

JOHN WAIHEE
GOVERNOR OF HAWAII



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'93 APR -6
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

Keith W. Ahue, Chairperson
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANAIKE

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

APR 5 1993

FILE NO.: MA-1/26/93-2624
DOC. NO.: 2461

MEMORANDUM

TO: The Honorable Brian J. J. Choy, Director
Office of Environmental Quality Control

FROM: KEITH W. AHUE, Chairperson *KA*
Board of Land and Natural Resources

SUBJECT: Document for Publication in the OEQC Bulletin
Environmental Assessment for Conservation District
Use Application No. MA-1/26/93-2624 for the
Subdivision of Lands at Kipahulu, Hana, Maui, TMK:
1-6-10: 01

The above mentioned Chapter 343 document was reviewed and a negative declaration was declared based upon the final environmental assessment provided with the CDUA.

Please feel free to call me or Roy Schaefer of our Office of Conservation and Environmental Affairs, at 587-0377, if you have any questions.

cc: Chris Hart & Partners

1993-04-23-MA-PEA-Ka'apahu Subdivision CDCA

APR 23 1993

CDCA # MA - 2624 **FILE COPY**

KA'APAHU HOLDING COMPANY
FINAL
ENVIRONMENTAL ASSESSMENT
PROPOSED SUBDIVISION OF CONSERVATION DISTRICT
LANDS

TMK 1-6-10: 1
KA'APAHU, KIPAHULU, HANA
ISLAND OF MAUI



Prepared For

Mr. David Dodds
Ka'apahu Holding Company
561 Pi'iholo Road
Makawao, Maui, Hawaii 96768

Phone: (808) 572-0812

Prepared By

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January 1993

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- Map of Project Area showing sites discussed in the Phase I Archaeological Inventory text

AGENCY COMMUNICATIONS

- Letter dated December 21, 1992 from Mr. Don Hibbard, Administrator, State Historic Preservation Division, regarding historic preservation review of an archaeological report at Ka'apahu (Kipahulu), Hana, Maui.
- Letter dated June 8, 1992 from Mr. George Kaya, Director, Department of Public Works, County of Maui granting preliminary subdivision approval for the Ka'apahu Subdivision, TMK (2) 1-6-10: 01 (File No. 1.117).
- Response memorandum dated June 1, 1992 from Mr. David Craddick, Director, Department of Water Supply.
- Memorandum dated May 28, 1992 from Mr. Brian Miskae, Planning Director, advising that the proposed subdivision is exempt from the County's Special Management Area permit requirements.
- Response memorandum dated May 27, 1992 from Mr. Robert Siarot, Maui District Engineer, Highways Division, State Department of Transportation.
- Letter dated May 27, 1992 from Mr. Don Hibbard, Administrator, State Historic Preservation Division, regarding preliminary plat review of the Ka'apahu Subdivision.
- Letter dated May 19, 1992 from Mr. David H. Nakagawa, Chief Sanitarian, Maui District Health Office.

ARCHAEOLOGICAL INVENTORY SURVEY REPORT

- Kimberly D. Kornbacher, International Archaeological Research Institute, Inc., Archaeological Inventory Survey of Ka'apahu Subdivision Remnant Lots 5, 5, and 7 and the Hana Highway Corridor, Kipahulu, Hana, Maui, Hawaii, 1993.

**ENVIRONMENTAL ASSESSMENT REPORT
FOR THE SUBDIVISION OF LANDS
IN THE STATE CONSERVATION DISTRICT
SITUATED AT TMK 1-6-01: PORTION OF 1, KA'APAHU (KIPAHULU), HANA
ISLAND OF MAUI**

I. Identification of the Applicant

- A. Applicant: Mr. David Dodds, on behalf of the Ka'apahu Holding Company, 561 Piihola Road, Makawao, Maui, Hawaii 96768 (Res. Phone: (808) 572-0812).
- B. Applicant's Interest: Mr. Dodds is the General Partner of the Ka'apahu Holding Company, a Hawaii registered limited partnership, through the 3-D Corporation, a Hawaii registered corporation, of which Mr. Dodds is President-Director.
- C. Applicant's Agent: Mr. Christopher L. Hart or Mr. John E. Min, Chris Hart & Partners; Landscape Architecture and Planning, 305 E. Wakea Avenue, Kahului, Maui, Hawaii 96732 (Bus. Phone: (808) 871-5726/ FAX (808) 871-6706)

II. Approving Authority

Since the proposed action involves the subdivision of lands in the State Conservation District, the State Department of Land and Natural Resources is the accepting agency for Conservation District Use Permit applications and environmental assessment determinations.

The Board of Land and Natural Resources, State of Hawaii, is the approving authority for Conservation District Use Permit applications.

III. Agencies Consulted

A. County of Maui

- 1. Department of Planning (Written comments attached)
- 2. Department of Public Works (Written comments attached)
- 3. Department of Water Supply (Written comments attached)

B. State of Hawaii

- 1. Department of Transportation, Highways Division (Written comments attached)
- 2. Department of Land and Natural Resources, Historic Preservation Office (Written comments attached)
- 3. State Department of Health (Written comments attached)

IV. Description of the Site

A. Location: The subject property is situated in a remote and mountainous region of East Maui. It is located approximately 4 miles east of Kaupo and 13 miles south of Hana Town and is identified by TMK 1-6-01: 1, Ka'apahu, Kipahulu, Island of Maui.

B. Site Description: The subject parcel, comprising a total area of 1,478 acres, is currently configured as an *ahupua'a* running from the mountain to the sea. The *makai* portion of the subject parcel is bisected by the Hana Highway, a two-lane paved roadway that is the only public road access through this remote area of East Maui.

The portions of the site within the State Conservation District include the existing Hana Highway and 6.2 acres of shorefront lands, which are currently unimproved and generally unsuitable for development, due to cliff conditions or rocky substrata, flood hazard potential, and severe wind and ocean spray exposure.

The soils within this area are identified primarily as rock land (rRK) and for the portion at the mouth of Alelele Stream, stony alluvial (rSM). According to the U.S. Soil Conservation Service, rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops are mainly basalt and andesite and very shallow soils are the main characteristics. The natural vegetation at lower elevations consists mainly of kiawe, klu, pilgrass, Japanese tea and koa haole. This land type has a high shrink-swell potential that may affect the integrity of buildings, foundations and retaining walls on steep slopes, when the soil is saturated.

Stony alluvial land at the mouth of Alelele Stream consists of stones, boulders, and deposited soil. The natural vegetation consists of guava, kukui, hilograss and Christmas berry in wet areas. Improvement of this land is difficult because of the stones and boulders.

The average annual rainfall in the Ka'apahu area is over 100 inches per year.

C. Existing Uses: As previously noted, the existing Hana Highway, which is maintained by the County of Maui, traverses the *makai* portion of the parcel. The shoreline areas in the Conservation District, notably Remnant Lots 6 and 7, are currently used by local residents for fishing and swimming. Within the higher elevations of the *mauka* Agricultural District lands, limited timber harvesting occurs.

D. Surrounding Land Uses: The immediately surrounding properties are undeveloped. In general, the subject site is situated in a remote, mountainous and sparsely populated region of East Maui.

E. Land Use Designations

1. Hana Community Plan: Conservation (*makai* of Hana Highway) and Agriculture (*mauka* of Hana Highway)
2. State Land Use Classification: Conservation District (*makai* of Hana Highway) and Agricultural District (*mauka* of Hana Highway)
3. Conservation District Sub-Zone: Limited
4. Special Management Area: The subject parcel is within the Special Management Area, pursuant to HRS Chapter 205A.

F. Existing Utilities and Public Infrastructure

1. Water Service: none
2. Access: Hana Highway, a 16 foot-wide paved roadway.
3. Sewer: The Kipahulu area is not serviced by a waste water treatment system. Sewage disposal is handled by individual waste water disposal systems (i.e. cesspools; septic tanks).
4. Drainage: Storm water run-off is disposed of by sheet flow and diverted into existing streams that traverse the subject parcel.
5. Electricity and Power: none
6. Fire Protection Service: none

V. Description of the Proposed Action

The Applicant is proposing to subdivide a 1,478 acre parcel, comprising of approximately 1,472 acres in the State Agricultural District and 6.2 acres in the State Conservation District, Limited Sub-zone. The area of the Conservation District includes the existing 16-foot wide Hana Highway and *makai* shorefront lands.

On June 8, 1992, the County Department of Public Works ("DPW") granted a preliminary subdivision approval for three (3) large lots *mauka* of Hana Highway in the State Agricultural District, consisting of two 31-acre lots ("Lots 1 and 2") and a 1,409-acre lot ("Lot 3"). As a condition of approval, the DPW required that a 50-foot wide roadway lot for Hana Highway be

dedicated to the County of Maui. Currently, there is no defined public roadway lot for this section of Hana Highway.

In order to comply with this County requirement, it is necessary to subdivide portions of the parcel in the Conservation District. The proposed subdivision would consist of the Hana Highway Roadway lot ("Lot 4") and three (3) remnant shorefront parcels ("Remnant Lots 5, 6 and 7"). The total area of these lots is approximately 8.93 acres, as follows: Hana Roadway Lot (5.652 acres); Remnant Lot 5 (0.92 acres); Remnant Lot 6 (0.74 acres); and Remnant Lot 7 (1.62 acres). Approximately 6.2 acres of the total area is in the Conservation District.

The remnant parcels will remain as unimproved open space. The Applicant is not proposing any development, improvements nor change in use for these lands, which exhibit some severe topographic constraints (i.e. cliffs), rocky substrata, flood hazard potential, and severe wind and ocean spray exposure. Any future roadwidening within the Hana Highway Roadway lot by the County of Maui would require a separate Conservation District Use Permit.

The roadway lot will be dedicated to the County of Maui, in accordance with Maui County Code Title 18 relating to Subdivisions. Initially, the construction of subdivision improvements will be deferred, pursuant to Maui County Code § 18.16.270 relating to large lot subdivisions. All future subdivision improvements, including utility, infrastructure and road widening, will occur on lands in the State Agricultural District.

VI. Relationship of the Proposed Action to Objectives and Policies of the General Plan, Hana Community Plan and Other Applicable Land Use Regulations

- A. Maui County General Plan-- The proposed action will result in the creation of a public roadway lot and three remnant shorefront parcels in the State Conservation District. The roadway lot will be dedicated to the County of Maui. The shorefront parcels will remain undeveloped open space, consistent with the broad objectives and policies in the Maui County General Plan, pursuant to Ordinance No. 2039 (1991) amending Maui County Code Chapter 2.80.
- B. Hana Community Plan-- The proposed action is consistent with the concept of land uses designated in the Hana Community Plan. The land use designations in the existing Hana Community Plan of the County of Maui reflect the current State land use district boundaries, namely Conservation and Agriculture.
- C. Other Regulations-- The proposed action conforms with other regulations, as follows:

1. Special Management Area, pursuant to HRS Chapter 205A-- According to the Maui County Planning Department in a memorandum dated May 28, 1992, the proposed action is exempt from a County Special Management Area permit, pursuant to HRS Sections 205A-22 (B) (xi) and (xii). (See attached agency comments.)
2. Shoreline Setback Area, pursuant to HRS Chapter 205A-- The proposed action will not involve development or construction activity within the shoreline setback area nor changes in the current use or natural character of the area. Accordingly, the proposed action will not violate provisions of the County's shoreline setback rules and regulations, in accordance with HRS Chapter 205A.

VII. Identification and Summary of Major Impacts and Alternatives Considered

- A. **SHORT TERM--** The proposed action does not involve any improvements, construction nor change in use on lands within the State Conservation District.

Initially, the construction of subdivision improvements will be deferred, pursuant to Maui County Code § 18.16.270 relating to large lot subdivisions.

In general given the limited scale of the overall development, any short-term impacts associated with construction activities, dust, noise and traffic will be minimal and limited to lands *mauka* of Hana Highway in the Agricultural District.

B. **LONG TERM**

1. Traffic-- The proposed action is intended to comply with the County DPW's requirements for a 50-foot wide Hana Highway roadway lot, as part of a three-lot agricultural subdivision *mauka* of Hana Highway. Currently, there is no defined public roadway lot for this section of Hana Highway. The proposed roadway lot will be dedicated to the County of Maui based on agricultural roadway standards.

The proposed action will not directly affect traffic in the area along Hana Highway. Furthermore in terms of the overall development, any additional vehicular traffic generated by the three large agricultural lots will be minimal.

2. Sewage Disposal-- The State Department of Health (DOH) advises that individual wastewater systems are allowable as the number of dwellings and lot sizes meet the requirements of its agency rules, Chapter 11-62. The subject parcel is a critical wastewater disposal area and therefore wastewater disposal should be via an individual wastewater treatment system, in accordance with DOH design standards.
3. Relationship to Surrounding Land Uses-- The proposed action does not involve any improvements, construction nor change in the use on lands within the State Conservation District and therefore will not adversely impact surrounding land uses. Furthermore, the subdivision of three large lots in the *mauka* Agricultural District represents a density of one dwelling unit per 490 acres, in keeping with character of this remote and sparsely populated region of East Maui.
4. Drainage-- Storm water run-off will continue to be handled by percolation or be directed into natural drainage channels, notably the existing streams, that traverse the subject property and outlet at the shoreline. Again, the proposed action does not involve any improvements, construction nor change in use on lands within the State Conservation District.
5. Archaeological and Cultural Resources-- Since the general area is known to contain archaeological sites, a Phase I inventory survey was conducted within the area of the proposed Hana Highway Roadway Lot and *makai* remnant lots. A draft of this report has been reviewed by the State Historic Preservation Division.

Within Remnant Lot 5, a rockshelter was located west of Kalepa Stream (Site 3140), in addition to a terraced structure (Site 1130) identified in previous studies. The function of this structure is undetermined. No artifacts or midden were found but there is some sediment accumulation that might further reveal artifacts or cultural features useful in assessing its function.

Within Remnant Lot 6, a series of five stone terraces, two retaining walls, and one mound make up this complex at Alelele identified as Site 1129 in previous studies. An additional feature identified during the recent survey is a rockshelter (Site 3141) and appears to be a firepit or possibly a hearth or some sort of processing pit. The cultural deposit within the exposed alluvial sequence is significant under Criterion D of the State of Hawaii and National Registers of Historic Places and is in imminent danger of erosion by Alelele Stream and the ocean.

In addition within Remnant Lot 6, a subsurface feature (Site 3142) was recorded which is assumed to be a burial area because of its inaccessible location and constructed opening.

Within Remnant Lot 7, the Lelekea terrace complex (Site 1492) was previously identified and interpreted as an agricultural site, although there are structures that may have been used for habitation or some other purpose. In addition, the recent survey recorded four rockshelters (Sites 3144 and 3146) that may have been used to provide temporary shelter from the elements.

The proposed action does not involve any improvements, construction nor change in the use on lands within the State Conservation District and therefore will not adversely impact recorded archaeological sites. Phase II detailed mapping and testing will be conducted at a later date upon commencement of actual construction work. Preliminary indications from the State Historic Preservation Office are that the Phase I inventory is adequate and that Phase II work is not necessary at this time.

6. Flora and Wildlife-- The coastal sections of the site contain plant and wildlife species common to the area. The proposed action will not affect rare or endangered species of plant and wildlife.
7. Public Facilities and Services-- Given the scale and nature of the proposed action and three-lot subdivision in the *mauka* Agricultural District, minimal impacts are anticipated relative to available public services and facilities on the island, such as schools, parks, police and fire protection, social services and medical services.

The comments from reviewing agencies referenced in the DPW's preliminary subdivision approval letter dated June 8, 1992 do not raise concerns relative to major adverse impacts on public facilities and services.

8. Public Infrastructure, Solid Waste Disposal and Utilities-- Given the scale and nature of the proposed action and three-lot large lot subdivision, it is unlikely that existing public roadways and other infrastructure in the area will be adversely burdened.

The DPW's preliminary subdivision approval letter dated June 8, 1992 identifies specific infrastructural improvements that will be required for this subdivision. As previously noted, these improvements will be confined to lands within the Agricultural District.

9. Secondary Impacts-- The proposed subdivision will result in minimal secondary impacts associated with population increases, demands on public services, and impacts on surrounding areas.
10. Cumulative Impact-- The proposed subdivision of Conservation lands is triggered by the County DPW's requirement for a roadwidening lot in conjunction with the *mauka* subdivision of 1,472 acres of land into three (3) large lots in the Agricultural District. As discussed in the foregoing summary of impacts, the scale and density of the associated development will contribute to minimal impacts, provided that appropriate mitigative measures are implemented and applicable State and County requirements are met.

C. ALTERNATIVES CONSIDERED

1. Establish a Hana Highway Roadway Easement, so that the Conservation lands would not require subdivision-- Under this alternative, a 50-foot wide easement for public vehicular access would be granted in perpetuity to the County of Maui. The advantage of an easement versus a roadway lot is that the creation of an easement would not involve the subdivision of Conservation lands. The Conservation lands could therefore remain intact as a single parcel by incorporating it within the larger 1,409 acre lot (Lot 3). This alternative, however, was rejected by the County DPW.
2. Establish a Hana Highway Roadway Lot and one parcel for the remnant shorefront lands-- Under this alternative, the remnant shorefront lands would remain intact as a single parcel instead of three (3) remnant parcels under the proposed subdivision. This alternative is unfeasible, however, from the standpoint of engineering requirements and topographic conditions of the subject property.
3. Relocation of the Hana Highway-- Due to the steep topography of the subject property, the *mauka* relocation of the Hana Highway outside of the Conservation District is unfeasible and environmentally unacceptable.
4. No Action-- This alternative is unfeasible and inconsistent with subdivision requirements of the County of Maui.

VIII. Proposed Mitigation Measures

1. Prior to the application and approval of grading/grubbing and/or building permits on any of the lots, a Phase II archaeological inventory

survey shall be conducted to identify significant historic sites. A final report shall be submitted to the State Historic Preservation Division for review and comments. If significant historic sites are identified, an acceptable mitigation plan shall be submitted to the division prior to implementation.

2. Sewage disposal for residential uses will be via individual wastewater treatment system.

IX. Requested Determination

Based on the environmental assessment and conclusions therein, it is requested that a Negative Declaration be filed, pursuant to HRS 343 and the Environmental Impact Statement Rules and Regulations, Department of Health.

X. Findings and Reasons Supporting Determination:

1. There will be no improvements nor change in use within the *makai* Conservation lands. All subdivision improvements will be constructed *mauka* of Hana Highway and within the Agricultural District. Furthermore, any future improvements within the Conservation lands would be subject to a separate Conservation District Use Permit application.
2. The proposed action meets the intent of the Maui County General Plan and the policies of the Hana Community Plan.
3. Unusual conditions exist to warrant the proposed subdivision of Conservation District lands. The circumstances are the result of a requirement by the County of Maui to dedicate a Hana Highway Roadway Lot, in conjunction with the resubdivision of 1,472 acres of Agricultural District land into three (3) large lots. In order to comply with this roadway lot dedication requirement, Conservation lands must be subdivided, since the existing Hana Highway and lands *makai* are in the Conservation District. Furthermore, the delineation of a 50 foot-wide roadway lot to meet engineering standards and topographic conditions of the area results in the creation of three (3) remnant shorefront parcels.
4. Currently, there is no defined public roadway lot for this section of Hana Highway, although it is maintained by the County and is the only vehicular access in this remote section of East Maui. The proposed subdivision of Conservation District lands is therefore related to a public purpose.

5. The existing natural character of the shorefront lands will remain unchanged. The physical conditions of these areas are not conducive to development, due to slope conditions (slight to steep cliff); rocky substrata; flood hazard potential; and severe wind and ocean spray exposure. The intent of the proposed action is therefore consistent with the objective of the limited sub-zone, which is to limit uses where natural conditions suggest constraints on human conditions.
6. The application, if granted, would not adversely affect or interfere with public or private schools, parks, playgrounds, water systems, sewage and solid waste disposal, drainage, roadway and transportation systems, or other public requirements, conveniences or improvements.
7. The application, if granted, would not adversely impact the social, cultural, economic, environmental, and ecological character and quality of the surrounding residential area.
8. The proposed action is consistent with County Subdivision requirements, pursuant to Maui County Code Title 18, and conditions of the preliminary subdivision approval issued on June 8, 1992.
9. The proposed action is exempt from the County's Special Management Area Permit requirements, pursuant to HRS Chapter 205A.
10. Other alternatives to the subdivision of Conservation lands were examined, and the proposed action is the most feasible course of action.

