           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| WATER QUALITY       | Erosion        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Drainage       | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Groundwater    | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| NOISE               | Land Use       | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Alteration     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| BIOLOGICAL          | Flora          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Fauna          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| ARCHAEOLOGICAL      | Water          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Wastewater     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Power          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Communication  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Emergency Access| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Police         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Fire           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Refuse         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| VISUAL              | Hunting        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Fishing        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Picnicking     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Boating        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Swimming       | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Surfing        | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Camping/Hiking | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| RECREATION          | Life Style     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Economic       | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

1. Develop coordinative plans with other Divisions of DLNR.
2. Maintain existing trails and firebreaks.
3. Provide general information maps and brochures.
4. Develop hunting information programs to prevent conflicts and hazards to users of the area.
5. Post interpretive, regulatory, directional and warning signs.
### IMPACT ANALYSIS WORKSHEET

**Table 4-9**

**REMOTE OPEN SECTOR**

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**KEY:**
- ○ No Impact
- ● Primary short-term, positive
- ▲ Primary short-term, negative
- □ Primary long-term, positive
- ▲ Primary long-term, negative
- △ Secondary, positive
- ▲ Secondary, negative

1. Develop coordinative plans with other Divisions of DLNR.
2. Provide general information map and brochure.
3. Develop hunting information programs to prevent conflicts and hazards to users of the area.
4. Post interpretive, regulatory, directional and warning signs.
adverse environmental effects
SECTION 5

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

This section will briefly discuss probable adverse environmental impacts and mitigative measures when applicable, and the rationale for proceeding with the proposed action notwithstanding unavoidable effects.

I. PRIMARY SHORT-TERM IMPACTS

A. Probable Impacts and Mitigative Measures

Construction related impacts include dust and erosion which can be mitigated by the use of water sprinkling, incremental clearing, and immediate re-vegetation of exposed areas, as well as scheduling construction during the dry summer months.

B. Reasons for Proceeding

The probable short-term adverse impacts encountered during the construction phase of the proposed park are minor and can be controlled by using acceptable mitigative measures.

II. PRIMARY LONG-TERM IMPACTS

A. Probable Impacts and Mitigative Measures

1. Water

Water is unavailable and a well, pump and storage facilities will have to be developed adjacent to high use recreational areas. Continued monitoring of the well to insure that the safe yield will not be exceeded is an acceptable mitigative measure.

2. Removal of Vegetation

Selective clearing and grubbing of the existing scrub vegetation will be required for the picnic and camping areas, parking and restroom facilities, and firebreaks. Mitigative
measures include selective clearing and immediate landscaping and revegetation.

B. Reasons for Proceeding

Selective clearing of the scrub vegetation is necessary for the implementation of the park and no significant adverse impacts are anticipated.

III. SECONDARY IMPACTS

A. Probable Impacts and Mitigative Measures

1. There will be inconvenience to the recreational users in areas where vehicular access will be limited or prohibited. No mitigative measures are available under the present plan. However, this would not preclude future implementation of other access modes which have been evaluated and studied in order to meet future recreational needs.

2. Recreational use to the handicapped and elderly will be prevented in areas only accessible by foot or nonmotorized bicycles. Mitigative measures are not available at this time.

3. Potential conflicts with recreational uses in the Makua area.

   a. Military

   The military currently uses Makua Valley for training and live firing exercises. The continued use of Makua Valley for these activities is essential for the combat readiness of the 25th Infantry Division. It is not anticipated that military activities mauka of Farrington Highway will have an adverse impact on the recreational use of the area makai of the highway except for the possible noise effects. To prevent future recreational-military conflicts in this area, the lands makai of Farrington Highway could be managed by the State as a buffer zone. Also, continued study and evaluation of the recreational needs in relationship to the military needs for Makua Valley will be an on-going program.
b. Removal of the Unauthorized structures on Makua Beach

The removal of the unauthorized structures on Makua Beach will have a negative impact on the lifestyles of the people presently occupying these structures. It has been pointed out that these structures do not conform to standard building code requirements which include standards for ceiling heights, separation of living, sleeping, and cooking areas, structural requirements such as bracing of posts, tight fitting floor boards to prevent entrance of insects, vermin and moisture. Roof framing must be of sufficient size to carry the imposed loads safely. The existing structures do not have the required water closets, lavatory sink, bathtub, and shower facilities. No building permits were obtained for the construction, and enlargement or alteration of the structures.

In addition to the building code violations, violations to the Department of Health Regulations include numerous sanitation problems, the presence of flies and strong offensive odors due to improper sewage disposal, scattered refuse and litter, potential rodent breeding areas such as the abandoned cars, and the construction of wooden floors directly on the ground.

The presence of these structures pose potential sanitary and health problems. Removal of these structures will not only prevent serious potential health problems from arising but will also make the area more available for beach recreational use by the public.

B. Reasons for Proceeding

1. Inconvenience to recreational users

Inconvenience to the recreational users must be accepted to protect the sensitive Kaena Point area from further degradation.
2. Accessibility to recreational areas by the Elderly and handicapped

The problems associated with providing accessibility to recreational areas to the handicapped and elderly can be evaluated at a future date.

3. Potential recreational conflicts

a. Military

The problem of the potential military-public use of Makua Valley cannot be evaluated at this time. Complete evaluation and analysis of this problem should not prevent the immediate implementation of the proposed park plan.

b. Unauthorized Structures

The unauthorized structures not only present potential health and safety problems but preclude the use of Makua Beach by the public. Removal of the unauthorized structures is necessary to prevent potential health problems and to provide the public with an additional recreational site.
alternatives  6
SECTION 6

ALTERNATIVES TO THE PROPOSED ACTION

This section discusses the alternatives to the proposed action that have been considered.

I. NO ACTION

The no action alternative would allow uncontrolled and conflicting uses of the area to continue. Litter is spoiling scenic views. Unrestricted use of motorcycles and four-wheel drive vehicles along the coastal dune areas is increasing erosion and threatening native vegetation. Cattle grazing is destroying native plants as well as introducing undesirable species into pristine native forests. Uncontrolled use of firearms for target practice exposes the region's users to stray bullets. Fires caused by hikers, campers, motorcyclists and military activities within Makua Valley have damaged existing flora and subjected areas to erosion. The no action alternative will allow continued deterioration of one of the last, semi-wilderness areas remaining on Oahu.

A no action alternative would not achieve the goals and objectives of the Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites. These goals and objectives are:

1. To preserve and enhance for present and future generations a natural, scenic and cultural resource of statewide significance.

2. To provide a wide range of resource-oriented recreational opportunities and related facilities for residents of the State that will not destroy or impair the features and values to be preserved.

II. ALTERNATIVE SITES

Alternative park sites were not evaluated because there are no available semi-wilderness areas remaining on the island of Oahu that offer both ocean and mountain recreation in proximity to each other. The Makua-Kaena Conceptual Plan is designed to provide guidelines and controls to ensure the preservation of the region's natural resources and uniqueness. The Makua-Kaena Park concept is distinctive for Oahu because, in contrast to traditional parks where an area is modified to meet the recreational
needs of the people, human activities will be modified to preserve and enhance the area. Ultimately, human recreational needs and environmental needs of the land can both be satisfied.

III. ALTERNATIVE USES AND DEVELOPMENT CONCEPTS

Alternative uses and development concepts considered included medium and maximum intensity development measures. These concepts were not selected when present needs, high costs, public opinion and environmental impacts were evaluated. The benefits from such actions cannot be substantiated at this time. However, future needs may justify some of the alternative concepts considered.

Alternative use and development concepts are presented for specific areas.

A. Makua Beach and Keawaula (Yokohama Bay)

1. Provide access by an improved shuttle bus or historically restored railroad system

   a. Facility Requirements (Shuttle Bus)

      * terminal facilities.
      * paved roadway, drainage improvements, wall and other retaining structures.

   b. Facility Requirements (Train)

      * terminal facilities to include offices, ticket facilities, storage areas, and interpretive museum, boarding platforms, restrooms, concessions, parking areas, repair shop, engine house, water tower, and attendant facilities.
      * rolling stock and attendant equipment, retaining walls, bridges, revertments, drainage and other facilities.
      * portable sanitary and water facilities at Kaena Point and along the Windward Coast.

2. Restore the Ukanipo Heiau.
3. Provide additional picnic facilities, shelters and parking areas.

4. Provide additional landscaping and irrigation for high use areas.

5. Develop additional camping areas at Keawaula Bay.

6. Realign the existing road mauka of Keawaula Beach as part of a parkway linking the Windward and Leeward Coastal communities.

   a. Facility Requirements (Parkway)

      * access provided by a two-lane, low speed parkway with pull-off areas located where physical features permit.

      * earthwork, paving, guardrails, elevated structures, drainage, and attendant facilities.

B. Leeward Coastline

1. Controlled access by a historic railway or mini-bus system.

2. Develop rest stops and shelters for trail users.

3. Through access provided by a scenic parkway.

C. Kaena Point

1. Access to the Point provided by a historically restored railway or mini-bus system.

2. Develop a scenic lookout mauka of the railroad right-of-way.

3. Develop an interpretive and information center.

4. Improve interpretive signs.

5. Remove existing building foundations, gun emplacements and abandoned utility lines from park lands.
6. Provide portable sanitary and water facilities in the vicinity of Kaena Point and along the Windward Coast.

7. Access around the Point provided by a scenic parkway.

8. Provide a limited parking area east of Kaena Point.

9. Develop a more extensive interpretive program.

10. Provide water and permanent restroom facilities.

D. Windward Coastline

1. Controlled access by a historic railway or mini-bus system.

2. Develop rest stops and shelters for trail users.

3. Improve trail systems.

4. Through access provided by a scenic parkway.

5. Provide water at rest stop.

E. Areas Surrounding Camp Erdman

1. Access provided by a historically restored railroad system or shuttle bus.

   a. Facility Requirements (Shuttle Bus)

      * terminal facilities.

      * paved roadway, drainage improvements, walls and other retaining structures.

   b. Facility Requirements (Train)

      * terminal facilities to include offices, ticket facilities, storage areas, boarding platforms, restrooms, concessions, parking areas, repair shop, engine house, water tower, and attendant facilities.
* rolling stock and attendant equipment, retaining walls, bridges, revertments, drainage and other facilities.

* portable sanitary and water facilities at Kaena Point and along the Windward Coast.

2. Provide additional picnic facilities, shelters and parking areas.

3. Develop additional camping areas.

4. Provide additional landscaping and irrigation for high use areas.

5. Access provided by a scenic parkway.

a. Facility Requirements (Parkway)

* access provided by a two-lane, low speed parkway with pull-off areas where physical features permit.

* earthwork, paving, guardrails, elevated structures, drainage, and attendant facilities.

F. Peacock Flats

1. Develop additional campsites, picnic and shelter areas.

2. Develop permanent restroom and sanitary facilities.

3. Develop interpretive/information center.

4. Controlled clearing and grubbing of specified major use areas.

5. Provide landscape improvements by planting additional trees.

6. Provide picnic tables/shelters and barbeque facilities.

7. Provide electric service.
8. Expand firebreaks.

G. Nike Site

1. Obtain permanent easement via the Nike access road.
2. Re-establish water and electric service.
3. Provide security for existing communication systems.
4. Renovate the two main buildings for group camping.
5. Clean and maintain grounds.
6. Provide landscape improvements by additional plantings.

H. Central Upland Sector

1. Develop new trails and upgrade existing trails and firebreaks.
2. Develop shelters and trail rest stops.
3. Develop emergency helicopter landing areas.
4. Relocate existing trails away from heavily hunted areas.
5. Expand firebreaks.
7. Develop additional rest stops, shelters and small day use trail campsites.
8. Develop additional emergency helicopter landing areas.

I. Remote Open Sector

1. Develop new trails.
IV. ALTERNATIVE TRANSPORTATION MODES

The following transportation modes were evaluated and will not be implemented at this time due to the proposed philosophy of the park which was based on present needs, high costs, public opinion and environmental impacts.

A. Shuttle bus or multi-functional people mover

B. Historically restored railroad

C. Scenic parkway
short term uses
long term productivity
SECTION 7
THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES
OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND
ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section will include a brief discussion of the extent to which the proposed action involves trade-offs between short-term environmental gains at the expense of long-term losses, or visa versa, and a discussion of the extent to which the proposed action forecloses future options, narrows the range of beneficial uses of the environment, or poses long-term risks to health or safety.

The proposed actions developed for the Makua-Kaena Park have considered the environmental attributes of the area, public desires for recreational uses of the area, and recreational needs of the people. The proposed actions, when implemented, will preserve and enhance the natural, scenic and cultural resources of the Makua-Kaena area and provide diverse recreational opportunities for the residents of the State and will not destroy or impair the features and values which are to be preserved.

The proposed actions will not involve trade-offs between short-term losses or foreclose future recreational options, or narrow the range of beneficial use of the environment, or pose long-term risks to health and safety.

The proposed actions for the Makua-Kaena Park will enhance environmental attributes of the area by preventing further degradation of the area through regulating and controlling recreational uses of this area.
resource commitment 8
SECTION 8

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section considers the commitment of resources that is made once the project is implemented.

State funds, human labor, construction and building materials, and fuel will be committed to the project. Maintenance and operation manpower and funds will be required. Irrigation of landscaping and use of restroom facilities will require water. Using the land as a park will permanently remove it from the tax rolls. Limiting the land for park use will also prohibit urban and resort developments.
government policy

offsetting adverse effects
SECTION 9

AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS OF GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

This section will indicate the extent to which these countervailing benefits could be realized by following reasonable alternatives to the proposed action that would avoid some or all of the adverse environmental effects.

I. ACCESS

The State Department of Transportation and the Department of Land and Natural Resources have worked together to establish basic policies on transportation requirements for the proposed Makua-Kaena Park. From the inception of the park, both agencies have endeavored to evaluate how best to provide access and transportation to the park. It was established that the transportation access and system would serve the recreational concepts developed for the park. After careful evaluations of the environmental attributes of the area and the goal of preserving the wilderness quality of the area, it was decided that a through access around Kaena Point would not be compatible with maintenance of the wilderness area. The parkway at this time is not recommended. The decision not to construct a parkway around Kaena Point minimizes the potential adverse impact on the communities on the leeward and windward sections. An access corridor has been designated in the Conceptual Plan in the event that alternative transportation modes are required to meet future needs.

II. PARK USES

Numerous community meetings and informal sessions with concerned individuals and groups were held in the development of the recreational uses for the area. It was a consensus of the people that minimum development be implemented in order to preserve the wilderness quality of the region. A minimum development minimizes the potential adverse environmental impacts to the area.

III. POTENTIAL RECREATIONAL CONFLICTS, MILITARY USE OF THE AREA MAUKA OF FARRINGTON HIGHWAY AND PUBLIC RECREATIONAL USES MAKAI OF FARRINGTON HIGHWAY

The potential recreational conflicts between civilian and military uses of the area near Makua Valley is of
concern to both the Federal and State Government. Therefore, the military is presently preparing an environmental impact statement for the Makua Valley training area to evaluate the anticipated environmental impacts from their training activities. As of this date, the environmental impact statement has not been released. In the interim, the Army is taking positive steps for the preservation and enhancement of specific environmental factors. These include development of new firebreaks and maintenance of existing firebreaks to prevent fires from encroaching onto State lands containing native flora. Known archaeological sites within Makua Valley have been surveyed and appropriately marked. Specific archaeological sites are presently being protected by fencing off the sites to prevent damage. It is anticipated that both Federal and State Governments will continue to work together to prevent potential military-civilian conflicts and to increase the recreational potential of this area.
unresolved issues 10
SECTION 10

SUMMARY OF UNRESOLVED ISSUES

This section will briefly discuss the unresolved issues mentioned in the environmental impact statement.

The joint civilian-military use of Makua Valley mauka of Farrington Highway is one of the major unresolved issues. This issue cannot be resolved at this time. It involves policy decisions and future plans and will be an on-going discussion topic between the State and the Federal Governments. Another unresolved issue is the setting of the exact date when the removal of the unauthorized structures on Makua Beach will commence. These unauthorized structures present potential health and safety problems and inhibit recreational use of the beach area by the public. The final major unresolved issue is the provision of access to the Kaena Point area for the handicapped and the elderly.
approvals 11
SECTION 11
NECESSARY APPROVALS

Anticipated necessary approvals required for construction:

Board of Water Supply
Department of Public Works
State Department of Health
Division of State Parks, Outdoor Recreation and Historic Sites DLNR
Division of Land Development DLNR
Special Management Area Permit (SMA)
Conservation District Use Application
organizations and persons consulted 12
SECTION 12

ORGANIZATIONS AND PERSONS CONSULTED

This section provides a list of agencies, organizations, and individuals consulted in the preparation of this document. Section 13 and 14 contains comments and responses to the Notice of Preparation and Environmental Impact Statement respectively.

Federal

Department of Agriculture, Soil Conservation Service
Department of Commerce, National Oceanic and Atmospheric Administration
United States Air Force
United States Army, Hawaii
United States Coast Guard
United States Navy

State

Department of Education
Department of Transportation
Department of Planning and Economic Development
Department of Labor and Industrial Relations
University of Hawaii
    Environmental Center
    Marine Advisory Program
    Cooperative Extension Service
    Water Resources Research Center
    Lyon Arboretum
    Leeward Community College
Department of Agriculture
Department of Defense
Department of Hawaiian Home Lands
Department of Social Services and Housing
Office of Environmental Quality Control
Department of Land and Natural Resources
Department of Health
Department of Accounting and General Services

County

Department of Parks and Recreation
Department of Transportation Services
Department of Housing and Community Development
Police Department
County continued

Department of Public Works
Board of Water Supply
Fire Department
Department of General Planning
Department of Land Utilization
City Council

Organizations/Individuals

Hawaii Visitors Bureau
Waianae Rotary Club
Waianae Coast Neighborhood Board
Queen Liliuokalani Children's Center
   Leeward Unit
Waianae Coast Chamber of Commerce
Waianae Hawaiian Civic Club
Hookele Community Association
Nanakapono Hawaiian Civic Club
Hui O Neneu Senior Citizens
Waianae-Nanakuli Education Center, Advisory Board
Waianae Development Co. Ltd.
Waianae Business and Professional Women's Club
Na Wahine Lokahi Mothers Club
Nanakuli Hawaiian Homesteaders Association, Inc.
Waianae-Nanakuli Community Action Program
Waianae Coast Culture & Arts Society, Inc.
Waianae Recreation Advisory Council
Sunset Beach Community Association
Walalua Community Association
Camp Harold R. Erdman
Walalua Lions Club
Walalua Recreation Advisory Council
Haleiwa Community Association
Mokuleia Ranch and Land Company
North Shore Jaycees
Hawaii Science Teachers Association
Hawaii Motor Sports Association
Nanakuli Surf Club
Save Our Surf
Makani Kai Surf Club
Capital Investment of Hawaii, Inc.
Hawaii Council of Marine Science Teachers
Environmental Education Association of Hawaii
Haleiwa Surf Club
Hawaii Council of Diving Clubs
Makaha Properties Ltd.
Castle & Cooke Inc.
B. P. Bishop Museum
Young Men's Christian Association
The Hawaiian Coalition of Native Claims
Congress of the Hawaiian People
YWCA of Oahu
Norman Mau Realty Inc.
Girl Scout Council
4-H Club Federation - Hawaii
Kaena Point Ad Hoc Committee
Hawaii Trucking Association
Life of the Land
Sierra Club
Oahu Development Conference
Hawaiian Botanical Society
Hawaii Audubon Society
Lyon Arboretum Association
Chamber of Commerce of Hawaii
The Outdoor Circle
Hawaiian Railway Society
Hawaiian Trail and Mountain Club
Historic Hawaii Foundation
Oahu Council of Sportsmen's Club
Richard Kimball
Ed Arrigoni
John Obata
Hawaiian Electric Company, Inc.
Waialua Sugar Company, Inc.
Waianae Rap Center
Lord James Blears
David Boynton
Jennie L. Doss
Laurence K. Lau
Victoria Paniccia
Karen E. Shigematsu
Jean Snodgrass
Mrs. Lorrin F. Thurston
Barbara Mountain
notice of preparation consultation period comments & responses 13
SUBJECT: MAKUA-KAENA STATE PARK, Environmental Impact Statement Preparation Notice

Thank you for your written response to the Makua-Kaena State Park Environmental Impact Statement Preparation Notice.

