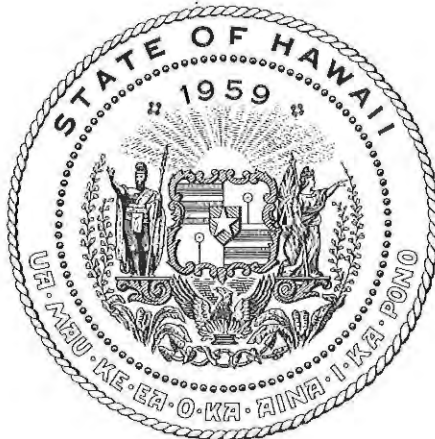


STATE LAND USE DISTRICT BOUNDARY REVIEW

HAWAII



Office of the Governor
OFFICE OF STATE PLANNING

1992



EXECUTIVE CHAMBERS
HONOLULU

JOHN WAIHEE
GOVERNOR

FOREWORD

The State Land Use District Boundary Review takes a bold step toward defining what kind of Hawaii we want to leave as our legacy for future generations. The growth and protection of our precious islands must be planned, and planned carefully.

This review sets forth the direction for urban growth that is needed for housing and economic development in our fair State. Rather than reacting to proposals by landowners and developers, this review has allowed the State to plan for development well into the next century. It provides for an adequate supply of urban lands in locations which can be efficiently serviced by infrastructure and other public facilities and which will not have adverse impacts on our environmental, cultural and agricultural resources.

While economic development is essential, it simply must not threaten our fragile environment. This review identifies the unique and special areas that are part of our heritage. Our native forest, wetland and stream ecosystems and rare flora and fauna habitats must be protected. Significant historic sites, coastal areas and scenic and open space resources are other treasures which must be safeguarded for future generation.

The protection of our watersheds is also critical to assure that we have the groundwater resources to support the growth of our population.

While the final decisions for the reclassification of lands identified in this report are left to the Land Use Commission, the information provided in this review will be the standard by which land use decisions will be judged in the future.

JOHN WAIHEE



OFFICE OF STATE PLANNING

Office of the Governor

MAILING ADDRESS: P.O. BOX 3540, HONOLULU, HAWAII 96811-3540
STREET ADDRESS: 250 SOUTH HOTEL STREET, 4TH FLOOR
TELEPHONE: (808) 587-2846, 587-2800

XCHN WAIHEE, Governor

FAX: Director's Office 587-2848
Planning Division 587-2824

PREFACE

The most recent Five-Year Boundary Review began in 1990 and concluded in 1992. It was an opportune time to conduct an assessment of our State Land Use District boundaries. Hawaii was emerging from a period of intense development pressures and many areas that residents thought were "safe" from development, in fact, were not.

Many were saying that it was time to step back and reassess our lands and their designations before the next wave of investment hit. Many questioned whether we wanted every square inch of these islands developed and asked whether anything would be left for future generations.

Agriculture was changing; a way of life disappearing. The old, large-scale sugar and pineapple plantations were downsizing or closing. The projected outlook for diversified agriculture was mixed. The visitor industry was the State's dominant industry and was largely dependent on Hawaii's natural scenic beauty.

In conducting the boundary review, we turned to the Constitution:

"For the benefit of present and future generations,
the State ... shall conserve and protect Hawaii's
natural beauty and all natural resources ..."

Article XI, Sec. 1
Hawaii State Constitution

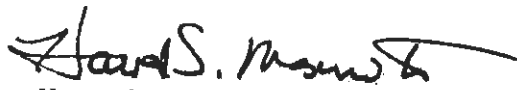
Therefore, a major focus of the review was to protect Hawaii's special areas before they were placed in jeopardy or irretrievably lost.

When we examined the actual lands in the districts, we found that many sensitive environmental resources were in the Agricultural District which left them vulnerable to development. Many of the lands in the Agricultural District were agricultural in name only. The boundary review has recommended that sensitive environmental areas be reclassified to the Conservation District or be protected by other means.

The review has also sought to direct growth and provide lands to meet long-range needs for housing and economic development. Some of this has already been addressed in the extensive statewide urbanization of land over the last five years. More land was urbanized during the last five years than during the prior ten-year period, primarily for affordable housing. However, the review has identified areas which are desirable and suitable for urbanization in order to direct growth to these areas.

Finally, we have worked to retain sufficient agricultural lands to meet the industry's changing needs and to provide open space.

The Office of State Planning is deeply appreciative of the many individuals, organizations and agencies that helped in this process and thanks them for their time, advice and concern for Hawaii's limited land resources.


Harold S. Masumoto
Director

CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. STUDY METHODOLOGY	7
III. APPROACH	11
IV. CONSERVATION, AGRICULTURAL, RURAL AND URBAN DISTRICT ISSUES . .	15
V. POPULATION AND ECONOMIC CONDITIONS	21
VI. COUNTY PLANS	25
- Hawaii County General Plan	25
- Analysis of County LUPAG Designations and Existing State Land Use Districts	26
- Keahole to Kailua Development Plan	27
VII. REGIONAL PLANS	29
- West Hawaii Regional Plan	29
- Hamakua Regional Plan	31
VIII. EXISTING STATE LAND USE DISTRICTS	33
IX. URBAN AND RURAL DISTRICTS	37
- Existing Land Uses	37
- Urban Land Requirements	38
- Infrastructure	45
- Urban Land Use Issues	53
- Analysis of Urban Lands	55
X. AGRICULTURAL DISTRICT	57
- Existing Land Uses	57
- Agricultural Land Requirements	57
- Agricultural Land Use Issues	58
- Analysis of Agricultural lands	62
XI. CONSERVATION DISTRICT	65
- Watersheds	65
- Forest Reserves	66
- Public and Private Protected Natural Areas	66
- Native Ecosystems and Rare Species	72
- Native Forests	80
- Critical and Essential Forest Bird Habitats	82
- Wetlands	91

CONTENTS (cont.)