REFERENCES

- Maui County General Plan (1992)
- Hana Community Plan, County of Maui.
- Mr. Stacey Otomo, P.E. and Project Engineer.
- Mr. Bruce Lee, Land Surveyor, Newcomer-Lee Land Surveyors, Inc.
- Kimberly D. Kornbacher, International Archaeological Research Institute, Inc., Archaeological Inventory Survey of Ka'apahu Subdivision Remnant Lots 5, 5, and 7 and the Hana Highway Corridor, Kipahulu, Hana, Maui, Hawaii, 1993.
- Subdivision File No. 1.117, Land Use and Codes Division, Department of Public Works, County of Maui.
- Atlas of Hawaii: Second Edition. Department of Geography, University of Hawaii, University of Hawaii Press, 1983.

- Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. United States Department of Agriculture Soil Conservation Service, August 1972.

FIGURES

- Location Map
- Map of Second Division, TMK 1-6-10, Ka'apahu-Kukuiula, Kipahulu, Hana, Maui
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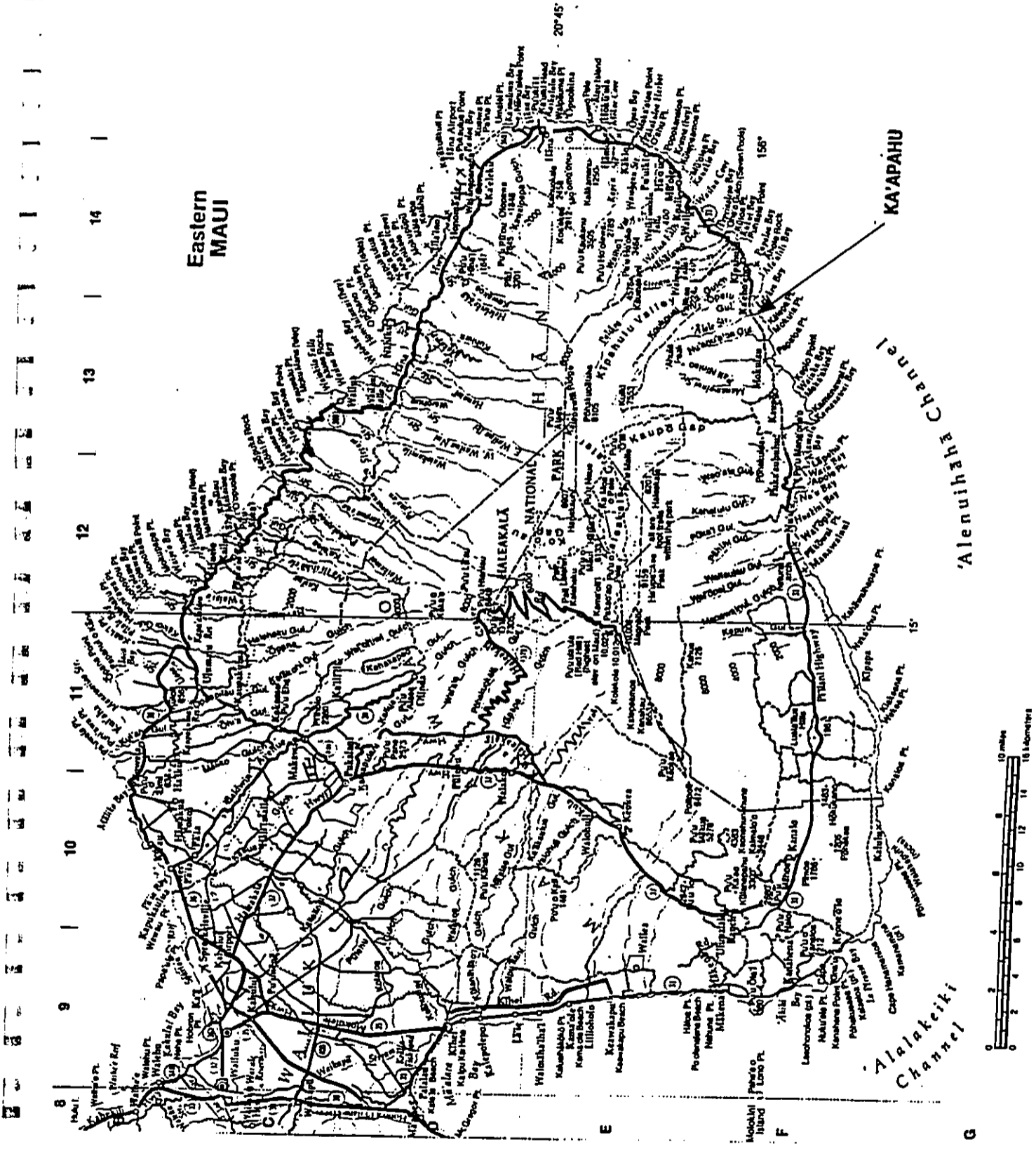
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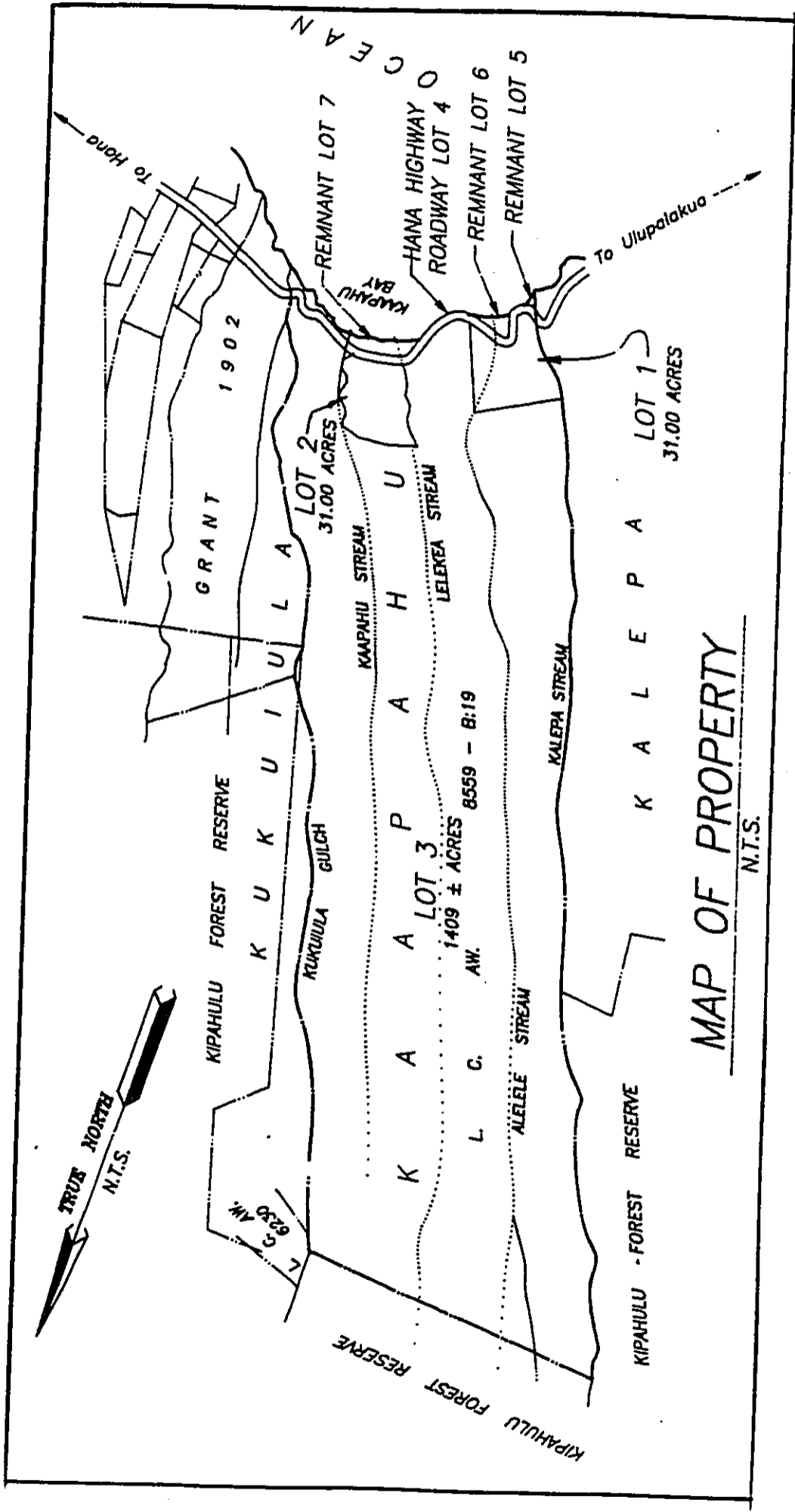
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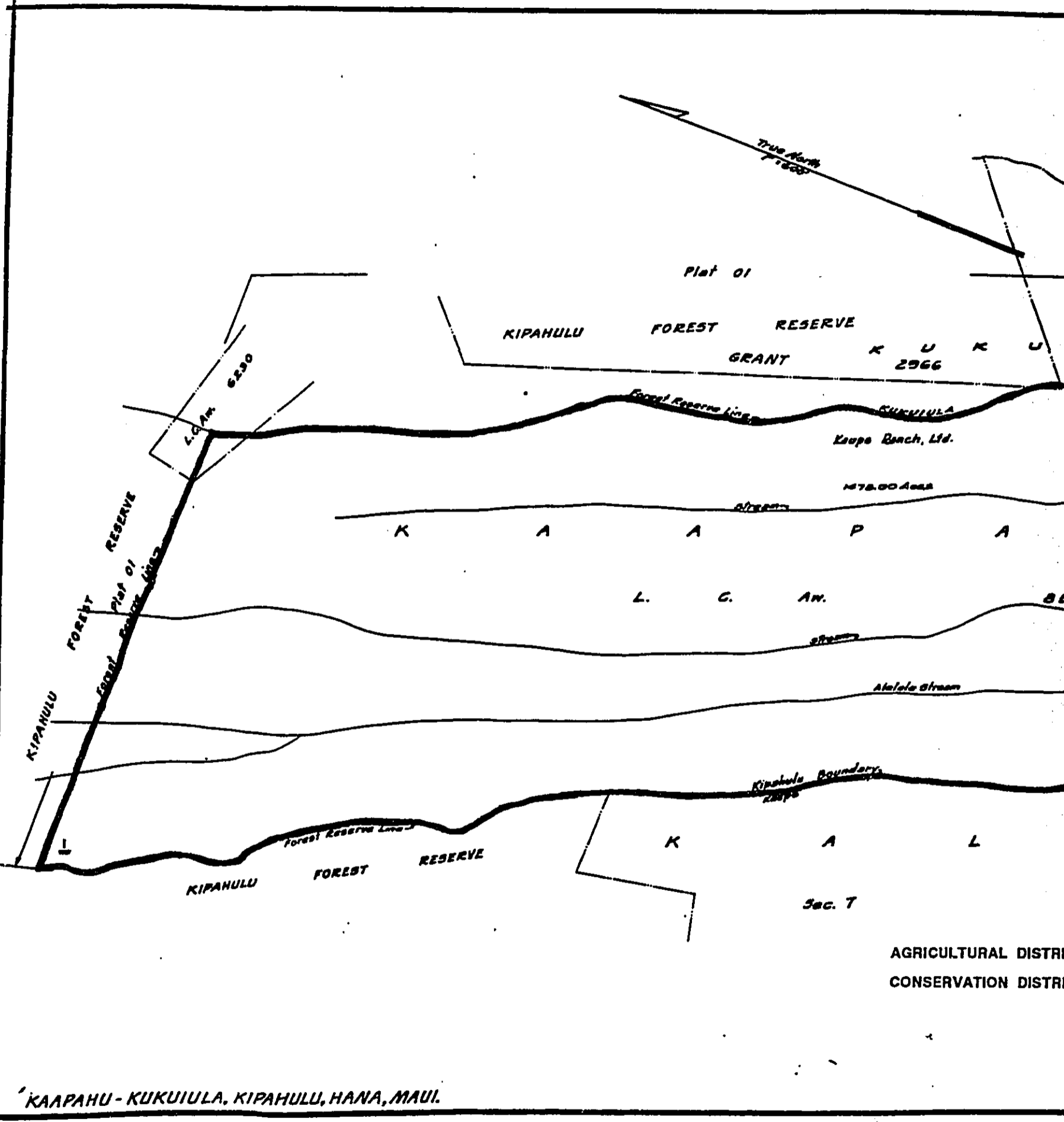
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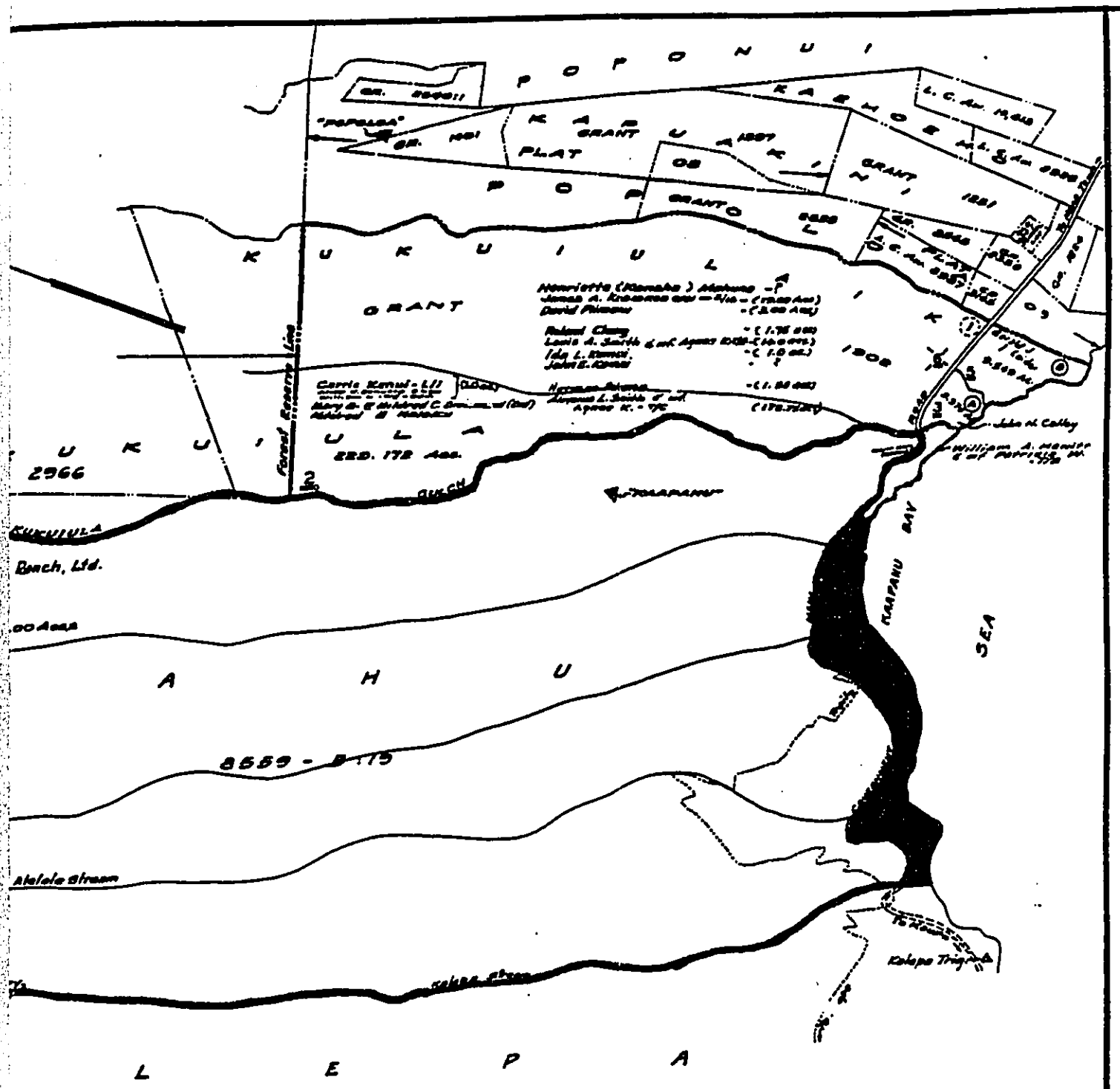
LOCATION MAP



MAP OF PROPERTY
N.T.S.

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





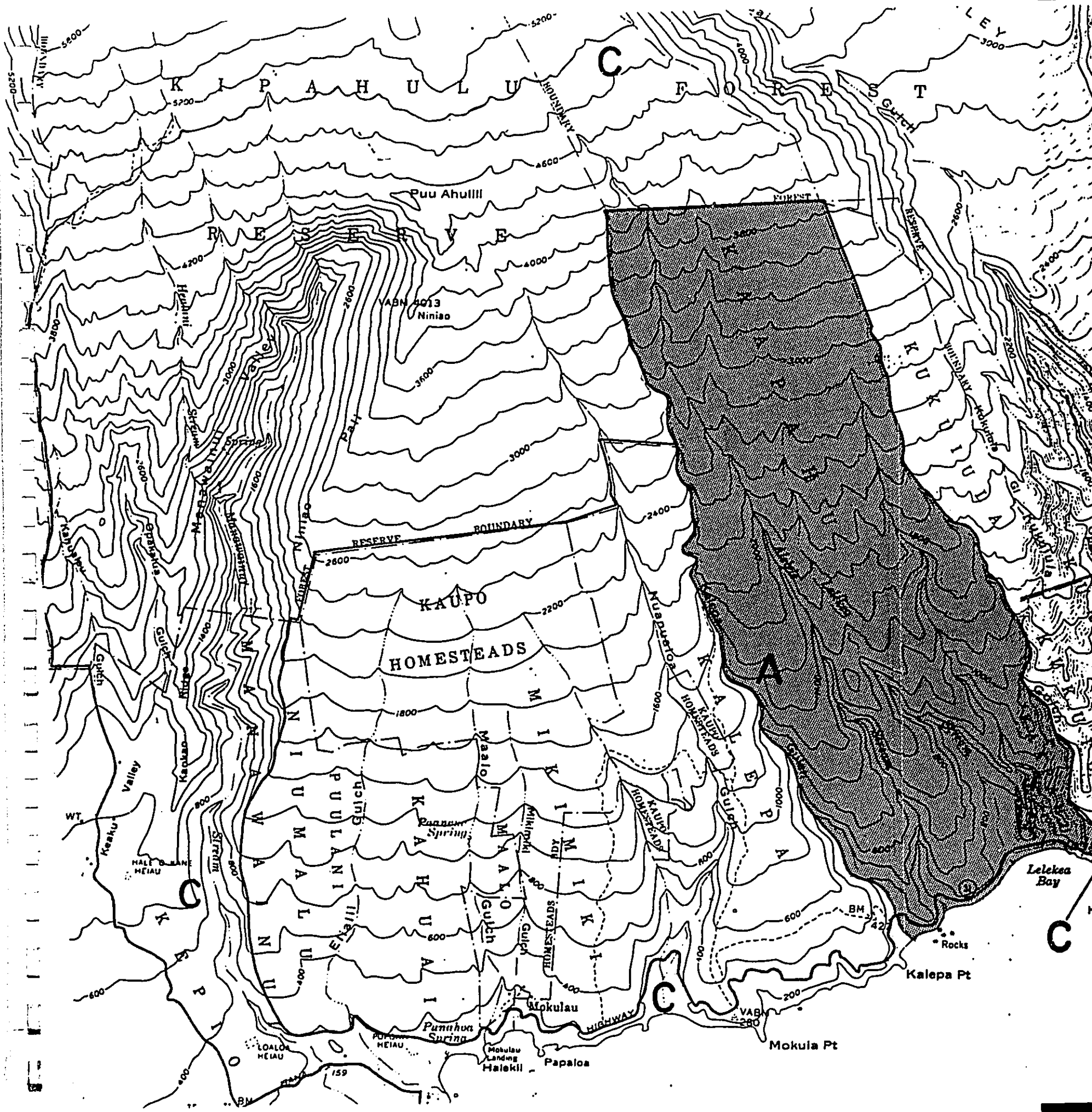
TAX MAP SHOWING SUBJECT PARCEL (TMK 1-6-10: 01) AND STATE LAND USE DISTRICT CLASSIFICATIONS