Your comments have been carefully reviewed and considered in the preparation of the Makua-Kaena State Park Environmental Impact Statements. We expect this document to be scheduled for a 30 day review period beginning with the announcement of its availability in the November 23, 1977 issue of the EQC Bulletin. Copies may be obtained from the Office of Environmental Quality Control, 550 Halekauwila Street, Honolulu, 96813. (Tel. No. 548-6915).

Your continued interest in this project will be appreciated.

Very truly yours,

W. Y. THOMPSON
Chairman
Mr. J. M. Souza, Jr.,
State Parks Administrator
P. O. Box 621
Honolulu, HI 96809

April 25, 1977

Dear Mr. Souza:

Subject: Haun-Una State Park, DSS Preparation Notice

We have reviewed the above-mentioned document and have no comments.

Sincerely,

Jack P. Kauail
State Conservationist

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May 2, 1977

Mr. J. M. Souza, Jr.
State Parks Administrator
P. O. Box 621
Honolulu, HI 96809

Dear Mr. Souza:

We have received and reviewed your Notice of Preparatory Report for the following comments on this document:

The National Marine Fisheries Service (NMFS) is in complete accord with the National Park Service (NPS) in their concern for the ecological significance of the proposed State Park. If you have any questions on this report, please contact Mr. John S., Kingdom of my office (April 26, 1977).

Sincerely,

[Signature]

STATE PARKS ADMINISTRATION

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[Handwritten notes and signatures]
MAKUA-KAENA STATE PARK
Environmental Impact Statement Preparation Notice

State of Hawaii
Department of Land and Natural Resources
Division of State Parks
PO Box 621
Honolulu, HI 96809

1. The subject Environmental Impact Statement Preparation Notice has been reviewed and the following comments are offered.

   a. Reference para II.M.4 page 52.

       The overhead power line around the point is still actively in use. In the event of a failure in the power line from Makoha, this segment provides HECO power to the Canadian Overseas Telecommunication Facility via the Waialua feeder.

   b. Reference para II.M.6 page 53.

       The US Air Force and not the FAA maintains and operates the Satellite Tracking Station located on the Kaena Point ridge.

2. It is requested that this office be given the opportunity to provide input in the plan development.

   Charles L. Goldstein
   Major, USAF
   Chief, Operations Branch

State of Hawaii
Dept of Land and Natural Resources
Division of State Parks
P.O. Box 621
Honolulu, Hawaii 96809

Gentlemen:

Environmental Impact Statement Notice of Preparation for Makua-Kaena State Park, dated 28 March 1977 has been reviewed and the following comments are offered:

   a. There are no plans at present to turn over Makua Military Reservation to the State of Hawaii and it is questionable if Army owned land should be included in the park planning process.

   b. Makua Military Reservation is not currently suitable for recreation area due to unexploded ordinance accumulated over the past 35 years.

Thank you for the opportunity to review the document. Request you include this office in any future distributions of information on the proposed project.

Sincerely yours,

Carl P. Ridolph
Colonel, CE
Director of Facilities Engineering
Dear Mr. Souza:

We have reviewed the Environmental Impact Statement Preparation Notice for the proposed MakauKaena State Park as requested in your letter of 28 March 1977.

Since the project plans are conceptual, we cannot presently determine if a Department of the Army permit will be required for any phase of the proposed development. However, it appears that erosion control measures are planned for the leeward and windward coastlines. If this work or any other work is to be done in waters subject to tidal action up to the mean higher high waterline, a Department of the Army permit under Section 10 of the Rivers and Harbor Act of 1899 would be required. Additionally, if dredged or fill material is to be discharged into either tidal waters for the erosion control measures or into any stream, wetland, or any other navigable water body, a Department of the Army permit under Section 404 of the Federal Water Pollution Control Act Amendments of 1972 would be required. The placement of a revetment along a stream bank is considered as a discharge of fill material.

Although the introduction of undesirable species is listed in your section on management concerns, we would like to emphasize that concern and suggest that members of the local horticultural and botanical communities be included in the review of landscape plans and planting lists. This is particularly important for the Peacock Flats and Nike Site areas

as both are adjacent to proposed Natural Area Reserves. Horticultural and botanical communities should also review the food plants that the Division of Fish and Game introduce into game management areas.

We appreciate having had the opportunity to review your excellent report.

Sincerely yours,

[Signature]

Chief, Engineering Division
Mr. J. H. Souza, Jr.
Administrator
State of Hawaii
Department of Land & Natural Resources
Division of State Parks
P. O. Box 621
Honolulu, HI 96809

Dear Mr. Souza:

Staff review of the "Hakua-Kaena State Park, Environmental Impact Statement Notice of Preparation" has been completed.

The Coast Guard has a concerned interest in this study because of the location of the lighthouse at Kaena Point. The presence of endangered species of flora (the OHAI) and of possible historic sites on this property makes this an environmentally and culturally sensitive area. Steps are currently under consideration to protect the OHAI plants on our property. Since continued use of this property is anticipated by the Coast Guard, the development of a Hakua-Kaena State Park may have an effect on Coast Guard interests.

The Coast Guard appreciates the opportunity to comment on the EIS Notice of Preparation and anticipates future inputs to this study. A copy of the Draft EIS is requested when it becomes available.

Sincerely,

[Signature]
Captain, U. S. Coast Guard
Chief of Staff
Fourteenth Coast Guard District

Copy to:

HQ CCR
DCQ Washington
DCQ Puget Sound
Commandant (C-121-1)
Safety, health, and comfort considerations for our students necessitate safe hiking trails, including adequate markings and separation from vehicular roads, safe and sufficient water supplies, picnic and camping areas, restroom facilities, and reasonable accessibility to medical facilities in case of accident or illness. (Communication and transportation facilities must be available.)

For the sake of our students, therefore, the Department would like to see the Kaena Point region retain its character as a semi-wilderness area to provide the type of environmental experiences which are available at very few other places on Oahu. However, some degree of development for this area is necessary to realize the potential of the region as an educational facility.

In line with this thinking, we are in favor of the development of this area which includes:

- Controlled access by historical railway, minibus system, or roadway;
- Developed rest stops and shelters;
- Developed camping facilities;
- Separated pedestrian and vehicular access; and,
- Improved trails.

Such development will probably cause minimal change in the character of the region but increase its potential to provide our students with viable learning experiences.

Sincerely yours,

Eikō I. Kudo
Assistant Superintendent
Office of Instructional Services

EIKOJNIA

Page 2
June 14, 1977

Mr. J. H. Souza, Jr.
Office of Instructional Services
Dear Mr. Souza:

Subject: Hakua-Kaena State Park, Environmental Impact Statement Preparation Notice

Thank you very much for giving us the opportunity to review the above-captioned document. We concur that an EIS is required for the project. We do not have any comments to offer, however, which could improve your EIS preparation notice.

Sincerely,

E. Alvey Wright
Director
Mr. J. M. Souza, Jr.
State Parks Administrator
Department of Land and
Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza:

Thank you for providing us a copy of the Hakua-Kaena State Park Environmental Impact Statement Notice of Preparation. We have no comments to offer on the subject matter at this time, however, we appreciate the opportunity to review and respond to this document.

If we can be of any help on this project, please feel free to call us.

Sincerely,

GORDON T. FURUTANI
Executive Officer

LAND USE COMMISSION
Suite 1795, Pacific Trade Center, 190 S. King Street, Honolulu, Hawaii 96813

May 26, 1977

COMMISSION MEMBERS:

James Curran
Charles Duke
Calvin Higata
Shinsei Higato
Akira Duke
Earl Kihate
Edward Yeax
GORDON FURUTANI
Executive Officer

TO: The Honorable Christopher Cobb, Chairman
Department of Land and Natural Resources

ATTN: J. M. Souza, Jr., State Parks Administrator

FROM: Hideto Kono, Director

SUBJECT: Hakua-Kaena State Park
Environmental Impact Preparation Notice

We have reviewed your notice of preparation of an environmental impact statement for the Hakua-Kaena State Park and offer the following comments on the potential use concepts for different sections of the study area.

The survey findings of the 1975 State Comprehensive Outdoor Recreation Plan indicated that more recreational facilities are needed to accommodate both beach picnicking and camping activities in the Hakua-Kaena region. We, therefore, recommend that a medium development concept for the Hakua Beach and Keawaula Bay areas, and the area surrounding Camp be investigated. This may offer an alternative to satisfy these recreational needs without incurring extreme maintenance costs and/or degradation of resources. It is also recommended that the remaining areas be developed under the minimum development concept to meet existing and projected recreational needs.

We appreciate this opportunity to review this preparation notice.
MEMORANDUM

TO: Mr. Christopher Cobb, Chairman
Department of Land and Natural Resources
Attention: Mr. Joseph M. Souza, Jr.
State Parks Administrator

FROM: Joshua C. Apsalud, Director
Department of Labor and Industrial Relations


May 31, 1977

Thank you for your letter of May 20 on the above referenced subject.

This is a negative response. Since we have no direct or indirect involvement in this project we are not submitting an environmental impact statement.

If we can be of any assistance, please contact me.

[Signature]

[Office of the Director]

March 30, 1977

Mr. J. M. Souza Jr.
State Parks Administrator
Department of Land and Natural Resources
Division of State Parks
P. O. Box 621
Honolulu, Hawaii 96809

RE: MAKUA-KAENA STATE PARK, EIS Preparation Notice

Dear Mr. Souza:

The Environmental Center of the University of Hawaii does not, in general, participate in the preparation stage of the Environmental Impact Statement process. We have taken this position so as not to be in conflict with our later review responsibilities, nor in apparent competition with private consultants.

Certainly we are available for consultation on an informal basis, however, formal review comments will be limited to the EIS.

In the case of the EIS in question, however, we would like to commend you on the level of environmental impact analysis indicated in the preparation notice. The extensive analysis already made should minimize considerably the effort necessary in preparing the EIS for formal review.

Yours very truly,

Doak C. Cox
Director

University of Hawaii at Manoa

Environmental Center
Crawford 307 + 3300 Campus Road
Honolulu, Hawaii 96822
Telephone [808] 956-7381
May 25, 1977

Dear Mr. Souza,

Thank you for your letter of May 20 regarding the Hanauma-Kaena State Park EIS/P.P. I am very sorry that I had not written back to you earlier on the EIS/P.P. I intended to send in some comments but never got around to it. Thanks for the reminder.

Regarding vehicular access to Kaena Point, the park plan should consider either: (1) leaving the dirt road pretty much as is (e.g., no improvements except for requiring dangerous conditions); or (2) limiting access around the point to pedestrians and bicyclists.

I am enclosing a recent study prepared by Mr. Ray Takemoto, a student at the University of Hawaii. One of his conclusions is that off-road vehicles and trucking have increased open areas between vegetated dune areas and reduced numbers of certain native species of plants such as ahuka and i'lima.

Personal observations also indicate that much of the Hanauma section of the proposed park has suffered substantial damage from off-road vehicles and motorbikes. Also, cattle grazing appears to have seriously damaged native vegetation such as mala and mano'a-lahaka. Vehicles should be restricted to the main dirt road in order to eliminate further damage to the coastal plants below the main road. Another possibility could be to limit vehicles from proceeding far into the park; this may require a parking facility near the end of the paved roads on both sides. Such a limitation, however, would limit campers and fishermen who may desire to transport supplies and equipment closer to the point. If the consultants recommend that the old dirt road be left open, the following precautions should be taken: keep vehicular traffic on the dirt road; prevent any vehicle from entering the sensitive dune areas near the point; control foot traffic by use of marked paths; provide alternate area for motor-cross biking.

J.H. Souza, page 2
May 25, 1977

As Kaena provides many unique opportunities for a semi-wilderness experience and for environmental education, every effort should be made to avoid excessive intrusion of people and amenities. A park planned for relatively low-intensity use will help perpetuate and, perhaps, restore some of the native vegetation and physical features (such as the dunes). Much of the damage to date resulted from uncontrolled vehicular access in a sensitive environment. Minimum development, as proposed by the consultants, should greatly help in reversing this trend.

I trust you have already received a copy of our field book on Kaena. If you have not, please call our office at 943-8191 or 8262. We'll be glad to send you a copy.

Thank you for the opportunity to offer some comments on the question of development alternatives. I am looking forward to attending some of your upcoming information meetings. Incidentally, our program has also produced a 15-minute slide show on the area. If you desire, we could make the slide show available for your meetings.

Aloha,

Ray Takemoto
Marine Education Specialist

enclosure

cc: Roy Takemoto
John Hall, Jr., coordinator
J. N. Sousa, Jr.
State Parks Administrator
DLNR, Div. of State Parks
P.O. Box 621
Honolulu, Hawaii 96822

Dear Mr. Sousa,

Subject: Hakua-Kaneohe State Park, EIS Preparation Notice

We have reviewed the EIS Preparation Notice for the proposed Hakua-Kaneohe State Park and have no critical comment. We regret that we did not respond to your office within the requested time period and hope this did not adversely affect your efforts.

Sincerely,

[Signature]

Ronald H. [Last Name]
Asst. Director, DLNR

14 June 1977

Mr. J. M. Sousa, Jr.
State Parks Administrator
Department of Land and Natural Resources
Division of State Parks
P.O. Box 621
Honolulu, Hawaii 96822

Dear Mr. Sousa,

After my return from a three-weeks' vacation, I found your letter of May 20th on my desk.

I did receive the write-up on the Hakua-Kaneohe State Park proposal but there was no indication that a personal response from me was expected.

I regret very much that there has been this misunderstanding because I am deeply interested in the area under consideration and was elated that the Division of State Parks proposes to make this area into a state park. This is wonderful news; those of us who are interested in the preservation of natural areas commend you on this move and would like to help in any way we can.

Personally, I, too, would like to join those who strongly favor minimum development with no vehicular access, in order to preserve as much of the present natural beauty and scientific value of the area as possible.

How may I best express my thoughts on this matter?

Sincerely yours,

Beatrice Kikta
Research Affiliate
Lynx Arboretum

[Signature]
Kukua-Ka'ena State Park, EIS Preparation Notice

We have reviewed the Kukua-Ka'ena State Park EIS Preparation Notice and have the following comments.

(1) Exactly what people-centered objectives are necessary to accomplish the stated project goals? Is it to make the areas accessible to as many people as possible? To develop a recreational utopia? To develop a recreational showcase? What is meant by "resource-oriented recreational opportunities"? Are tourists to be included or excluded? A clearer identification of such objectives will determine which management objectives are most appropriate.

(2) Due to its unique natural and cultural resources, we believe that the project area must be protected from any further environmental degradation regardless of the extent of development. Toward this end, we recommend that

(a) human access be carefully regulated and controlled
(b) grazing animals be completely eradicated and prevented from returning
(c) new infrastructures such as roads, shelters, housing facilities and transmission lines not be constructed
(d) vehicular traffic (of all types) be eliminated in the coastal sector and allowed, but carefully regulated, only in areas where a paved road already exists
(e) a conservation program be developed to protect endangered flora and fauna
(f) an educational program be conducted to inform residents of the aesthetic, cultural, historical and ecological significance of the Ka'ena-Pāhoa area
(g) a long term research program be established on the population dynamics of endemic coastal flora and forest fauna and flora.

(3) What is the carrying capacity (page 10, line 10) of each sector and how was it determined? What guidelines were used to determine if the proposed alternative concepts were compatible with the carrying capacity?
May 27, 1977

MEMORANDUM

To: Mr. J. H. Souza, Jr., State Parks Administrator
Department of Land and Natural Resources

Subject: Hakua-Kaena State Park, EIS Preparation Notice

Thank you for your letter of May 20, 1977 regarding the Hakua-Kaena State Park.

Since we have no facilities or other activities in the Hakua-Kaena area, we have no input toward the preparation of the Environmental Impact Statement. We appreciate the opportunity to comment on this project.

Sincerely,

John Farias, Jr.
Chairman, Board of Agriculture

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26 May 1977

Mr. J. H. Souza, Jr.
State Parks Administrator
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza:

Thank you for your letter of May 20, 1977 regarding the Hakua-Kaena State Park.

Since we have no facilities or other activities in the Hakua-Kaena area, we have no input toward the preparation of the Environmental Impact Statement. We appreciate the opportunity to comment on this project.

Sincerely,

Layne R. Tominash
Captain, CE, HARS
Contr & Engr Officer
Mr. J. M. Souza, Jr., State Parks Administrator
Department of Land and Natural Resources
Division of State Parks
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza,

SUBJECT: Hakua-Kaena State Park, Environmental Impact Statement Preparation Notice

The subject area does not involve lands owned by this Department. Because of this, we have no preference regarding use of the area.

Mahalo for the opportunity to comment.

Owau no me ka ha'aha'a,
(I am, humbly yours)

(MRS.) BILLIE BEANER, CHAIRMAN

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TO: Honorable Christopher Costco, Chairman
Department of Land & Natural Resources

ATTN: J. M. Souza, Jr.
State Parks Administrator

FROM: Andrew I. T. Cheng, Director

SUBJECT: Hakua-Kaena State Park, Environmental Impact Statement Preparation Notice

Subject did has been reviewed for its impact on our program.

We are in agreement with the general plan and the concept of not permitting vehicular traffic. However, we feel that provision for access of specialized vehicles for transporting incarcerated persons be considered. Vols could be constructed at suitable points. These could accommodate pedi-cabs, welder chairs, or other means of localized travel in the park proper.

Thank you for the opportunity to review and comment.

[Signature]

Director
The environmental, social and economical impact of a highway link between the Windward and Leeward coasts via Kaena Pt. upon the Waimanalo and Hikulaulia residents and their business.

2) Can the cost/resident need for a park be achieved elsewhere on Oahu.

The Environmental Council is basically in favor of very minimal development for the Hikua-Kaena State Park, if any.

Thank you for allowing us to be a consulted party in the preparation of an EIS for the Hikua-Kaena Park.

We hope our comments will prove useful in your planning efforts.
At its last meeting, the Commission reviewed the maps of the three levels of Kaena development and strongly favored the minimum version.

They also recommended that a 4 acre tract of the slopes beginning from the dirt road be given NAR status as the attached map shows. Dr. Derral Herbst would be the most knowledgeable person to mark it out on the ground and on precise maps. This would have no impact on needed park developments as it is mostly on steep slopes.

Also, we have written the Attorney General on dual Enforcement Officers for NARs and Parks and Forest Reserves in an attempt to facilitate management.

Sincerely,

P. Quentin Tuitch
Chairman
MEMORANDUM

TO: J. Sousa, Division of State Parks

FROM: Michio Takata, Director
Division of Fish & Game

SUBJECT: Comments on Hakua-Kasema State Park E.I.S. preparation notice.

The enclosed memorandum from Ralph Saito to Ronald Walker reflects the views of the Division of Fish and Game with respect to the subject document.