	<u>Page</u>
XI. CONSERVATION DISTRICT (cont.)	
- Beaches and Coastal Areas	92
- Streams	92
- Significant Scenic Resources	96
- State Parks	102
- Historic Sites	102
- Game Management Areas	105
- Open Space and Natural Areas	105
- Steep Slopes	106
- Lava Hazard Areas	109
- Ground Fractures and Subsidence Hazard Zones	110
- Other Uses	113
- Conservation District Issues	113
- Analysis of Conservation Lands	116
XII. POLICIES TO GUIDE STATE LAND USE DISTRICT BOUNDARY REVIEW . . .	119
XIII. FINDINGS	121
XIV. PRIORITY LISTING	129
XV. RECOMMENDATIONS FOR STATE LAND USE DISTRICT BOUNDARY AMENDMENTS	141
Hamakua District	143
1. Lalakea Stream	145
2. Waipio Valley Rim	149
3. Upper Paauhau	153
4. Kaohe	157
North Hilo District	161
5. Kanakaleonui and Keanakolu Tract	163
6. Waipunalei	167
7. North Hilo Streams, Laupahoehoe to Maulua Bay	171
8. North Hilo Streams, Maulua Bay to Haiku Point	171
9. North Hilo Streams, Nahaku Point to Hakalau Bay	171
South Hilo District	181
10. Hakalau Forest NWR (Humuula) and Adjacent Forest Bird Habitat Areas	183
11. Area above Hilo Forest Reserve-Waikoloa Ponds	187
12. South Hilo Streams, Lehuawehi Point to Alia Point	191
13. South Hilo Streams, Onomea Bay to Maumau Point	191
14. South Hilo Streams, Wailuku River	191
15. Panaewa (Waiakea) Residence Lots	201

CONTENTS (cont.)

	<u>Page</u>
Puna District	205
16. Keaau	207
17. Olaa West	213
Kau District	217
18. Kilauea-Keauhou	219
19. Hawaii Volcanoes National Park	223
20. Kau Forest Reserve Addition, Moaula	227
21. Kau Forest Reserve Addition, Kaalaiki-Ninole	227
South Kona District	233
22. South Kona Forest Reserve Addition, Honomalino	235
23. South Kona Forest Reserve Addition, Oleomoana	235
24. South Kona Forest Reserve Addition, Kaohe-Kukuipae	235
North Kona	243
25. North Kona Forest Reserve Addition, Honuaula Tract 3 Extension	245
26. North Kona Forest Reserve Addition, Honuaula Tract 3	245
27. North Kona Forest Reserve Addition, Honuaula Tract 2	245
28. North Kona Forest Reserve Addition, Makaula-Ooma	245
29. Keolonahihi-Keakealaniwahine Complex	257
30. Puuwaawaa	261
31. Kaupulehu	267
32. Kaloko and Honokohau Fishponds	271
33. Kailua to Keahole - State-owned Lands	275
34. Kailua to Keahole Urban Area	279
South Kohala	283
35. Wailea Bay	285
36. Hapuna Beach Recreation Area	289
37. Hills of Waimea	293
38. Puus - South Kohala	297
39. Waikoloa Stream	301
North Kohala	309
40. Kehena	311
41. Lapakahi-Makai	315
42. Lapakahi-Mauka	319
43. Akoakoa Point	323
44. Kohala Cliffs and Valleys	327
45. Puus-North Kohala	331

CONTENTS (cont.)

	<u>Page</u>
Areas of Critical Concern	337
46. Kona Watershed and Natural Resource Areas	339
47. Kohala Mountain Watershed and Natural Resource Area	343
REFERENCES	359
LIST OF APPENDICES	
Appendix A - Population Projections	363
Appendix B - Summaries of Future Area Requirements by Land Use . . .	367
Appendix C - Preliminary TMK Listings for Reclassification Recommendations	379
ACKNOWLEDGEMENTS	397
LIST OF ABBREVIATIONS	407

TABLES

	<u>Page</u>
1. Existing and Projected Resident and De Facto Population	21
2. County of Hawaii General Plan Population Projections	25
3. State and County Designations	26
4. Estimated Acreage of Land Use Districts	34
5. Visitor Industry Projections, 1985 to 2010	37
6. Urban District Reclassifications, 1976-1990	41
7. Vacant Developable Urban Lands	42
8. Urban Land Requirements, 1995-2010	43
9. Available Urban Lands to Meet Future Demands, 2000	44
10. Enrollment Projections - Hawaii District Schools	53
11. Agricultural Production Acreage Requirements for Hawaii County	58
12. Assessment of Areas Identified as Containing or Suspected of Containing Biological Resources	75-80
13. Special Streams: Stream Corridor Guidelines	99
14. Special Streams: Hawaii	100-101

FIGURES

	<u>Page</u>
1. State Land Use Districts	35
2. State, Federal and Hawaiian Home Lands	39
3. Infrastructure	47
4. Municipal Water Service Areas	50
5. Public Facilities	54
6. A&B Agricultural Lands	59
7. High Recharge Areas - Kona	67
8. Federal, State and Private Reserves, Refuges and Preserves . . .	69
9. Native Ecosystems and Rare Species-- North, South and East Hawaii	83-88
10. Essential Habitat for the Hawaiian Honeycreepers and the Hawaiian Hawk	89
11. Wetlands and Waterbird Recovery Habitat	93
12. Perennial Streams	97
13. Priority 1 and 2 Special Streams	103
14. Slope of Land	107
15. Lava Flow Hazard Zones	111