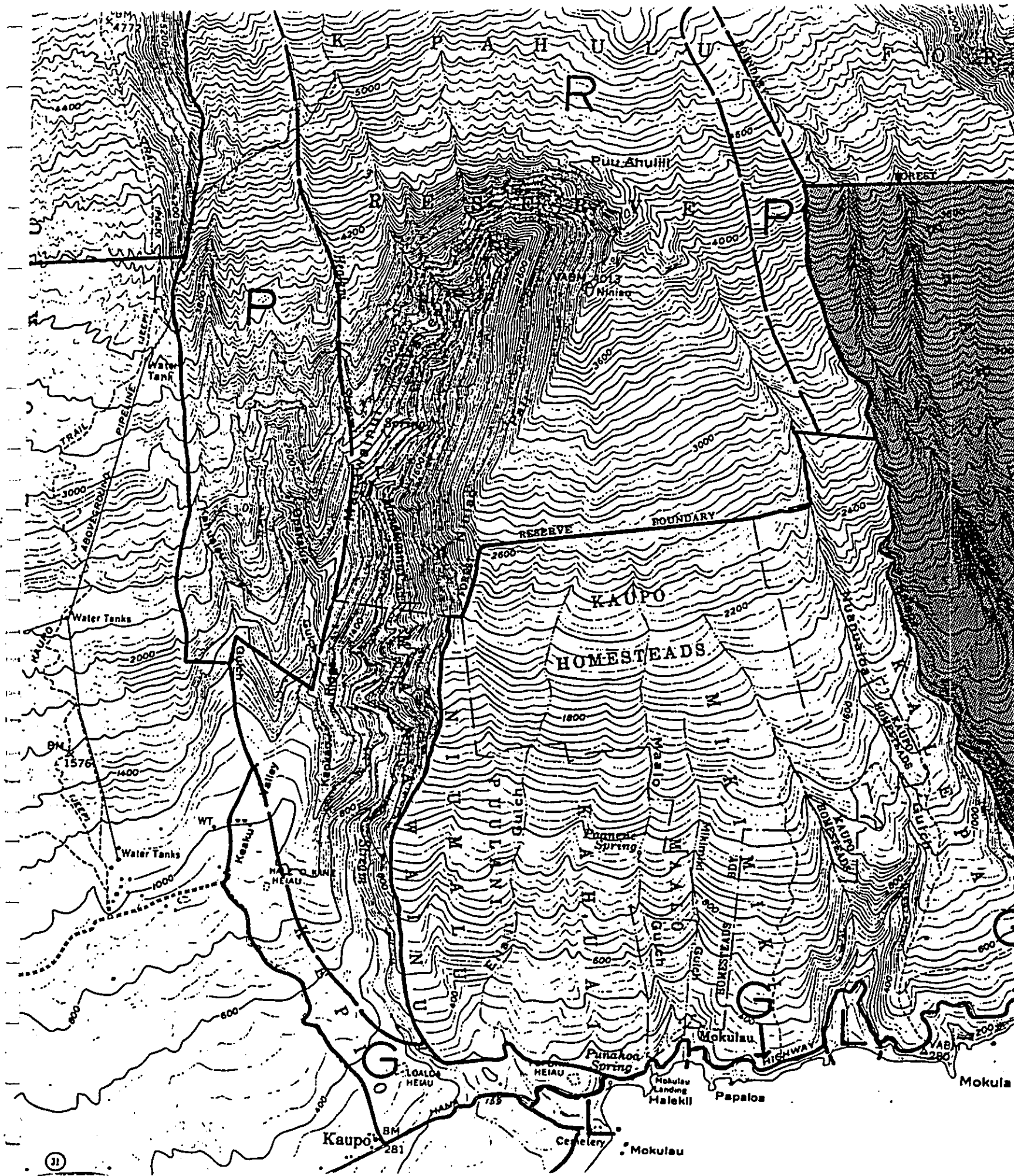
AGRICULTURAL DISTRICT (RED)
 CONSERVATION DISTRICT (BLUE)

DRAWN PARCELS: 6,
 2 63

SECOND DIVISION		
ZONE	SEC.	PLAT
1	6	10
CONTAINING PARCELS		
SCALE: 1 IN. = 600 FT.		

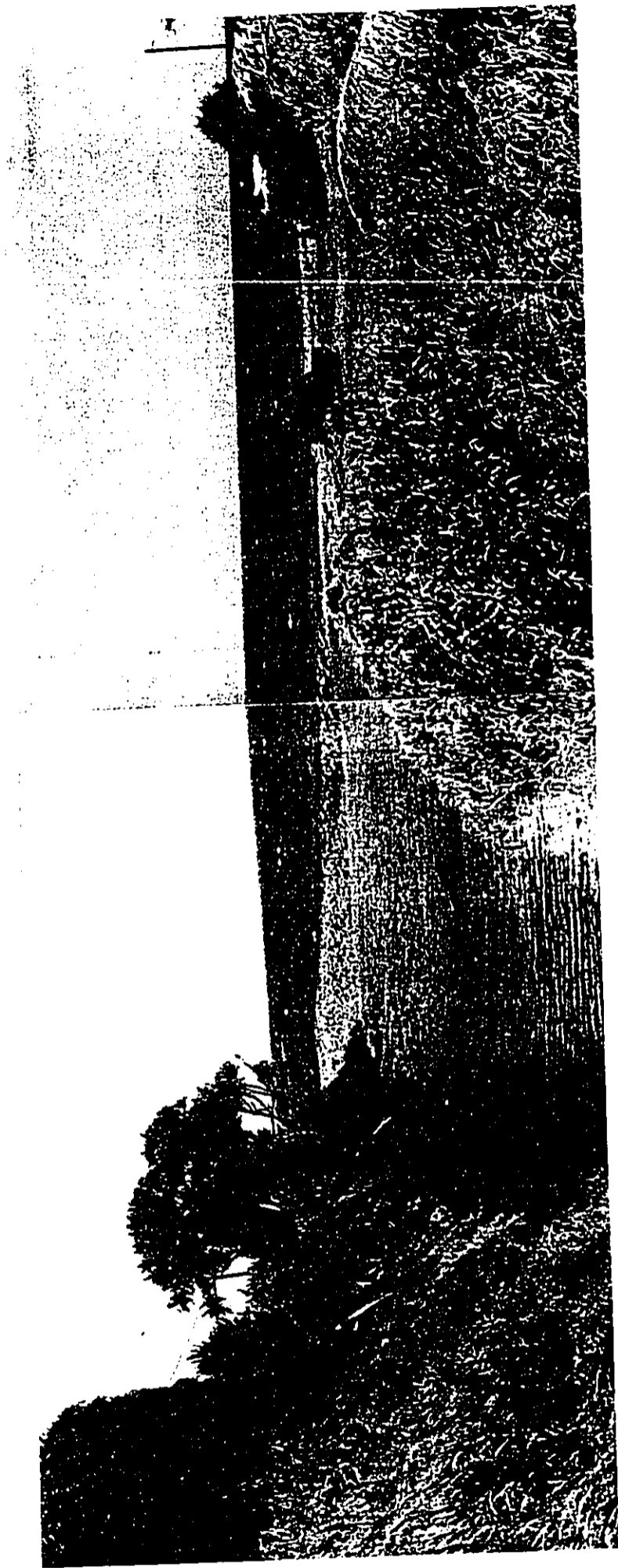
ADVANCE SHEET
 SUBJECT TO CHANGE



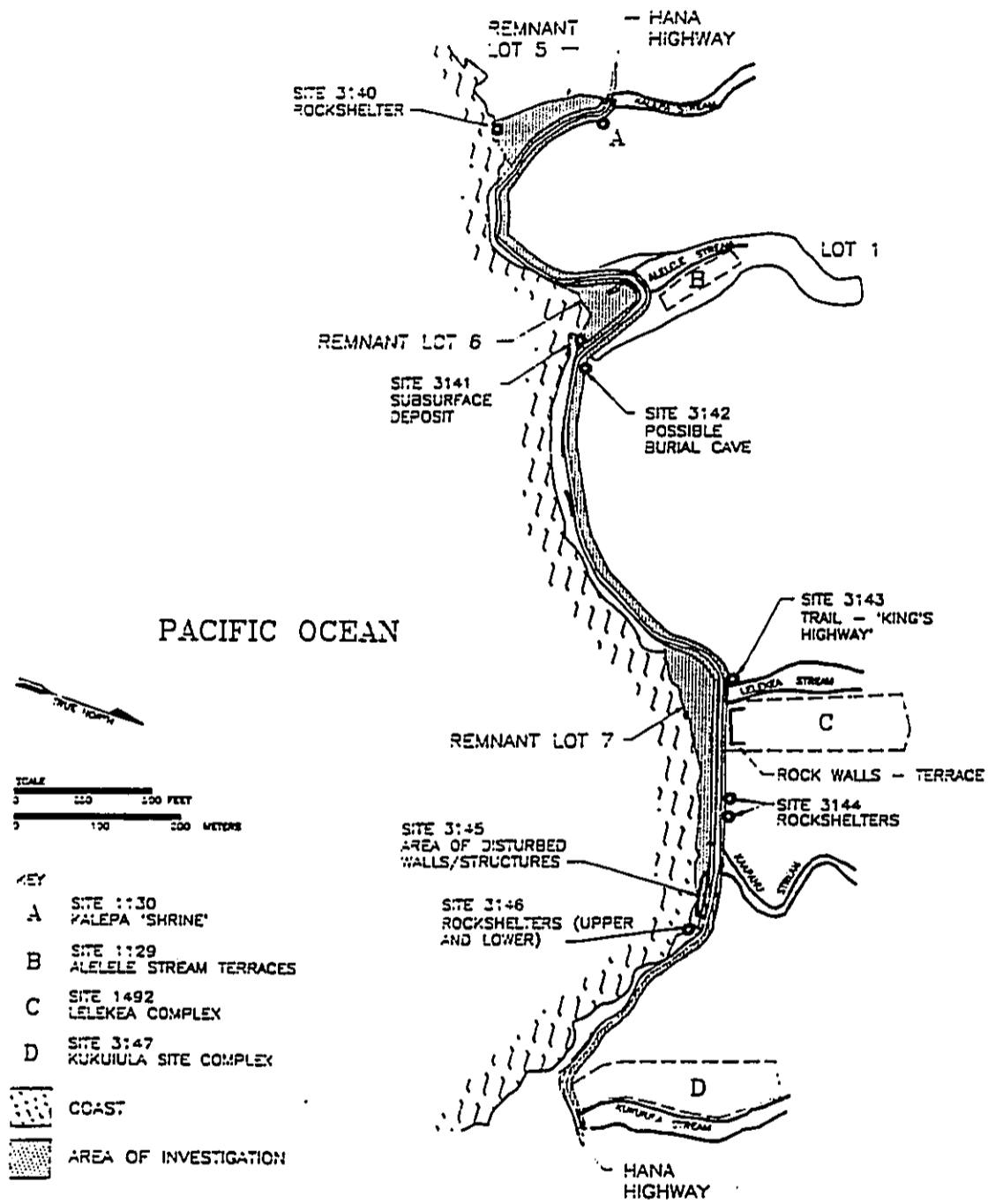




MOUTH OF KALEPA STREAM (FOREGROUND) WITH A VIEW TOWARDS THE HANA DIRECTION
(LELEKEA OR KA'APAHU BAY IN THE BACKGROUND)



SHORELINE AT THE MOUTH OF ALELELE STREAM



Map of project area showing sites discussed in text.

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- Letter dated June 8, 1992 from Mr. George Kaya, Director, Department of Public Works, County of Maui granting preliminary subdivision approval for the Ka'apahu Subdivision, TMK (2) 1-6-10: 01 (File No. 1.117).
- Response memorandum dated June 1, 1992 from Mr. David Craddick, Director, Department of Water Supply.
- Memorandum dated May 28, 1992 from Mr. Brian Miskae, Planning Director, advising that the proposed subdivision is exempt from the County's Special Management Area permit requirements.
- Response memorandum dated May 27, 1992 from Mr. Robert Siarot, Maui District Engineer, Highways Division, State Department of Transportation.
- Letter dated May 27, 1992 from Mr. Don Hibbard, Administrator, State Historic Preservation Division, regarding preliminary plat review of the Ka'apahu Subdivision.
- Letter dated May 19, 1992 from Mr. David H. Nakagawa, Chief Sanitarian, Maui District Health Office.

IGIHI WAHIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 8TH FLOOR
HONOLULU, HAWAII 96813

December 21, 1992

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LOG NO.: 7081
DOC NO.: 9212AG44

Ms. Kimberly D. Kornbacher
International Archaeological
Research Institute, Inc.
949 McCully St., Suite 5
Honolulu, Hawaii 96826

Dear Ms. Kornbacher:

SUBJECT: Historic Preservation Review of an Archaeological
Report
Ka'apahu (Kipahulu), Hana, Maui
TMK: 1-6-10: 1

Thank you for the opportunity to review and comment on your final report entitled Archaeological Inventory Survey of Ka'apahu Subdivision Remnant Lots 5, 6, and 7 and the Hana Highway Corridor, Kipahulu, Hana, Maui, Hawai'i (1992).

As we understood from Chris Hart and Partners, the survey was conducted to obtain information to be used for the landowner's future Conservation District Use Application as required by the subdivision approval of this property. While the landowner has no plans to develop the remnant lots, the road lot may be developed in the future for road widening. In consideration of the cost to do an inventory survey, IARII's clients agreed to have the survey done in two phases and this report presents the results of Phase I which consists only of surface survey; no testing or detailed mapping was conducted. We concurred with Chris Hart and Partners that no testing is necessary at this time, but additional work will have to be conducted prior to any development.

We reviewed this report and we have the following comments:

- 1) Figure 2, page 3: This map does not show the boundaries of the project area.

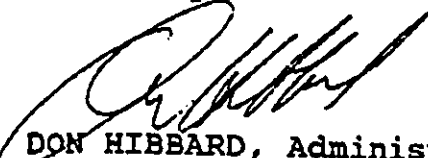
DOCUMENT CAPTURED AS RECEIVED

Kimberly Kornbacher
December 21, 1992
Page 2

- 2) There needs to be a separate section on the summary of the settlement pattern for the ahupua'a of Ka'apahu and the project area based on the findings from the historical background and previous archaeological investigations.
- 3) Survey Results: In addition to previously identified historic sites, several new sites were identified during your survey. These consist of a rockshelter in Remnant Lot 5; a subsurface deposit and a possible burial cave in Remnant Lot 6; a trail, an area of disturbed walls/structures and 4 rockshelters in Remnant Lot 7. Permanent State site numbers should be assigned to these sites. Please call our office to obtain site numbers.
- 4) Recommendations: We concur with your tentative significance assessments and your recommendations for additional work on these sites.

Please make the necessary revisions on this report and re-submit it to our office for final acceptance. If you have any questions about these comments, please call Ms. Annie Griffin at 587-0013.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

AG:aal

LINDA CROCKETT LINGLE
Mayor

GEORGE N. KAYA
Director

CHARLES JENCKS
Deputy Director



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS

LAND USE AND CODES ADMINISTRATION

250 SOUTH HIGH STREET

WAILUKU, MAUI, HAWAII 96793

AARON SHINMOTO, P.E.
Land Use and Codes Administration

EASSIE MILLER, P.E.
Wastewater Reclamation Division

RALPH HAGAMINE, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Solid Waste Division

MELVIN HIPOLITO
Highways Division

IN REPLY, REFER TO:
1.177

June 8, 1992

Mr. Bruce R. Lee, RLS
NEWCOMER-LEE LAND SURVEYORS
P. O. Box 1179
Kula, Hawaii 96790

Dear Mr. Lee:

Re: Kaapahu Subdivision
TMK: 1-6-10:01

Preliminary approval is hereby granted to the subject subdivision. Final approval shall be contingent upon compliance with the following conditions:

1. Requirement of the Department of Water Supply:

Enter into a private water system agreement.

2. Requirements of the State Department of Health:

As the proposed subdivision is located on the critical wastewater disposal area, we recommend that the wastewater disposal be via an individual wastewater treatment system.



Mr. Bruce R. Lee, RLS
Page 2 (1.177)
June 8, 1992

3. Requirement of the State Department of Land & Natural Resources:

This parcel has not undergone a complete archaeological survey. However, there are two previously identified significant historic sites in our inventory: 1129, Alelele Terraces, and 1492, Lelekea Complex. The first site consists of a series of agricultural terraces along the east side of the stream and mauka of the highway. The second site is located mauka of the highway and consists of a large complex of several walls, platforms, enclosures, and Paokahi Heiau. It is highly likely that other significant historic sites are also present elsewhere on the property. A report on the archaeological reconnaissance conducted in 1982 by the staff of the Planning Department and the Department of Parks and Recreation for the reconstruction of the Lelekea, Alelele and Kalepa Bridges noted the presence of shelter/burial caves not far from the bridges.

Because of the large size of this property and the undetermined purpose of this subdivision, it appears to be unreasonable to have the entire parcel surveyed at this time. Therefore, to ensure a "no adverse effect" determination, we recommend that the following condition be included for the final approval of this subdivision:

Prior to the application and approval of grading/grubbing and/or building permits on any of the lots, an archaeological inventory survey shall be conducted to identify significant historic sites. A final report shall be submitted to the State Historic Preservation Division for review and comments. If significant historic sites are identified, an acceptable mitigation plan shall be submitted to the State Historic Preservation Division prior to implementation.

4. Provide electrical service to the lots.
5. Obtain a Conservation District Use Application from the Department of Land and Natural Resources, Office of Conservation and Environmental Affairs, for the portion of land being subdivided within the Conservation District.

Mr. Bruce R. Lee, RLS
Page 3 (1.177)
June 8, 1992


6. Dedicate roadway lot 4 to the County. Submit the original and five (5) copies of an executed deed to the County with a completed State conveyance tax exemption certificate. Also, please submit a Partial Release of Mortgage if applicable.
7. Improve the adjoining half of Hana Highway to the provisions of the subdivision ordinance for roads within the agricultural district or comply with conditions #8 and #9.
8. Submit the original and four (4) copies of the Subdivision Agreement (for Large Lots) from the owner to provide all deferred roadway, drainage and sewer improvements upon actual agreement or future resubdivision of the large lots. The Large Lot Subdivisions.
9. Submit the original and four (4) copies of the Subdivision Agreement (for Three Lots or Less) executed by the owners and extended to their heirs and executors or assigns to pay the pro rata share of the cost of future road improvements for Hana Highway, pursuant to Section 18.20.40, subsection A of the Maui County Code.
10. Submit a Subdivision Agreement (for Agricultural Use) executed by the owners and extended to their heirs and executors or assigns.
11. Payment of \$ 1,705.84 for parks and playground assessment. Make a check payable to the Director of Finance, County of Maui, and remit payment to the Division of Land Use and Codes Administration. Please note that this amount may be subject to change as the parks and playground assessment will be based on the applicable rate at the time of final approval.
12. Submit ten (10) copies of the construction plans for review and approval. The engineer is requested to discuss with the Division of Land Use and Codes Administration his preliminary road grades and drainage schemes before proceeding with the finalization of the construction plans for submittal.
13. Submit fifteen (15) copies of the final plat in accordance with the procedures of Section 18.12.070 Technical Review, Action on Final Plat and Filing of Plat and prepared in accordance with the subdivision ordinance. The plat should include all revisions as per the attached map.

Mr. Bruce R. Lee, RLS
Page 4 (1.177)
June 8, 1992

Within one (1) year from the date of preliminary approval of the subdivision, all requirements shall be completed, unless an extension of time is granted by the division. Applications for extension of time should be made in writing to the division at least fifteen (15) days before the expiration date.

Please call Mr. Glen Ueno of our Land Use and Codes Administration at 243-7373, if you have any questions or need further assistance.