Michio Takata

MEMORANDUM

TO: Ronald L. Walker, Chief, Wildlife Branch

FROM: Ralph S. Saito, Wildlife Biologist, Oahu

SUBJECT: Comments on the HUAU-KASA STATE PARK, Environmental Impact Statement Preparation Notice.

The Kuaokala Game Management Area, the Kuaokala Forest Reserve and the Makua Valley are public hunting units open to hunting on a seasonal basis. Thus, hunting is not a potential recreational use item in these areas as stated but an on-going program managed by the Division of Fish and Game. The Kuaokala Valley and Makua Valley would be an area where hunting should be considered as a potential recreational use item. Figure 3 should be amended to reflect the present hunting program.

The development discussions for "Peacock Peaks" and the "Mike Site" should state that these two areas are within the public hunting area. Accurate delineation of the parameters of these areas is necessary so safety zones can be established if recreationists other than hunters are permitted in the areas during the open hunting season.

The "Central Upland Sector" and "Remote Sector" are part of the public hunting area managed by the Division of Fish and Game.

This Environmental Impact Statement Notice of Preparation is not detailed enough to be evaluated as to the effects the park system would have on endemic forest birds, pueo, and migratory shorebirds.

This is also true of the effects the park system would have on our hunting program in this area except for what has been previously stated. Also the notice does not state the reasons why lands already managed by a Division of the State Department of Land and Natural Resources, in this instance by the Divisions of Forestry and Fish and Game as Game Management Areas or Forest Reserves open to the public has to be redesignated a State Park managed yet by another Division of the same Department.
The list of fauna for the lower elevation should include: lace-necked dove (Streptopelia chinensis), Brazilian cardinal (Euphaea coronata), house sparrow (Passer domesticus), house finch (Carpodacus mexicanus frontalis), ricebird (Lonchura punctulata), Japanese white-eye (Zosterops japonicus), mockingbird (Mimus polyglotus), Pueo (Anio flammeus sandwichensis), Kolea (Pluvialis dominica fulva), Willi (Matoecusculus incanus), Akeaka (Arenaria interpres), Hunakai (Calodris alba).

The peacock (Pavo cristatus) is found in the Makua head Forest Reserves and should be so stated. Chukar (Alectoris chukar) should also be listed with the other game birds.

The following State agencies should be consulted especially since they are now directly involved with various management aspects of the State lands portion of this park concept: The Division of Forestry and the Division of Fish and Game.

The following organizations should be consulted since their present recreational activities in this area may be modified by this park concept: Pig Hunters Association of Oahu; Hawaii Rifle Association and the various fishing clubs on Oahu.

It is requested that alternative concepts are being drafted by the Division of State Parks or consultants (whomever they are) based upon comments received from government agencies, organizations and individuals, the Divisions of Forestry and Fish and Game be permitted to review and comment on the concepts before final form. It is also requested that copies of the final concepts (that is presented to the Board) be given to the Divisions of Forestry and Fish and Game.
Mr. J. M. Souza, Jr.
State Parks Administrator
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza:

SUBJECT: MAKUA-KAENA STATE PARK, ENVIRONMENTAL STATEMENT PREPARATION NOTICE

We have reviewed the above document and provide the following comments.

We would like to recommend that Farrington Highway, extending from Makua Beach and around Kaena Point, be relocated as far mauka as possible from the shoreline. Further, in the event that the highway is extended towards the Camp Erdman area, we would recommend the same.

Sincerely,

YOUNG SU NO, DIRECTOR
March 30, 1977

Department of Land and Natural Resources
Division of State Parks
P. O. Box 621
Honolulu, Hawaii 96809

Gentlemen:

Subject: Makua-Kaena State Park Environmental Impact Statement Notice of Preparation

Thank you for forwarding to us a copy of the subject notice.

At present, we have no comment.

Sincerely,

TYRONE T. KUSAO
Acting Director

April 14, 1977

Mr. J. M. Souza, Jr.
State Parks Administrator
Division of State Parks
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza:

Makua-Kaena State Park

We have reviewed the Environmental Impact Statement Notice of Preparation on the Makua-Kaena State Park. The extent of police involvement in this area will depend on the type of development the State proposes to undertake. If the State decides on a minimum development plan, there should be no appreciable change in police activities in this area. The land is currently owned by the State and has always been open to the public. However, the lack of improved roads has limited its use.

If the State decides on either medium or maximum development, police activity will increase accordingly as both of these plans will obviously increase the flow of people into the area. With the increase of visitors, police problems of theft, vandalism, traffic control, etc., will also increase.

Another area to be considered is whether security personnel, other than police officers, will be used. The leeward coastline is patrolled by one officer from the Waianae Station and the windward coastline by a beat officer from Wahiawa Station. The proposed development will greatly increase the patrolling area of these two officers from separate stations.

Very truly yours,

FRANCIS KEALA
Chief of Police
Mr. J. M. Souza, Jr.

Dear Mr. Souza:

Subject: Environmental Impact Statement
Preparation Notice for Hakua-Kaena State Park

We have reviewed the subject document and found it satisfactory with respect to our area of responsibility.

The Hawaiian Electric Company, with the cooperation of the State Department of Planning and Economic Development, University of Hawaii and the Public Works Department, is planning to erect a meteorological tower located on Hill 1589 adjacent to the Kaena Point Satellite Tracking Station. It is anticipated that the meteorological tower will be about 160 feet in height and would be secured by cables to anchor blocks.

The tower will be in an enclosure approximately ten (10) feet square with a four sided chain link fence, eight feet high, and topped with barbed wire. The installation will be operational for a period of about eighteen (18) months after the commencement date which is not precisely known at this time. Work will not commence of course until all the necessary approvals and permits are obtained.

If the wind data from this area is encouraging from a wind energy viewpoint, the site may be selected by the Federal Energy Research and Development Administration (ERDA) for a "second generation" wind turbine. This possibility, however, is mere conjecture at this time. If you desire further information, you may call Mr. E. Chipman Higgins, Hawaiian Electric Company (548-7721), Dr. Eugene Grabbe, Department of Planning and Economic Development (548-4155), or Mr. Chew Lun Lau, Department of Public Works (523-4150).

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CC: Mr. Chip Higgins
Mr. Gene Grabbe
Subject: Environmental Impact Statement Preparation Notice for Makua-Kaena State Park, Oahu, Hawaii

We have the following comments on the proposed park:

1. The water system master plan must be submitted to us for review and approval. Our system ends about 2,500 feet from the Waialua High School on the Waianae coast side. Any water system improvement costs must be borne by the project.

2. Sewage disposal plans must be more specific as to method of disposal, anticipated quantity and location of disposal.

Please call Lawrence Whang at 548-5221 if further information is needed.

Very truly yours,

Edward Y. Hirata
Manager and Chief Engineer

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Mr. J. M. Souza, Jr.
State Parks Administrator
Division of State Parks
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Makua-Kaena State Park, Environmental Impact Statement Preparation Notice

Thank you for allowing us to review the Environmental Impact Statement Preparation Notice for the Makua-Kaena State Park.

We do not object to the minimum development for this area, but we strongly recommend that vehicular access be available for our emergency vehicles to take care of any emergencies or incidents that may occur within the park.

We also recommend that some sort of water system be provided to allow us to effectively combat the brush fires which we have recently had difficulty in extinguishing because of lack of water.

We inadvertently misplaced your first request for which we apologize for this delay.

Very truly yours,

Anthony J. Lopez
Acting Fire Chief
April 20, 1977

Mr. J. M. Souza
State Parks Administrator
Division of State Parks
Department of Land and Natural Resources
P. O. Box 521
Honolulu, Hawaii 96809

Dear Mr. Souza:

Makua-Kaena State Park - EIS Preparation Notice
Comments Requested March 28, 1977

We have the following comments and suggestions:

1. Maps. We hope that your EIS will include many of the maps you have prepared in your planning process. Maps can result in a better understanding of the present environment and the potential impacts of your various alternative plans. Some of the mapped items which should be included are:
   a. Land ownership and leases, areas proposed for acquisition
   b. Slope categories and pali areas
   c. Purunual stream beds and flood prone areas
   d. Land uses, existing and proposed, inside and outside of the proposed project area
   e. Areas with plants on the Federal Register of Endangered Species
   f. Sites or places of historical or archaeological interest, especially if they are on the Federal or State register.

2. Rainfall. The preparation notice indicates that annual rainfall varies from 20" to 100" in the area but does not relate this to other areas on Oahu. The EIS should include information on the frequency and intensity of rains. One of the attractions, as well as a problem, at the Waianae area is that it is drier than other areas of Oahu and for a higher percentage of the year.

3. Ground Water. This is not mentioned in the EIS preparation notice. The availability of ground water resources could have an impact on alternate plans.

4. Avifauna. The presence of exotic species of avifauna is indicated. The species are not identified.

5. Land to be Acquired. It is indicated that the State is in the process of acquiring beach lands. Consideration should be given to the acquisition in fee or of easements, or dedication by the owners, of the mountainous areas on the Waianae side between Kailia Trail and Dupont Trail, as well as the trails themselves down to their intersection with Farrington Highway.

6. The Military in Makua. The EIS should indicate in greater detail how the military use of Makua Valley started and the conditions of the use agreement or ceding of the land. The frequency and extent of fires in Makua should be documented. Since it could be a long time before the military relinquishes control, the impact of military operations on park use, as well as the converse situation, should be discussed.

7. Proposed Uses. The relationship of proposed facilities in the alternative plans to existing and proposed uses adjacent to the park should be discussed. For instance, camping sites are proposed. How do these relate to the supply of camp sites, existing as well as proposed, of the Department of Parks and Recreation along both the Waianae and Makaha coasts? The kind of controlled hunting to be permitted should be discussed.

8. Social Problems. The problem of squatters at Makua Beach is not mentioned. This relates to socio-economic factors.

9. Traffic. Existing and projected traffic volumes on Farrington Highway with and without park development should be provided.

10. Solid Waste. Solid waste disposal, especially in the upland areas, should be discussed.
11. Costs and Funding. Costs of alternate plans should be discussed, together with user benefits. The method of funding should be indicated.

Sincerely,

ROBERT R. WAY
Chief Planning Officer

Mr. Christopher Cobb
Chairman of the Board
Department of Land & Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, HI 96809

Dear Mr. Cobb:

Hakua-Kaena State Park - EIS Preparation Notice

Thank you for giving me an opportunity to respond to the Notice of EIS Preparation for the Hakua-Kaena State Park.

My principal concerns relate to the impact of the surrounding uses and the social and transportation problems associated with this facility.

Because the military currently uses Makua Valley as a training area, the effect of their operations on park use should be examined in detail.

It is generally acknowledged that there are squatters living in the vicinity of Makua Beach. The impact of relocating these people should be discussed.

Will there be transportation problems because of the park use? What are the projected traffic volumes on Farrington Highway because of this development?

I hope my comments will be helpful in your preparation of an environmental impact statement for this facility.

Sincerely,

GEORGE AKAHANE
Councilman

April 26, 1977
June 9, 1977

Mr. J. H. Souza, Jr.
State Parks Administrator
State Of Hawaii
Department of Land and Natural Resources
Division of State Parks
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza:

Thank you for sending us the Impact Statement Preparation Notice regarding Makua-Kaena State Park.

As of this moment, the Hawaii Visitors Bureau would doubtless support the park development for this area, as long as this would not be in any way offensive to the residents of the area.

We would appreciate your apprising us as developments occur in the Makua-Kaena area.

Warm Aloha,

Barbara Hills (Mrs.)
Director of Visitor Satisfaction

Barbara Hills (Mrs.)
Mr. J.M. Souza Jr.
State Parks Administrator
Division of State Parks
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza:

We are in receipt of the Makua-Kaena State Park EIS preparation notice.

Please be advised that a "straw" vote of the board indicates a favoring of the minimum development plan. We do intend to hold a public hearing on this issue in late June, on a date immediately following the informational hearing being planned by your department.

I have indicated to Dennis Kim of Hawaii Design Associates that we intend to lead the citizen participation process for the Leeward Area. If we can be of service to your office please, feel free to call me at 696-2703.

Aloha,

Peter K. Aro
Director

cc: Dennis Kim
George Akahane

April 27, 1977

Mr. J. M. Souza, Jr.
State Parks Administrator
Division of State Parks
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza,

Thank you for sending a copy of the Makua-Kaena State Park Environmental Impact Statement Preparation Notice.

The Waialua Community Association is in favor of a park system to prevent further abuse and deterioration of our natural resources. We, however, are in favor of a minimum development concept.

Please continue to keep us informed and include us in future planning sessions.

Sincerely,

Masa Uehara
President
CAMP HAROLD RANDOLPH ERDMAN
YOUNG MEN'S CHRISTIAN ASSOCIATION OF HONOLULU

April 9, 1977

Mr. William Gorst
Planner
Department of Land and Natural Resources
Division of State Parks
State of Hawaii
P.O. 621
Hono[...]

Dear Bill:

Thank you for accepting to meet with the Board of Managers of Camp Erdman Branch of the YMCA of Honolulu on Thursday, May 19th at 12 noon at Maunaua YMCA.

We understand that this meeting will be an informative meeting with my Board. The Camp Board is reviewing the Impact Statement for the Nahua-Kaena State Park.

Bill, I thought I would like to share with you for your presentation some of the general concerns of the board that might be presented at that meeting:

- the need for low density development around Camp Erdman
- the need for ingress and egress under the proposed roadway (makua side of camp) to our hiking and nature study trails.
- what controls will be implemented for water run-off once the proposed roadway is completed
- unofficially, what will be involved for the YMCA in acquiring the present roadway if the proposed roadway is constructed.
- infringement from camp onto Camp Erdman, trespassing, etc.
- what restrictions and/or requirements will be imposed on the YMCA in the State Park.

I know there will be other concerns but I feel that the above mentioned will be the major questions.

Thank you again for your continued support and concern for the YMCA of Honolulu and if there are any questions, please be free to call me.

Sincerely yours,

William S. Suzuki
Executive Director

Office: 401 ATKINSON DRIVE  •  Honolulu, Hawaii 96814  •  Phone: 941-3344

Mr. J. M. Souza, Jr., Administrator
State of Hawaii
Department of Land and Natural Resources
Division of State Parks
P.O. Box 621
Honolulu, Hawaii, 96809

Dear Mr. Souza,

Thank you for the "Nahua-Kaena State Park, Environmental Impact Statement Preparation Notice." Our committee would like to have five more copies and we will review the document and comment as needed. Our group is very interested in the development of the Park. Please keep us informed in include us in future planning.

We are in favor of minimal development. We would like to request a joint meeting with Waianae and Northshore representation. Our interests may differ from the Waianae group. We would like your department to set a date with approval from both districts.

Please feel free to contact us. Thank you for your kind attention in these matters.

Sincerely yours,

Francis Miyake, Chairman
Waianae-Northshore Recreation Advisory Council
67-228 Kokea Circle, Phone: 677-524
Waianae, Hawaii, 96791
Mr. J. H. Souza, Jr.
State Parks Administrator
Department of Land & Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Souza,

Nokulela Ranch appreciates receiving a copy of the Environmental Impact Statement for the Makua-Keena State Park proposal. We have discussed the EIS among Directors of Nokulela Ranch & Land and would like to make the following comments.

The idea of a state park on the west tip of Oahu fits in well with the Nokulela Ranch goal for maintaining the area orientation for an agricultural recreational type of use.

Your Plan A, recently presented at the Public Informational Meetings, is our preference for access development to Keana Point. We do not support an auto road or a railroad around the point.

Your EIS is seriously lacking in archeological site identification. One omission is the identification of the Hawaiian holua which runs from the cliff top to its base in the area of the present road, in the vicinity of the old Libby Pineapple road. There are undoubtedly other archeological sites not identified in the EIS.

We continue to have interest in your plans for this park development and will appreciate being informed of all future public meetings and plan discussions.

Sincerely,

Jack Larsen Vice President MLL Co.

cc: Lowell S. Dillingham
Baylor H. Dillingham

July 18, 1977
3. The Kaena Point Road should be completed, even on a two-lane basis. Not only would this alleviate the pressure on existing island beach parks by opening up the beach areas between Makaha and Mokuleia, but it would relieve the traffic along Farrington Highway generated by park users who would have the option of returning to Honolulu by way of Waialua and the H-2 freeway.

We thank you for the opportunity to express our views.

Very truly yours,

Stuart T. K. Ho
President

Bernice P. Bishop Museum
P.O. Box 621, Honolulu, Hawaii 96809

July 22, 1977

Mr. J. M. Souza, Jr.
State Parks Administrator
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Subject: Makua-Kaena State Park, Environmental Impact Statement Preparation Notes

Dear Mr. Souza:

We apologize for the delay in replying to your letter of June 3rd, asking for input on the Makua-Kaena State Park.

The archaeologists most familiar with this area, Peggy Luscomb and Paul Rosendahl, have just returned from a three-month field trip to the Trust Territory. Their input is necessary and valuable in assessing the archaeology of the Makua-Kaena area. They feel that the proposed development would endanger the existing sites—both those sites already known, and those sites that they anticipate would be located in future archaeological surveys, on the basis of discoveries made during their recent work in sections of the area concerned.

They recently conducted an archaeological reconnaissance of the U.S. Army lands in the Makua-Kaena area under a contract (No. DACA84-76-C-0175) between the Bernice P. Bishop Museum, Department of Anthropology, and the U.S. Army Corps of Engineers, Pacific Ocean Division (Fort Shafter, APO San Francisco). The results of this survey were submitted to the Corps of Engineers. We are writing to Col. Rodolph, the contracting officer, for permission either to make available to you a copy of the list of sites in the Makua-Kaena area and maps showing their location, or for them to send you a copy of the report.

As soon as we receive a reply, we will contact you.

Sincerely yours,

Marion Kelly
Acting Chairman
Department of Anthropology
Dear Mr. Souza:

In response to your written request received by us on May 25, 1977, encouraging our input to the aforementioned subject, we wish to comply.

At the informal public hearing conducted at the Waikiki public library last summer, we were encouraged to witness an official from your department respond to the expressed wishes of those people present, to write in on the layout map of the Hakua-Kaena area, "Encourage native Hawaiian use and occupancy."

Public testimony that evening focused on the fact that native Hawaiians are an endangered species of compassionate and generous people who are presently on the verge of extinction. The attempts by the community representative at sensitizing the public officials to the diversity and richness of Hawaiian culture, to appreciate Hawaiian values and lifestyles, to understand the oppression to which Hawaiians have been subjected, was a sincere effort to reach an amicable solution which will manifest itself when the ahupua'a of the Hakua and the Kaena area is restored as a show place for Hawaiian people and their habitation, along with endemic flora and fauna. There is no doubt when this restoration is completed, it will benefit all the people of the State as well as the visitor industry.

It is our hope that you can capture the sincerity of the communities and their concern for the preservation and perpetuation of the Hawaiian race and culture in restoring the land base of Hakua-Kaena to human habitation with special emphasis on creating much-needed jobs and/or a constructive trust relationship between the State of Hawaii and her original inhabitants—native Hawaiians.

Please advise if we may be of further assistance in any capacity to your endeavors.

With warm personal regards, I remain

Sincerely,

[Signature]

C.K. Projean
Director

[Handwritten note: Page Two]
In response to your request for input concerning your work with the proposed Ka'ena park, our group has met and discussed the Preparation Notice issued by your office, and we would be pleased to be able to share our thoughts on the future of Ka'ena point.

As you know, through our close contact with your office, we completely share the idea that the Ka'ena point area is a beautiful natural area, very special in many ways, and that the area is in need of some sort of protection to prevent the destruction of its delicate balance. We are in complete agreement with the first of your project goals, that of preserving and enhancing the area as a scenic, cultural resource for present and future generations, however, we question the feasibility of the second goal. It's hard for us to see how using the area for a wide range of activities that are to draw people from all over the state can have the effect of preservation and enhancement.