EXHIBITS

	<u>Page</u>
1. Lalakea Stream	147
2. Waipio Valley Rim	151
3. Upper Paaauhau	155
4. Kaohe	159
5. Kanakaleonui and Keanakolu Tract	165
6. Waipunalei	169
7. Laupahoehoe to Maulua Bay (North Hilo Streams)	175
8. Maulua Bay to Haiku Point (North Hilo Streams)	177
9. Nahaku Point to Hakalau Bay (North Hilo Streams)	179
10. Hakalau Forest NWR (Humuula) and Adjacent Forest Bird Habitat Areas	185
11. Area above Hilo Forest Reserve-Waikoloa Ponds	189
12. Lehuawehi Point to Alia Point (South Hilo Streams)	195
13. Onomea Bay to Maumau Point (South Hilo Streams)	197
14. Wailuku River and Waiau (Awehi) Streams	199
15. Panaewa (Waiakea) Residence Lots	203
16. Keaau	211
17. Olaa West	215
18. Kilauea-Keauhou	221
19. Hawaii Volcanoes National Park (Portion)	225
20. Moaula (Kau Forest Reserves)	229
21. Kaalaiki-Ninole (Kau Forest Reserves Additions)	231
22. Honomalino (South Kona Forest Reserves Additions)	237
23. Oleomoana (South Kona Forest Reserves)	239
24. Kaohe-Kukuipae (South Kona Forest Reserves Additions)	241
25. Honuaula Tract 3 Extension (North Kona Forest Reserves)	249
26. Honuaula Tract 3 (North Kona Forest Reserves)	251
27. Honuaula Tract 2 (North Kona Forest Reserves)	253
28. Makaula-Ooma (North Kona Forest Reserves)	255
29. Keolonahihi-Keakealaniwahine Complex	259
30. Puuwaawaa	265
31. Kaupulehu	269
32. Area East of Kaloko and Honokohau Fishponds	273
33. Kailua to Keahole - State-owned Lands	277
34. Keahole to Kailua Urban Area	281
35. Wailea Bay	287
36. Hapuna Beach State Recreation Area	291
37. Hills of Waimea	295
38. Puus - South Kohala	299
39. Waikoloa Stream/Waiulaula Gulch	305-307

EXHIBITS (cont.)

	<u>Page</u>
40. Kehena	313
41. Makai Extension of Lapakahi State Historical Park	317
42. Mauka Extension of Lapakahi State Historical Park	321
43. Akoakoa Point	325
44. Kohala Cliffs and Valley	329
45. Puus-North Kohala	333-335
46. Kona Watershed and Natural Resource Area	341
47. North Kohala Watershed and Natural Resource Area	345-349

I. INTRODUCTION

Purpose of the Five-Year Boundary Review

The purpose of the Five-Year Boundary Review is to conduct a statewide, comprehensive, policy-oriented examination of State land use district classifications. It provides the Land Use Commission (LUC) the opportunity to review urbanization proposals from a broad, comprehensive and long-range viewpoint rather than incrementally on a case-by-case basis. It also provides an opportunity to identify conservation or agricultural resources which are not in the appropriate land use district and should be reclassified.

Section 205-18, HRS, of the State Land Use Law, requires the Office of State Planning (OSP) to undertake a review of the classification and districting of all land in the State every five years. Upon completion of the Five-Year Boundary Review, a report of findings and recommendations will be submitted to the State Land Use Commission. The Office of State Planning may then initiate petitions for boundary amendments to implement the report.

The Legislature reinstated the Five-Year Boundary Review in 1985 in order to emphasize long-range planning in the land use decision-making process. The boundary review report provides the basis for recommending changes to existing land use district boundaries during the Five-Year Boundary Review and provides guidance for future land use decisions.

This report comprises the boundary review for the Island of Hawaii. Separate reports have been prepared for Kauai, Oahu, Maui, Molokai and Lanai.

1991-92 Review - Direction and Scope

The 1969 Five-Year Boundary Review was conducted with the philosophy that "the elements of land, air and sea are resources to be managed for the welfare of present and future generations." The 1991-92 boundary review has been conducted with the same philosophy in mind. Specifically, the Five-Year Boundary Review has been guided by Article XI, Section 1, of the Hawaii State Constitution which states: "For the benefit of present and future generations, the State ... shall conserve and protect Hawaii's natural beauty and all natural resources ..."

Factors that shaped the direction and scope of the 1991-92 Five-Year Boundary Review were:

- (1) Statutory provisions which require the review to focus on the Hawaii State Plan and County Plans;
- (2) Continuing discussion of constitutional provisions relating to important agricultural lands and the finding that there are significant acreages in the Agricultural District which contain conservation resources;

- (3) The need to revise boundaries based on new information and growing public awareness and support for protection of Hawaii's natural resources; national attention which has been focused on Hawaii's native species extinction crisis; and Act 82, SLH 1987, which calls for reclassifying high quality native forests and the habitat of rare native species of flora and fauna into the Conservation District;
- (4) Recommendations in the Hawaii Water Resources Protection Plan that call for increased protection of watersheds; and
- (5) The need to provide urban land to meet population and economic growth needs and promote infrastructure planning.

A. Statutory Provisions

The Land Use Law provides that OSP shall focus its review on the Hawaii State Plan and County General Plans and County Development and/or Community Plans. The Hawaii State Planning framework includes the State Plan itself as well as State Functional Plans. Seven State Functional Plans relating to physical resource needs and development were approved in 1991. The major theme for these physical resources Functional Plans was "balanced growth" and focused on the promotion of a balanced growth approach in the use of our limited resources. This theme provided direction for the boundary review and weighed heavily in the decision to conduct a physical resources-oriented assessment rather than an administrative or organizational review and to focus on the protection of natural resources.

The County General, Development/Community Plans and specific regional plans were closely examined for policy direction, particularly for the location of urban growth areas. In addition, a technical study was conducted to identify differences between existing State land use districts and County Plan designations. An assessment of these areas of inconsistency was conducted in order to recommend the appropriate State land use designation.

B. Continuing Discussions Over LESA

There have been a number of proposals put forward to implement Article XI, Section 3, of the Hawaii State Constitution which calls for the identification and protection of important agricultural land. One of these proposals recommended by the Land Evaluation and Site Assessment (LESA) Commission would have taken all non-important agricultural land out of the Agricultural District and placed these lands and Urban District lands into a new district under County jurisdiction. Of the approximately 1.9 million agriculture acres in the existing Agricultural District, 700,000 acres would be retained as important agricultural land while 1.2 million acres would go into this new district. The State would still have land use responsibilities in regulating conservation land and important agricultural land. For these conservation and important agricultural lands, the existing dual land management system would apply since both State and County approvals would be required for development.

However, there were a number of reservations regarding the LESA Commission proposal. A major reservation included the concern that there were conservation resources in the Agricultural District which should not go into an urban-type district but instead should be reclassified to the Conservation District. A pilot study undertaken by OSP in 1987 found that there were significant acreages in the Agricultural District with potential conservation value. Thus, it was felt that the Five-Year Boundary Review should specifically examine areas in the Agricultural District which merit reclassification to the Conservation District.