Very truly yours,


GEORGE N. KAYA
Director of Public Works

GAU:jm

enclosure

attachment: Tax Information Release for Agricultural Lands

xc: Engineering Division
Water Supply SD 92-46
Maui Electric Company
State Department of Health
Department of Land and Natural Resources
Planning Department

LINDA CROCKETT LINGLE
Mayor

BRIAN W. MISKAE
Director

ROBERT K. KSKUNA, JR.
Deputy Director



BILL MEDERIOS
Long Range Division

COLLEEN M. SUYAMA
Current Planning Division

KALVIN KOBAYASHI
Energy Division

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

May 28, 1992

MEMORANDUM

To: Aaron Shinmoto, LUCA Administrator
From: Brian Miskae, Planning Director *B. Miskae*
Subject: Kaapahu Subdivision, TMK: 1-6-10:1, Hana, Maui.

Thank you for the opportunity to comment on the above mentioned subdivision.

According to Chapter 205A-22(B) HRS, "Development" does not include the following:

- (xi) the subdivision of land into lots greater than twenty acres in size;
- (xii) The subdivision of a parcel of land into four or fewer parcels when no associated construction activities are proposed, provided that any such land which is so subdivided shall not thereafter qualify for this exception with respect to any subsequent subdivision of any of the resulting parcels.

Pursuant to Subsection (xi), lots 1, 2, and 3 are greater than twenty acres, therefore are exempt from Special Management Area ("SMA") Rules and Regulations. Pursuant to Subsection (xii), the remaining four (4) lots are also exempt. However, if construction activities are required through the subdivision process, and/or this land has qualified for this exception in the past, an SMA Use Permit shall be required.

Furthermore, parcels 5, 6 & 7 are located within the Conservation District. Therefore, this subdivision should be reviewed by the State Department of Land and Natural Resources.

Should additional clarification be necessary, please contact Mr. Daren Suzuki of my staff at X7735.

DS/ds

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JOHN WAHEE
GOVERNOR OF HAWAII

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COUNTY OF MAUI



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
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WATER AND LAND DEVELOPMENT

May 27, 1992

Mr. Glen Ueno
Land Use and Codes Administration
Department of Public Works
County of Maui
250 South High Street
Wailuku, Hawaii 96793

LOG NO: 5374
DOC NO: 2291A

Dear Mr. Ueno:

SUBJECT: Preliminary Plat Review of the Kaapahu Subdivision
(LUCA File No. 1.177)
Kipahulu, Hana, Maui
TMK: 1-6-10: 01

Thank you for the opportunity to comment on the proposed subdivision into 3 (large) lots, a highway roadway lot, and 3 remnant lots makai of the highway.

This parcel has not undergone a complete archaeological survey. However, there are two previously identified significant historic sites in our inventory: 1129, Alelele Terraces, and 1492, Lelekea Complex. The first site consists of a series of agricultural terraces along the east side of the stream and mauka of the highway. The second site is located mauka of the highway and consists of a large complex of several walls, platforms, enclosures, and Paokahi Heiau. It is highly likely that other significant historic sites are also present elsewhere on the property. A report on the archaeological reconnaissance conducted in 1982 by the staff of the Planning Department and the Department of Parks and Recreation for the reconstruction of the Lelekea, Alelele and Kalepa Bridges noted the presence of shelter/burial caves not far from the bridges.

Because of the large size of this property and the undetermined purpose of this subdivision, it appears to be unreasonable to have the entire parcel surveyed at this time. Therefore, to ensure a "no adverse effect" determination, we recommend that the following condition be included for the final approval of this subdivision:

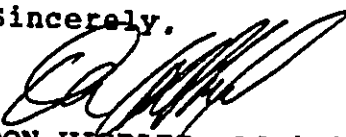
- 1) Prior to the application and approval of grading/grubbing and/or building permits on any of the lots, an archaeological inventory survey shall be conducted to identify significant

Mr. Glen Ueno
May 27, 1992
Page 2

historic sites. A final report shall be submitted to the State Historic Preservation Division for review and comments. If significant historic sites are identified, an acceptable mitigation plan shall be submitted to the State Historic Preservation Division prior to implementation.

Please contact Annie Griffin at 587-0013 if you have any questions.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

AG:jen

JOHN WAIMEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

PAUL E. HOFFMAN, M.D., M.P.H.
DISTRICT HEALTH SERVICES ADMINISTRATOR (M.D.)

May 19, 1992

Mr. Aaron Shinmoto
Administrator
Land Use & Codes Administration
County of Maui
250 S. High Street
Wailuku, Hawaii 96793

Dear Mr. Shinmoto:

Subject: Kaapahu Subdivision, File No. 1.177, TMK: 1-6-10:01

We have reviewed the subject preliminary plans of the subject subdivision. Individual wastewater systems are allowable as the number of dwellings and lot sizes meet the requirements of Chapter 11-62. Therefore, we have no objections to the subdivision.

However, as the proposed subdivision is located on the critical wastewater disposal area, we recommend that the wastewater disposal be via a treatment individual wastewater system. Details of the wastewater systems for the future homes must be submitted for review and approval to the Wastewater Branch on Oahu.

Sincerely,


DAVID H. NAKAGAWA
Chief Sanitarian

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COUNTY OF MAUI
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 LAND USE & CODES ADMINISTRATION
 200 SOUTH HIGH STREET
 WAILUKU, MAUI, HAWAII 96793

DOT-HWYS
 MAUI DISTRICT OFFICE File No. 1.177

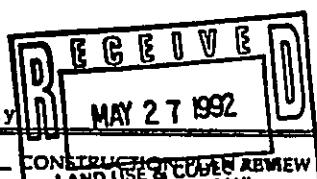
Subdivision Name: KAAPAHU SUBDIVISION

Location: Kipahulu, Hana Tax Map Key: 1-6-10:01
 Owner: Kaapahu Holding Co. State Land Use: Ag
 Surveyor/Engineer: George P. Newcomer County Zoning: None
NEWCOMER-LEE No. of Lots: 3
P. O. Box 1179
Kula, Hawaii 96790

PRELIMINARY PLAT REVIEW Received: 4/28/92 Sent: 5/7/92
 Engineering State Health w/EA
 Water Supply SD ~~LOCAL Zoning~~
 Electric Co. State DLNR
 State Hwys. State Agrl.
 Planning ~~Waste Water Reclamation~~
 Submit your comments by 5/28/92, or we will proceed without your review.

05/27/92

Subdivision does not abut a State highway.
 We have no comments at this time.

FC:kky

 Engr
 Water Supply SD
 SCS w/drainage report & erosion control report

By: Robert O. Siarot
 Received: _____ Sent: _____
 State Health
 State Hwys. w/3 plans
 State DLNR
 Waste Water Reclamation

Submit your comments by _____, or we will proceed without your review.

By: _____
 _____ FINAL PLAT & SUBDIVISION REVIEW Received: _____ Sent: _____
 Engineering w/file folder
 Water Supply SD
 State DOH
 State Hwys.
 Electric Co.
 State DLNR
 Waste Water Reclamation

Submit your comments by _____
 Improvements are _____ not complete _____ complete and acceptable.
 Fees and/or assessments _____ have been paid _____ have not been paid.
 Final plat _____ conforms _____ does not conform.
 Final approval of the subdivision is _____ recommended _____ not recommended.
 By: _____

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
LAND USE & CODES ADMINISTRATION
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

File No. 1.177

Subdivision Name: KAAPAHU SUBDIVISION

Location: Kipahulu, Hana Tax Map Key: 1-6-10:01
 Owner: Kaapahu Holding Co. State Land Use: Ag
 Surveyor/Engineer: George F. Newcomer County Zoning: NONE
 Transmitted By: NEWCOMER-LEE No. of Lots: 3
P. O. Box 1179
Kula, Hawaii 96790

PRELIMINARY PLAT REVIEW Received: 4/28/92 Sent: 5/7/92
 Engineering _____ State Health w/EA _____
 Water Supply SD 92-46 ~~State Zoning~~ _____
 Electric Co. _____ State DLNR _____
 State Hwys. _____ State Agri. _____
 Planning _____ ~~Waste Water Reclamation~~ _____
 Submit your comments by 5/28/92, or we will proceed without your review.

Our requirements/comments are as follows:

1. Enter into a private water system agreement.

David R. Craddick
 By: DAVID R. CRADDICK, Director
 6/1/92

Received: _____ Sent: _____
 State Health _____
 State Hwys. w/3 plans
 State DLNR _____
 Waste Water Reclamation _____

Submit your comments by _____, or we will proceed without your review.

RECEIVED
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 2 PM 4: 01
 COUNTY OF MAUI
 WAILUKU, HI 96793


By: _____

_____ FINAL PLAT & SUBDIVISION REVIEW Received: _____ Sent: _____
 Engineering w/file folder State Hwys. _____
 Water Supply SD Electric Co. _____
 State DOH _____ State DLNR _____
 Waste Water Reclamation _____

Submit your comments by _____

Improvements are _____ not complete _____ complete and acceptable.
 Fees and/or assessments _____ have been paid _____ have not been paid.
 Final plat _____ conforms _____ does not conform.
 Final approval of the subdivision is _____ recommended _____ not recommended.

By: _____



**ARCHAEOLOGICAL INVENTORY SURVEY OF
KA'APAHU SUBDIVISION REMNANT LOTS 5, 6, AND 7
AND THE HĀNA HIGHWAY CORRIDOR,
KIPAHULU, HĀNA, MAUI, HAWAI'I**

by
Kimberly D. Kornbacher

**INTERNATIONAL ARCHAEOLOGICAL RESEARCH INSTITUTE, INC.
HONOLULU, HAWAI'I**

1993



**ARCHAEOLOGICAL INVENTORY SURVEY OF
KA'APAHU SUBDIVISION REMNANT LOTS 5, 6, AND 7
AND THE HĀNA HIGHWAY CORRIDOR,
KIPAHULU, HĀNA, MAUI, HAWAI'I**

by

Kimberly D. Kornbacher

revised final report prepared for:

**Chris Hart & Partners
Landscape Architecture and Planning
305 E. Wakea Ave.
Kahului, Maui, Hawai'i 96732**

**International Archaeological Research Institute, Inc.,
949 McCully Street, Suite 5
Honolulu, Hawai'i 96826**

January 1993

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ABSTRACT

A Phase I inventory survey was conducted by International Archaeological Research Institute, Inc. (IARI), under contract with Chris Hart & Partners, August 27 and 28, 1992. The project area covers a small portion of the *ahupua'a* of Ka'apahu along the Hāna Highway between Kalepa and Kukuiula Streams, on the southeast coast of East Maui. The survey was undertaken as a part of the Ka'apahu Subdivision project for the State Land Use District Five-Year Boundary Review and the reclassification of portions of the property from the State Agricultural District to the Conservation District. This report presents an environmental overview, documents background historical data, summarizes previous archaeological work in the survey area, presents the results of the survey with an interpretive discussion, and provides initial recommendations.

The objectives of the survey were to relocate previously recorded archaeological sites in the project area, evaluate the existing documentation, update descriptions if necessary, and locate and describe previously unrecorded sites. Within the project area (which consists of three "remnant lots" on the seaward side of the Hāna Highway totalling 3.28 acres, and a narrow corridor on either side of the highway) are three state inventory sites (1129, 1130, and 1492) and several previously unrecorded sites, including three culturally modified rockshelters (one is a possible burial area), a large rock wall, a subsurface cultural deposit that contains a probable firepit, and a large complex of surface features.

Functional inferences that are made in the absence of subsurface testing or data recovery are in most cases only preliminary. Based on the distribution and variability of sites, however, the project area is hypothesized to be an area of intense occupation and varied land use during late prehistoric and early historic times. Habitation, food processing, agriculture, and burial are activities likely represented by the archaeological remains. In addition, the presence of Paokahi *heiau* near Lelekea Stream implies religious, economic, and sociopolitical activities were conducted in the area.

Although a full determination of significance must usually await subsurface testing, preliminary assessments can be made for some sites recorded on the current survey, and initial recommendations advanced. The significance of one site can be assessed in the absence of testing. The subsurface feature at Alelele is judged significant by Criterion D of the State of Hawai'i and the National Registers of Historic Places, and it is in imminent danger of destruction. It is strongly recommended that this feature be removed and the cultural stratum be tested before further erosion of the alluvial exposure ensues.

ACKNOWLEDGEMENTS

A report even of this modest size requires the cooperation of many individuals. In particular I wish to thank Judy Kinser for generously sharing her collection of historical documents and her vast knowledge of the Kipahulu area. John Min of Chris Hart and Partners provided helpful input, especially in the initial planning and write-up stages of the project. Greg Burtchard and Steve Athens reviewed drafts of this report and greatly improved its quality with their comments and suggestions. A special thanks to Roger Blankfein for drafting Figures 3, 5, and 6 and for his infinite patience. Finally, I want to thank Christine Fadden for her unfailing enthusiasm and hard work in the field.

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I: INTRODUCTION

This report presents the results of the inventory survey conducted by International Archaeological Research Institute, Inc. (IARII) in the district of Kipahulu, Hāna, Maui (Fig. 1). The land of the project area is owned by Mr. David Dodds of the Ka'apahu Holding Company. The survey was conducted in conjunction with the State Land Use District Five-Year Boundary Review and the reclassification of portions of the property from the State Agricultural District to the Conservation District. By the order of the County, the property owner has defined and dedicated a roadway lot for the Hāna Highway and this portion of the property is the current project area. To avoid Mr. Dodds' liability for the safety of surveyors and engineers, the survey for the roadway lot dedication required that the project area be subdivided into "Remnant Lots" with portions of the corridor that are unsurveyable due to dangerous cliffs in-between.

While this project was contracted by Chris Hart and Partners as an inventory level survey as defined by the Department of Land and Natural Resources, Division of Parks, IARII and John Min of Chris Hart agreed to conduct the survey in two stages. Thus while inventory level survey normally includes testing, it was decided that to be more cost effective, a Phase I surface inventory survey would be conducted. Following the survey, evaluation of the findings was undertaken in consultation with Agnes Griffin of the Historic Preservation Office, to determine if a second stage of work involving testing would be necessary. The Historic Preservation Office determined that the findings of the survey did not warrant a testing stage at this time. Thus the current inventory report presents only the results of the surface survey.

The Ka'apahu Subdivision project area is located within the *ahupua'a* of Ka'apahu, Kipahulu, Hāna district of East Maui approximately 15 km southwest of Hāna. The project area is bounded by Kalepa Stream to the southwest and Kukuuiulu Stream on the northeast (Fig. 2), and includes a narrow corridor on either side of the Hāna Highway. As illustrated in Figure 3, the remnant lots are on the seaward side of the road and coincide with the stream drainages of Kalepa (Remnant Lot 5), Alelele (Remnant Lot 6), and Lelekea and Ka'apahu (Remnant Lot 7). The survey of the Ka'apahu Subdivision project area was conducted on August 27 and 28, 1992 by Kim Kornbacher with the assistance of Christine Fadden. The objectives of the survey were to relocate previously recorded sites, evaluate the existing documentation, update descriptions if necessary, and locate and describe previously unrecorded sites.

As outlined in the Department of Land and Natural Resources "Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports", this report includes a descriptive section on the environment of the project area, a section on the historic background, including available information on Land Commission Awards and early historic data, an archaeological background section detailing previous archaeological work in the area, and a brief discussion of the *ahupua'a* settlement pattern. The section entitled "Field Investigation" provides a description of the methodology of the present survey, the results of the fieldwork presented for each remnant lot, and a summary of the findings. The "Summary and Conclusion" section is a review of the findings, including a discussion of functional inferences that can be drawn from the archaeological materials located and described in the present survey. Finally, the "Recommendations" section provides initial significance assessments, and suggests a plan for conservation and management of the archaeological resources.

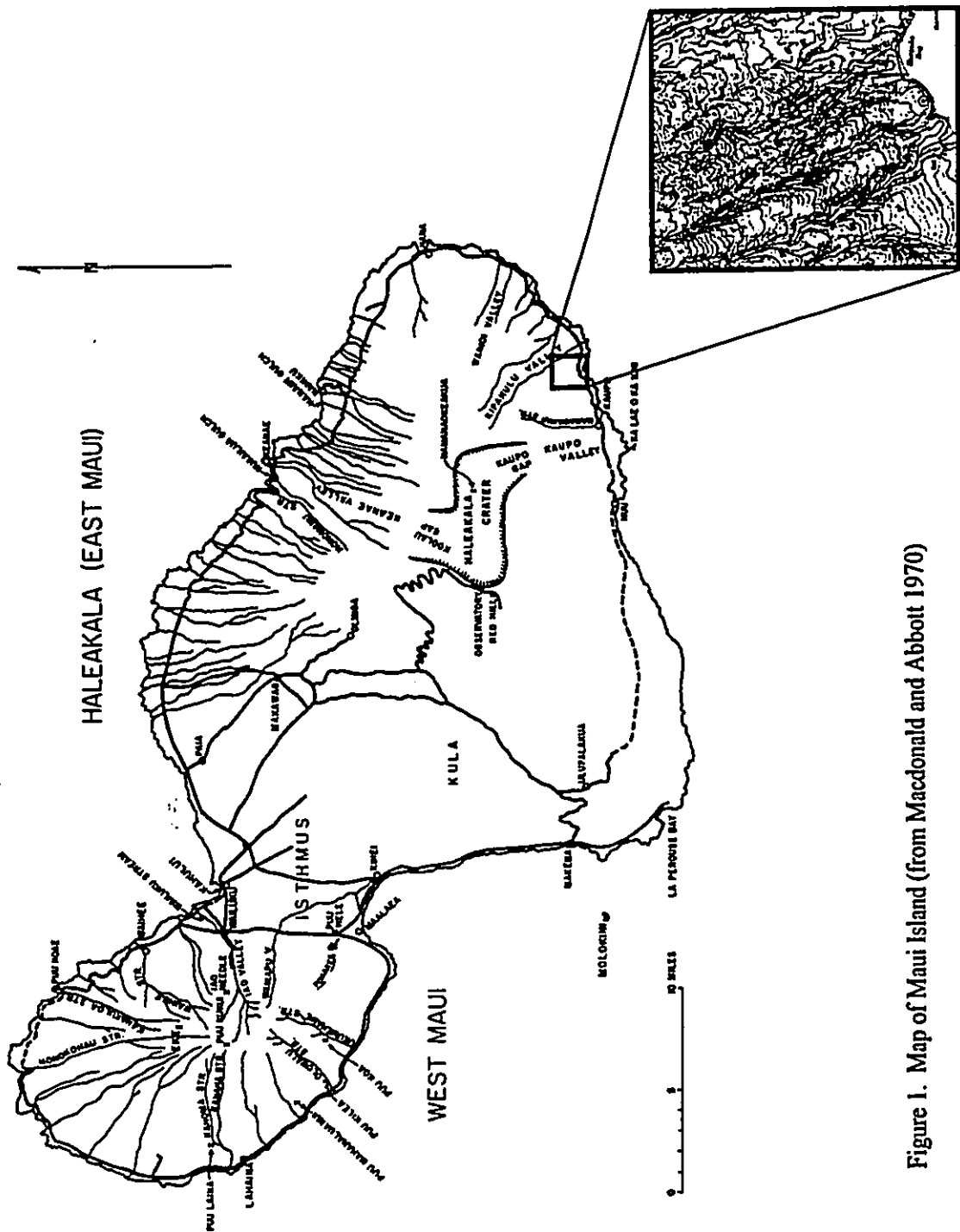
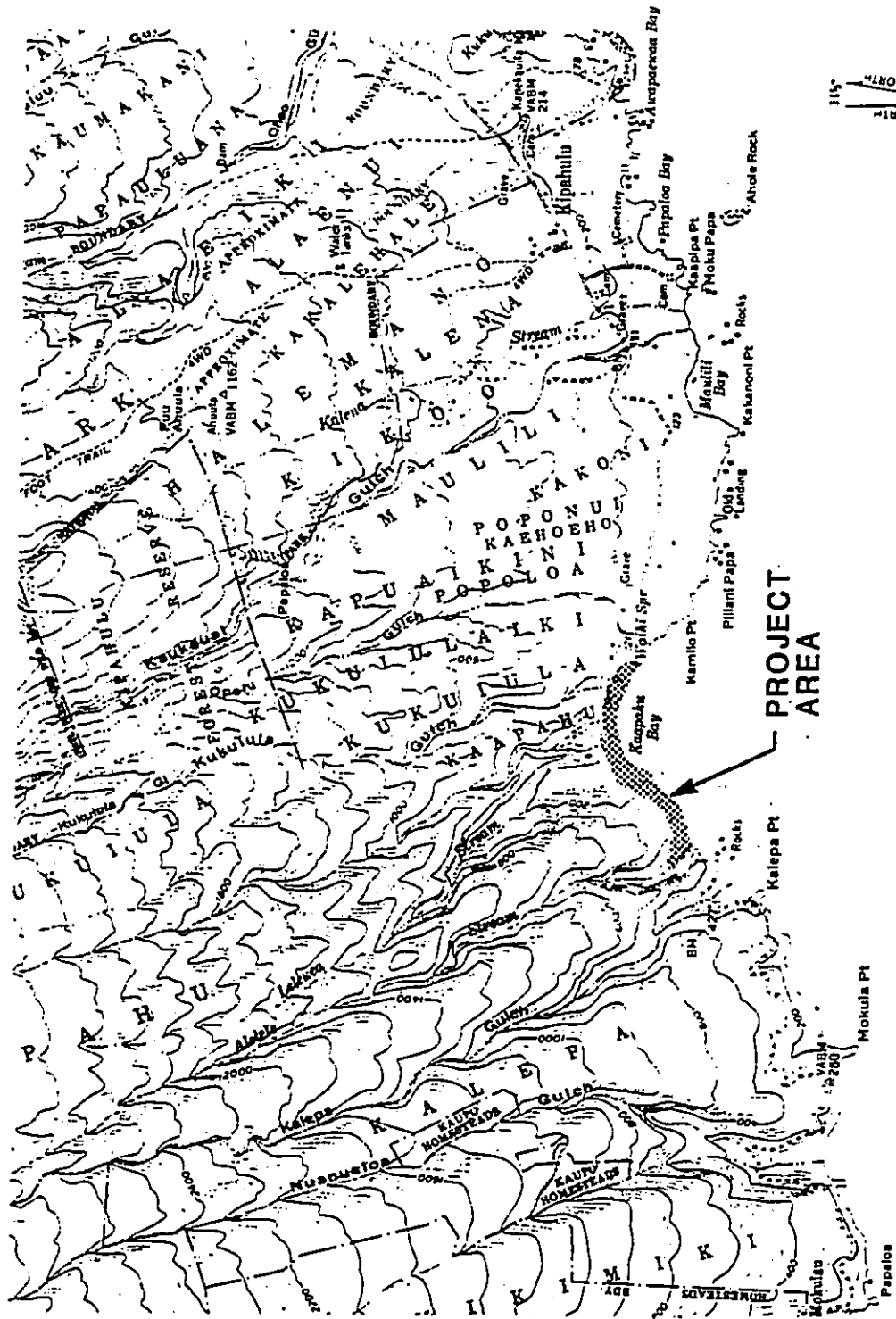
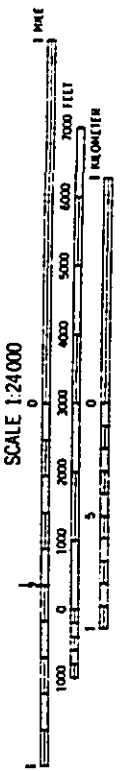