We disagree with the concept that all land is but a resource, to be used to its full potential, especially in this case where the effect would be the loss of the untouched wilderness and wildness of Ka'ena, an experience very hard to find on O'ahu today. As the population of our island grows everyday, it becomes more and more important to maintain spaces like Ka'ena, not only in the interest of the preservation of natural beauty, but in the interest of health, to allow people to get completely away from our very civilized society. We hope this feeling is understood.

Ka'ena Ad Hoc completely supports the state on the concept of protection and preservation through management, of "one of the State's most significant natural and scenic resources". Management lends itself to many interpretations. With that in mind, we shall now review the preparation notice.

Concerning the development of the Makua beach and Keawaula areas:
- The minimum development does not reflect present use patterns
- Removal of "aquattera" is a question yet to be dealt with by the state
- Allowing day use to continue and controlled clearing should be clarified
- The rest of the minimum development for these areas are reasonable
- All of the medium and maximum development plans listed on Makua and Keawaula bay we consider to be unacceptable, unnecessary.

Concerning the leeward coastline:
- The minimum plan seems acceptable depending on the type of bike path
- All of the medium and maximum development plans are overwhelmingly undesirable, a waste of a great deal of money and natural resources.

Concerning the Ka'ena point area:
- Access by foot or bike is good and vehicle barriers are important
- The need for interpretative signs is not clear, are they necessary?
- By including controlled access for emergency and maintenance needs, the planner has completely stepped on the toes of the minimum development concept. Any vehicle access built into the park will be purposely abused by the public, who will not acknowledge that government and park officials should ride to the point and around it when the public must walk. Vehicle access must be altogether stopped or must be granted to everyone. In this case it should be stopped.

One alternative to building a costly access system and barricading it to the public would be to spend that money to employ a crew of horse mounted park rangers, to establish that program both for maintenance and emergency needs.

- All of the medium and maximum plans for the Ka'ena point area are built on the concept of intensive use and therefore completely unacce-
Preparation Notice review (cont.)

Concerning the development of the Windward coastline:
- all of the minimum plan is acceptable with the note that any tree
planting or planting with an eye for erosion control should be done
very carefully, so as to not upset the delicate and already strained
balance there.
- All of the medium and maximum plans are unnecessary for the "preserva-
tion and enhancement of the area for present and future generations".

Concerning Peacock flats:
- Minimum development seems more than adequate
- Medium and maximum development seem unnecessary

Concerning Nike site:
- Existing improvements are adequate and further development seems un-
necessary.

Central Upland sector:
- Minimum development would be desirable, especially the making available
information and maps, perhaps at local libraries.

Remote uplands:
- Here especially the minimum development would be important, meaning
little or no changes.

Under access considerations, the planner should definitely allow
for the serving of park purposes without vehicle access. There are
many alternatives not listed. The possibility of park rangers coupled
with an emergency phone and/or perhaps a resident caretaker where needed
would be preferable to the idea of a highway patrolled by police cars.

It is impossible to discuss properly, any development of the Ka'ena
region, without considering the effect this will have on the surround-
ing communities. The Waianae coast and the Waialua/Makuleka coast will
experience direct impacts of Park development varying with the intended
intensity of Park use.

Consideration of how different use patterns would affect the adja-
cent areas of Waialua and Waianae in their present state would give
us the initial impact effect, but the planners responsibilities should
definitely go a few steps further on this.

We are aware that the proposed Park and road area is bordered on
4 sides by large landowners who are all development oriented, that one
of these landowners has requested the state to build a road around
Ka'ena prior to park concept initiation and that another of the develop-
ners increased their adjacent holdings just prior to park funding.

With this kind of information, it becomes very important to look
at the social impact of the surrounding rural communities with an eye
to the future, taking into consideration land use changes, probable
developments, effect of urbanization and development pressure on ag-
culture and rural lifestyle.

By meeting with these landowners to see how they would react to
different Park use patterns and by looking into how different intens-
ities of park use and access affect development feasibility, the State
planners could then draw a clearer picture of the true impact of the
Ka'ena park and/or road.

If this kind of study goes beyond the scope of the present plan-
ning contract, then we recommend that the Division of Parks increase
the contract funding if necessary, to cover this important part of
planning and study.

We understand that the S.C.O.R.P. shows a great need for new park
space on this island and that the Ka'ena park would greatly improve
these statistics. However, considering that the worst lack of park
space in proportion to population is definitely in inner-city areas
Preparation Notice review (cont.)

of Honolulu, especially Kailua-Palama, we would like to recommend that the Division of State Parks make very few "improvements" in the Ka'ena area and focus more money and time alleviating the more chronic need of our city dwellers. The availability of open space affects us all.

In closing this response, I hope that our group's particular point of view, which we feel is shared by many, has gotten across. We feel that there is no improvement that the state can make that can better what has occurred naturally over thousands of years at the wild tip of this island, O'ahu.

Respectfully yours,

Marvin Nogelmeier, representative
Ka'ena Ad Hoc Committee

---

Dear Sirs,

I am writing on behalf of the Hawaiian Botanical Society which at present consists of 296 members.

We realize that input from the public concerning the Hakua-Kaena State Park is critical since it will ultimately affect which alternative will be taken in development of the park. We believe that minimum development along the leeward and windward coastlines, and at Kaena Point would be the best alternative for these areas. Minimum development would preserve "the unique character and values the area possess," and maintain this area "in its natural and semi-wilderness condition." Medium or maximum development of the Hakua Beach-Kaena Bay area and the area surrounding Camp Erdman would provide a varied range of recreational activities for the public with minimum impact on any rare or endangered native plants. In the upland mountain sector, either medium or minimum development could be followed. If possible, native species should be used in landscaping the camping areas.

We will be closely following the progress and decisions made on the Hakua-Kaena State Park Plan.

Yours truly,

Winnona P. Char
Director
Hawaiian Botanical Society
August 3, 1977

Testimony on KAENA SHA STATE PARK by Francis G. Nowath

The Hawaii Audubon Society has long had an interest in this area for its natural values and has recommended that portions of it be included in the Natural Area Reserve System. We are in favor of many of the uses reported in this preliminary plan. We do, however, have some reservations and some additional suggestions.

The most critical threat to the area now concerns the sand dunes at Kaena Point. This rich example of a unique Hawaiian ecosystem, with its bizarre endemic strand plants and insects, is being inexorably destroyed by off road vehicle use. A portion of this area must be protected as soon as possible in order that the extant sand dunes and vegetation are stabilized. This protection, preferably by establishing a State natural area, should be given the highest priority, before these dunes are irretrievably lost.

The natural area would, by necessity, require limited access to only those persons with a valid purpose. A small natural area such as Kaena Point will not long survive if incompatible land uses are neighbors on either side. Thus, a buffer zone should be established. The ideal buffer zone would be an educational interpretive state park in which the public could enjoy a natural area's resources without the need to enter the core or primary area of the reserve. The buffer zone should be large enough to protect the reserve and, in itself, be able to withstand recreational use.

A small potential natural area was omitted in the map on p. 11. This is a rectangular area on the windswept ridge between Pu'u Peo and the proposed highway. This talus slope has been free of many of the perturbations acting within the area because of its ruggedness, and much of its native flora survives. Many of its plants are the same as those growing in the Kaena Point natural area, and the two natural areas could be contiguous.

A highway leading to Kaena Point may be incompatible with the Natural Area Reserve System. Certainly we must insure the protection of the natural areas and the planned route of a circumisland road should be made only after a viable natural area has been established.

We are pleased with the other proposed natural area reserves, and again reject the need for buffer zones for these upland natural areas. Interpretive recreational parks would be ideal. The outstanding native floral habitats on the ridges behind Ha'iku Valley within the restricted military area should eventually be included in the natural area. In the meantime the military should be enjoined to contain its fires and look for alternative training methods.

"Thank you very much for the second chance to present this testimony on behalf of the Hawaii Audubon Society."
June 9, 1977

Mr. J. M. Sousa, Jr.
State Parks Administrator
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: KAENA STATE PARK

Dear Mr. Sousa:

Thank you for sending us the Environmental Impact Statement Preparation Notice on Kaena State Park.

We are most pleased to see that concerns which we expressed when the first planning for the area was done by the Department of Transportation have now been considered, with emphasis given to the planning of a recreational area rather than a part of the highway system.

We have the following specific comments to make:

1 - We would like to see the reasons for the restrictions on use of the three roads into the mountain areas closely scrutinized. Other roads on our islands pass through ranch land, roads in Hakalau State Park are not even paved but are used by the public. It may be that the interests of the general public should, in the case of Kaena, be given greater weight than the interests of others and that safety standards applicable to primitive areas be adopted.

2 - We would recommend that a more aggressive policy towards the restoration of Hakalau Valley to the State be adopted.

3 - We suggest that data on the incidents of crimes against state park users (especially overnight campers) in the Waianae area be collected.

4 - Considering the popularity of Haunauma Bay, is any part of Kaena shoreline suited to such use?

Yours sincerely,

Mrs. Theodore Crocker
President

[BC/ha]

THE OUTDOOR CIRCLE

Kaena State Park
Page Two
State of Hawaii
Department of Land and Natural Resources
Division of State Parks
P. O. Box 621
Honolulu, Hawaii 96809

Attention: Mr. J. N. Souza, Jr.
State Parks Administrator

Subject: Hakua-Kaena State Park
Environmental Impact Statement
Preparation Notice

Gentlemen:

Reference is made to your letter of March 28, 1977 which appended the subject notice of preparation. We appreciate being given an opportunity to review this document dealing with the Hakua-Kaena State Park. Our comments follow.

I. General

(1) We note that the proposed "Hakua-Kaena State Park" does not appear on the 1964 Oahu General Plan, nor is it clearly addressed in the new Oahu General Plan adopted by the City Council earlier this year.

   "The City Charter provides that no "public improvement or public project" shall be initiated or approved if it does not "conform to and implement the pertinent Development Plan for the area of concern."

   Failure to comply with an officially adopted local comprehensive plan can be a principal cause of project termination and/or limitation of state and federal funding, as evidenced by a great number of recent court decisions across the nation. Accordingly, the State Land Board should formally request that the "Hakua-Kaena" park--and the other state park areas as well--be properly shown on the detailed development plans which will implement the new General Plan.

(2) The "Conservation District Inventory" maps published by the Department of Land and Natural Resources in February, 1977 make no reference to the spectrum of recreational opportunities at "Hakua-Kaena" envisioned by the park plan, other than the "wild shoreline" and "public hunting area" notations. This apparent inconsistency should receive legal review due to potential litigation that might adversely affect the park funding or development.

II. Economic

(1) A more thorough analysis of the economics involved is needed. Rather complete justification for the expenditure of public funds for "Hakua-Kaena" as compared to other park needs on Oahu should be set forth in the EIS.

(2) The cost of public accessibility to "Hakua-Kaena" needs to be addressed. Is the (long-planned) roadway around Kaena Point feasible in terms of park accessibility alone, or could it be justified on the basis of general public "around-the-inland" need? If so, how? Coordination with the State Department of Transportation is necessary.

(3) Reconstruction of the railroad system or introduction of a cable car, tracked vehicle or minibus-type vehicle and related roadways would appear to defeat the "wilderness concept" of the "Hakua-Kaena" park area. In any event, the capital costs and operating/maintenance costs of such modes require extensive analysis and justification.

III. Electrical Requirements

(1) That section of the Notice of Preparation which deals with "Electricity" (paragraph II H 4 on page 52) is completely inadequate in our opinion. Considerable discussion should be included on the existing and probable future electrical facilities in the area. Additionally, we do take exception to the verbiage "from earlier usage" for the transmission line in the area as the following discussion will point out.

(2) The existing overhead electric line around Kaena Point was originally installed before World War II. It connects the Waialua and Hakeha substations and insures the necessary overall system reliability along the North Shore (Mokuleia) and the Waianae Coast. Presently energized at 12kv, this
line will eventually be a combined 46kv/12kv circuit as shown on the Oahu Electrical Master Plan submitted by HECO to DLNR in 1971. This line is covered by several perpetual grants of easement, including State Land Board approval within THK 6–8–02:17 on June 10, 1971 and the grant within THK 8–1–01 dated February 11, 1966.

(3) Other major lines which exist in the area include the two overhead 12kv feeders to the Air Force Kaena Point Tracking Site—one from the Hokuilea side, and the other from the Waianae side over former McCandless lands pursuant to CDUA approval by the Land Board (OA-1/29/73-406) on July 27, 1973.

(4) Maps of the existing lines are available in the Hawaiian Electric Company files and the State Bureau of Conveyances files for notation on the park plans. These are rights of way documents 59–91, 62–107 (A, B, C, D, E and F), 64–115 and 72–74. Such notation is very important because the existing lines will likely provide the source for various extensions to serve the lighting, security, pumping, sanitary, and other electrical demands generated by the proposed "Hakua-Kaena" park as well as existing customers. The extent of new electrical facilities and easements required cannot, of course, be precisely delineated until the detailed park plans are fairly well advanced. Preliminary park planning, however, should recognize and allow for this basic infrastructure requirement.

(5) The Hawaiian Electric Company, with the cooperation of the State Department of Planning and Economic Development and the City and County of Honolulu, has been selected to sponsor one of 17 sites for the possible test of a large 1 megawatt (enclosure 1) wind turbine.

If Hawaii is selected for the actual site of this large wind turbine, it will be erected within the subject park. The selected site is on the ridge line about 250 yards above the satellite tracking station in the Kuaohala Forest Reserve. The land use in this area should be compatible with the test of this large wind turbine, as it will be critical to the development of the future role of wind power in Hawaii. We suggest that a wind farm designation be adopted for the Kuaohala Forest Reserve.

Further we strongly recommend that the Notice of Preparation clearly address the fact that high voltage transmission lines will be needed to transport the wind generated energy out of the area.

(6) Some eight years ago, the Hawaiian Electric Company was requested to design an overhead to overhead relocation for its existing facilities in conjunction with the State Department of Transportation project for the realignment/widening of Farrington Highway on the North Shore almost all the way out to Kaena Point. These plans await implementation at the direction of the Department of Transportation. These plans should also be addressed in the Notice of Preparation.

Very truly yours,

Meade D. Wildrick
Sr. Project Administrator

cc: F. R. Montgomery
P. C. Lewis
V. E. Cronkhite
R. E. Bell
J. P. Richardson, Jr.
E. C. Higgins
Department of Land and Natural Resources  
Division of State Parks  
P. O. Box 621  
Honolulu, Hawaii 96809

May 21, 1977

Gentlemen:

The Environmental Impact Statement Notice of Preparation dated March, 1977, has been reviewed and the following recommendations are offered:

Hana Bay Beach and Kauaula Bay – minimum development
Leeward coastline – minimum development
Windward coastline – medium development to include a low density road most of the distance to Kaena Point providing picnic and camping facilities
Areas surrounding Cape Eriman – medium development
Peacock Flats – medium development
Koke Site – medium development
Central Open Sector – medium development
Remote Open Sector – minimum development

There has been extensive discussion on provision of trails, bikeways, roads, and railways around Kaena Point. Because of the severe abuse in this area by vehicles that can get into the area with the limited facilities, it is recommended that no around-the-point vehicular means be provided except for possible consideration of a railway. A hiking path is considered desirable but it should be installed as to prevent any through use of motorcycles, mopeds or vehicles of that nature with the possible exceptions of bicycles.

It is believed a road would lead to extensive destruction of the character of the Kaena Point area and that traffic must be controlled. This could be provided by a railroad which could cross trestles or other structures that would prevent their use by automobiles, motorcycles, or other vehicles.

While it is recognized that the opinions of the people living on the Leeward and Windward side adjacent to the Kaena Point park should be given ample consideration, this park is intended for the benefit of all the residents of Oahu and those from other islands who wish to use it.

Every effort should be made to obtain views from others than those who may feel that everyone else should be kept out. It should be pointed out that some national parks (Yosemite for one) has found it is necessary to control traffic by prohibition of private vehicles through certain areas in order to prevent over taxing the facilities.

Please be assured we wish to do everything possible to assist you in the planning and development of the park.

We should point out that on page 32 it is stated that "The tradewinds, generally arriving from a north-northeast direction (NNW), are active throughout the year but are least continuous from October through April, Hawaii's winter season. Winds vary between 15-17 knots throughout the year." The tradewinds normally blow from the east northeast.

Yours very truly,

WAIKII SUGAR COMPANY, INC.

Frederick L. Gross, Director  
Civil Engineering and Environmental Standards
May 25, 1977

J.M. SOUZA, JR.
ADMINISTRATOR
DIVISION OF STATE PARKS

Dear Mr. Souza:

I have read the E.I.S. Statement regarding the Makua-Kaena State Park. Our basic position is that no vehicular traffic be allowed access to the Kaena Point area. The Kaena area should be maintained as a preserve for "limited" recreational use, our Hawaiian sea shores are rapidly becoming barren. We have fished, picked limu, opihii, ha'ukii uki, 'ama'ama etc., from the Kaena area. These are now all endangered species. We would like to see some strict Kapu's set to re-stock our reefs. Otherwise a little bit of what is left of Hawaii will be seen only in the book. Our Ohana will stand strong on this issue.

In regards to the Makua area there needs to be some questions answered in regards to how military and civilian use will co-exist. I have camped with family and friends at Makua for a long time and I know when the military bomb Makua the shock waves from the blasts are Incredincible. We have hunted up at Kualakai and the pups and dogs go down into Makua Valley. I believe this point must be clarified to avoid unfortunate incidents in the future.

We are very anxious to meet with you and the State to discuss the political implications of the Makua-Kaena State Park. We know of the outside pressures to develop Waianae. The future of our Hawaii is not for us but for our children. So please understand that feelings often run very high.

Sincerely,

Enos

June 10th 1977

Lord James Blears
P.O. ox 621
Honolulu 96809

Dear Mr. Souza JR.: 

Reference to your letter of June 2nd 77. 

It was my error. I did not know that a written reply to the book you sent was required. Sorry.

Here is my reply:

I join the many, many people who I meet out in the Waianae area every day in their belief that there be "A MINIMUM DEVELOPMENT WITH NO and I repeat NO, VEHICULAR ACCESS" in the KAENA POINT AREA. 

I certainly hope sincerely that the Hawaii Design Associations do recommend MINIMUM Development in this and all areas in this area.

We have clean water and clean air out here and please let all work to keep it that way.

I have travelled from Manchester England leaving the bad air behind, was driven out of California with the crowds and the bad air and water and driven out of Waikiki 7 years ago because of the same thing and after Ewa where do I go? Is at the end of the Island.

Thank you for jogging my memory.

Sincerely and Makaloa No Loa

Lord James Blears.
Hope this is not too late but:

I am a Biology and Environmental Science teacher presently at Waima High School on Kauai.

I am very concerned about what lies in the future for Oahu's last "wilderness" shoreline area. You have a planning opportunity in this area with potentially far-reaching impact. This is a last chance to prevent suburbanization of completely surrounding Oahu. I am definitely in favor of upgrading facilities in the area, but not to the point where local people will lose this shoreline wilderness to the tourist industry.

Therefore, priority #1: No paved road - no upgrading of the existing road which will be acceptable. Open it up to auto access. It's been many a year since I've driven around Kaaawa point, but I remember one very coded and dangerous point in the road.

2) Yes to the railroad - this could be tied in with a tourist bus and THE BUS hook up to make Kaena Point accessible in a very appealing way. It is a potentially profitable and environmentally sound alternative. A halfway point stopover where people can get off the train, exploration the area on foot should be included.