C. Need to Revise Boundaries Based on New Information and Growing Support for Protection of the Environment

The general trend is that lands have been slowly taken out of the Conservation District. There were 2,009,087 acres in Conservation in 1969 and 1,960,976 in 1990. At the same time, there has been a growing awareness of and support for the need to protect Hawaii's natural resources. Further, there has been new information which has been developed since the last boundary review, for example, on the location of rare and endangered species. Rare and endangered species were not specifically addressed during previous reviews. There has also been data and information collected as a result of statewide recreation and water resources planning, stream studies and other studies which serve to identify conservation resources. The Five-Year Boundary Review provides an opportunity to assess this new information and propose areas for reclassification to the Conservation District.

In addition, Hawaii's native species extinction crisis has received national attention. Approximately 75 percent of species extinctions recorded in the U.S. have occurred in Hawaii. Currently, 25 percent of all rare and endangered plants and animals in the U.S. are found in Hawaii. Proper classification of conservation resources is one of many steps which must be taken to affirmatively address this crisis.

Act 82, SLH 1987, states that the Legislature finds that Hawaii has several rare species of plants, animals, and fish that are found nowhere else in the world. The Legislature also finds that Hawaii has sizable areas of high quality native forests which are not in the Conservation District. The Act further states that to the maximum extent practicable, it is the intention of the Legislature to preserve Hawaii's unique native flora and fauna by reclassifying such areas as Conservation Districts.

D. Water Resources Protection Plan

The 1978 Hawaii State Constitutional Convention proposed and the electorate approved a new section on water resources which became Article XI, Section 7. This section in part states that the State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people. The State Water Code, Act 45-87, was adopted pursuant to Article XI, Section 7, of the Hawaii State Constitution. The Hawaii Water Plan and its component Water Resources Protection Plan were prepared as required by the Water Code.

The plan calls for increased protection of watersheds. Therefore, a Watershed Protection Study was conducted for the Five-Year Boundary Review to identify areas which should be protected as important watersheds. High priority areas were identified for study as budgetary limitations precluded a study of the entire State.

E. Urban Land Needs and Infrastructure Planning

Infrastructure is a major limiting factor affecting growth and development in all Counties of the State. In addition, new wastewater rules do not allow individual wastewater systems for developments exceeding 50 dwelling units. As such, infrastructure planning among landowners/developers and between the public and private sector will become even more critical in the years ahead. The Land Use Commission can play a major role in promoting infrastructure planning and development by delineating future areas of growth consistent with County and regional plans so that landowners and developers can make long-range commitments for the provision of infrastructure.

In addition, the Land Use Law and Land Use Commission Administrative Rules provide that the Urban District contain sufficient land to meet a ten-year projection. As a result, the boundary review looked at urban land requirements with respect to meeting population and economic needs for the next ten years. A 25 percent surplus factor was added on to account for lands which may be held out of the market for various reasons. The projections are also on the high side because existing densities and a 5 percent vacancy factor were used; household size was projected to decrease significantly and the redevelopment of existing urban areas at higher densities was not taken into account.

The boundary review has recommended the reclassification of lands to the Urban District to meet population and economic growth needs for the next ten years and to assure predictability in infrastructure planning.

Background of the Boundary Review

The 1969 Review

There are no readily available statistics on acreages reclassified during the 1969 boundary review. However, the review found that there was sufficient vacant urban land to meet projected growth for the next ten years on Oahu and Maui County. Additions to the Urban District were primarily made to refine district boundaries to include areas of existing urban use or accommodate public facilities. For Hawaii County, the study found that available vacant urban lands could accommodate three times the anticipated growth of resident population. Changes were made primarily to refine district boundaries. Many resort area proposals were submitted for Hawaii County. Available growth projections did not substantiate the need for redistricting most of the areas at the time of the review. However, some changes were made in response to detailed requests. For Kauai County, although the present Urban Districts were sufficient to accommodate foreseeable growth, the

location and distribution of these areas did not necessarily provide for specific locational needs determined in the County General Plan. Adjustments were made for residential areas, and the proposed resort areas at Princeville and Keoniloa Bay at Poipu were urbanized.

One of the major contributions of the 1969 review was to add certain lands along the shoreline to the Conservation District. The original land use boundaries were based heavily on forest reserve boundaries and steep slopes, although some shoreline/coastline areas were included. The 1969 review specifically examined the shoreline, river valleys and areas of steep topography. Many areas with scenic resources were also added to the Conservation District.

With respect to the Agricultural District, there were relatively minor additions to the Agricultural District on all islands.

The 1974 Review

During the 1974 boundary review, 4,731 acres were reclassified from the Agricultural to Urban District (significantly less than the 13,104 acres that landowners and developers proposed for urbanization).

Areas urbanized included Waipio, Ewa Town and Oneula on Oahu; Waikoloa, Kaupulehu and Kealahou on Hawaii; Wailuku and Wailuku Heights on Maui; and Kapaa and Nukoli on Kauai.

Approximately 33,278 acres were reclassified from Conservation to Agriculture (primarily from the mauka Kona area in the Keauhou ahupuaa). There were 23,871 acres reclassified from Agriculture to Conservation (15,000 acres of which were in Kapapala, Hawaii). Over 3,000 acres went from Urban to Agriculture (1,680 acres were at Kaluakoi and planned for hotel use) and 679 acres were reclassified from Urban to Conservation. The Urban to Conservation reclassifications included lands at Kahaluu, Heeia Fishpond, and Hawaii Kai on Oahu for open space and at Hapuna and Keei, South Kona in Hawaii for open space.

On Molokai, three areas planned for hotel use, Puaahala, Paialoa, and Kaluakoi were reclassified from the Urban District to the Agricultural and Conservation Districts.

II. STUDY METHODOLOGY

The 1992 Five-Year Boundary Review process included reviews of the Hawaii State Plan, State Functional Plans, County General Plan and County Development and/or Community Plans, baseline studies, resource mapping through the State's Geographic Information System, a Public Information and Participation Component, and extensive coordination with State, County and Federal agencies and other public and private organizations and individuals.

Baseline Studies

The following are baseline studies conducted for the State Land Use District Boundary Review:

- County Plans and State Land Use District Review and Mapping Study, PBR, Hawaii, addresses the requirement to review County General Plans and County Development and/or Community Plans. The study examines the relationship between existing State land use district boundaries and County plan designations.