Figure 1. Map of Maui Island (from Macdonald and Abbott 1970)



TRUE NORTH
MAGNETIC NORTH

APPROXIMATE MEAN
DECLINATION 1983



CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 2 FEET

Figure 2. Topographic map of project area.

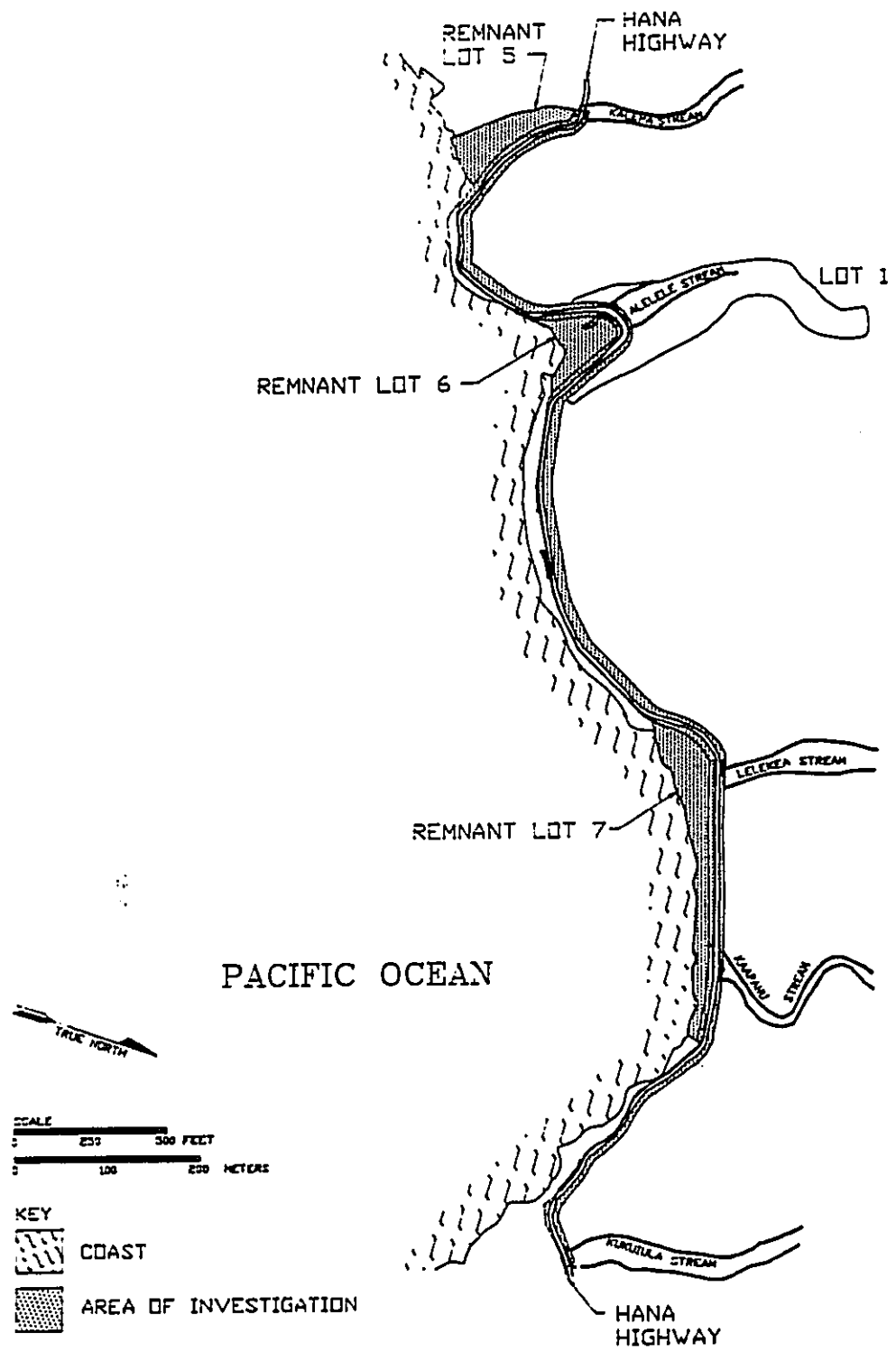


Figure 3. Map showing detail of project area.

II: ENVIRONMENT

Physical Environment

With an area of 1873 km², Maui is the second largest island in the Hawaiian archipelago. It is composed of two major volcanoes: Pu'u Kukui forms West Maui and Haleakala East Maui. The youngest of the two shield volcanoes is Haleakala, the lavas of which were deposited against the slope of Pu'u Kukui and formed the broad isthmus between East and West Maui (Macdonald and Abbott 1970).

The project area is located on the southeastern coast of East Maui between two of the major erosional features on the island: Kaupo Valley to the west and Kipahulu Valley to the east (Fig. 2). This area is built up of flows from Haleakala and is composed of Honomanu Series lavas, basalts and andesites from the later Kula Volcanic Series and from the most recent Hāna Volcanic Series. The erosional processes that formed the valleys of Ke'anae, Kipahulu, and Kaupo occurred mainly during a long period of volcanic dormancy following the Kula Series eruptions. The onset of the Hāna Volcanic Series during the Late Pleistocene ended this period of volcanic inactivity. The Hāna Series eruptions were interspersed with erosional periods and alluvial deposition (Macdonald and Abbott 1970:326-336). The permeability of the recent Hāna basalts and andesites contribute to the occurrence of low altitude springs that served as sources for many of the perennial streams on East Maui (Kolb 1991:34).

Climate and Vegetation

The windward location of the project area has certain climatic implications, as on other islands. In general, rainfall is deposited in an uneven gradient from windward to leeward sides of the islands as trade winds pass over the windward side, encounter volcanic mountain ranges, and rise. During their ascent, the winds undergo cooling and form clouds. They deposit their moisture as rainfall on the windward slopes and are thus relatively devoid of moisture by the time they reach the leeward sides (Giambelluca *et al.* 1986:12).

On the windward side of East Maui specifically, the slopes of Haleakala cause the Northeasterlies to rise, cool, and form rain clouds. Consequently, the project area, situated on the southeast coast, is characterized by a moist climate. Figure 4 is an isophyte map that shows median annual rainfall for the entire island of Maui. Within the 0-305 meter elevation range, the map indicates that rainfall on the southeastern coast is over 2000 mm annually (Armstrong 1973; Giambelluca *et al.* 1986:47). This wet climate supports a varied and prolific floral community.

The distribution of vegetation across the landscape is frequently described in terms of "zones" of association. Usually these zones are closely correlated with moisture gradients. Certain taxa of plants require mesic conditions while others thrive in xeric environments. In addition to precipitation, another extremely important variable affecting floral associations is temperature. Temperature is dependent mainly upon elevation; temperatures are usually mild near sea level and cooler as elevation increases. In upper elevational extremes, only cold-tolerant species can survive. Physiognomy is the third important variable used for zone classification. The classes are based on percentage cover of the

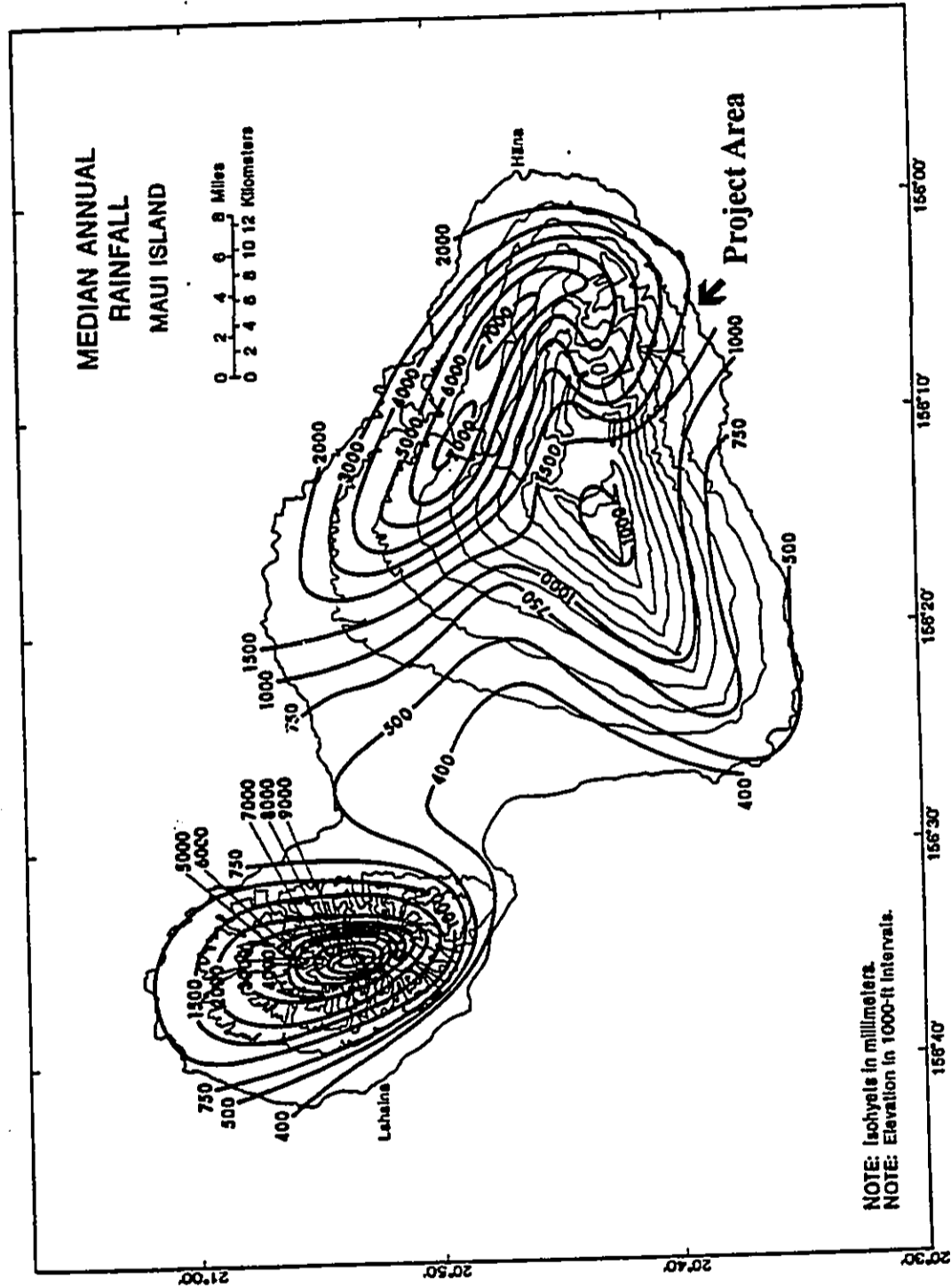


Figure 4. Median Annual Rainfall, Maui Island, Hawaii'i (from Gimbelluca *et al.* 1986)

dominant plant life-form in the uppermost vegetation layer e.g., grasslands, shrublands, forests, etc. (Gagne and Cuddihy 1990:45). Thus, while zonation is a construct that helps us simplify complex and varied biotic phenomena, fairly consistent associations of vegetation are roughly correlated with variations in precipitation and elevation.

Several different vegetation zones, the names of which vary with reference (e.g., Armstrong, ed. 1973:64; Neal 1965; Wagner *et al.* 1990), are encompassed within the Ka'apahu Subdivision area. A generalized vegetation zone classification (Sohmer and Gustafson 1987; Gagne and Cuddihy 1990) places the majority of the region within the "coastal mesic forest" zone (Photo 1) and a "coastal" zone that varies between shrubland and sedge-lands. Commonly occurring plants in the project area include wild ginger or 'opuhi, 'awapuhi-kuahiwi (*Zingiber zerumbet*), breadfruit or 'ulu (*Artocarpus communis*), guava or kuawa (*Psidium guajava*), hibiscus or hau (*Hibiscus tiliaceus*), pandanus or hala (*Pandanus odoratissimus*), Indian mulberry or noni (*Morinda citrifolia*), ti (*Cordyline terminalis*), cane grass or ko (*Saccharum spp.*), coconut or niu (*Cocos nucifera*), plum (*Eugenia spp.*), and candlenut or kukui (*Aleurites moluccana*). This list is intended only to provide a general notion of the nature of the biotic community in the project area and should not be considered exhaustive.



Photo 1. Example of mixed mesic forest vegetation, Alelele Stream.

III: HISTORICAL BACKGROUND

The historical background of southeast East Maui is described below in terms of three periods:
1) the late prehistoric - early historic period before 1848 when most data are derived from oral history and ethnographic analogy; 2) the time of the Great Mahele land division; and 3) the recent (post-1850) historical period.

Early History (before 1848)

Our knowledge of the late prehistory and early history of Hawai'i is limited by the drastic changes that occurred in the archipelago immediately following European contact, and in some cases even preceding direct contact. Introduction of European goods, weaponry, economics, and, perhaps most importantly, a variety of diseases for which Hawaiians had no immunity, induced tremendous change in Hawaiian population structure, economics, land use, and sociopolitical organization. The rapidity with which these wide-reaching, dramatic changes occurred explains in part why more is not securely known about early Pacific adaptations. Within a few years of the Cook expedition and his charting of the Hawaiian islands, the lure of a new area within which economic gains could be rapidly made led exploration and trading ships from Europe and America to travel to Hawai'i, carrying metal and weapons (Burtchard and Athens, in prep.), and effected swift and radical change. Consequently, accounts of prehistoric and early historic Hawaiian society, if not derived from oral histories, are assumed by analogy from observations made in later times. Widely varying estimates of the native population before contact (e.g., Schmitt 1968; Stannard 1989) epitomize the limited nature of our knowledge about traditional Hawaiian society before 1778, and suggest that accounts of these early time periods be evaluated with caution.

Specific references to the project area in early histories are difficult to find, and once found may be difficult to assimilate into a coherent chronology of events in the region (e.g. Kamakau 1992). Most historical accounts describe chiefs vying for control of Maui; battles were fought between the chiefs of different islands as each attempted to expand their own sphere of control (Fornander 1969; Ii 1959; Kamakau 1992). Embedded within these descriptive accounts, however, are some relevant references to construction of features that are now part of the archaeological record.

Authors generally agree that the Hāna area was a center of late prehistoric population concentration and political development, and served as the traditional seat of power for East Maui chiefs (Cleghorn and Rogers 1987; Handy and Handy 1972; Kirch 1985:136; Kolb 1991:62; Pearson 1970). The importance of the area is probably best explained in terms of economics and strategic location:

Kipahulu district and its neighbor, Hana, were coveted lands, prized by the alii for their abundance of foodstuffs and all the valued products of land and sea. Plentiful food and resources made possible a large population, and many followers meant power to the chief controlling the land. Small wonder, then, that Hana and Kipahulu were often the cause of contention among ambitious chiefs. A few miles south, across the Alenuihaha channel, lay Hawaii, also endowed with wealth and powerful chiefs. As might be expected, warfare was not infrequent (Soehren 1963:2).

Oral histories (as recounted by Fornander 1969:39) support Soehren's conclusion and inform us that one of the first known chiefs residing in Hāna lived in the 12th century and was named Hua-Kapuaimanaku or Hua-a-Kapuaimanaku. At Hāna he built the war *heiau* Honua'ula. After a successful raid on Hawai'i Island he built another *heiau* called Kaumalu. After killing the priest named Luaho'omoe after a dispute, Hua and many of his followers perished during the drought and famine that ensued. Luaho'omoe is referred to in Kamakau (1992:223) simply as the kahuna: "as also in the story of Lua-ho'omoe, the kahuna".

The next known chief of Maui was Pi'ilani who is said to have been ruler of six bays as well as portions of Molokai, Lana'i, and Kaho'olawe that could be seen from these bays (Day 1984:143). Pi'ilani's daughter Pi'ikea was one of 'Umi-a-Liloa's wives and bore two children with him (Kamakau 1992:19):

From the beginning of 'Umi's reign until he became old, there was continued peace with his father-in-law Pi'i-lani, ruler of Maui, and with his chiefs. No battle was fought between the two kingdoms. After the death of Pi'i-lani, father of Pi'i-kea, trouble began with the heir of the kingdom (Kamakau 1992:21).

Kamakau (1992:22-33) goes on to tell how the sons of Pi'ilani fought for control over Maui after his death. Lono-a-Pi'ilani was the eldest son and ruled peacefully for a short time. Kiha-a-Pi'ilani, the second son of Pi'ilani (Day 1984:77), wrested control from his brother and became the next known chief of Maui and the Hāna District. He is said to have lived in the Hāna area during the 16th or 17th century (Cleghorn and Rogers 1987:9) and is credited with finishing the construction of the paved road around the island, known as "the King's Highway" (Kinser, pers. comm.), that was begun by Pi'ilani:

The Hāna District was . . . the home of the famed Kihapiilani, hero of many legends, who is said to have built the trail which follows the coast in the park [Waiapanapa] area (Walker 1931:23,52) [in Pearson 1970:7].