3) Makua - Keawaula shoreline area - yes to the medium development plan. We need some civilization up to this point which to me seems like the "Wild West." Portable restroom facilities with no caretaker would be destroyed within a week. I don't want a proliferation of restrictions, limitations, picnic...
more amendable to human intrusion.

Forest - Let's be aware that the already
assumed land. Pressed nature will infiltrate the already
development. Any thing else.

4) Central Apartment Rowlands
5) Beacon Heights

facilities / because of its cost.
The need for resident caretakers
experience. I question
area. For a more natural
keep it as a small volume

(8) Forest Floor

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Good luck and please don't put a paved road around Keene Point. Let's have one shore line area where local people can come have fun without hoards of tourists.

Yes to Railroads!!

Amen and
Amen.

Frans David Boynton
PO Box 651
Walwa Hi 96296
Thank you for the brochure and letter on the Makua-Kaena State Park which I requested. I have been studying and reading all that was written in it, plus the maps and the proposals and concerns expressed for this area future development.

My main interest is with the Kaena-Nokulea section of the park, although the over-all park as a whole is of interest to me also.

Much of my childhood was spent at Camp Erdman in the late 1920's through the 1930's and early 40's, so am well acquainted with this area and have loved it all of my life. My father, Arthur Kamal, was Physical Director for Central YMCA and a YMCA secretary. My mother served as the health nurse for Camp Erdman. My childhood memories go back to the very first building at Camp Erdman, My memories go back to the very first building at Camp Erdman, it is serene and candid, and the true wilderness it was then, to the railroad which was still in operation, walking the tracks to Kaena Point, biking on the Kama Trail to the mountains above, to Half Moon Cove and Crystal Canyon, and up along the coast line where we called 'Shell beach', and of course the marvellous shell collecting and beautiful shells that were in abundance on the beaches in these years, but have diminished since.

Many of our friends live this area too, among some of whom are Mrs. LeRoy Bowman now of Hawaii, who owned a house beyond Camp Erdman for many years and which is still there, and condemned for the park. I feel very grateful for the newspaper articles on the considerations for the park and the coming hearings, for I have notified several people who I know live the place and hopefully will express some public opinions on its future.

The Environmental Impact Statement which I found to my delight, is very well done and put together. It is truly informative and a thorough study of this whole huge area of mountains and coast line. I'm grateful to see the intelligence and care that went into it. It seems to be an unbiased and truthful report.

Page One of the report sum up the heart of the question of the future for this area in the sentence, "The absence of an improved access route has maintained this area for many years in its natural and semi-wilderness condition and has preserved the natural and scenic resources of the region." This is the key, and only way to go if this area is to be preserved and enjoyed for what it is, and not for what it is not. This makes it imperative that if any development is to take place at all, it be the absolute minimum plan.

As attractive as a scenic railroad, scenic highway with limited stopping privileges (controlled), and shuttle-type public transportation may sound for getting more people out there to enjoy this area, it would be devastating this area and its environment. It's historical value, its fragile endangered plant life and purity of its ocean waters. It would do another thing, completely change the wilderness character. Surely we civilized people can realize and accept the need for preservation of a few such areas on an island which has been largely converted to everything but wilderness. We need wild places in which to commune with the ocean and wind blow trees with nature untouched by man except for the solitary individual on foot who comes to enjoy it. We are on an Island that is living example of what can and has happened when so called "improvements" of our choice beauty spots have taken place in making them more available for public use and abuse. Massive proposed future development like Herbert Horitz's massive hotel-housing city project from Barbers Point to Waimanalo and the rapid self development of the Waimanalo coast line town and areas, plus Prudential plans for a half billion dollar development of Kaua'u area (the other end of the railroad line, think of its history) are all just over the horizon if not upon us and a massive effect on what lies between...literally this park area. Without a doubt the pressure of population, of money interests, all will put this park under great stress in the years ahead, which makes good solid planning that is secure for the future imperative now, with legal clout to maintain its character.

It is also good to promote development that cannot be maintained properly. New road or rail or laws that have limited use. I think this is very important in viewing any development in this area. Right now motor cycles are tearing up the fragile plant life near the end of all the passable roads close to Kaena Point. Not many months ago while at the beach very near Camp Erdman, beach buggy vehicles were tearing up the sand, beach plants, any beach users in their way, and one fragile island of sand covered with drift wood in their way, to any nothing of the purity of the sand, the contours of the beach itself. Garbage without end and broken glass strewn the land next to the beach areas, not uncommon from picnickers but over-nighters, who refuse to haul it out themselves, or to pick up and came might help but who is to enforce their use and to penalize non-use. Quite evidently development of these areas must go hand in hand with public education beginning in our public schools.

What provisions have been made for the protection of the beaches and the purity of the ocean on the ten miles of coast line in view of the ever increasing boating interests? There seemed to be little in this report on this. Boats do dump garbage at sea, also sewerage, oil from diesel motors etc. They do pull into quiet bays and anchorages and leave water spaces with other water related activitis. A few years ago I took a Scuba diving course, and the first few lessons were class room work, pointing out among other things the hazards of diving in areas where boats were apt to be at all. Makaha beach swimmers and surfers now compete with the new popular sport of outrigger canoe paddling, etc. Beaches that once were covered for their dangerous nature when I was a child, are now popular surfing and racing spots. The fact that the Nokulea coast line is rough and can be hazardous I feel will have little impact on our waters become more and more crowded with people activities, and especially from fishing boats under power.
The proposed parks immediate areas of development would seem best served in the mountain areas which could best serve expanded public interests for hiking, camping especially, and nature education. Along with this should be a continuing program of the development of protection of all historic sites, so that none will be lost or destroyed. Has has been the case in the past. Considering the historic interest of Kamaole Cave, hopefully something will be undertaken soon to start on the huge job of cleaning up its walls (if at all possible) from the vandalisms of the public use of paint spray cans and use as a bathroom. It has much potential as a place of historical value that is presently easily available to the passing public, and could be developed as an educational center as well, perhaps for pointing out locations of all historical shrines and sites within the park area. High noon cave above Camp Erdman in the mountain wall, though not mentioned in the report was a burial cave, and because it is easily identified by shape should be of interest, at least for distant viewing.

I would like to see the botanic preservation and gardening of ancient and rare plants that grow naturally in these areas. I fondly remember the wild iliau, the poha berries (bushes), and even wild cherry trees that seemed to grow luxuriously in the Hokuulea section during my childhood. Development in Waimea Falls Park of tropical plant gardens, preservation of ancient sites for public enjoyment and education, in the botanic park inside of Coca Crater, all point to ways and means for future styles of preservation and development that are in keeping with public use and enjoyment.

The public would be interested in just what the financial picture is not only for acquisition but the development and maintenance of this huge park, and within the frame work of what is practical, what kind of program would be most feasible. Some things need to be taken into consideration, such as the energy shortage, and the ability of the majority of people on this island, other than those who live in nearer by areas, to get to and use this park (which is not to say that a railroad, tram or other opening of the park should be considered), but rather, practically just how much use the park can expect under any circumstances other than promotional for momentary ends. A case in point could be the present Poli lookout development which of itself generates no income, but does serve to the detriment of local residents the ends of the tourist industry and those related to it, not always local such a foreign investment and mainland investment. Above all this park should not be viewed as just another asset for the tourist industry. It seems a never ending struggle where money and profit are concerned to preserve what is natural and beautiful more or less unchanged, and for the good and use of all.

Thank you for reading my ideas, and thank you for all the work that went into the very fine Environmental report on the Hokuulea State Park.

Sincerely with Aloha,

(Hy) Jennie L. Doss

Jennie L. Doss
1101 Okeanawa
Pearl City, HI.
Mr. J.H. Souza, Jr.
State Parks Administrator
Department of Land & Natural Resources
P.O. Box 621
Honolulu, Hawaii 96817

Re: Hakua-Kaena State Park, EIS Preparation Notice

Dear Mr. Souza:

Thank you for your reminder dated June 2, 1977.

I regret that I have not commented sooner on the park proposals. Unfortunately, I do not have the time to discuss in detail, but I wish to express my concern about the preservation and development of the area. Briefly, I favor the following:

1. Promote the wilderness qualities of the area. I realize that the island is not a true wilderness, but the area is one of the wildest on the island, and I think that the park should preserve it. The state should establish at least one major wilderness area in order to preserve the diversity of environments and opportunities which I feel the people need. Environmental homogeneity is undesirable; there is a proper place for cities, but Oahu already has large and growing urban areas.

2. Protect native, especially endemic, vegetation. I also favor wilderness for its own sake, independently of a utility to man, although wilderness protection can be justified by its present educational value and future resource potential.

3. Minimize, reduce, restrict, or prohibit motorized transportation in the proposed park area, especially in the rare ecologically fragile areas. Travel by foot should be the encouraged method of transportation. I have toyed with the idea of a highway around the island but am against building one at present. A bike path would be acceptable, but only for people-powered bikes. Motorbikes tend to be noisy and incompatible with the dominant peaceful quality of the area.

I will try to continue to follow the development of the EIS and the eventual park.

Sincerely,

[Signature]

V. Panici

69-435 Farrington Hwy.
Waianae, Hi 96791
639-1901
Dear Mr. Souza:

Your records are correct that I have not responded to the Hakua-Kaena State Park IIS Preparation Notice as yet. However, my copy of the notice was shared with several friends, who eventually may have responded.

In any case, as an individual, I feel that the Hakua-Kaena State Park in the Yokohama Bay, Hakua Beach, and Camp Ederman areas could be improved by moderate or maximum development. These are valuable recreation areas.

However, Kaena Point, the Windward coastline, and the Leeward coastline have potentials that would only be damaged by minimum or even medium development. Minimum development should be planned for these areas so that their archaeological, scientific, and educational values will be protected. I am sure that they are more that numerous high school and college classes, clubs, and other organizations, as well as whole families have trekked out to this "semi-wilderness" and that places like this are becoming very difficult to find on Oahu. More and more people are seeking out tranquil, natural surroundings, like Kaena Point, where they can fish, camp, study plants and animals, and take scenic walks.

One way to greatly enhance the Kaena Point and coastline resources would be to prohibit vehicles, except emergency and maintenance vehicles, from the entire Kaena Point area and of the adjacent coastline regions. Motorcycles are presently a terrible nuisance because of their noise and the threat of running down hikers. Your IIS Notice of Protection has a cover photograph which shows quite well the destruction of plant life and erosion that are caused by vehicles that drive over the sand dunes.

I'm glad that your consultant, Hawaii Bight Associates, might recommend minimum development for each of the study areas. Please keep me informed of future public meetings. Thank you.

Sincerely yours,

[Signature]

[Address]

June 6, 1977

Dear Sirs:

SUBJECT: Hakua-Kaena State Park, Environmental Impact Statement Preparation Notice

After carefully reviewing the entire notice I submit any other development besides low intensity would mean eventual and total destruction of a most fragile and priceless area.

This area of the island is particularly important environmentally and ecologically. One has only to go there to see it. With urban sprawl gobbling up our open spaces, clean air and water and a strong feeling of threat to the residence of the Waianae coast, recent residents are of Hawaiian ancestry and feel the destruction i.e., development of some of their land is far beyond their ability to tolerate.

I would like to emphasize again any development other than low intensity would mean destruction of an environmentally and culturally priceless area of our island. The Waianae community is aware of this project and in the past year has worked very hard to educate itself in all the many aspects of this issue. I think you will find working with us a refreshing experience in community concern.

Respectfully,

[Signature]

Jean Snodgrass
89-946 B Lilikau St.
Waianae, Hawaii 96792
Subject: Hakua-Kaena State Park, Environmental Impact Statement Preparation Notice

Reference: Your Letter of June 2, 1977

My apologies for lack of prior written response. Due to time considerations of the response deadline it was not possible to poll the entire membership of the Hakula State Beach Colony Association of Co-Owners. Thus far, none of the members or residents have expressed being in favor of maximum development.

I concur with the position of those strongly favoring minimum development with no vehicular access to the Keena Point area. I found the EIS Preparation Notice to be very well prepared and appreciate having received it.

Sincerely,

Nancy B. Thurston
(Mrs. Lorrin F. Thurston)
May 27, 1977

Bill Gore
Department of Land and Natural Resources
Division of State Parks
PO Box 631
Honolulu 96809

May 31 9 23 AM '77

Dear Bill:

Here are some scattered and not too systematic thoughts on the proposal. I hope they are within the deadline. There are some hard questions to answer and I hope I haven't been oversensitive. Thanks for the opportunity to comment. And please excuse the typos.

Sincerely,

Barbara Morello
67-319 Kubu Circle
Wailua, HI 96791
10. Arrows above to limit access to fishing areas. If vehicles are not allowed to park alone road, how will fishermen get to desired area. Layway came two states before access solely for the tourist. Access to 'look at' things from a distance.

11. A lot of words are like filler eg. p 12 & 17 provide unapproved parking areas - what to provide, there are already areas where car parks now

12. k. 17 'each windbreak. The present 'bush' is a lot better windbreak than the one at localised each park.

13. Uland Bannock deteriorate - Uland Evaluation is very difficult without projected uses.
- that number of people are anticipated daily at each level
  - if access is by minibus alone how does this serve residents as stated earlier. Tents and cars on the bus. Tents will certainly be limiting too, as hunters usually go up before dawn. Also hikers leave early.
  - what is planned for peacock flats? There aims a view. How would info be used or interpretative center?
  - could peacock access be from paved road addition or just stop of bus so hikers could get out?
  - unsure how these areas would be used.

14. Proposed natural area reserve should be extended to include remaining forest in the east of roposed area. That area is presently all native vegetation and should be given maximum protection.

1. The problem that seems unsolvable to me is that protection of native flora and fauna. Unless we are body searched upon leaving the area, they will take forms, snakes, butterflies, flowers, and other organisms. Egyptian toad is an example. The fish are protected, because they are hard to carry out unnoticed, but there are still almost no invertebrates to be found there. Shells are easily too easy to put in pockets. The swallows, geese will be attracted. This is one of the highest density of snakes on the island. Additional nesting is very slow growing and re-seeding maturity after more than 6 years. For an adult snail to re-lace itself it probably takes 7 or 8 years. A group of or 5 or is committed to setting the last of the endangered species could write out the population in a matter of a couple days. In the next population have come back after many years of such a decimation only to succumb to another researcher for that last snail. I have been studying the growth and natural History of this snail since 173. No other work has been done on them to my knowledge. Since my work is as yet unpublished I would be happy to provide the data so far accumulated relating to the species as endangered.
e.i.s.
review period
comments & responses
Mr. William Y. Thompson
Chairman, Board of Land
and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Thompson:

Subject: Makua-Kaena State Park, Environmental Impact Statement

We have reviewed the above-mentioned environmental impact statement and have no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,

Jack P. Kanalz
State Conservationist

cc: Office of Environmental Quality Control
Environmental Impact Statement (EIS) for Makua-Kaena State Park, Oahu, Hawaii

Governor, State of Hawaii
[Office of Environmental Quality Control]
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

1. This headquarters has reviewed the subject EIS and the following comments are forwarded for your consideration:

   a. All references to the abandoned "Air Force Nike Station" should be corrected to read abandoned "Army Nike Station".

   b. Since February 1975, Dillingham Air Force Base proper has been under the jurisdiction of the Department of the Army and is currently identified as Dillingham Military Reservation.

   c. The Satellite Tracking Station Access Road is identified in the EIS as the only road presently available in reaching the upland mountain regions of the proposed park from the leeward coast. We would like to strongly reemphasize that the Air Force will require continued restrictive usage (as addressed in the EIS) of this road due to the classified missions and operations of this station.

2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review and comment on the subject EIS.

   ROBERT Q. K. CHING
   Chief, Engineering, Construction
   and Environmental Planning Div
   Directorate of Civil Engineering

   cc: Office of Environmental Quality Control

Mr. Robert Q. K. Ching
Chief
Engineering, Construction
and Environmental Planning Div
Directorate of Civil Engineering
Department of the Air Force
Headquarters 15th Air Base Wing (PACAF)
Hickam Air Force Base, Hawaii 96853

Dear Mr. Ching:

SUBJECT: MAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your comments on the subject Environmental Impact Statement. Your suggested changes will be incorporated in the revised EIS.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board
Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) prepared pursuant to Chapter 343, Hawaii Revised Statutes and its Rules and Regulations:

Title - Hakua-Kaeoa State Park
Location - Hakua-Kaeoa Point, Oahu, Hawaii
Classification - Agency Action

We would appreciate your comments or acknowledgement of no comments. Please submit one copy each to:

1) Accepting Authority: Office of Environmental Quality Control
   Address: 550 Halekauwila St.
             Room 301
             Honolulu, Hawaii 96813

2) Proposing Party: Department of Land and Natural Resources
   Division of State Parks
   Address: 1133 Punchbowl St.
             Honolulu, Hawaii 96813

Your comments must be received or postmarked by: December 23, 1977

If you have no future use for this document, please return the EIS to the Commission. [Comments or acknowledgement of no comments should be directed to both the accepting authority and proposing party.]

Thank you for your participation and cooperation in the EIS process:

5 December 1977

Any comments that Director of Health Services has will be incorporated into a joint response by Directorate of Facilities Engineering.

Patricia A. Greene
Colonel, ANC
Chief, Health and Environment Activity
Directorate of Health Services, USASCH

January 19, 1978

Dear Colonel Green:

SUBJECT: HAKUA-KAEOA STATE PARK

ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the Subject Environmental Impact Statement.

Very truly yours,

W. Y. Thompson
Chairman of the Board

dmc

cc: Office of Environmental Quality Control
DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII 96859

Office of the Governor
State of Hawaii
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Carl P. Rodolph
Colonel, CE
Director of Facilities Engineering
Department of the Army
Headquarters United States Army
Support Command, Hawaii
Fort Shafter, HI 96858

Dear Colonel Rodolph:

SUBJECT: NAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Sincerely,

CARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

Copies furnished:
Office of the Governor
State of Hawaii
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Department of Land and Natural Resources
Division of State Parks
1151 Punchbowl Street
Honolulu, Hawaii 96813

January 30, 1978

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
P. O. BOX 438
HONOLULU, HAWAII 96808

CARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

Thank you for your review of the subject Environmental Impact Statement.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

dar

cc: Office of Environmental Quality Control
Department of Land and Natural Resources
Division of State Parks
1151 Punchbowl Street
Honolulu, Hawaii 96813

Gentlemen:

We received the Environmental Impact Statement entitled Makua-Kalana State Park and have the following comments to offer for your consideration.

We note that the tsunami hazard zones delineated on Figure 2-8 and discussed on Pages 2-20, 21 of the EIS is based upon the 50-foot elevation contour line. A Corps of Engineers Waterways Experiment Station report on Tsunami runup at Kaena Point shows that the hazard zones may not be as extensive as the EIS suggests. We have included for your use two copies of data from the NES study which give specific tsunami runup elevations for the 50-, 100-, 500-year tsunami events.

Sincerely yours,

[Signature]
KISIK OHMAI
Chief, Engineering Division

Copies Furnished:
Office of Environmental Quality Control
550 Haleakula Street, Room 301
Honolulu, Hawaii 96813

<table>
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<th>Site No.</th>
<th>Elev. of Tsunami (feet)</th>
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<tr>
<td>1</td>
<td>18.5 27.5 48.5</td>
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<tr>
<td>2</td>
<td>16.8 26.5 42.3</td>
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<td>3</td>
<td>12.9 22.5 39.0</td>
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<td>4</td>
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<td>12.3 16.5 28.2</td>
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<tr>
<td>105</td>
<td>21.9 30.0 50.0</td>
</tr>
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</table>

Elevation of tsunami (map datum) at approximately 200 ft inland from the shoreline.
January 30, 1978

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Engineer District, Honolulu
Bldg. 230
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

SUBJECT: MAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. Your comments regarding tsunami runup at Kaena Point is gratefully acknowledged.