Development or Community Plan maps were overlayed onto State land use district boundary maps and guidelines were developed to show which classifications were consistent with each of the State's Urban, Rural, Agricultural or Conservation Districts. Areas of inconsistency between State and County land use designations were identified and highlighted so that these areas could be further examined to determine the appropriate State land use classification.

- The Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., examined urban land in the State to determine how much urban zoned land is required to accommodate population and economic growth for the next five, ten and twenty years. Key components of this analysis include determining the existing supply of vacant urban lands in each County, assessing the general suitability of these lands for development, relating the supply to anticipated future demands for urban lands including residential, industrial, commercial, resort and public uses and identifying urban land requirements.
- Infrastructure Constraints and Opportunities Study, Eugene P. Dashiell, AICP, Planning Services, assesses infrastructure constraints and opportunities by County and planning area. Major infrastructure systems including airports, harbors, highways, water systems, sewerage and solid waste are examined.
- Agricultural Resources Study, Deloitte & Touche, analyzes issues and trends in the State's major agricultural industries and assesses their outlook.
- Watershed and Water Recharge Areas, University of Hawaii Water Resources Research Center, identifies high priority watershed and water recharge areas that should be reclassified to the Conservation District. The Hawaii Water Code and Hawaii Water Plan call for increased protection of

our watershed and water recharge areas. The Water Resources Protection Plan recommends that minimum areas of conservation lands for watershed as protected infiltration areas should be set aside. This study serves to address these concerns.

- Proceedings of the Native Ecosystems and Rare Species Workshops records the information gathered from a series of workshops conducted by OSP with the assistance of The Nature Conservancy of Hawaii. The purpose of these workshops was to identify areas that are known or suspected to contain significant biological resources including native forests and shrub lands, rare and endangered species, and unique or important habitats. The report does not contain recommendations and serves primarily as a resource study which identifies the location of these resources like other planning or resource studies which have identified important agricultural lands, historic sites, steep slopes, flood hazard zones, etc. The areas identified were assessed by OSP with the assistance of State and Federal agencies.
- David L. Callies provided overall land use and planning assistance.

Public Information and Participation

A Land Use Stakeholder Survey was conducted by Sunderland Smith Research Associates, Inc., to obtain input on land use issues from individuals and organizations involved in land use throughout the State. In-depth interviews were conducted with 150 community and government leaders and other "stakeholders" to delineate priority goals for land use planning, identify stakeholders' opinions on land use and growth policies and areas that should be protected in the Agricultural and Conservation Districts.

Highlights of the Land Use Stakeholder Survey include the following:

- The major land use concerns and priorities of participants in the survey varied according to the interests and organizational affiliations of the individuals involved. For example, developers and landowners were most concerned with reducing the burden of land use regulations and streamlining the review process, while environmentalists were most interested in protecting natural resources.

There was a consensus that truly prime agricultural land should continue to be protected.

Opinions were more divided on the extent to which other land currently classified as agriculture should be made available for housing and other development, maintained as open space or retained for diversified agriculture or other uses.

A number of individuals expressed a desire to make unused non-prime agricultural land available for urban purposes, especially for housing development.

Other survey participants, however, were more interested in ensuring that undeveloped lands receive protection from urban encroachment. They feared that with the phasing out of sugar, pressures to develop agricultural land would become very great. Environmentalists in particular felt that keeping land in its natural state and ensuring open space should be a basic policy objective.

- Respondents were asked to prioritize the most important goals for land use in the State of Hawaii today. The priority "Guide and direct development to make sure it serves Hawaii's needs" ranked first place overall. By affiliation, the development interests ranked in first place "guide and direct development ..." and in a tie for second "Assure adequate infrastructure" and "Provide land for jobs and economic growth." The two goals of guide and direct development and assure infrastructure were the two picks of the government sector.

Environmental organization representatives think that keeping Hawaii's air and water clean and pollution-free, and preserving shorelines, coastal areas and open space are the two priority goals.

Civic organizations put preservation of Hawaii's scenic beauty at the top, followed by guide and direct development to serve Hawaii's needs.

The preservation of agricultural land was pretty low on the lists of all segments except environmental groups. The only issue that was ranked lower to some groups was preservation of historic and cultural sites.

While most participants agreed that government policy should provide direction, there was not a consensus on what that direction should be. As discussed earlier, the group's priority goals was to "Guide and direct development to make sure it serves Hawaii's needs." Developers, however, interpreted that objective to mean that growth should continue at a fairly rapid pace to meet expanding needs, whereas environmentalists saw it more as a mandate to slow down and stabilize the rate of growth and development.

- A majority or near majority of every segment except environmental organizations, would like to see some growth and development in Hawaii over the next decade. "Some growth" was the usual choice from the roster of four possibilities that was offered to respondents: "a lot of growth"; "some growth"; "a little growth"; and "no growth at all."

Public informational meetings were conducted in March and April 1991 to solicit general comments and proposals for changes to land use district boundaries from the general public, special interest groups, community organizations, landowners and developers. As a result of this request for input, a number of recommendations for boundary changes were received--approximately 11 on Kauai, 42 on Maui (including Molokai and Lanai), 32 on Hawaii and 41 on Oahu. These were evaluated by OSP within the context of the overall review and baseline studies. Those that have been recommended are included in this report.

Public informational meetings were also conducted statewide from March-June 1992 to solicit comments on the draft report. The Office of State Planning also met with a number of organizations and community groups to present the draft proposals and obtain public input.

Resource Mapping/State Geographic Information System

One of the objectives of the review is to build up long-term capabilities in land use planning. The emphasis on a physical resources-oriented review led to use of the State Geographic Information System for this project.

Data layers added to the system to assist in the boundary review included State land use districts, vegetation maps which identify areas of native vegetative growth, State forest reserves, State natural area reserves, marine life conservation districts, national wildlife refuges and parks, rare and endangered species from the Heritage Program of The Nature Conservancy, native bird habitats, lands in sugarcane and pineapple cultivation and lava flow hazard zones. Overlays of resource information were prepared and examined to identify areas for potential reclassification.