Traditions about Kihapiilani state that among other things he was noted for his road building activities. Part of the trail over the ridges from Kipahulu to Kaupo is attributed to him though it is now kept up by the County of Maui. However, from the way in which smooth flat beach stones have been laid down side by side, it is evident that the trail was not intended for horse travel as it is exceedingly slippery when wet (Walker 1931:300).

Another possible archaeological manifestation of the times may be found at strategic Ka'uiki Hill:

Many places in the districts of Hana, Kipahulu, and Kaupo were scenes of conflict between the raiders from Hawaii and the men of Maui. The most famous of course was Kauiki Hill at Hana. This is referred to as the "Fort of Kauiki" in some of the old accounts, but there is no evidence of any form of permanent fortification here or at any of the other so-called "Fortified Hills" on Maui (Walker 1931:302).

Rogers (Cleghorn and Rogers 1987:9) summarizes information from a number of sources and describes the fortress of Ka'uiki during the battle between Kiha-a-Pi'ilani and Lono-a-Pi'ilani:

Lono-Pi'ilani's forces were commanded by Ho'olaemakua at the fortress of Ka'uiki. The fortress consisted of several thatched towers and was accessible only by ladder. Although the fortress was well manned by defenders using slings, these weapons were

less effective at night when vision was reduced (Speakman 1981:8-10; Elbert 1959:154, 174; Fornander 1969:146-147; Sterling n.d; Kamakau 1961:28-31; Beckwith 1970:387-388).

Kamakau's (1992:31) account of Kiha-a-Pi'ilani's takeover tells how fearful Lono-a-Pi'ilani became when he heard that the fortress of Ka'uiki was taken; in fact, intense fear resulting from the takeover of Ka'uiki is cited as the cause of Lono-a-Pi'ilani's death.

Ka'uiki Hill or Fortress continued to play an important role in later power struggles as well. It is mentioned in accounts of battles between Kalani'ōpu'u and Kahekili. In 1775 or 1776, for example, it was captured by Kalani'ōpu'u, ruling chief of Hawai'i Island, and the districts of Hāna and Kipahulu were annexed to his territories (Walker 1931:26).

Kekaulike is the next ruler of Maui mentioned in historic accounts. It was not possible to determine the relationship (genealogical or exact chronological) between Kiha-a-Pi'ilani and Kekaulike from the available sources. Kekaulike died of epilepsy in 1736 (Day 1984:74), so it is possible that he was the successor to Kiha-a-Pi'ilani. Kamehamehanui, Kekaulike's eldest son, was ruler after the death of his father. Kalani'ōpu'u, the brother-in-law of Kahekili (brother of Kamehamehanui and eventual successor) was ruler of Hawai'i Island and captured several districts of Maui in 1759. Kahekili, regained power from his brother-in-law in 1765 and was ruler of Maui until the mid-1770s when Kalani'ōpu'u again seized Kaupō and Ka'aiki from Kahekili's forces. Several sources (Cleghorn and Rogers 1987; Fornander 1969; Kamakau 1992; Soehren 1963) relate battles between these individuals for control of Maui. Soehren provides an interesting example:

During the mid-eighteenth century, Kalaniopuu, king of Hawaii, wrested control of Hana and Kipahulu from Kamehamehanui, son and heir to Maui's king Kekaulike. When he attempted some years later to seize Kaupo district, Kalaniopuu was routed by Kahekili, young brother and successor to Kamehamehanui, in a bloody battle near Ka-lae-o-ka-ilio, in Kaupo. Perhaps some of the many graves on this rock strewn promontory are those of warriors fallen in that battle. Among the defeated was Kamehameha, a young warrior from Kohala, Hawaii, who had distinguished himself in battle and was destined to become master of Maui (Soehren 1963:2).

Fornander (1969:216; cited in Cleghorn and Rogers 1987:10) describes how the animosity between the chiefs of Maui and Hawai'i was aggravated by Captain Cook and Captain Clerke of the *Resolution* and *Discovery* in 1778. They entertained Kalani'ōpu'u, king of Hawai'i Island and rival of Kahekili, while they were anchored at Hāna, Maui. It is understandable that the Europeans would make this error because Kalani'ōpu'u and his troops were garrisoned at Ka'uiki.

The invasions of Maui by Kamehameha following Kalani'ōpu'u's death in 1782, involved several attempts to take Ka'uiki fortress from Kahekili. There are no more references to structures at the site of the fortress. However, its apparent importance in history suggests that it may be an important archaeological site as well. Soehren provides a specific reference to the project area in a description of an invasion by Kamehameha:

Several years elapsed before Kahekili regained Hana and Kipahulu, but he was to hold those lands only a few years. He successfully repulsed Kamehameha, who in 1786 sent his younger brother to retake Hana. In a hot battle on the Kipahulu side of Lelekea Gulch the Hawaii forces were defeated and withdrew to Maulili where they received reinforcements, but to no avail. Four years later Kamehameha himself

led a second invasion of Maui, in which he won control of the entire island (Soehren 1963:2-3, emphasis added).

After Liholiho's abolition of the *kapu* system in 1819, the districts of Kipahulu and Kaupo declined in economic and strategic importance. All over Hawai'i, massive depopulation due to disease and the movement of people to large population centers altered the settlement structure. More remote districts, such as Kipahulu, saw a sharp decline in population from which they never recovered.

The Great Mahele (1848-1851)

In 1846 a Board of Land Commissioners was appointed by the government to conduct a land division that became known as the Great Mahele (Chinen 1958; Daws 1968). Foreign and Hawaiian people were required to make formal claim for the land on which they had been living and working by presenting testimony, with witnesses, to the Board. If the claim was accepted, the land was "given" to the tenant as a Land Commission Award (LCA). However, one did not receive full title to the land until one-third of the value of the land was paid to the government, at which time a "Royal Patent" was issued and the government could make no further claims on the land.

The Ka'apahu Subdivision area is a small portion of a large land claim awarded to William C. Lunalilo (LCA 8559-B). Born in 1833, Lunalilo was the son of Kekaulohi and Kanaina. He was the successor of Kamehameha V, voted to the throne in 1873 nearly unanimously. Lunalilo died in 1874 of tuberculosis after having served just over a year as king (Day 1984:88). Often the testimonies given for the land claims contain information about land use at the time the claim was made or in years up to that time. Unfortunately, no testimony was necessary if the claimant was *ali'i*. Thus, the project area is part of an award that was simply granted without testimony to Lunalilo and no information on early land use is available in the archives. Probably also due to the rank of the awardee, no Royal Patent was applied for or issued on the property. A "Land Patent" was eventually granted on the property. This patent was given much later, after Hawai'i was proclaimed the 50th state in the Union (cf. Chinen 1961).

Recent History (post 1851)

For the Hawaiian islands in general, the latter half of the 19th century saw rapid development of the sugar industry. Sugar cane was grown extensively in the Hāna area and at the peak of the industry in the latter part of the century, there were six sugar companies in Hāna. Two of the well-known companies, Hāna Plantation and Reciprocity Sugar, had their own mills and piers. After the Great Mahele, there was little incentive for private landowners to work on sugar plantations; they farmed and cultivated their own land. Much of the labor for the sugar industry was thus derived from Chinese, Portuguese, Filipino, and Japanese immigrants. Since there was no reciprocity agreement with the United States, tariffs on sugar exported to the mainland were extremely high. The high tariffs adversely affected the industry, especially during post-Civil War years. Despite the fact that a reciprocity agreement was reached in 1876, labor disputes (threat of unionization) and labor shortages eventually caused the downfall of the sugar trade in the area (Kuykendall 1938, 1953; Youngblood 1983).

Since the 1940s, Hāna's market economy has relied on a combination of broad-based agriculture and tourism. As an attempt to fill the economic void created by the collapse of the sugar industry in Hāna, Paul Fagan, an entrepreneur who was part-owner of the Hāna Plantation, purchased and developed a large area of land as a cattle ranch. In addition, Fagan made in-roads into the tourist

industry. In an attempt to develop Hāna as a luxury resort area, he opened the Hotel Hāna-Maui in October of 1946. The Hāna-Maui is still one of the few hotels in the Hāna area today (Youngblood 1983).

IV: PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Previous Archaeological Investigations in the Region

In contrast to other high islands in the Hawaiian archipelago, our knowledge of the archaeological record of Maui is limited. Synthetic studies of the leeward side of the island exist but little is known of the windward regions (Kirch 1985). In part this is due to the fact that much of the windward side is covered by extremely dense vegetation. This, coupled with minimal development, has inhibited archaeological investigation of portions of the project area in the last several decades. The vast majority of the work that has been done on the windward side of East Maui has focused upon Hāna and the immediately surrounding land, largely due to its relative accessibility and to the fact that most development that has taken place in the region has occurred here. Cleghorn and Rogers' (1987) field inspection of the Hana Ranch Lands, Pearson's (1970) survey of Wai'ānapanapa State Park, Soehren's (1963) survey of "portions of East Maui", and Walker's very early (1931) work that includes some parts of East Maui, comprise the bulk of the archaeological investigations of this region of Maui (see also Nakkim 1970). Chapman and others (Chapman and Kirch 1979) conducted an intensive settlement pattern survey and excavation of seven rockshelters and one coastal habitation site in the neighboring district of Kahikinui. Although this was actually a leeward-area investigation, the regional focus made the study a potentially very valuable contribution to knowledge of Maui prehistory. Due to Chapman's untimely death, however, a final report on the project was never written (Kirch 1985:138). Other work has been conducted in the windward Kipahulu-Hāna area on the scale of a single site or kind of structure, often *heiau* (e.g., Cordy 1970; Kolb 1990, 1991; Thrum 1909, 1910, 1917). Kolb's work on Pi'ilanihale and Lanikele *heiau* represents some of the first excavations ever to be undertaken in the Hāna, Ko'olau (Kolb 1991:499; see Pearson 1970), Kaupo, or Kipahulu districts of Maui. Nevertheless, as Cleghorn and Rogers (1987:14) note, *heiau* dominate the site inventory for the region. This is no doubt a reflection of research biases towards religious structures and not a function of a higher number of these structures occurring in the archaeological record.

Previous Archaeological Investigations in the Project Area

The vicinity of the project area is relatively undeveloped and somewhat isolated; very little archaeological work has been done. The first archaeological investigation in the project area was conducted by Thomas George Thrum in the early part of the 20th century. Thrum, born in 1842, was not an archaeologist by vocation, but made his living instead as a publisher (Day 1984:121). He was very interested in Hawaiian archaeology and folklore and described many *heiau* sites in his own edited reference work, *Hawaiian Almanac and Annual*. Thrum (1909) wrote specifically about Paokahi *heiau* at Lelekea, Kipahulu and stated that it was built in the time of Heleipawa. No information is provided on how this chronological conclusion was reached. In a later article, Thrum mentioned Paokahi again, describing it as an old *heiau* in Lelekea Gulch. He observed that the large *heiau* was in ruins and measured approximately 100 by 149 feet (Thrum 1910:131).

In a 1917 article, Thrum once again discussed the Paokahi *heiau*:

The next *heiau* visited was that of Paokahi, situate [sic] some little distance from the shore road of the deep gulch of Lelekea, whose ruins were all rooted over by the pigs

of a lone Japanese in this once well-peopled valley. The front or seaward wall Paokahi, standing N. E. and S. W., measured 149 feet in length. Owing to its decided ruined character, and constructions for present use it was hard to define its *mauka* boundaries, being also in a dense growth of hala, kukui, breadfruit and guava, but it must have been 100 feet wide. The locality is said to get the name of Lelekea from the incident of an ancient *alii* being brought to the temple in a weak condition for restoration and expiring there, --"breath flown" (Thrum 1917:57-56).

Since Thrum's major interest in the archaeological record centered on one kind of site, *heiau*, he made no mention of other archaeological remains in the project area.

There is one reference (Walker 1931:1) to some other work on Maui Island during approximately the same time: "J.F.G. Stokes made a hurried trip to the island in 1916 and added a few more sites to the list. In 1920 Kenneth P. Emory in company with R.G. Aitken spent three weeks making a reconnaissance of the ruins in the crater of Haleakala. . .". Records indicate no further archaeological observations or investigations on East Maui until the late 1920s.

In 1928, W.M. Walker began work on a project as a research fellow of the Bishop Museum. His goal was to conduct an archaeological inventory of all of Maui Island alternating between travelling on foot, by auto, or on horseback. Walker began in October of 1928 and finished his survey in August of the following year. The manuscript was completed in 1931 but never published. Emory (in Walker 1931) reviewed the manuscript two years later and claimed it was unfit for publication due to:

a failure to grasp the significance [sic] of details,--details are loosely presented, often incorrectly, and in such cases are worse than valueless. When so much ground is to be covered, only a limited number of details can be covered. The selection of details by Walker show, often, lack of experience and good judgement (in Walker 1931, no page number).

In addition to Emory's criticisms, Soehren (1963:22), working in the area over thirty years later, noted that Walker's principal emphasis was on *heiau* sites "with only brief attention given to other surface features and none to subsurface remains." An examination of Walker's manuscript confirms this observation. While some information about burials, house sites and village sites is included, the vast majority of sites described are *heiau* and most descriptions are centered on West Maui and more accessible leeward locations. With the exception of the Paokahi *heiau*, Walker did not describe any sites in the project area.

This is a large *heiau* with an extreme length of 130 feet and a width of 100 feet. It is built of stream worn boulders to a height of 12 feet above the stream. It is the open platform type with possibly three terraces on top, but pigs have so disturbed the interior that it is difficult to determine accurately the structures. At the southwest corner are two small enclosures, paved with flat stones and pebbles. A low wall 5 feet thick runs along the north side of the *heiau*. Only on the east is a double step-terrace visible. Mango and other trees have disturbed the southeast corner so badly that the outlines can not be determined The name Kumuula was also given for this *heiau* by informant, Kaiwiane (Walker 1931:209).

The next archaeological work in the project area was not undertaken until the early sixties, nearly 35 years after Walker's manuscript was written. Soehren's (1963) Bishop Museum survey was conducted under contract with the US National Park Service. The purpose of the survey was to

supplement the earlier work done by Walker for the museum; specifically, the goals were to relocate sites, find previously unrecorded sites, and improve upon already existing locational data.

While many new agricultural and residential sites were located and the locational data for some previously recorded sites were greatly improved, Soehren was unable to locate many of the sites described by Walker. For example, from Puaaluu stream on the east to Kepio Point on the west, Walker recorded 14 *heiau* or *heiau* sites. Soehren relocated only seven or eight of these. Soehren explained the difficulty in relocating sites in part as a result of destruction of some structures due to late 19th and early 20th century sugar plantation activities. "Most house sites, agricultural terraces and ditches in Kipahulu were demolished by the operations of a sugar plantation. The majority of those which survive today . . . are probably contemporaneous with the plantation, which closed about 1923" (Soehren 1963:22). A chronologically more plausible explanation for the discrepancy between Walker and Soehren's results is that the vegetation changed during the 35-year investigatory hiatus and many of the previously visible structures were covered by thick and often impenetrable vegetation during Soehren's survey. The paragraphs quoted below cite both destruction and heavy vegetation as reasons more of Walker's sites were not located:

Numerous remains of house sites and associated structures were found and recorded in the present survey, and nearly all gave definite indications of recent use. The dense, frequently impenetrable brush which covers most of the abandoned land of Kipahulu and the gulches of eastern Kaupo undoubtedly conceal other structures. Their archaeological value was not considered sufficient, on the basis of the sites found, to justify the expenditure of time required to locate, clear and identify them. The many stone walls to be found, particularly in Kipahulu, are chiefly cattle fences and boundaries of garden plots, and are of recent origin.

Agricultural terraces and irrigation ditches were recorded in several places, and many more have been destroyed by the plantation. . . . The abundance of water made Kipahulu ideal for the cultivation of wet taro (*Colocasia esculenta*). In contrast, Kaupo was traditionally known as a land of sweet potatoes (*Ipomea batatas*), which requires no complex terracing or irrigation. Sweet potato patches might have some rough terraces, however, or more likely mounds or heaps of stone, resulting from clearing the ground for planting. In Kaupo is found another type of structure associated with agriculture: a stone wall shelter termed *ka ua pe'e pa pohaku*, stone wall (behind which) to hide from the rain (Walker, 1931, p. 81). Such walls, about 10 feet long and 5 or 6 feet high, were placed near garden plots where one could quickly find shelter from the brief squalls which drive across the land from the east at certain times of the year (Soehren 1963:22-23).

The discrepancy with Walker in numbers of *heiau* sites located does not detract from the importance of Soehren's work in this region of southeast Maui. His survey results are the only record of the existence of some sites in the area; he did not restrict his observations to *heiau* but recorded agricultural and dwelling sites, or whatever was visible within his search area. For clarity and ease of comparison, Soehren's specific observations on sites in the project area are presented in the "Field Investigation" section of this report.

In the early seventies, a State Historic Preservation Office inventory survey was conducted on East Maui and included the project area. State site forms were completed by Robert D. Connolly III (1974) and Robert J. Hommon (1974) documenting archaeological remains in the vicinity of Alelele, Lelekea and Kalepa Streams. All sites in the project area documented on the State survey were

recorded previously by Soehren (1963). The forms provide more up-to-date information on the site location, extent, surface content, condition, configuration, and functional inferences.

As a result of devastation caused by hurricane Eva in 1982, Charles Keau and Muffy Mitchell of the Maui County Planning Office (Keau and Mitchell 1982) conducted a brief survey of areas near the Lelekea, Ka'apahu, Alelele, and Kalepa bridges. The purpose of the work was to ascertain the presence of archaeological sites in the area of proposed bridge reconstruction. The letter report mentions "shelter caves" at Lelekea and a possible burial cave at Alelele that would be impacted if the road were widened. These are the only two previously unrecorded sites discussed in the report. New bridges were constructed in 1983 at Ka'apahu and Alelele and no reported archaeological sites were impacted.

Apart from these surveys and the recent Alelele Stream reconnaissance survey (Kornbacher 1992) conducted in conjunction with the current project, the project area has seen no professional archaeological investigation. No research has been conducted in this area and no formal testing of the documented sites has occurred. Thus, the archaeological remains located within the Ka'apahu Subdivision are a relatively undisturbed record of early occupation and use of this unstudied portion of southeastern Maui.

V: SETTLEMENT PATTERN ANALYSIS OF KA'APAHU AHUPUA'A

An *ahupua'a* is a geographically and sociopolitically based traditional Hawaiian land division. It ideally encompassed a range of environmental zones from the coast to high elevation regions within one or more valleys, thus providing inhabitants access to the diversity of resources required for sustenance:

A Hawaiian family belonged not to a village but rather to an *ahupua'a*, a land division usually extending from the mountain heights to the sea. Typically, an *ahupua'a* consisted of at least one valley and included the ridges on both sides of the valley as well as the offshore area to the depth of a man's chest or to the reef crest. . . . *Ahupua'a* varied in size from large to small, but their typical inclusion of *mauka* and *makai* (seaward) lands assured their residents access both to the mountains, which supplied timber, cordage, food, and herbs, and to the sea and its resources (Abbott 1992:11).

Obviously, a detailed settlement pattern analysis of an *ahupua'a* must be based upon thorough historical and archaeological investigations of at least a sample of the cultural remains of the entire range of environments within an *ahupua'a*. The paucity of archaeological work undertaken and the total lack of previous research in the Kipahulu area, coupled with the fact that there are virtually no accounts of historic land use or prehistoric remains in the upland areas of the valleys, make this sort of analysis impossible for the *ahupua'a* of Ka'apahu at the present time. However, historical and archaeological work in the region and in other areas of the Hawaiian archipelago allow plausible inferences to be drawn about settlement within the portion of the *ahupua'a* that falls within the boundaries of the project area.

The Kipahulu district and neighboring Hāna were "coveted lands, prized . . . for their abundance of foodstuffs and all the valued products of land and sea" (Soehren 1963:2). If Soehren is correct in his assessment of traditional Hawaiian regard for resource abundance in the project area, it is likely that this part of Maui was occupied intensively in prehistoric times. Historical accounts of warfare in the district and oral traditions recounting the construction and use of *heiau* indicate that at least during early historic times this area was probably occupied on a permanent basis. Construction of coast-inland trails and fortresses also indicate an investment in the long-term occupation of the area. How far back in time this generalization can be extended cannot be determined from the data currently available.