Very truly yours,

W. M. Thompson
Chairman of the Board

cc: Office of Environmental Quality Control
Department of Transportation
United States Coast Guard

Commander
Fourteenth Coast Guard District
Prince Kalanihaanole Federal Bldg.
300 Ala Moana Blvd.
Honolulu, Hawaii 96810
Phone: 808-546-7510

16475
2-3 Dec 1977

H. G. Holmgren
Captain, U. S. Coast Guard
Chief of Staff
Fourteenth Coast Guard District
Acting

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIvision of State Parks
P. O. Box 921
Honolulu, Hawaii 96802

January 30, 1978

H. G. Holmgren
Captain, U. S. Coast Guard
Fourteenth Coast Guard District
Prince Kalanihaanole Federal Bldg.
300 Ala Moana Blvd.
Honolulu, HI 96850

Dear Captain Holmgren:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. The Coast Guard's 20-foot wide right-of-way to the Kaena Point Light Station will not be impaired by the control of public access to Kaena Point.

Very truly yours,

W. I. THOMPSON
Chairman of the Board

Copy to:
Governor, State of Hawaii
Dept. of Land & Natural Resources
Commander, EA-WP/71
EPA Washington
DEQD Hawaii

cc: Office of Environmental Quality Control
Environmental Quality Commission
Office of the Governor, State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Captain Hystedt:

SUBJECT: MAKUA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Very truly yours,

W. H. THOMPSON
Chairman of the Board
dmr

cc: Office of Environmental Quality Control
Mr. William Waters
Acting Superintendent
Department of Education
P.O. Box 2368
Honolulu, HI 96804

Dear Mr. Waters:

SUBJECT: MAKAU-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your comments on the subject Environmental Impact Statement.

We are pleased that you concur with our concept of preserving this area while providing recreational needs of the public.

Very truly yours,

W. W. THOMPSON
Chairman of the Board

cc: Office of Environmental Quality Control
Office of Environmental Impact Statement
550 Halekauwila St., Rm. 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement
Makua-Kaena State Park, Oahu, Hawaii

The above-captioned document is a result of a cooperative effort between the Department of Transportation and the Department of Land and Natural Resources. We have no comments to offer which could improve the Statement.

Sincerely,

E. Alyce Hatfield
Director

Mr. Ryokichi Higashionna, Ph.D.
Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Higashionna:

SUBJECT: MAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your department's review of the subject Environmental Impact Statement.

Very truly yours,

W. F. Thompson
Chairman of the Board

cc: Office of Environmental Quality Control
November 29, 1977

Ref. No. 5085

TO: Dr. Richard E. Harland, Director
   Office of Environmental Quality Control

FROM: Hideto Kono, Director

SUBJECT: Environmental Impact Statement for Makua-Kaena State Park

We have reviewed the subject EIS and find that, in general, it has adequately evaluated the primary and the secondary environmental impacts which could be anticipated from the implementation of this project.

We are pleased to note that our previous comments made in regard to the EIS preparation notice of this project were satisfactorily addressed in this document.

Thank you for the opportunity to review this statement.

cc: Hon. William Y. Thompson

Mr. Hideto Kono
Director
Department of Planning and Economic Development
250 South King Street
P.O. Box 2359
Honolulu, HI 96804

January 30, 1978

Dear Mr. Kono:

SUBJECT: MAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

dnr

cc: Office of Environmental Quality Control
Office of Environmental Quality Control
550 Halekauwila St., Rm. 301
Honolulu, Hawaii 96813

Dear Mr. Cox:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

We acknowledge receipt of your letter dated December 29, 1977, stating that the Environmental Center will not participate in a formal review due to constraints in time and available personnel.

Very truly yours,

Chairman of the Board

cc: Office of Environmental Quality Control
December 7, 1977

Hr. W. Y. Thompson
Director, DLNR
Division of State Parks
1131 Punchbowl St.
Honolulu, Hawaii 96813

Dear Hr. Thompson:

We have reviewed the Makua-Kaena State Park EIS and have no comment. Thank you for the opportunity to review this EIS. We are retaining the EIS for our files.

Sincerely,

Reginald H. F. Young
Asst. Director, WRRC

cc: OEQC

January 30, 1978

Mr. Reginald H. F. Young
Assistant Director
Water Resources Research Center
2540 Dole Street
Honolulu, HI 96822

Dear Mr. Young:

SUBJECT: MAKUA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

dmr

cc: Office of Environmental Quality Control
16 December 1977

Governor, State of Hawaii  
Office of Environmental Quality Control  
550 Kaeauaum St.  
Rm. 301  
Honolulu, Hawaii 96813

Gentlemen,

I have reviewed the Environmental Impact Statement for the proposed Hakua-Kaena State Park. Please accept my following comments:

I am most pleased to see that the proposed plan involves minimal development. Kaena should be preserved as a wilderness area. The control points at Keawaulea and Hakulaia, however, should be developed as recommended. I am strongly in favor of the vehicular barriers but will these barriers also be effective in excluding motorcycles and city moped bikes? Will the barriers be vandal-proof? Will there be 24-hour security?

According to Figure 1-6 the camping and picnic area in Peacock Flats appears to be in an area of secondary vegetation and not in the native forest. This is an excellent idea as the native forest cannot tolerate such an activity over many years. Peacock Flats and the Bike Site will be high usage areas which are very close to sections of pristine native forest. Some provision should be made to limit or otherwise regulate the number of people hiking through these fragile areas.

One of the recommendations for the Kaena portion of the park is to "Establish or designate a corridor for future public transportation access." I cannot understand how such a corridor for public transportation (in mass transportation?) can be in consonance with the spirit and philosophy of a wilderness park. Is this an attempt to put a highway around the point?

Host of the recommendations proposed in the EIS are quite valid and the basic philosophy of a wilderness park for education as well as recreation is admirable. However, the public must be educated; the public should come to appreciate the uniqueness and fragility of our ecosystems. Informational and interpretive signs, no matter how comprehensive, are insufficient. In addition to the physical structures, a multi-media ecological program should be developed and made available to the mass media, schools and interested organizations.

Thank-you for allowing me to share these ideas.

Aloha,

Kenneth M. Nagata  
Research Associate

---

University of Hawaii at Manoa

Harold L. Lyon Arboretum  
3800 Mauna Road, Honolulu, Hawaii 96822
Mr. Kenneth H. Nagata
Research Associate
Harold L. Lyon Arboretum
3860 Manoa Road
Honolulu, HI 96822

Dear Mr. Nagata:

SUBJECT: MAKUA-RAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. Your comments are addressed in the order presented in your letter.

The vehicular barriers were recommended to prevent all non-authorized motorized vehicles from passing the control points. The exact type of barrier has not been determined, however, a vandal-proof barrier is difficult to achieve. The resident caretaker will provide an added measure of security which should minimize vandalism.

The use of the upland mountain sector will be controlled. The Division of State Parks will control access to this area and require permits for camping at Peacock Flats and the Nike Site.

The sentence "Establish or designate a corridor for future public transportation access" should read "Establish or designate a corridor for possible future public transportation access." An access corridor has been designated in the Conceptual Plan in the event that alternative transportation nodes are required to meet future needs, as designated by community desires. This is explained on page 9-1 under

We agree that the public should be educated about ecosystems and it is our intention that the provision of informational and interpretive signs will be a beginning to this process. We feel that by preserving this unique area, its assets can be retained for the benefit of future education about this ecosystem.

Thank you for your thorough analysis and comments on our document.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

cc: Office of Environmental Quality Control
December 21, 1977

Governor, State of Hawaii
Office of Special Programs and Community Services
550 Halekauwili St.
Honolulu, Hawaii 96813

Dear Sir,

The following comments on the "Environmental Impact Statement for Makua-Kanekoa State Park" were contributed by Bert Kimura (Instructor, Chemistry), Jack Zimmermann (Instructor, Social Sciences), and Ken Kim (Instructor, Math and Sciences).

Water Development

A well may not be appropriate for water development if its water quality does not meet applicable use criteria (e.g., too much chloride for coastal wells). What is the most probable location of a well and for what uses is it required? What will its water quality be? (vii)

Scientific Findings

Are the marine fossils found at Koʻena of any scientific value or otherwise? The paleontological significance of these fossils should be documented prior to park development, if this has not been accomplished. (2-7)

Flora & Fauna

References must be made to specific literature and communications used in constructing the flora and fauna data (as done in section XII, Archaeology). Area survey limitations such as dates of survey, areas covered, and methods used should be discussed. (2-12)

While the destruction of some vegetation is admitted to have a slight negative impact, a more significant indication of damage would be a listing of any endemic and endangered species that are to be removed in the specific areas to undergo development.

Governor, State of Hawaii
December 21, 1977
Page 2

Endemic Insects

Recognition of endemic insects is commendable. Were field surveys conducted in an attempt to confirm the presence of suspected species within the project areas? One response (Barbara A. Mount) received during the consultation period suggests that a knowledgeable and willing informant may be available. Are there other unique groups of insects suspected of inhabiting the project areas? Documentation on this subject will be critical for any future modifications of the upland park sites and surrounding areas. (2-10)

Archaeological Sites

Is there any potential for the restoration of archaeological sites mentioned? Will consideration be given for the eventual restoration of some sites prior to implementation? (2-28)

Introduction of Exotic Flora

An extremely critical secondary negative impact due to increased recreational activity is the eventual introduction of noxious weeds and other exotic flora especially into native forest and critical coastal habitats. Some concern has been raised that Chladiola hirta has become widespread throughout the Koʻulaus with assistance from the mongoose since 1960. Efforts are being made to retard its invasion into the native forests of the Waiʻaku Mountains (Honolulu Star-Bulletin, February 21, 1977, A-11). More emphasis should have been given to this regard. It is very briefly mentioned on page 4-11. (4-5, 4-10, 4-11, 4-12)

Unauthorized Structures

The removal of unauthorized structures on Makua Beach should have highest priority upon project implementation. In view of the failure of DOT regarding analogous structures on Makua, the success of the State Park may be severely hampered by this seemingly simple task if it is not accomplished. A waiting period or inaction will simply make it more difficult in the future. (5-3, 10-1)

Future Needs

What types of future needs, if any, are being anticipated which would justify some of the alternative concepts considered?
Urban Development

The impact of no road versus a highway through the park that will carry motorized vehicles on urban development in the adjacent area should be discussed. This secondary impact can be seen as either positive or negative given the interpretation of local government and communities. Since no road would lessen the future development of both coastal areas and is in agreement with current planning goals to keep these areas rural, the effect seems to be beneficial.

Security

The media frequently runs stories of theft and violence that occur in public parks. Due to the limited access, what type of security measures will be taken and what demands will be made of the local policy force? This is certainly a secondary social impact.

Alternatives

In the light of the opening paragraph (alternative III on page 6-21), implementation of the proposed plan should consider the probability and time frame for some of the options proposed under Alternative III.

Summary

Our compliments to the Division of State Parks and Hawaii Design Associates, Inc. for an EIS well prepared, organized, and presented. A commitment to minimum development best serves the interest of the people of O'ahu and will preserve the integrity of Mānua-ka'ena. Measures to prevent further environmental degradation are sorely needed and we hope that DHNR, DOT, and the Governor will take immediate action upon acceptance of this EIS.

Sincerely yours,

[Signature]
George M. Kiyomi
Community Information and Resource Center

cc: Department of Land and Natural Resources
Waialua Community Association
Mānana Community Association
Mānana Neighborhood Board

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
M.N. BOX XI
HONOLULU, HAWAII 96820

January 30, 1978

Mr. John E. Moriyama
Community Information and Resource Center
Leeward Community College
96-045 Ala Ike
Pearl City, HI 96782

Dear Mr. Moriyama

SUBJECT: HAKUA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for reviewing the Environmental Impact Statement for the proposed Hakua-Kaena State Park. Your comments are addressed in the order they were presented in your letter.

Water Development

An existing well will be located adjacent to the high use recreational areas at Keawaulei will be refurbished. The well is anticipated to supply non-potable water for restroom facilities and irrigation. The well will be monitored to ensure that the safe yield will not be exceeded. In the future, potable water is expected to be obtained from wells drilled further south.

Scientific Findings

The marine fossils at Kaena are of unknown scientific value and their paleontological significance can be investigated as funds become available.
Flora and Fauna

As noted on page 2-12, the biological information contained in this section is based on existing literature, general area surveys, and personal communications with people familiar with the area. While the archaeology section contained references to specific literature, we discovered that this was not possible for the biological section because of the countless fragments of information necessary to prepare an accurate, general description of the study area which encompassed 15,700 acres. The dates of specific surveys, areas covered and methods used are available for your perusal, however as previously noted, the inclusion of this information in the text would only serve to confuse the general public.

Specific areas to be developed will be surveyed for the presence of endemic and endangered species. Every precaution will be taken to avoid disturbance of any endemic or endangered species found and alignment of construction will be coordinated with the contracted survey biologist. The proposed plan is to aid in the establishment and maintenance of native species wherever possible.

Endemic Insects

Field surveys were not conducted for endemic insects. The distribution and speciation of insects in the area is extremely difficult to study as evidenced by the lack of literature on this subject. Other unique insects probably inhabit the study area. Future modifications of the upland park area and surrounding areas should address anticipated impacts to the native flora and fauna, including insects.

Archaeological Sites

Restoration of archaeological sites mentioned in the text is dependent on historical importance and availability of funds. The preservation and restoration of important archaeological sites is the responsibility of the Historic Preservation Office. Within the study area, only one site is listed in the Hawaii Register of Historic Places. This is the remains of a fishing camp located at Kaena Point beneath the light station. Additional information is presented on page 2-30 and figure 2-9. State archaeologists are working in the area in order to check development sites and salvage any material found. Some significant findings have been made and sites with interpretive value will be stabilized.

Eventual restoration of some sites has already been given as an example of the recommendation to remove graffiti from Kaneana Cave and maintain the area. Kaneana Cave, identified as site 177 by McAllister, was reported to be "the dwelling place of a shark goddess who held away from Kaena Point to Keahiki Point." Additional restoration efforts were not included in the minimum development concept. Future needs and considerations may justify some of the alternative development concepts, such as the restoration of the Ukanipu Heiau, which is one of the alternatives presented on page 6-2. Legendary values will also be considered.

Introduction of Exotic Flora

We agree that increased recreational activity probably will lead to eventual introduction of noxious weeds and other exotic flora. Although people, of course, are only one of several ways plants are introduced. The conceptual plan, as addressed in the EIS, actually will benefit the critical coastal habitat found at Kaena Point by restricting vehicular access. The Department of Land and Natural Resources plans to conduct a public awareness program through the use of brochures and signs. This and the maintenance program should help preserve critical areas.

Unauthorized Structures

Your comment on the removal of unauthorized structures on Makua Beach is acknowledged.

Future Needs

Some of the alternative concepts presented could be justified by a change in public desires and needs as determined by the public.

Urban Development

The EIS for the proposed Makua-Kaena State Park is based on the conceptual plan accepted by the Board of Land and Natural Resources. The recommendation to restrict vehicular access to Kaena Point is analyzed in the EIS. An impact of a highway through the park should be addressed in a separate document if a highway becomes a viable possibility.
Security

Resident caretaker facilities will be constructed at Hakua and Keawaula Beaches, Camp Erdman, and Peacock Plats to provide maintenance and security services for the park. The Waianae and Wahiawa police stations will still have jurisdiction within their respective districts, but the resident caretakers will have a positive impact on the local police force by alerting them of theft and possible violence. The impact of specific recommendations on the police force is presented under Public Facilities and Services on the impact analysis worksheets at the end of Section 4. The plan also recommends that park rangers be hired to patrol the park.

Alternatives

The proposed plan includes specific recommendations selected after careful examination of various alternatives. Those concepts not selected are listed on pages 6-2 to 6-7. These alternatives may be justified in the future; however, a new assessment would be necessary should an alternative become viable.

Thank you for your kind comments, thorough evaluation, and participation in the review of the Hakua-Kaena Environmental Impact Statement.

Very truly yours,

W. V. THOMPSON
Chairman of the Board

dnc

cc: Office of Environmental Quality Control
To: Office of Environmental Quality Control
Subject: EIS for Makua-Kaena Park
Makua-Kaena Point, Oahu, Hawaii

The Department of Agriculture has reviewed the subject EIS. Our only suggestion is that you may wish to include a statement that there are no "prime" or "unique" agricultural lands located within the proposed park boundaries. Such a statement could be of value should the decision be made at a later date to seek federal funds for the park's development.

We appreciate the opportunity to comment.

JOHN FARIAS, JR.
Chairman, Board of Agriculture
cc: Office of Environmental Quality Control

Mr. John Farias, Jr.
Chairman, Board of Agriculture
Department of Agriculture
1428 South King Street
Honolulu, HI 96814

Dear Mr. Farias:

SUBJECT: MAKUA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for your comments on the subject Environmental Impact Statement.

Your suggestion to include a statement that there are no "prime" or "unique" agricultural lands located within the proposed park boundaries will be incorporated in the revised EIS.

Very truly yours,

W. L. THOMPSON
Chairman of the Board

cc: Office of Environmental Quality Control
TO: Environmenhal Quality Commission
550 Haleakula St., Room 301
Honolulu, Hawaii 96813

FROM: Andrew I. T. Chang, Director
Department of Social Services and Housing

SUBJECT: Environmental Impact Statement - Kaena-Kaena State Park

We have received the subject EIS and are general accord with the accepted plan. We urge further consideration be given in the area of unresolved issues regarding access to the proposed park for elderly and handicapped persons. This should not necessarily compromise the proposals for limited access by trails only or access by special purpose vehicles such as Handicabs, etc.

We are returning the EIS for your further usage.

Thank you for the opportunity to review and consent.

Attachment

cc: Governor (Ofc. of Environ. Quality Control)
Dept. of Land & Natural Resources,
Div. of State Parks

Mr. Andrew I. T. Chang
Director
Department of Social Services
and Housing
1390 Miller Street
Honolulu, HI 96813

Dear Mr. Chang:

SUBJECT: MAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Minimum development will not preclude use of and is designed to improve the quality of existing beach recreation. The difficulty the elderly and the handicapped would encounter with the proposed park concept would be the limited access around Kaena Point to pedestrian access.

The EIS addresses the accepted conceptual plan, which is subject to change depending upon community desires. A change in the plan to accommodate transport of special groups around the point would be a policy decision to be made at a later time.

Very truly yours,

Chairman of the Board

cc: Office of Environmental Quality Control
5) Existing land use and ownership. There is no discussion of the squatter problem in this section (p. 3-2). How many illegal structures are there? How many persons would be affected by the removal of the structures?

6) The creation and maintenance of trails will have a long term impact on the native flora in the proposed natural area reserves and the different upland areas through the cutting and or removal of native species and the introduction of competitive exotic species. Will the maintenance program include the control of the spread of exotics throughout the park?

7) Alternative uses and development concepts. We wish to make two recommendations for this section of the EIS. a) There should be a brief discussion on how the consultation phase of the EIS process aided in the development of the proposed alternative uses and development concepts for the proposed park. Reference should be made to the extensive comments presented in Section 12. b) The potential environmental impacts of the alternatives should be identified in a form similar to that of the impact analysis worksheets found in section 4 of the EIS. This would show the greater magnitudes of the impacts associated with the medium/maxium development alternatives. We note that many potential impacts were pointed out by the persons and agencies consulted.