The State Geographic Information System was an invaluable land use planning tool which assisted greatly in the analysis and presentation of complex information.

III. APPROACH

This boundary review places high priority on the protection of Hawaii's conservation resources. Watersheds, habitats of rare and endangered species, wetlands, special streams, historic sites, and coastal, open space and scenic resources are all heritage resources which require protection for the benefit of future generations.

However, there will be opposition to placing lands into the Conservation District. Landowners who have had plans for more intensive use of their properties will object because only certain types of uses are allowed in the Conservation District. Some land use options which would greatly increase the value of these lands may be foreclosed.

Other landowners who may only want to continue existing uses object to the additional regulations and paperwork which may be involved to obtain permits to expand or change uses in the Conservation District.

Objections may also be raised because lands which could have been used to provide some community benefit as a trade-off for urban zoning would already be protected through Conservation districting.

In addition, the Counties raise home rule concerns. Conservation lands fall under the jurisdiction of the Board of Land and Natural Resources rather than the County. The Counties would prefer to retain regulatory control over these lands.

Nonetheless, despite potential opposition, the statute requires that the review be conducted. Further, it is in the long-term interest of the State that these valuable assets be reclassified into the Conservation District.

The reclassification of lands requires review and approval by the Land Use Commission under quasi-judicial proceedings.

Because it can be expected that some petitions to reclassify lands to the Conservation District will be contested, the justification for initiating a petition to reclassify land into the Conservation District must be strong. Therefore, there are two types of Conservation District recommendations in the report. Priority #1 areas have been identified as top priority recommendations for Conservation reclassification which OSP will initiate petitions for. These are recommendations which have strong justification and can withstand the scrutiny of contested case proceedings.

Priority #2 Conservation recommendations include areas which OSP recommends but will not be initiating petitions because of budgetary constraints. Priority #2 also includes areas which have been identified as containing conservation resources, but documentation of these resources is not strong enough to defend a petition under contested case proceedings. It further includes areas where other methods have been agreed to, to prevent changes in use or in certain instances, to even enhance identified conservation values.

The purpose of identifying Priority #2 Conservation recommendations is to alert State and County agencies, the Land Use Commission, and the public that the land contains certain conservation values which should be considered in any petition for reclassification. It should also alert the landowner as to the State's position in the event that these areas are proposed for development.

During the review, the question of whether to submit proposed legislation to amend the Land Use Law to allow the Land Use Commission to conduct the boundary review under quasi-legislative rather than quasi-judicial proceedings arose. Under the quasi-legislative process, the LUC would hold hearings on the report and proposed amended land use maps. After the hearing, the LUC would adopt or reject the proposed map amendments.

Under quasi-judicial proceedings, the State would submit a petition to the LUC; the LUC holds a hearing; the landowner may request to intervene; and the LUC may approve, approve with modifications or deny the petition.

The advantage of the quasi-legislative proceedings would be that changes would be more directly based on public input and more policy-oriented in nature. Quasi-judicial proceedings are heavily fact-based. Further, because of the amount of information needed to support a reclassification and the procedures involved, the number of reclassifications that can be considered are limited. Reclassifications under these procedures are also site-specific rather than broad-brush proposals.

The decision was to retain the contested case process as it provides for careful scrutiny of all petitions--urban, agricultural and conservation--and allows the landowner or other affected parties to intervene under contested case procedures. Therefore, no amendments to the statute to change the proceedings have been proposed.

However, because the Five-Year Boundary Review is a comprehensive, overall review, petitions under the Five-Year Boundary Review should be reviewed in the same broad fashion, and OSP may request that the Land Use Commission review petitions by region or subject area, e.g., watersheds.

Types of Recommendations

A. Reclassifications to the Conservation or Agricultural District

Priority #1. These are areas that OSP will likely petition for in FY 92-93 and beyond. These include areas which require protection, i.e., conservation resources for which there is sufficient documentation and justification to support a petition under contested case proceedings.

Priority #2. These are areas that are recommended as lower priority. They include, for example, conservation resources: a) which are already protected because of government or non-profit ownership with conservation objectives such as national parks; b) that are significant but not of as high quality or abundance as other areas or not as critical to meeting a specific conservation objective such as protecting endangered birds; c) which are believed or known to contain conservation resources but further survey work is necessary

to either verify resources or determine appropriate boundary lines; d) which are of high quality but resource constraints limit the number of petitions which can be prepared; e) but other methods are available to protect the identified conservation values.

B. Reclassifications to the Urban and Rural Districts

The Office of State Planning may also initiate petitions for certain State, County and private lands which are recommended in the State Land Use District Boundary Review reports for reclassification to the Urban and Rural Districts. The decision as to which petitions OSP will initiate will be based on policy considerations, additional information, conditions on development, and the availability of manpower and financial resources.

C. Areas of Critical Concern

Two Areas of Critical Concern have been identified for Hawaii County. Natural Resources Roundtable discussions are to address these areas. Petitions will not be initiated if landowners submit a letter of agreement promising not to develop their lands for five years (tied to the next Boundary Review) or until a mutually agreeable solution to the resource problem is reached, whichever is shorter. However, these areas require attention and alternative methods of regulation or management to protect the resources which are present. Some of these areas are in agricultural use and that agricultural use is generally compatible with protection of the conservation resources. However, these areas are subject to development pressures and more intensive uses which are allowed in the Agricultural District.

D. Department of Hawaiian Home Lands (DHHL)

DHHL lands containing conservation resources and lands proposed for urbanization have been identified in the report. However, these lands are not subject to the State Land Use Law according to the Hawaiian Homes Commission Act of 1920, and action will not be taken on these lands.

Land Use Commission Petition Stage

The Office of State Planning will file petitions to reclassify Priority #1 areas with the Land Use Commission. In this case, OSP and the respective County planning departments are mandatory parties to the petition. Landowners, as well as any other parties with standing, may intervene in the proceedings by filing an application with the Land Use Commission.

The procedures of the LUC are guided by Chapter 205, HRS, and the LUC Administrative Rules. The petitioner is required to serve copies of the petition to affected landowners. Public notice of the hearing on the proposed boundary amendment is also required.

The Land Use Commission will conduct a hearing on the proposed boundary amendment. Six affirmative votes are necessary to approve any boundary amendment.