In considering the role of the project area in the settlement pattern of Ka'apahu *ahupua'a*, one must keep in mind that only a small part of the *ahupua'a* is represented. Since resources in most Hawaiian valleys are distributed on an elevational gradient, the availability of resources (and thus the technology necessary for exploitation of different microenvironments) varies greatly throughout the *ahupua'a*. The primary microenvironment of the project area falls within the "coastal mesic forest" zone, as previously discussed. Although vegetation patterns have been greatly altered since European contact, the current setting of the project area still reflects an overall view of resource diversity and distribution. The portion of the *ahupua'a* encompassed by the project area was no doubt a crucial

component of the native settlement system, given the number of fresh water sources and proximity to the coast.

Exploitation of marine resources from inshore waters and reefs "provided the most important source of protein for the prehistoric Hawaiians" (Kirch 1985:5), and was probably an important aspect of land use at the more accessible coastal locations in Ka'apahu *ahupua'a*. Historic and archaeological data suggest that agriculture, probably taro farming, was very important to native subsistence and was conducted in the mesic forest zone of the project area along stream terraces, such as those of Alelele and Lelekea. Based on these assumptions of traditional land use, settlement of the coastal and lowland forest zones of the project area may be inferred to have been residential in nature and permanent or semi-permanent during late prehistoric and early historic occupation. Less tentative and more detailed analyses must await further study.

VI: FIELD INVESTIGATION

Methodology

The Ka'apahu Subdivision inventory survey project area (Fig. 3) extends along the Hāna Highway between Kalepa Point and Kukuila Stream. The remnant lots form the bulk of the survey area and are associated with each stream delta, as discussed in the "Introduction" section of this report. At the confluence of stream and ocean, the topography is relatively gentle and beaches form in these locations. Most portions of the project area that are not indicated as remnant lots on Figure 3 rise steeply in elevation on the landward side of the Hāna Highway and drop steeply on the seaward side. Thus, the survey consisted of two components: a road corridor component and a remnant lot component. Surveying along the road corridor involved walking the highway between remnant lots, noting any accessible areas that might contain archaeological remains, and investigating those areas. Along portions of the highway in which there are no accessible off-highway areas, the procedure was to note any features within the cliff face or at the shoreline that were indicative of cultural modification or use.

For the remnant lot component of the survey, all portions of the lot were systematically examined for surface or exposed subsurface archaeological remains unless the vegetation was impenetrable and examination was not possible. In areas covered with impenetrable vegetation, the survey procedure was to walk along the margins of growth and clear a small area at intervals of approximately two meters in order to determine if surface features exist that intersect the vegetation margins. All less densely vegetated and clear areas were examined at 100% coverage.

The physical environment of the project area conditions to some extent the probability of occurrence and the kind of archaeological remains expected. For example, in the cliff face along the Hāna Highway, surface features such as rock walls obviously do not exist. Consequently, the survey strategy was to look for evidence of walls and other rock structures in the cane grass in beach areas, and for culturally-modified caves and rockshelters at the base of cliffs and bluffs. Despite this efficiency-maximizing strategy, it is important to be aware that the range of variation in the archaeological record of the area is great and findings may deviate in kind and location from expectations. The survey was conducted with the goal of documenting the entire range of archaeological diversity in the project area. The results of the survey are presented graphically in Figure 5 and discussed below by remnant lot areas and associated stream drainages.

Survey Results

Remnant Lot 5

Remnant Lot 5 is a 0.92 acre piece of land located at the mouth of the Kalepa Stream. The vast majority of the lot is covered with dense cane grass (Photo 2). Paths on either side of the stream allowed us to survey along the highway corridor and check intermittently in the cane grass for structural remains. One site has been previously recorded in the vicinity of the Kalepa Stream. State inventory Site 50-50-16-1130 is referred to as a fishing shrine (Soehren 1963) and has been located

and described on three previous surveys. This structure was not relocated during the present survey. Soehren (1963) wrote the first description of Site 1130:

About one hundred feet east of Kalepa stream and below the highway, one hundred feet above high water mark is a well built terrace twenty-nine by thirty feet, five feet high on the seaward side and flush with the ground behind. It is built of water worn stones from the beach, and paved with cobbles and pebbles. No interior features were discernible. The structure is undoubtedly a fishing shrine (Soehren 1963:81).

In the early seventies, Connolly (1973) relocated the "shrine" and added to Soehren's description. He noted changes in the vegetation and in the condition of the structure.

Kalepa shrine is a rectangular platform, measuring 9.1 x 8.5 m. It is in good condition although the platform surface is covered with grass. On the E side, there is a growth of young pandanus trees which will undoubtedly cause some deterioration unless they are removed. The platform is of multiple-stacked construction, built with water-worn basalt boulders. It ranges from 0.9 to 1.5 m in height on the S end and is level with the ground on the N. The N and part of the W boundaries are fairly indistinct, although a few rocks that probably are part of the platform are visible.

On this site form, Connolly noted that the site can be seen from the road. The situation has changed in the nearly twenty years that have elapsed since Connolly's survey; the cane grass has grown to a height of nearly three meters in this area and the structure is no longer visible from the highway. This may actually contribute to its preservation.



Photo 2. Remnant Lot 5, Kalepa Stream, view west.

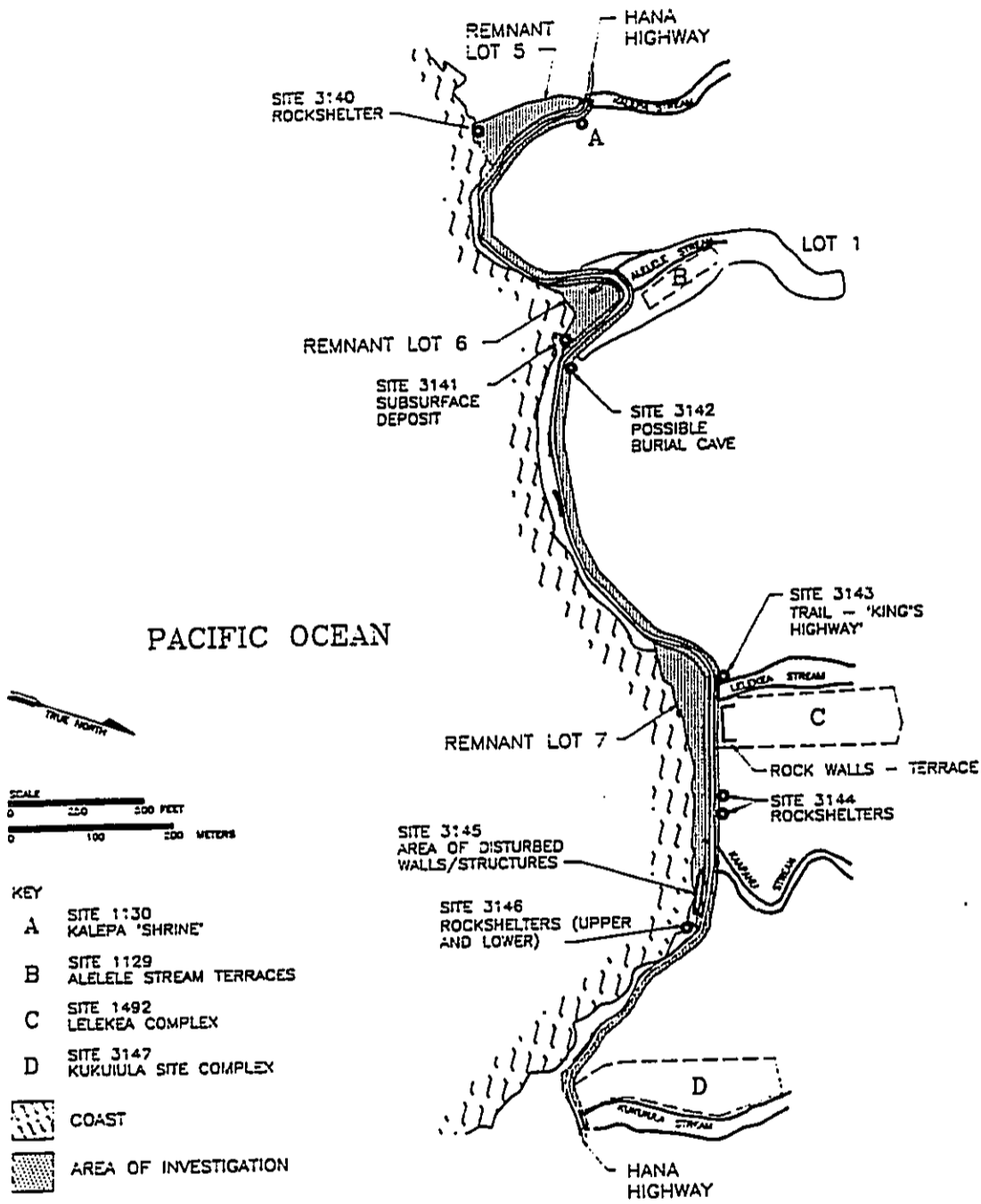


Figure 5. Map of project area showing sites discussed in text.

Most recently, Keau and Mitchell (1982) note the location of the Kalepa Shrine at an unrecorded number of meters southeast of the bridge. They report that there are no archaeological sites in the vicinity of the proposed bridge reconstruction site, which includes the current project corridor on either side of the Hāna Highway.

The seaward portion of Remnant Lot 5 is a high energy cobble beach partially bounded on the landward side by high cliffs. Several rock overhangs potentially suitable for shelter have been eroded out of the cliff face. None of these contained artifacts or midden or appeared to be culturally modified. Near the western end of the beach there is a large rockshelter (Fig. 5). The opening is approximately five meters above the beach surface and approximately 1.5 meters high (Photo 3). Once through this opening, the cave descends a few meters and the opening widens enough for standing upright. Beyond this point the cave continues to drop down at an angle, but the ceiling is lower. At the highest point along this face the opening is not quite one meter high. From this lower face the shelter extends back another 10 meters. Thus, the height of the cave at the back is less than a meter. The front opening to the back of the wall, the cave measures 17 meters. A preliminary examination of the cave sediments did not reveal any artifacts or midden; nor does the cave contain modern garbage. A pictograph is drawn on the second face of the cave overhang. It is very faint and may be recent in origin. This rockshelter was assigned state inventory Site 50-50-16-3140.



Photo 3. Opening of Rockshelter, Remnant Lot 5, Kalepa Stream

Soehren (1963) recorded two other sites at Kalepa during his 1962 survey. One is referred to as a possible house site, located on the west side of Kalepa stream near the shore, just outside of the project area. Two walls were observed at right angles parallel to the shore and the stream. The location of this structure is the only discernible reason for Soehren's functional interpretation (1963:82). The other site noted by Soehren is located "just below the road and in the brush" (1963:83) also on the west side of the stream outside the remnant lot boundary. The two structures are described

as rectangular enclosures, each with three walls: two short end walls and one long (approximately 18 meter) wall. Soehren suspected these enclosures served an agricultural function, stating that the "area within the walls is quite clear of stone, as if intended for cultivation" (1963;83). Neither of these features were relocated on the present survey. Time was limited and the description of the site locations places them outside of the project area. Relocating these two sites in the future may be difficult since thirty years have passed since Soehren's survey, and cane grass and other vegetation has grown to the point that the structures are probably obscured.

Remnant Lot 6

Remnant Lot 6 is a 0.74 acre portion of the Alelele Stream drainage area that is southwest of the Hāna Highway. This beach area has three access roads and is heavily used by locals and visitors for picnics and other recreational activities; it is known locally as *Hanawi* (Keau and Mitchell 1982). No archaeological structures were found on Remnant Lot 6. If structures did exist at one time, disturbance from the construction of the highway and the Alelele bridge, and the three access roads onto the beach, has rendered them unrecognizable.

On the east side of the Alelele Stream near the mouth is an alluvial sedimentary deposit with an exposure of approximately 2.3 meters. The record of deposition of stream-transported sediments is observable, as the current course of the Alelele stream has down-cut earlier deposits. Photo 4 shows the location of the exposed bank in a view looking southeast from the Alelele Bridge. Within the primarily alluvial sediments, 80 cm below the surface of the bank, is a lenticular deposit of ash and



Photo 4. Location of subsurface deposit at Remnant Lot 6, Alelele Stream, view southeast.

charcoal that appears to be a firepit. Charcoal is visible within the ash and the entire deposit is capped by a darker colored sediment. Close examination of the sediments revealed lithic artifacts in the surrounding matrix; several basalt flakes and one basalt core were noted. No historic artifacts were observed. This lack of metal, glass or other recent artifacts, coupled with the fact that 80 cm of alluvial sediments representing at least three depositional events overlie the ash stratum, suggests that the cultural deposit may be of considerable antiquity. A small charcoal sample, too small for traditional radiocarbon analysis but perhaps suitable for dating by accelerator mass spectrometry, was removed from this deposit and is curated with field notes at IARII. The subsurface deposit was assigned state inventory Site 50-50-16-3141.

Figure 6 illustrates and describes the profile at Alelele. Six distinct strata were identified. All strata, with the exception of the one bearing cultural material (Stratum III), have a common source and transport agent. Thus, they share many attributes and vary mainly in color and texture. All have abrupt, smooth lower boundaries, moderate grade, fine granular peds, and a dry, slightly hard consistence. All are gravelly and cobbly (17% to 50% gravel or cobbles by weight) but are composed of a clay-rich matrix. The oldest exposed depositional unit in the Alelele Stream profile (labelled Stratum I in Fig. 6) is only partially visible in Figure 6. This layer extends approximately 50 cm farther than illustrated to the base of the exposure. The deposit appears slightly oxidized with a reddish color that can be described as a Munsell category 7.5YR 4/4. The most striking feature of this stratum is the texture. The large proportion of large cobbles (10-20 cm) indicates the deposit was formed during an extremely high energy flood event. Stratum II is similar in color to Stratum I with a slightly different, less reddish, chroma (7.5YR 4/2). The texture also varies. The proportion of large cobbles is less; the predominant cobble size ranges between 5 and 10 cm. Stratum III is the cultural deposit containing ash, a dark sediment lens, lithic materials, charcoal. It was deposited within an alluvial stratum of similar color as Stratum II, although the texture of this deposit is markedly different than the underlying stratum. It is finer textured, containing a much lower proportion of cobbles. Thus, including the alluvial layer in which the cultural sediments were deposited, there are actually three different deposits that make up Stratum III. They vary greatly in color and texture. The deposit overlying Stratum III is very similar in color to Stratum II (7.5YR 4/4). It contains cobbles ranging from 5-10 cm in size, but a much lower proportion than Stratum II. Stratum V contains fewer cobbles and is more similar to Stratum III (the alluvial portion of the deposit) in texture. It is slightly darker in color (10YR 3/2) and appears to contain some organic material. The youngest stratum (VI) is a relatively organic-rich layer with a dark (10YR 2/2) color, containing roots and gravels ranging from 1 to 5 cm in size.

Northeast of the Alelele bridge and approximately 30 meters from the highway is a series of walls and terraces collectively referred to as state inventory Site 50-50-16-1129. A report of the recent reconnaissance survey results (Kornbacher 1992) provides a sketch map and baseline description of this complex.

In their survey for bridge reconstruction in 1982, Keau and Mitchell reported a "possible burial cave" just northeast of the Alelele bridge. The rockshelter was relocated for the current survey (Fig. 5). From the northeast corner of the old bridge, which is located northeast of the new Alelele bridge, the western edge of the rockshelter is 18.4 meters east. It is situated approximately five meters above the road surface and the visible opening is approximately 3.5 meters wide and less than one meter high (Photos 5 and 6). The functional interpretation of this rock crevice as a possible burial area is supported by the presence of water worn cobbles near the opening which appear to constitute a low wall that further contributes to the inaccessibility of the cave. The location of the cave also provides support for the burial interpretation because it is difficult to reach without climbing apparatus and is on a point of land facing towards the ocean. All of these factors suggest the rockshelter at Alelele was used as a burial area. The function of the rockshelter was not determined unequivocally due to



Photo 5. Rockshelter, Alelele Stream, view northeast (possible burial area)



Photo 6. Rockshelter with constructed wall, possible burial area, Alelele Stream

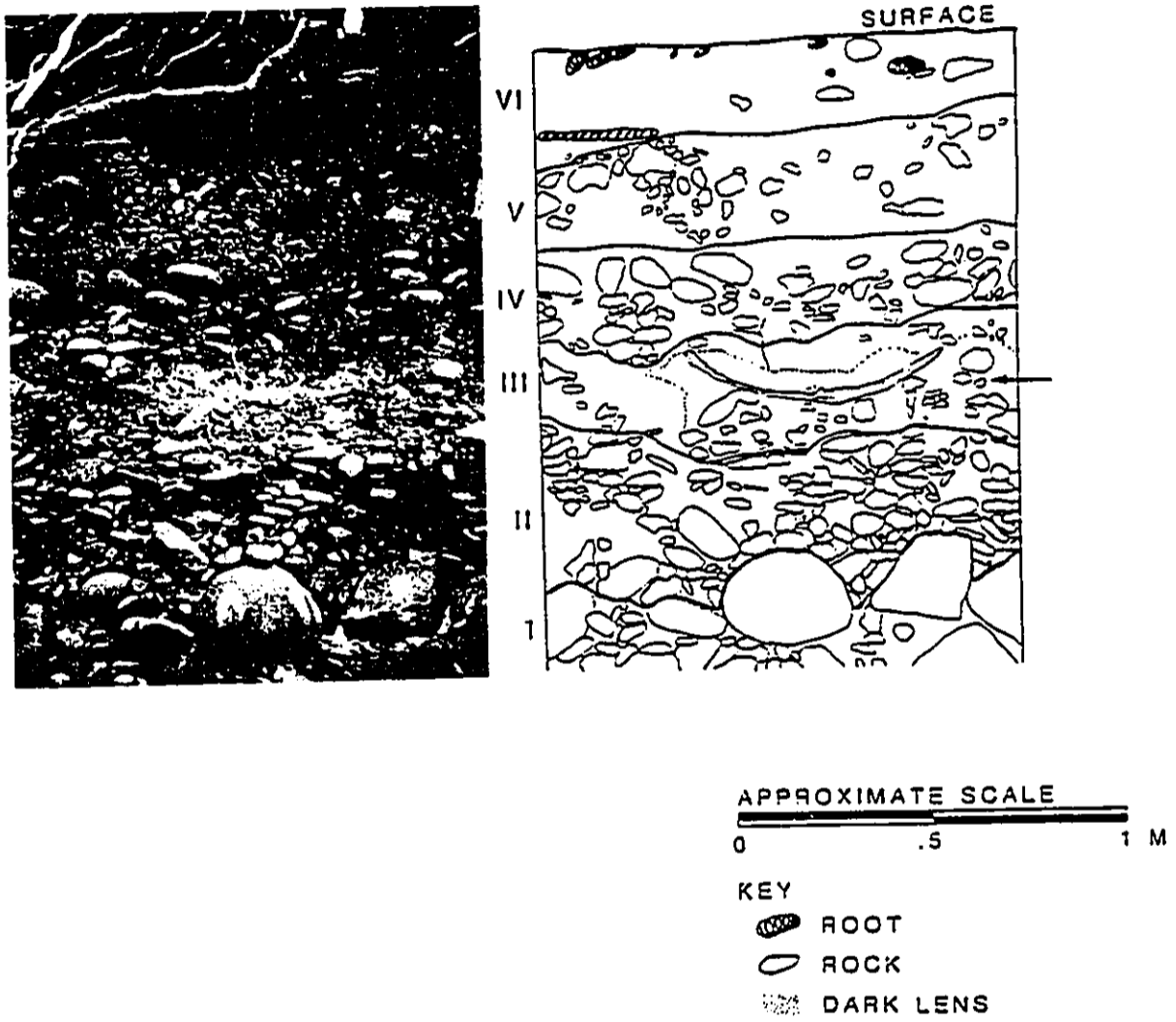


Figure 6. East profile of alluvial exposure, Remnant Lot 6, Alelele Stream
(Arrow indicates cultural deposit)

difficulty in gaining access. As observed by Keau and Mitchell (1982) any widening or alteration of the highway will likely result in destruction of the rockshelter. This possible burial cave was assigned state inventory Site 50-50-16-3142.