8) Mike Site (p. 4-6). What is the difference between the proposed development and that shown here under alternative uses? They appear quite similar.

9) The quote on page 7-1 of the EIS Regulations, section 1-42 (h) needs a correction. After "...trade-offs between short-term..." insert "environmental gains at the expense of long-term..."

10) The potential environmental education spinoffs from this EIS should be recognized. The information presented in the EIS should be useful in any environmental education programs which the Nakua-Kaena area as a study area.

The EIS Regulations (section 6, 1:62) allows the accepting authority or his authorized representative to consider responses received after the fourteen day response period. This Office will consider responses after the fourteen day period since more than fourteen days might be required to prepare adequate responses.

Thank you for allowing us to review this EIS.
List of comments received on the Environmental Impact Statement for Hakua-Kaena State Park, Oahu (DLNR)

State Agencies
- Dept. of Accounting and General Services 12/8/77
- Dept. of Agriculture 12/14/77
- Dept. of Education 11/28/77
- Dept. of Planning and Economic Development 11/19/77
- Dept. of Social Services and Housing 12/12/77
- Dept. of Transportation 12/19/77
- University of Hawai‘i 12/14/77
- Harold L. Lyon Arboretum 12/21/77
- Leeward Community College 12/7/77

Federal Agencies
- Dept. of the Army 11/28/77
- Fourteenth Naval District 12/2/77
- Dept. of the Air Force 12/6/77
- Soil Conservation Service 12/7/77

City and County of Honolulu Agencies
- Dept. of General Planning 12/6/77
- Dept. of Housing and Community Development 11/30/77
- Dept. of Land Utilization 12/14/77
- Dept. of Parks and Recreation 12/15/77
- Dept. of Public Works 11/25/77
- Dept. of Transportation Services 12/20/77

Others:
- Victoria A. Panucci 12/19/77

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
P.O. BOX 131
HONOLULU, HAWAI‘I 96809

January 30, 1978

Mr. Harry Akagi
Acting Director
Office of Environmental Quality Control
550 Halekauwila Street
Room 301
Honolulu, HI 96813

Dear Mr. Akagi:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. Your comments are addressed in order of their comments.

1. This will be corrected in the EIS.

2. The actual amount of funding previously appropriated will be incorporated in the section on phasing and funding.

3. "Recorded runoffs" has been corrected to read "recorded runups". An emergency warning system to warn park users of a potential tsunami has been considered. The Department of Land and Natural Resources will be coordinating this effort with local police and civil defense officials.

4. Thank you for the additional information. It will be incorporated into the oceanography section.
5. The squatter problem is discussed in other sections of the EIS. Section 3 describes how the proposed action conforms or conflicts with approved or proposed land use plans, policies and controls. We felt it better to address the squatter situation in Section 10, Unresolved Issues. The number of illegal structures varies, however, during one survey there were 52 structures, 10 tents, 2 campers and 1 bus. Numbers of squatters are unavailable. It appears that the majority of squatters are not full-time residents, but use the area as a weekend retreat.

6. Controlling the spread of exotics throughout the park may be unrealistic because of the many species of exotics and because of funding limitations. However, exotics will be controlled where this is practical. For the foreseeable future only existing trails will be used. Our intention is to establish, maintain, and thereby preserve various native species at certain locations. This should enable us to preserve as many unique habitats as possible.

7a. Alternatives to the proposed Hakua-Kaena State Park were developed and the consultation period (which included public meetings, organizational meetings, opinion polls and solicited comments) established which option was to be implemented. A discussion on how the plan was formulated is presented on page 1-2 and 6-2.

7b. Impact analysis worksheets for the alternative concepts would require an additional 18 tables for purposes of comparison (2 alternatives x 9 sectors). Since both alternatives would have involved greater environmental tradeoffs than the proposed concept, we felt that the additional tables were unnecessary and would have defeated their purpose by creating confusion.

8. The proposed plan primarily calls for making the Nike Site available for recreational use while the alternative recommends various measures which will make the site more attractive to users.

9. The quote on page 7-1 will be corrected.

10. Thank you for commenting on the potential value of this document for environmental education of the Hakua-Kaena area.

We hereby acknowledge the extended period for responses. Thank you for your thorough analysis and comments on the subject EIS.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

dmr

cc: Office of Environmental Quality Control
To: Dr. William J. Thompson, Chairman
Department of Land & Natural Resources

Subject: Environmental Impact Statement (EIS) for Hakua-Kanea State Park, Hakua-Kanea Point, Oahu, Hawaii

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we have no objections to the project as the final plans are submitted to this office for review.

Very truly yours,

cc: Office of Environmental Quality Control

James S. Kumagai, Ph.D.
Deputy Director of Health
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801

January 30, 1978
Dear Dr. Harland:

Subject: Environmental Impact Statement for Hakua-Kaena State Park

The subject project will not have any adverse environmental impact on any existing or planned facilities serviced by our department.

Thank you for this opportunity to comment.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

cc: Office of Environmental Quality Control
Office of Environmental Quality Control
350 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: HAKUA-KAENA STATE PARK - ENVIRONMENTAL
IMPACT STATEMENT COMMENTS REQUESTED
NOVEMBER 21, 1977

1) The EIS does not adequately address the specific types of
recreational activities (both positive and negative) that
will be impacted by park development. For example, in
Section 4-A, under Secondary Negative Impacts, the EIS
states “limiting motorized accessibility will not prevent
recreational use of the area.” This conflicts with impact
analysis worksheets found in the same section which show
negative impacts to several recreational activities as a
result of limiting vehicular access.

2) The EIS does not provide information on the projected number
of users and the amount of facilities needed to accommodate
them. Projected traffic volumes on Farrington Highway with
park development should be included. Without this data, it
is impossible to determine sufficient parking capacity to
avoid “bottlenecks” at the control points.

Sincerely,

Robert T. Fukuda
Acting Director
Department of Parks
and Recreation
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Fukuda:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for reviewing the Environmental Impact
Statement for the proposed Makua-Kaena State Park. Your
comments are addressed in the order presented in your
letter.

1. The impact analysis worksheets at the end of
Section 4 addresses specific types of recrea-
tional activities that will be impacted by each
recommendation of the recreational conceptual
plan. As stated at the beginning of Section
4, the discussions in this section summarizes
anticipated environmental impacts by areas.
The statement “limiting motorized accessibility
will not prevent recreational use of the area”
means that although some activities will experience
negative impacts, these activities will not be
eliminated or prevented from occurring.

cc: Department of Land and Natural Resources
2. Approximately 1189 to 1723 individuals are expected to visit the park on a typical day. Capacity of parking lots at the control points will be established during the final design for the park. Use of the park is expected before many facilities are built and this use will be monitored. Initially, "informal" parking areas are planned.

Sincerely,

W. J. THOMPSON
Chairman of the Board

cc: Office of Environmental Quality Control
Mr. Kazu Hayashida  
Director  
Department of Transportation Services  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

Dear Mr. Hayashida:

SUBJECT: MAKUA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Very truly yours,

W.Y. THOMPSON  
Chairman of the Board

dar

cc: Office of Environmental Quality Control

Environmental Quality Commission  
550 Balclutha St., Room 301  
Honolulu, Hawaii 96813

Gentlemen:  

Makua-Kaena State Park  

We have reviewed the subject impact statement and are satisfied with their assessment of traffic impact of the project on the supporting street system.

Very truly yours,

[HOS] KAZU HAYASHIDA  
Director

cc: Gov. Ariyoshi  
Dept. of Land and Natural Resources
November 30, 1977

Environmental Quality Commission
550 Halekuwila Street, Rm. 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Makua-Kaena State Park Environmental Impact Statement

Thank you for giving us the opportunity to review the subject environmental impact statement.

We have no comments on the project.

Per your request, we are returning the copy of the EIS forwarded to us.

Sincerely,

TYRONE T. KUSAO
Director

Enc.
Gentlemen:

Subject: Environmental Impact Statement for the Proposed Hakua-Kaena State Park

We have reviewed the subject statement and have no additional comments.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of State Park, DLNR

cc: Office of Environmental Quality Control

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Miyahira:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement.

Very truly yours,

M. H. THOMPSON
Chairman of the Board

cc: Office of Environmental Quality Control
Honorable George R. Ariyoshi
Governor, State of Hawaii
c/o Office of Environmental Quality
Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96811

December 20, 1977

Dear Governor Ariyoshi:

Your Letter of November 21, 1977, Relating to Environmental Impact Statement for Makua-Kaena State Park, Oahu, Hawaii

We do not have any objections to the development of the proposed park. However, we request that the environmental impact statement discuss in more detail where the water will be needed, how much will be required and how these demands will be met. Since the park is remotely located from our water system, the statement should discuss whether sources in the area will be developed. The discussion should also consider developing brackish water supplies for park irrigation use in areas such as Keawaula Beach.

If you have any further questions on this matter, please call Lawrence Whang at 548-5221.

Very truly yours,

[Signature]

For Edward Y. Hirata
Manager and Chief Engineer

cc: Division of State Parks
Dept. of Land and Natural Resources
State of Hawaii

Mr. Edward Y. Hirata
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96813

January 30, 1978

Dear Mr. Hirata:

SUBJECT: MAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. An existing well will be refurbished above Keawaula Beach to provide water for irrigation and restroom facilities. The well is expected to supply non-potable (brackish) water for the previously mentioned uses and may be replaced.

Additional sources may be developed in the future. Details concerning how much water will be required and where it will be required will be ascertained in the design development phase, which will include detailed plans for the proposed recreation area.

Very truly yours,

W. H. THOMPSON
Chairman of the Board

dmr:

cc: Office of Environmental Quality Control
December 6, 1977

Dr. Richard E. Harland, Director
Office of Environmental Quality Control
State of Hawaii
550 Malawahila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Harland:

Makua-Kaena State Park
Environmental Impact Statement

We appreciate the opportunity to review the above-captioned Environmental Impact Statement.

We note that our comments for the EIS Preparation Notice regarding the relationship of facilities in the existing and proposed parks adjacent to the subject site and solid waste disposal in the upland areas were not addressed in the Final EIS. We feel that these matters should be discussed.

Thank you for providing us the opportunity to review and comment on the Environmental Impact Statement.

Sincerely,

Ramon Duran
Acting Chief Planning Officer

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January 30, 1978

Mr. Ramon Duran
Acting Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Duncan:

SUBJECT: MAKUA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. Your comments are addressed in the order presented in your letter.

As mentioned in page 3-8, the proposed Makua-Kaena State Park is expected to meet some of the recreational needs of SCORP Planning Areas 24 and 25 for picnicking, fishing, surfing, diving and hiking. The concept of Makua-Kaena State Park, however, would not directly relate to proposed parks adjacent to the subject site since community needs for active recreational pursuits, a function performed by County Governments, would be independent of the spirit of preservation of this resource for the people of the State.

As stated in SCORP (pg. 25):

*State Park development primarily relate to scenic, natural, historic or recreational areas of statewide significance. Presently, most State Park developments emphasize resource-oriented activities and conservation of significant resource areas.
...Due to restrictions necessary to assure conservation of natural areas, recreational pursuits therein are more limited; restrictions are necessarily more stringent in watersheds and other highly sensitive areas.

An inventory of recreational facilities in planning areas 24 and 25 can be found in the State Comprehensive Outdoor Recreation Plan of 1975 (SCORP).

Maintenance of the park will also include solid waste collection in the upland areas as well as the coastal areas. A trash removal program will be incorporated into the recommended measures for the upland areas and will be incorporated in the final plan.

Thank you for your thorough analysis and comments on the subject EIS.

Sincerely,

W. Y. THOMPSON
Chairman of the Board

dmr

cc: Office of Environmental Quality Control
Gentlemen:

Makua-Kaena State Park
Environmental Impact Statement

We have reviewed the above-captioned and are in accord with the objective of the proposed project: To preserve and enhance for present and future generations a natural, scenic and cultural resource of statewide significance.

By and large, we would encourage a minimum park development that would enhance the preservation of the amenities unique to this sensitive environmental setting. We would, however, look unfavorably upon any improvements that would attract undesirable urbanization or create irreparable damage to the authentic landscape of the area.

Although we find that the potential short- and long-term impacts and mitigation measures have been generally described, the EIS, nonetheless, lacks sufficient information to qualify as a full disclosure document. The EIS should have detailed, for example:

1. Precisely (on page 2-37), how sewage in the development site will be disposed of. Will cesspools provide a viable option?

2. Explicitly, indicate the estimated amount of solid waste material that might be generated from implementing this proposal, the method of disposing solid waste, the probable impacts on existing landfills, and revealing the parties responsible for handling solid waste in the area; and

3. The issue and apparent conflict with proponents of the "no vehicle" access around Kaena Point.

Since the proposed park development site, as reflected in the Conceptual Plan (Figure 1-31), lies within the Shoreline Management Area (SMA) established by Ordinance No. 4529, as amended, an SMA permit will be required. Therefore, subsequent to the acceptance of the revised Environmental Impact Statement by the Governor, the sponsoring agency (Department of Land and Natural Resources) may file a Shoreline Management Area application for a permit to proceed with the actions proposed.

We appreciate this opportunity to comment on this specific matter. If we can be of any assistance to you, please contact Mr. Joe Barientos of our staff at 523-4077.

Very truly yours,

GEORGE A. MORIGUCHI
Director of Land Utilization

GSM:ey

cc: DLNR
George S. Moriguchi
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Moriguchi:

SUBJECT: MAUKA-KAENA STATE PARK ENVIRONMENTAL IMPACT STATEMENT

Thank you for your comments on the subject Environmental Impact Statement. Our responses are presented in the order in which you commented. We appreciate your concurrence with our basic concept to preserve and to enhance a natural, scenic, and cultural resource.

We acknowledge your comment that you would not be favorable to improvements that would attract undesirable urbanization or create irreparable damage to the authentic landscape of the area. This, too, is a basic goal we are proposing in the spirit of the park concept.

1. The exact method for sewage disposal will be determined during the final design of the park. Cesspools will provide a viable option if they are determined to conform with regulations imposed by the jurisdictional State and County agencies. The County has determined that cesspools are adequate for the first restroom facilities under construction at Keawaula Beach.

2. During the fiscal year 1975-1976, 348,417 total tons were disposed at Oahu facilities. Deducting an average of 34,508 tons of demolition material disposed during 1975 results in about 503,917 tons per year (TPY). The defacto population for Oahu during 1975 was estimated at 759,700 individuals, resulting in a theoretical solid waste production of 0.66 TPY/individual or 3.6 lbs/day/individual. Approximately, between 1189 and 1733 individuals are expected to visit the park each day, during the park's first five years of operation, resulting in a theoretical solid waste production of between 2.14 and 3.20 tons/day.

The solid waste would be collected and disposed of by the State or by private collectors. The method of solid waste disposal probably will be by landfilling. Who will collect and how the refuse will be disposed will be determined later.

The Waianae Sanitary Landfill, Kawailoa Sanitary Landfill, and the Palailai Sanitary Landfill (privately owned) are in proximity to the project area. The Waianae and Kawailoa landfills each have about 3 years of landfill life remaining; the remaining life at Palailai landfill is unknown. Since the proposed project is not anticipated to substantially increase existing generation rates of solid waste in the project area, the proposed project should not adversely impact existing landfill lives. The City and County of Honolulu is proposing a Leeward Sanitary Landfill, which, because of its close location, would be beneficial for refuse operations of the park.

3. We feel the action of allowing only vehicles required for safety of users, management, and maintenance of the park will significantly improve existing conditions, and will be necessary for proper maintenance and use of the park. We do not feel that this would be incompatible with the issue of "no vehicle" access around Kaena Point.

Thank you for your information concerning the Shoreline Management Area (SHA) permit. We will file a SHA application for a permit to proceed with the proposed action upon acceptance of the revised EIS by the Governor.

Thank you for your thorough evaluation and review of our document.

Very truly yours,

W. Y. Thompson
Chairman of the Board

Note: The document includes a seal and the text "George S. Moriguchi Page 2" at the bottom right corner.
Good morning,

Thank you for extending to us an opportunity to review the Environmental Impact Statement for Hakua-Kaena State Park.

We are delighted to learn that the minimum development alternative has been selected. We support wholeheartedly the decision not to build a highway around Kaena Point.

This decision will minimize the adverse effects of urbanization that such a highway would bring to the communities along the leeward and windward coast. It will also help to preserve part of what little wilderness remains on Oahu.

Sincerely yours,

Stephen Okumura.

Stephen Okumura.
Dear Mr. Thompson,

May I first commend you on the excellently written E.I.S. for the Hakua-Kaena State Park. I have served as botanical consultant for the E.I.S. Corporation several times now and find that they always do a very professional job.

Following are several suggestions we think need to be considered:

- A survey of the plants in the areas to be grubbed and cleared should be made before work is initiated. The survey should be made after the rainy season begins. There is always the possibility of finding a rare or endangered plant.
- Areas where trails are to be improved or where new trails are planned should also be surveyed.
- The native seed/plant source for replanting should be obtained from within the boundaries of the proposed park area. This will ensure that the integrity of the gene pool within the area is preserved.
- The proposed Natural Area Reserves should be monitored for long-term effects. R. g. weeds, regeneration of native plants, fire-increased use will mean an increase in the number of fires in the area.
- Open the areas behind Hakua Valley to hunters; this would lessen pig damage.
- Several questions were left unanswered by the E.I.S. There was no indication of the projected number of people that will use the park. Will the fire and medical services be able to handle the large influx of people? What is the number of people that can be accommodated in the upland mountain sector? There should be a limit set up.
- How will the Natural Areas be policed? Who will police it? How do you keep people from ripping-off the rare and endangered plants before they become the past and extinct?

We will appreciate being informed of all future public meetings and plan discussions. Please feel free to contact us if we can be of any service.

Mahalo nui loa,

Winona P. Char
Secretary
Hawaiian Botanical Society

Ms. Winona P. Char
Secretary
Hawaiian Botanical Society
Department of Botany
University of Hawaii
Honolulu, HI 96822

Dear Ms. Char:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your review of the subject Environmental Impact Statement. Your comments are addressed in the order they were presented in your letter.

Areas that will require clearing and grubbing will be surveyed for the presence of rare and endangered plants before construction commences. Logistics problems may not enable survey to be conducted after the rainy season, but every precaution will be taken to assure that an endangered species be identified during the survey.

Areas where trails are to be improved or where new trails are planned will also be surveyed.

The Division of State Parks would be happy to coordinate plant selection and landscaping concerns with your organization.

The monitoring of the proposed Natural Area Reserves is contingent on the availability of funds and priorities. Construction of firebreaks and a public awareness program should lessen the danger of fire in these areas.
Your suggestion to open areas behind Makua Valley to hunters is acknowledged. The Division of Fish and Game regulates pig hunting in the forest reserves and open areas to hunters based on access, fire hazard, pig populations and other considerations.

The projected number of people that will use the park is not anticipated to increase significantly. In specific areas such as Kaena Point, controlled access will probably decrease the number of park users. Most of the recommendations for the park are designed to provide control and management. The most extensive improvements are planned for heavy use areas such as Keawaula, Makua, and the areas surrounding Camp Erdman where fire and medical services are readily available from nearby urban areas. Use of the upland mountain sector will be controlled by a permit system. The number of permits issued should control use of this sensitive mountain region.

Limiting access in the coastal area and a permit system in the mountain region should help preserve native species in the proposed Natural Area Reserves. If these areas are designated as Natural Area Reserves, the Department of Land and Natural Resources will have jurisdiction and will take appropriate action to regulate these areas.