IV. CONSERVATION, AGRICULTURAL, RURAL AND URBAN DISTRICT ISSUES

Conservation District Issues

Management of Conservation Resources. Landowners and environmental groups have both raised the point that proper management is needed to protect Hawaii's rare and endangered species. They contend that zoning is not enough. It is true that zoning is only one element of an array of actions needed to protect conservation resources. Zoning is the allocation of land resources to meet certain desirable community goals, but other things also need to take place to achieve those goals. Just as zoning lands Urban does not guarantee that these lands will be developed and provide houses and jobs, zoning lands Conservation does not guarantee that rare and endangered species will be preserved. For example, reclassification into the Conservation District may not solve the problems of pigs, banana poka and fire.

However, although Conservation designation does not address these natural forces which are so destructive to Hawaii's wildlife, it can protect these lands from man-made intrusions, e.g., construction and development which have also historically eliminated many natural areas. Placing limitations on intensive use of these lands can help to assure that there is a resource left to protect.

If lands remain in the Agricultural District, the potential for more intensive use of the land exists. Within the Agricultural District, agricultural subdivisions and golf courses (C, D and E lands) are permissible uses.

There are more restrictions on uses within the Conservation District and an environmental assessment is required before lands can be reclassified out of the Conservation District. Therefore, where high quality conservation resources were present, it was determined that the best course of action was to recommend that they be classified in the Conservation District.

Uses Within the Conservation District. From a landowner's perspective, there are too many restrictions on uses in the Conservation District. The permits that are required for uses in the Conservation District are disincentives and cause landowners to object to lands going into the Conservation District. It is acknowledged that restrictions on uses are needed in the Conservation District to protect fragile resources. However, it can be argued that not all uses should have to go through the same scrutiny. For example, why should conservation-oriented organizations such as the U.S. Fish and Wildlife Service have to obtain Conservation District Use Applications (CDUA) for fencing, laying pipes or similar uses in the Conservation District. If taro farming is a compatible use in wetlands because it keeps areas open for waterbirds, or aquaculture a compatible use in fishponds, should a CDUA be required for these uses?

From an environmentalist's perspective, Conservation District rules may not be restrictive enough. For example, residences and golf courses may be permitted in certain subzones within the Conservation District.

To address the concern that lands will be reclassified to the Conservation District but not protected, e.g., that residences or golf courses will be permitted, OSP is generally recommending as Priority #1 areas which meet the criteria for the protective, resource or limited subzones. The Office of State Planning will support designation of these areas into the protective, resource or limited subzones.

Existing statutes grandfather non-conforming uses in the Conservation District. Thus, if lands are reclassified to the Conservation District, existing uses are allowed to continue. A CDUA will only be required for an expansion of an existing use or a new use. Grandfathering of existing uses when lands are reclassified to the Conservation District is a way to not adversely impact current landowners while preventing additional harm to the resource and limiting more intensive use of the property. For the County of Hawaii, there may be areas which are used for grazing where the "grandfather" provision would apply.

Both landowners and environmental groups have pointed to a need for examination of Conservation District rules. It may be worthwhile to begin such an examination before the Five-Year Boundary Review is completed.

Scenic, Open Space and Wilderness Resources. The Land Use Law recognizes scenic, open space and wilderness areas as conservation resources. The original delineation of boundaries and the 1969 review included these areas in the Conservation District.

Open space and scenic resources were identified as important topics during the existing boundary review largely because of the debate over LESA and important agricultural lands. Agricultural lands are an open space resource. One of the initial objectives of the review was to identify open space and scenic resources in the Agricultural District which should be reclassified to the Conservation District. This proved to be very difficult to do and has been accomplished only to a very limited extent. The report does contain recommendations to reclassify some of the more outstanding scenic and open space areas in the State to the Conservation District, e.g., Olomana. However, there are many other scenic and open space resources which potentially should be in the Conservation District but have not been recommended for reclassification. This is because such resources are measured and valued qualitatively rather than quantitatively and further studies are needed to determine the significance of specific resources and to justify reclassification by the LUC. It is recommended that such studies be pursued because scenic resources are so important to Hawaii's visitor industry.

Wilderness areas should also be considered. The term wilderness here is not meant to denote Federally designated wilderness areas. The term refers to areas which may not contain rare or endangered plants or animals, may not have watershed value or contain steep slopes, etc., but have value primarily as natural areas. These may, for

example, include areas which are heavily vegetated with non-native species. These natural areas contribute to the overall landscape and are part of what makes Hawaii an attractive and special place. Care needs to be taken that these areas are not incrementally lost and reclassified to urban or agriculture simply because they do not contain rare and endangered species or are not of watershed value.

However, as with open space resources, OSP did not identify and recommend areas for reclassification during the review solely on wilderness values because the evaluation would have been qualitative in nature and difficult to support before the Land Use Commission.

Retention of Conservation District Boundaries. The review found that with the exception of Oahu and Kauai, large acreages of additional urban lands were not needed. Moreover, urban growth for the next ten years on all islands can be accommodated by the redistricting of agricultural land not needed to sustain sugar, pineapple or diversified agricultural operations. Sufficient important agricultural land will remain to meet agricultural production goals. Redesignation of Conservation District land is not needed to meet urban land requirements for the next ten years or to meet agricultural production goals.

Therefore, except for one area in Hawaii County, the review did not recommend that conservation land be reclassified out of the Conservation District.

In general, it is recommended that lands be retained in the Conservation District unless the Land Use Law is changed to establish an Open Space District, and that any future proposals to reclassify Conservation District land continue to be carefully assessed. If an Open Space District is established, lands which have low value as conservation or agricultural resources but which have open space value and are not needed for urban uses could be included in this district.

Coastal Conservation Issues. At several of the public informational meetings, participants proposed that a continuous greenbelt strip along the coastline be placed into the Conservation District. The Office of State Planning has not included this as a boundary review recommendation because this type of blanket statewide change should be addressed through legislation or by the Counties. The Office of State Planning proposed legislation in 1991 to increase the shoreline setback to 40 feet in the Urban District and 150 feet in non-Urban Districts with exceptions for small lots. This bill did not pass. However, the Counties already have the authority under Chapter 205A to establish setbacks greater than the minimum established in that Chapter and thus a more immediate solution to this issue may rest with the County governments.