Remnant Lot 7

Remnant Lot 7 is a long, narrow, 1.62 acre parcel (Photo 7) that runs parallel to the Hana Highway. It is associated with two different streams, Lelekea to the west and Ka'apahu on the east (Fig. 3). On the landward side of the highway on the west side of the Lelekea stream is a small path that runs along the side of the valley and extends up over the ridge. This is a portion of the old King's Highway. According to local informants, some parts of the pathway are paved and there are walls and platforms in some areas (Kinser, pers. comm.). The path is said to lead into the Alelele Valley on the landward side of the Alelele waterfall. This is likely the same walkway mentioned by Walker that reportedly extends from Kiaphulu to Kaupo. This trail was assigned state inventory Site 50-50-16-3143.

On the east side of the Lelekea Stream is a series of walls and terraces, state inventory Site 50-50-16-1492. The Lelekea complex includes Paokahi *heiau* described by Thrum, Walker, Soehren, and Hommon in previous archaeological surveys of the area (see section above on "Previous Archaeological Investigations"). Although the bulk of this complex is outside the project area (Fig. 5), some investigation during the current survey indicates that the complex is extremely extensive and has never been accurately mapped. The sketch map provided by Hommon (1974) does not show the complex in its entirety. The former pathway leading from the highway to the Lelekea complex has been bulldozed into a clearing. This area is now being re-cleared to prepare for construction of a helicopter landing pad. The bulldozing and probably bridge construction as well, has caused disturbance of the walls seaward of the Paokahi *heiau*; or perhaps more accurately, the configuration of the seaward walls is no longer as it is depicted in Hommon's sketch map.



Photo 7. Remnant Lot 7, Lelekea and Ka'apahu Streams, view southeast.

An additional structure was located within the project area that does not appear to have been previously recorded but should be considered part of the Lelekea complex. Although much of the structure is obscured by the extremely dense growth of *hau* (*Hibiscus tiliaceus*), the largest portion is visible and runs parallel to the road. Three walls were located in all (Fig. 5). The long wall is 53.6 meters long and the two short walls run perpendicular to this on either end of the main wall. On the eastern end the wall is six meters long and appears to run into the slope, giving the structure the appearance of a terrace. No back wall was located, although the extreme tangle of *hau* made access impossible without extensive clearing. The western wall is 7.2 meters long but appears to have been partially destroyed by bulldozing. It is only one rock high along most of its length. The vast majority of the rocks used in the construction of the terrace are angular basalt cobbles. More structures are located outside of the immediate project area but do not appear on the site record sketch map. These are located immediately north of the walls just described in an area of dense vegetation. Although the extent of these walls was not determined, judging from the way they are situated against the hillslope, they appear to be walls of terraces.

Between the western edge of the Ka'apahu bridge and the long wall segment described above are rock overhangs -- formed by water erosion -- along the landward side of the Hāna Highway (Fig. 5). The only reference to these structures in the archaeological literature is by Keau and Mitchell (1982): "When the bridge is reconstructed here it will not have any adverse impact on the shelter caves located approximately fifteen (15) meters northwest of the bridge". Two rockshelters were recorded during the current survey and assigned state inventory Site 50-50-16-3144. It should be noted that there may be another rock overhang to the west that is higher above the road and obscured by heavy vegetation. This portion of the corridor should be monitored for additional structures if development does occur.

The eastern edge of the first rockshelter is located 58.4 meters west of the northwest corner of the Ka'apahu bridge approximately 2.5 meters above the current road bed. The rockshelter is 5.2 meters long and the opening is 1.2 meters high at its highest point. The surface slants down and back about one meter to bedrock. There is little accumulation of sediment and no evidence of cultural modification, midden or artifacts, with the exception of some modern debris observed near the opening.

The second rockshelter is 18.2 meters west of the northwest corner of the Ka'apahu bridge, approximately three meters above the road surface (Fig. 5) and measures nine meters across. The shelter is actually composed of two different chambers divided by a resistant protrusion of rock. The opening of the largest chamber is about four meters high at its highest point. There is very little sediment accumulation in this side of the rockshelter -- in some places bedrock is only about 5-10 cm below the surface. Some modern debris was observed near the opening. The small chamber to the east (Photo 8) is culturally modified. A wall, 3.5 meters long and about 1.5 meters high has been constructed in front of the opening and is made of rounded basalt cobbles. The chamber extends back to bedrock about 2.5 meters. There is midden (the shell was too fragmented to identify) on the surface; sediment accumulation above bedrock is approximately 20 cm. *Kukui* nut shells and some soda cans and other modern debris were observed.

On the seaward side of the Hāna Highway east of the Ka'apahu bridge, cane grass has grown to a height of nearly three meters; *hau* and an unidentified very thick shrub further inhibit movement and visibility in this area. There are two access roads to the beach of Remnant Lot 7, and disturbance from these roads, highway construction, and probably bridge construction as well, is apparent. Surface features do occur in this area, including wall segments, linear rock alignments, and retaining walls. Due to the nature of the vegetation and the disturbed character of the area, only the existence of the features was confirmed, their extent could not be determined. Thus, this area should be cleared and



Photo 8. Rockshelter with constructed wall, Remnant Lot 7, view northeast.

examined further in a Phase II inventory or at least monitored if further development occurs. The entire area of disturbed features, illustrated in Fig. 5, was assigned state inventory Site 50-50-16-3145.

At the far eastern end of Remnant Lot 7 at beach level is a rockshelter (Fig. 5; Photo 9). It is approximately three meters across and the opening is less than one meter high at the highest point. A large amount of modern garbage has accumulated in the bottom, making a determination of the depth to bedrock difficult. The sediment accumulation under the garbage is estimated to be only about 15 cm., and there is no evidence of midden or artifacts. Although the structure itself is not culturally modified, a rock wall extends from the north end and runs parallel to the shore (and highway) for at least 10 meters.

Approximately four meters directly above this rock overhang is another larger rockshelter (Photo 9). It is approximately 4.5 meters across and the opening is 2 meters high at its highest point. The shelter extends back about two meters. There are no artifacts or midden visible on the surface. The depth of sediment accumulation could not be determined; it is at least 10 cm. but may be much greater. Aside from the presence of *kukui* nuts, there is no indication of use or modification of this rockshelter. Both rockshelters were assigned state inventory Site 50-50-16-3146.

Kukuiula

Although there is no remnant parcel at Kukuiula Stream, we investigated the west bank of the stream along the highway corridor portion of the project area (Fig. 5). From the northwest corner of

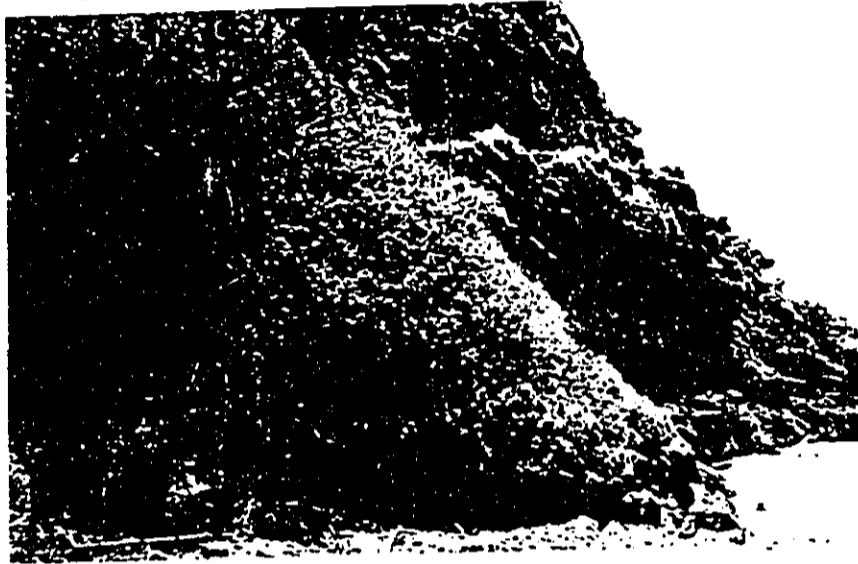


Photo 9. Upper and lower rockshelters, Remnant Lot 7, view east.



Photo 10. Portion of enclosure, Kukuila Stream.



Photo 11. Portion of terrace, Kukuiula Stream.

the Kukuiula bridge 27.5 meters northeast is a small faced wall that appears to be part of a terrace. This is one portion of a large system of retaining walls, terraces, enclosures, and cairns located on the western bank of Kukuiula Stream. Examples of surface features in this complex are shown in Photos 10 and 11. The features appear to be historic as they are in remarkably good condition. Soehren (1963) reported on the Kukuiula complex, but no state number was assigned. Soehren's report describes two different sites:

On the west side of Kukuiula Stream and a few yards above the highway in thick brush is an old cemetery. Several graves are outlined and covered with water-worn stones, and four cairns were found. All are unmarked (1963:77).

Along the west side of Kukuiula stream and beginning just above the old cemetery . . . is a series of walled taro patches. A dozen or more compartments range in size from twenty feet square to forty by one hundred feet. The walls are from one to five feet high and from two to five feet thick. A trail leading upstream may once have been an irrigation ditch, but identification is not positive. A length of three inch pipe was found near what was probably the intake. The entire complex is much overgrown with guava and coconut trees (1963:78).

The "cemetery" was not located during the current survey, although two cairns were noted (Photo 12). The Kukuiula complex was assigned state inventory Site 50-50-17-3147, although time limitations precluded the determination of the total number and extent of surface features.



Photo 12. Rock cairn, Kukuiula Stream.

VII: DISCUSSION AND CONCLUSION

The Ka'apahu Subdivision survey resulted in the location of several previously unrecorded surface features, three culturally modified rockshelters, one subsurface deposit, and three large site complexes at Alelele, Lelekea, and Kukuiula Streams. Based on the information presented in the preceding sections, several inferences can be drawn about occupation and land use during the late prehistoric - early historic periods in the Kipahulu area. This is best accomplished by first examining specific interpretations about the archaeological remains recorded within and near the project area, and then discussing more general conclusions about land use derived from a variety of historic, ethnographic, and archaeological information presented in this report.

Specific Functional Inferences

Remnant Lot 5 (Kalepa)

The function of the rockshelter located west of Kalepa Stream (Site 3140) cannot be determined without testing. The pictograph may be recent and not be indicative of historic use. No artifacts or midden were found but there is some sediment accumulation that might reveal artifacts or cultural features that would provide evidence of function. The rock walls located just to the west of the project area in the *ahupua'a* of Kalepa and recorded by Soehren "may be the remains of an old house site" (1963:82). The two rectangular enclosures, also located west of Kalepa Stream, "look clear of stone, as if intended for cultivation" (Soehren 1963:83). Soehren's tentative functional interpretations cannot be evaluated until more data are collected.

The terraced structure (Site 1130) that "is undoubtedly a fishing shrine" (1963:81) is also located in this area. Unfortunately, Soehren provided no information about why he believed this structure was a fishing shrine. Connolly (1973) states that "Coral is usually associated with fishing shrines, however, no coral was seen on this shrine." No uprights, artifacts, or midden that might suggest function are reported. A possible explanation for Soehren's conclusion may be found in this statement drawn from Thrum:

Maui folklore contains a few references to Kipahulu and Kaupo districts, mostly in localized variants of widely distributed tales. Among these may be mentioned the story of Aiai, son of Kuula, who established fishing shrines at various places in the islands, including Kipahulu and Kaupo (Thrum, 1907, pp. 230-249). . . [Soehren 1963:5].

Thus, one possibility is that Soehren based his assessment of Site 1130 on this account of local folklore, rather than on empirical evidence. The dimensions and construction of the structure are not inconsistent with a number of other functional interpretations, such as "habitation site". Currently we do not have the data necessary to select the most parsimonious explanation. To summarize, there are four different kinds of archaeological remains recorded at Kalepa Stream, and based upon morphological attributes, all appear to have different functions.

Remnant Lot 6 (Alelele)

A series of five stone terraces, two retaining walls, and one mound make up this complex (Site 1129). The function has been assumed to be irrigated taro cultivation, but it is probably more likely that the area was used for a variety of purposes including taro cultivation and habitation (cf. Kornbacher 1992). Also located in the Alelele Stream area is a rockshelter (Site 3141) that has been assumed to be a burial area because of its inaccessible location and constructed opening. In addition, a subsurface feature (Site 3142) was recorded which appears to be a firepit or possibly a hearth or some sort of processing pit. This feature appears to be associated with a larger cultural layer containing evidence of stone tool manufacture. Thus, in the Alelele Stream area, a variety of activities that may or may not have been contemporaneous are represented by the documented archaeological remains.

Remnant Lot 7 (Lelekea/Ka'apahu)

The Lelekea terrace complex (Site 1492), is interpreted as an agricultural site, although there are structures within this large complex of features that may have been used for habitation or some other purpose. Paokahi *heiau* is a large structure, probably used for a variety of religious, political, and possibly economic activities (cf. Kolb 1990, 1991). In addition to the Lelekea complex, four rockshelters (Sites 3144 and 3146) were recorded, one with a constructed front wall and two referred to as "shelter caves" by Keau and Mitchell (1982). These may have been used to provide temporary shelter from the elements, as the label implies. Cultural deposits are shallow to non-existent in all rockshelters (although midden was noted in one), and in two cases there is modern debris that suggests the walled part of the structure may be recent modification. Regardless of the contemporaneity of the archaeological remains recorded within and near Remnant Lot 7, a variety of activities are represented.

Kukuiula

Although the only description of the archaeological features at Kukuiula (Site 3147) is a very brief paragraph by Soehren (1963:77-78), he records two different functions of the features: a burial area and "walled taro patches". Brief observation of the area suggests this site complex contains structures that may have been used for habitation as well.

In summary, although functional inferences are based almost solely on morphological attributes and so are only tentative, the data suggest that the Kipahulu area of the Maui coast was inhabited, cultivated, and used for religious activities, including burial of the dead. This area cannot be assumed to have been used for solely agricultural purposes, as historic and archaeological evidence indicates intensive occupation and a variety of activities.

General Inferences

Soehren's observations about some of the environmental features of the Kipahulu and Hāna Districts led him to conclude that agriculture was crucial to early Hawaiians in the area. For example, there are very few good places to land a canoe -- the shore is rocky and cliff-bound. In addition, there are no reefs for inshore fishing and prevailing trade winds make deep sea fishing very difficult. Thus, according to Soehren (1963), the difficulties in procuring marine resources make agriculture the necessary subsistence focus. This reasoning is logical, although the relative importance of marine resources and agriculture to the traditional Hawaiian subsistence base remains to be assessed.

Unfortunately, historic records for the area do not provide this type of information; there are no testimonies for Land Claims that describe land use in the mid-19th century or earlier. Other potential data sources provide primarily sociopolitical and genealogical information and do not for the most part concern late prehistoric and early historic land use. Thus, functional inferences drawn (such as the area supported an agricultural community) must be tentative and viewed as hypotheses for testing.

If we assume a large percentage of traditional subsistence activities were agricultural (a reasonable assumption given various ecological and nutritional data, e.g., Hunter-Anderson and Zan 1985), the question that follows is, what crops were grown. The windward location of the project area is one factor that causes researchers to conclude that taro farming was the primary subsistence-related activity. As discussed above, the project area receives nearly 2,000 mm of rainfall annually and supports a rich and diverse floral community. In terms of these variables, the area is climatically similar to other locations where historic documentation of taro cultivation exists, such as Waipio Valley on Hawai'i Island and Hanalei on Kauai Island. For the Hāna area, Handy and Handy (1972) provide some discussion about where wet and dryland taro farming occurred:

Further eastward and southward along this windward coast line is the district of Hana, the fifth great [population] center. It is a region famous in legend and history, although it was supported chiefly by fields of mulched (dry) taro cultivation and sweet potato, the small steep stream-valley called Wailua being almost the only area of wet taro nearabout (1972:272)

On the banks [of the old terraces in East Maui] wet-taro farmers planted important subsidiary crops: bananas, sugar cane, arrowroot, and *ʻi* plants, the leaves of which had many uses and the roots of which appeased hunger in famine times (1972:94)

The purpose of including this information about taro cultivation is to point out that while taro was no doubt an important part of the traditional subsistence base, the region of the project area may have been used in a less-specialized manner than the sparse existing literature suggests (e.g., Walker 1931; Soehren 1963). While we cannot assess the function of any single site or feature in the absence of subsurface excavations, observations of surface remains indicate that a range of subsistence and non-subsistence activities were conducted, in addition to the cultivation of taro. The morphological diversity of structures and kinds of archaeological remains recorded provides evidence of functional diversity. Culturally modified rockshelters, a possible burial cave, rock terraces, and walls, Paokahi *heiau*, the structures at Kalepa, the subsurface deposit at Alelele, Kukuiula, Lelekea, and Alelele site complexes, including enclosures, terraces, cairns, and retaining walls, and all point to a complex and possibly long history of use in the project area.

VIII: RECOMMENDATIONS

A full determination of significance of all archaeological sites in the project area cannot be made without subsurface investigations of a full inventory survey. However, preliminary assessments can be made for some sites, and a full determination can be made in the case of the subsurface deposit at Alelele Stream, Site 3141. The cultural deposit within the exposed alluvial sequence is significant under Criterion D of the State of Hawai'i and National Registers of Historic Places and is in imminent danger of erosion by Alelele Stream and the ocean. The feature appears to contain charcoal in sufficient quantities for radiocarbon analysis, as well as associated lithic materials. It occurs 80 cm below the surface and underlies at least three distinct depositional events, indicating that it may be of considerable antiquity. This cultural stratum is the first such subsurface deposit recorded in the Kipahulu area and therefore has the potential to increase our understanding of the chronology and character of habitation in the area substantially. Thus, it is recommended that the cultural feature be removed before it is completely eroded, that samples be taken for radiocarbon dating, and that the stratum be tested for other features and artifactual remains.

State inventory Site 50-50-16-1130 referred to as a "fishing shrine" is recommended for subsurface testing before an assessment of significance can be made. It appears to be significant under Criterion D of the State of Hawai'i and the National Registers of Historic Places, and testing may reveal its significance under Criterion E as well. Since there are no visible surface manifestations of function, this structure must be cleared and tested to be properly evaluated.

An additional recommendation involves the rockshelter at Alelele (Site 3142). If the Hāna Highway is widened, this feature will be impacted. This possible burial area should be investigated closely, mapped, and tested if necessary prior to any modification of the area. Access to the rockshelter is possible with rope, ladder, or other climbing apparatus.

Due to extremely heavy vegetation, true 100% coverage of the project area was not possible during the Phase I survey. Consequently, there could be one or more surface features that were not detected. It is recommended that these heavily vegetated areas be cleared during the next stage of work and any archaeological features be mapped, described, and tested, if necessary. If these areas are developed before Phase II work is completed, it is recommended that they be monitored closely to prevent damage to possibly undetected archaeological remains.

Based on size, integrity, and potential to yield information important to the understanding of Hawaiian history and prehistory, the Lelekea, Alelele, and Kukuiula site complexes are considered significant. They appear to be potentially eligible for the State of Hawai'i and National Registers of Historic Places under Criterion D. Paokahi *heiau*, within the Lelekea complex, may also be significant under Criteria A, B, and E. It is recommended that prior to any modification of these site areas, all surface features within each site complex be recorded and mapped in detail and that subsurface testing be conducted to determine the existence, extent, and significance of subsurface deposits. Although the bulk of the surface features that make up these three site complexes do not fall strictly within the boundaries of this project, their eligibility for National Register nomination is raised here due to proximity to the project area and their undeniable importance to understanding the history of occupation and land use in the region.

No detailed mapping of any of the sites or site complexes that occur within or around the project area has been done. In several cases, it is important that this deficiency be corrected for preservation reasons. Many of the structures are deteriorating and continue to be damaged by natural processes of weathering and bioturbation. Erosion of stream banks is another source of damage, as the surfaces upon which structures were constructed are being undercut, contributing to the decomposition of the structures. In some cases damage by pigs, trees, and other biota, including people, has already been extensive. These sites need to be accurately described, mapped, photographed, and in many cases tested, before they are completely altered or destroyed.

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