We will inform you of future public meetings and planning discussions by mail or through notices in the public newspapers.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

cc: Office of Environmental Quality Control
Office of Environmental Quality Control  
550 Halekauia St  
Room 301  
Honolulu Hawaii  

Dec 19 1977

Dear Sirs,

Thank you for the copy of the Makua Kaena State Environmental Impact Statement. As a resident of the area I feel I have an expert and intimate knowledge of the area. I have two suggestions, both of which should be given your full and thorough consideration. These two matters are: the location of the day use camping area near Camp Erdman, and the public use of Peacock Plats.

Firstly, the Camp Erdman area; plans now call for the relocation of the road mauka of Camp Erdman and the establishment of a day use campground for the public on the Kaena side of the camp. This location is not the best place for such a camp. These are the reasons why:

1. The beach along the area (Erdman to the control point) is mostly rock cliff. The area that has sand is small and is filled with large rocks and boulders. The winter surf clears away most of the sand during the major portion of the year...this leaves a stretch of rocks and sandstone.
2. The beach is steep and there is little flat sandy area for sunbathing and other beach activities.
3. The area is windy.
4. The only sandy areas are where two seasonal streams run down to the ocean leaving the area wet and muddy.
5. There are Hawaiian burial grounds all along the area of beach and the immediate inland area.
6. There are several archeological sites mauka of the road along this area. This would prohibit any relocation of the road and grading of the land for a camp ground.
7. The swimming area is rocky and full of coral. There is little or no sandy/shallow water in which to swim.

I suggest that instead of developing this area as a day use campground, that instead you preserve it from heavy use and designate it as a trail area with identified and marked archeological sites. The beach area could be preserved for fishing, which is what this area is used most for at present. This way fishermen would not have to hike in past the control area for a quiet fishing area.

As a substitute for this area I suggest using the two mile stretch between the Mokuleia Beach Park and Camp Erdman. The area is in this area but that should be no problem since it is a recreational beach area and would not be out of place in the park. Part of this area (near the gravel pit) is already designated as a picnicing and camping and it would be easy to simply expand the area. The benefits of using this area are:

1. Easy access for the public.
2. The road need not be relocated.
3. There are little or no rocks on the beach in this area.
4. There are many excellent swimming, surfing, and diving sites in this area.
5. Past the airfield is a large flat area mauka of the road that can be expanded into a large camp ground.
6. There are wide sandy beaches.
7. There are many areas of shallow water without rocks and coral heads perfect for swimming and wading.

Secondly, I would like to comment on the idea of opening Peacock Plats to the public. The Impact Statement says on page 1-11 "Peacock Plats... is located close to pristine native forest areas containing spectacular views, native vegetation, and rare, endemic birds."

The Statement goes on to say that the eventual plan is to open Peacock Plats to general public use and to get public right away to the Nike road going up to the area.

Why would we want a pristine area exposed to the dangers of public day and camping use? Public use would be detrimental to the area and antithesis to the plan of preserving the Makua-Kaena area for these reasons:

1. Easier access to Peacock Plats would mean much easier access to the more pristine wilderness areas.
2. Trash would be a serious problem. Look at the beach area any day to see how the land is treated. I know because I pick up trash in the area weekly.
3. Fire threats would be a real and imminent danger.
4. Possible poaching of Mokuleia Ranch cattle.
5. Possible destruction of native plants by hikers and collectors given easy access to area.
6 Possible destruction of rare endemic birds by foolish hunters and collectors.

7 Limits would be placed on hunters. The area would have to be closed off to protect wandering picnickers.

I suggest that instead of wide public use the area be kept semi-closed. It could be regulated by issuing permits to hunters and hikers. Such a plan is used in the wilderness areas of the mainland with success. It keeps the areas open to the public but at the same time protects them from damage and over use.

I hope your office will take these suggestions under consideration and will act upon them. I have spent a lot of time in this area and know and love it well. The open areas of Hawaii are of utmost importance to the people. For this reason I strongly suggest that you include in the park the open beach front from the Mokuleia Beach Park to Camp Erdman. This land is open and a prime choice for public beach land. Regardless if you act on my other suggestions this one should be acted on. I would appreciate a response to my letter.

Mahalo Nui Loa

Victoria A. Paniccia
Waialua, Hawaii 96791

Dear Ms. Paniccia:

SUBJECT: HAKUA-KAENA STATE PARK
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your thorough evaluation and participation in the review of the subject Environmental Impact Statement. Your comments and suggestions concerning the Camp Erdman area and Peacock Flats are acknowledged. Your comments are addressed in the order presented in your letter.

1. As you point out in your letter, the proposed day use area on the Kaena side of Camp Erdman is not a good location for swimming. Therefore it is expected to attract fewer visitors than the protected leeward beaches such as Hakua. This area is designed for picnicking and camping activities only. Marked trails with interpretive and informational signs are planned for this area also. Any area to be modified will be cleared archaeologically and botanically before any construction commences. The concepts presented on Figure 1-3 are not definite locations and changes can be made when plans are finalized.

The land between Mokuleia Beach Park and Camp Erdman belongs to the U.S. Government and therefore cannot be included in the park. Funding for land acquisition is limited and these funds have been directed to purchase land needed to preserve the integrity of Kaena. I trust you will agree with our primary goal of preservation of the unique resources offered by this region.
2. Please note that the recommendation for public access states, "Obtain controlled public access to be regulated by DLNR, via the Hike access road." The recreational uses for the upland area will be strictly controlled by the Department of Land and Natural Resources. Park maintenance programs will handle trash problems, and firebreaks and a public awareness program will be instituted to minimize the danger of fires. The poaching of Hokuleia Ranch cattle is not anticipated to be a problem as this threat will not necessarily increase solely due to more public use. The presence of park personnel, informational and regulatory signs, and a controlled and regulated access is expected to provide the controls necessary to prevent destruction of the fragile ecosystem and uses conflicts.

Thank you for your thorough analysis of the EIS and genuine concerns expressed in your letter.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

dmr

cc: Office of Environmental Quality Control
appendix
CHECKLIST OF PLANTS

Families are listed alphabetically within each of four groups: Pteridophyta, Gymnospermae, Monocotyledonae and Dicotyledonae. Genera and species are arranged alphabetically. Taxonomy and nomenclature of pteridophytes follow Wagner's unpublished checklist of Hawaiian Pteridophytes except where more commonly accepted names are listed. Taxonomy and nomenclature of flowering plants follow St. John (1973). Common Hawaiian names used in the checklist are in accordance with Porter (1972) or St. John (1973).

For each species the following information is provided:

1. Scientific name.
2. Vernacular name, when commonly used, or Hawaiian name when known.
3. Status of the species. The following symbols are employed:
   - E endemic to the Hawaiian Islands, i.e. occurring naturally nowhere else in the world.
   - I indigenous, i.e., native to the Hawaiian Islands but also occurring naturally (without the aid of man) elsewhere.
   - X exotic, i.e., plants of accidental or deliberate introduction after the Western discovery of the islands.
   - P Polynesian introduction; it includes those plants brought by the Polynesian immigrants previous to Captain Cook's discovery of the island.


*endangered (a taxon which is in danger of extinction throughout all or a significant portion of its range - def. from Pub. Law 93205).
5. Distribution of species. An "X" indicates the presence or probable presence of a particular species in a given area. These indications are based on onsite surveys, literature reviews and personal communications with persons familiar with the project area. The absence of an "X" for any given area does not necessarily preclude the presence of the species in this area.
# MAKUA-KAENA

## CHECKLIST OF PLANTS

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<thead>
<tr>
<th>SCIENTIFIC NAME</th>
<th>COMMON NAME</th>
<th>STATUS</th>
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## DISTRIBUTION

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# Makua-Kaena

## Checklist of Plants

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## MAKUA-KAENA

### CHECKLIST OF PLANTS

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# Makua-Kaena

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# MAKUA-KAENA

**CHECKLIST OF PLANTS**

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# Makua-Kaena

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# MAKUA-KAENA

## CHECKLIST OF PLANTS

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## MAKUA-KAENA

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## MAKUA-KAENA

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## MAKUA-KAENA

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### MAKUA-KAENA

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## MAKUA-KAENA

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<tr>
<td><strong>URTIACEAE</strong></td>
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<tr>
<td>Doehmeria grandis</td>
<td>Akoka</td>
<td>E X</td>
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<tr>
<td>Neraudia melastomaefolia var. melastomaefolia</td>
<td>Ma'gloa</td>
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<tr>
<td>Pilea peploides</td>
<td>Poi</td>
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<tr>
<td>Pipturus albidus</td>
<td>Mamaki</td>
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<tr>
<td>P. oahuensis</td>
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<tr>
<td>Urea glabra</td>
<td>Opuhe</td>
<td>E X</td>
</tr>
<tr>
<td><strong>VERBENACEAE</strong></td>
<td></td>
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</tr>
<tr>
<td>Lantana camara</td>
<td>Lantana</td>
<td>X X X X X X</td>
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<tr>
<td>Stachytarpheta cayennensis</td>
<td>Vervain</td>
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### DISTRIBUTION

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<thead>
<tr>
<th>UPLAND</th>
<th>DRY FOREST</th>
<th>NEW FOREST</th>
<th>KOAKEYE DOG</th>
<th>KAENA POINT</th>
<th>VANDERB.COM STOPS AND GLOVES</th>
<th>VANDERB.COM COASTAL ZONE</th>
<th>VANDERB.COM REEFS AND TIDELANDS</th>
<th>MAKUA VALLEY</th>
<th>SLOPES AND REN</th>
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</thead>
<tbody>
<tr>
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Note: The table lists the scientific names of plants, their common names, and their status across different habitats and areas.
## MAKUA-KAENA

### CHECKLIST OF PLANTS

<table>
<thead>
<tr>
<th>SCIENTIFIC NAME</th>
<th>COMMON NAME</th>
<th>STATUS</th>
<th>UPLAND</th>
<th>COASTAL AREAS</th>
<th>NAUKUA VALLEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERBENACEAE continued</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>S. jamaicensis</td>
<td>Jamaica vervain</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbena littoralis</td>
<td>Wood verbena</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vitex ovata</td>
<td>Bench verbena</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>VIOGACEAE</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Isodendron longifolium</td>
<td>e</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Viola trachyphylla</td>
<td>Pamakani</td>
<td>X</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ZYGOPHYLLACEAE</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tribulus cistoides</td>
<td>Nolu</td>
<td>I</td>
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</tbody>
</table>
CHECKLIST OF FAUNA

Families are listed alphabetically under birds, mammals and Hawaiian land snails. Genera and species are arranged alphabetically. For each species the following information is provided:

1. Scientific name.
2. Vernacular name, when commonly used, or Hawaiian name when known.
3. Status of the species. The following symbols are employed:
   - E endemic to the Hawaiian Islands
   - I indigenous (native) in the Hawaiian Islands but also occurring naturally elsewhere
   - X an introduced species to Hawaii
   - P a species presumed to be of Polynesian introduction
4. Endangered Status -
   - *Endangered for the island of Oahu. Division of Fish and Game Regulation 6, August 1973.
   - **Endangered, State of Hawaii (Reg. 6) and Federal Register, October 27, 1976.
5. Distribution of species. An "X" indicates the sighting or probable presence of a species based on onsite surveys, literature reviews and personal communications with people familiar with the project area.
### MAKUA-KAENA

**CHECKLIST OF BIRDS**

<table>
<thead>
<tr>
<th>SCIENTIFIC NAME</th>
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<tbody>
<tr>
<td><strong>CHARADRIIDAE</strong></td>
<td></td>
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<tr>
<td>Arenaria interpres</td>
<td><strong>Ruddy turnstone, akeake</strong></td>
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<tr>
<td>Pluvialis dominica fulva</td>
<td><strong>Pacific golden plover, kolea</strong></td>
<td>I X</td>
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<tr>
<td><strong>COLUMBIDAE</strong></td>
<td></td>
<td></td>
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<tr>
<td>Geopelia striata</td>
<td><strong>Barred dove</strong></td>
<td>X X X</td>
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<tr>
<td>Streptopelia chinensis</td>
<td><strong>Lace-necked dove</strong></td>
<td>X X X</td>
</tr>
<tr>
<td><strong>DREPATIDAE</strong></td>
<td></td>
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<tr>
<td>Himatione sanguinea</td>
<td><strong>'Apapane</strong></td>
<td>E X X</td>
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<tr>
<td>Loxops maculata</td>
<td><strong>Oahu creeper</strong></td>
<td>E** X X</td>
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<tr>
<td>L. virens chloris</td>
<td><strong>Oahu amakili</strong></td>
<td>E X X</td>
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<tr>
<td>Ventilaria coccinea</td>
<td><strong>I'iwi</strong></td>
<td>X X X</td>
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<tr>
<td><strong>FREGATIDAE</strong></td>
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<td></td>
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<tr>
<td>Fregata minor palmerstoni</td>
<td><strong>Great frigate bird</strong></td>
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<tr>
<td><strong>FRINGILLIDAE</strong></td>
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<td></td>
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<tr>
<td>Carpodacus mexicanus frontalis</td>
<td><strong>House finch</strong></td>
<td>X X X</td>
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<tr>
<td>Lonchura punctulata</td>
<td><strong>Ricebird</strong></td>
<td>X X X</td>
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<tr>
<td>Vireoaria coronata</td>
<td><strong>Brazilian cardinal</strong></td>
<td>X X X</td>
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<tr>
<td>Passer domesticus</td>
<td><strong>English sparrow, house sparrow</strong></td>
<td>X X X</td>
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<tr>
<td>Richmondia cardinals</td>
<td><strong>Cardinal, Kentucky cardinal</strong></td>
<td>X X X</td>
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<tr>
<td><strong>MIMIDAE</strong></td>
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<tr>
<td>Mimus polyglottos</td>
<td><strong>Mockingbird</strong></td>
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<tr>
<td><strong>MUSCICAPIDAE</strong></td>
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<td></td>
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<tr>
<td>Chasiempis sandwichensis</td>
<td><strong>Oahu elepaio</strong></td>
<td>E X X</td>
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<tr>
<td><strong>PHAETHONIDAE</strong></td>
<td><strong>White-tailed tropic bird</strong></td>
<td>I X X</td>
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<tr>
<td><strong>PHASIANIDAE</strong></td>
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<tr>
<td>Alectoris graeca chukar</td>
<td><strong>Chukar</strong></td>
<td>X X X</td>
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<tr>
<td>Coturnix japonica</td>
<td><strong>Japanese quail</strong></td>
<td>X X</td>
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<tr>
<td>Francolinus erekeelli</td>
<td><strong>Erkeli's francoolin</strong></td>
<td>X X</td>
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<tr>
<td>Pavo cristata</td>
<td><strong>Pea fowl</strong></td>
<td>X X X</td>
</tr>
<tr>
<td>Phasianus colchicus torquatus</td>
<td><strong>Ring-necked pheasant</strong></td>
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# Makua-Kaena

## Checklist of Birds

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<tr>
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<tbody>
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<td><strong>Procellariidae</strong></td>
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<tr>
<td>Puffinus pacificus chlororhynchos</td>
<td>Wedge-tailed shearwater</td>
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</tr>
<tr>
<td><strong>Scolopacidae</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calidris alba</td>
<td>Sanderling, huna kai</td>
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</tr>
<tr>
<td>Heteroscelus incanus</td>
<td>Wandering tattler, 'ulili</td>
<td>I</td>
</tr>
<tr>
<td>Numenius tahitiensis</td>
<td>Bristle-thighed curlew, kioa</td>
<td>I</td>
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<tr>
<td><strong>Sturnidae</strong></td>
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<td></td>
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<tr>
<td>Acridotheres tristis</td>
<td>Common mynah</td>
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<td><strong>Strigidae</strong></td>
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<td></td>
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<tr>
<td>Asio flammeus sanwichensis</td>
<td>Pueo</td>
<td>E*</td>
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<tr>
<td><strong>Sulidae</strong></td>
<td></td>
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<tr>
<td>Sula sula rubripes</td>
<td>Red-footed booby</td>
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<tr>
<td><strong>Sylviidae</strong></td>
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<tr>
<td>Copyschus malabaricus</td>
<td>Shama thrush</td>
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<tr>
<td>Norcites cautans</td>
<td>Bush warbler</td>
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<tr>
<td><strong>Timaliidae</strong></td>
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<tr>
<td>Garrulax canorus</td>
<td>Melodious laughing thrush</td>
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<tr>
<td>Leiothrix lutea</td>
<td>Red-billed-leiothrix</td>
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<td><strong>Tytonidae</strong></td>
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<tr>
<td>Tyto alba pratincola</td>
<td>Barn owl</td>
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<td><strong>Zosteropidae</strong></td>
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<td>Zosterops japonica</td>
<td>Japanese white-eye</td>
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<thead>
<tr>
<th>Distribution</th>
<th>Upland</th>
<th>Ko'olaupoko</th>
<th>Kaena Point</th>
<th>Windward Tropical Forest</th>
<th>Windward Coastal Zone</th>
<th>Leeward Slopes and Valleys</th>
<th>Leeward Coastal Zone</th>
<th>Valley Floor</th>
<th>Forest and Run</th>
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# MAKUA-KAENA

**CHECKLIST OF MAMMALS**

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<thead>
<tr>
<th>SCIENTIFIC NAME</th>
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<tbody>
<tr>
<td>Bovidae</td>
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<td>Capra hircus</td>
<td>Goat, kau</td>
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<tr>
<td>Canidae</td>
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<tr>
<td>Canis familiaris</td>
<td>Dog, ilio</td>
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<tr>
<td>Equidae</td>
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<tr>
<td>Equus caballus</td>
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<td>Felidae</td>
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<tr>
<td>Felis catus</td>
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<tr>
<td>Muridae</td>
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<tr>
<td>Mus musculus</td>
<td>House mouse</td>
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<tr>
<td>Rattus exulans hawaiiensis</td>
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</tr>
<tr>
<td>R. norvegicus</td>
<td>Brown rat, iole</td>
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<tr>
<td>R. rattus</td>
<td>Roof rat, blackrat</td>
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<td>Suidae</td>
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<tr>
<td>Sus scrofa</td>
<td>Pig, pua'a</td>
<td>E</td>
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<tr>
<td>Vespertilionidae</td>
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<tr>
<td>Lasiurus cinereus semotus</td>
<td>Hawaiian bat</td>
<td>P**</td>
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<tr>
<td>Viverridae</td>
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<td>Herpestes auropunctatus</td>
<td>Mongoose, iole-manakuke</td>
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**DISTRIBUTION**

<table>
<thead>
<tr>
<th></th>
<th>UPLAND</th>
<th>COASTAL AREAS</th>
<th>MAKUA VALLEY</th>
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<td>GRASSLAND</td>
<td>DRY FOREST</td>
<td>NEW FOREST</td>
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# MAKUA-KAENA

## CHECKLIST OF HAWAIIAN LAND SNAILS

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<th>COASTAL AREAS</th>
<th>MAKUA VALLEY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACHATINELLIDAE</strong></td>
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<tr>
<td>Achatinella concavospira</td>
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<td>X</td>
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<td>A. lymania</td>
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<tr>
<td>A. mustelina</td>
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<td>X</td>
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<tr>
<td>A. sordida</td>
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<td>E</td>
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<td></td>
</tr>
<tr>
<td><strong>AMASTRIDAE</strong></td>
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<td>Amastra cornea</td>
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<tr>
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<td>E</td>
<td>X</td>
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</table>
REFERENCES


City and County of Honolulu. Oahu General Plan Map. 1964.


Holland, M. Helpful Hints for Shell Hunters. sponsored by Hawaiian Malacological Society.


Surfing Education Association. Statewide Surfing Site Inventory, prepared for Department of Planning and Economic Development. 1971.