The boundary review does identify specific areas along the coastline which should be reclassified to conservation because of their resources or to conform to County plans.

Agricultural District Issues

The existing Agricultural District contains lands with soils which are only marginally good for agriculture as well as lands with good soils. The reasons for this go back to the initial delineation of land use district boundaries. After the Land Use Law was adopted in 1961, the LUC adopted temporary boundaries. Generally, the LUC renamed the forest and water reserve zones as Conservation Districts and divided the remainder of the land into "urban" and "non-urban," temporarily classifying the non-urban as "agriculture."¹

Upon further and more detailed analysis, permanent boundaries were recommended by the Commission's consultants, Harland Bartholomew & Associates.² The Urban District was expanded to include a liberal allocation of land for anticipated population growth. The boundaries of the interim Conservation District were also modified considerably. State land leased for Agriculture was included in the Agricultural District as were lands in the original forest reserve suitable for agriculture. In other locations, the Conservation boundaries were extended to include areas subject to erosion, wilderness areas, unique examples of lava flows, areas of outstanding scenic quality, recreational and historic sites. Agricultural District boundaries were based on the soil classification, existing agricultural land uses, topography, rainfall and consultation with experts.

The Commission conducted meeting and public hearings and modified and subsequently adopted land use district boundaries.

The consultants encountered certain special problems during the course of their study, problems which are still applicable today. One of these problems was the appropriate disposition of so-called "waste lands" which are neither suitable for high-grade agricultural nor urban development, also called "residual" lands. They noted that 1) under the provisions of Act 187, the Land Use Law, there are no unidentifiable land uses or residual lands, 2) "residual" areas are sometimes viewed as land to be considered waste but such areas are also identified as wilderness and may contain plant or animal life, making them appropriate for Conservation designation, 3) the resources at the peripheral boundaries of the Agricultural and Conservation Districts may approach a line of diminishing positive identification, and 4) there is a need for the exercise of value judgments in the delineation of Conservation and Agricultural District boundaries in many parts of the State.³

¹ Harland Bartholomew and Associates, Land Use Districts for the State of Hawaii, Recommendations for the Implementation of the State Land Use Law, Act 187, SLH 1961, January 11, 1963, pp. 9-10.

² Ibid.

³ Ibid., pp. 17-19.

The question of what to do with lands in the Agricultural District that are not suitable for high-grade agricultural use still exists. Moreover, while it is the State's intention to protect important agricultural land pursuant to the Hawaii State Constitution, the future will bring further questions and concerns relating to the entire Agricultural District because of the changing face of agriculture in Hawaii.

Overall, acreages in sugarcane and pineapple are declining and are projected to decline further although there are individual plantations that remain very healthy. Diversified agriculture is growing and over the years, significant acreages have been planted in macadamia nuts. However, diversified agriculture is not expected to be able to utilize all of the lands taken out of sugar and pineapple.

Agricultural use has been one means of keeping areas in open space and providing related open space benefits. Fields of sugarcane, for example, have enhanced the scenic beauty of the islands. However, there is uncertainty as to the nature and strength of the sugar industry in Hawaii. Proponents of open space will no longer be able to rely on sugar or pineapple to provide open space as companies continue to shrink the size of their plantations. Some landowners of former sugar and pineapple lands have gone into alternative crops such as oats and coffee and this should be encouraged.

However, there is a growing recognition that open space is a valuable resource in its own right and should be protected and managed. Open space enhances the value of surrounding communities, provides buffer areas, scenic vistas, and facilitates efforts to manage and direct urban growth.

As stated earlier, this review initially looked at the issue of agriculture and open space but in many ways found it difficult to address under the existing land use categories. The establishment of a new district, an Open Space District, and a tightened-up Agricultural District containing only important agricultural lands has been under discussion by the Legislature and provides a solution to the agriculture/open space dilemma.

Rural and Urban District Issues

The boundary review recommends that certain lands be urbanized to meet urban land requirements for the next ten years and include a 25 percent surplus. Questions have been raised as to whether this land will actually be developed and specifically whether it will be developed to address the need for affordable housing. It has been suggested that taxation be used as an incentive. It has also been proposed that the provisions on agricultural dedication which allows lands in the Urban District to be dedicated to agriculture be reviewed to determine whether this provision has been facilitating the "holding" of lands rather than the development of urbanized lands.

The recently enacted "use it or lose it" provision can also be utilized to promote development of urbanized lands. Affordable housing requirements can be addressed during the petition process.

Expediting the permit process has also been raised as a concern. To facilitate implementation of the review and expedite development in areas which the review has determined are appropriate, OSP will be requesting the LUC to change some of its detailed requirements on the form and content of petitions during the boundary review.

V. POPULATION AND ECONOMIC CONDITIONS

The County of Hawaii's resident population is expected to increase by a little over 80 percent from 122,300 persons in 1989 to 206,100 persons by the year 2010. De facto population is projected to increase from 138,000 persons to 243,000 over the same time period.⁴ South Kohala, North Kona, North Kohala and Puna will experience the most growth.

Table 1. EXISTING AND PROJECTED RESIDENT AND DE FACTO POPULATION

	<u>De Facto</u>		<u>Resident</u>			<u>Percent Change 1987-2010</u>
	<u>1987</u>	<u>2010*</u>	<u>1987</u>	<u>2000*</u>	<u>2010*</u>	
<u>Planning Districts</u>						
Puna	18,819	39,330	19,003	29,131	39,865	110
S. Hilo	46,903	56,770	45,303	52,064	55,520	23
N. Hilo	1,481	1,480	1,495	1,572	1,500	less than 1
Hamakua	5,252	7,980	5,303	6,792	8,085	52
N. Kohala	3,567	8,370	3,602	5,924	8,470	135
S. Kohala	11,217	36,230	7,097	14,140	22,300	214
N. Kona	24,183	74,930	20,503	35,657	52,620	157
S. Kona	7,223	10,520	7,293	9,139	10,660	46
Kau	4,700	7,080	4,700	5,982	7,080	50
Hawaii Island-wide			114,299	160,400	206,100	
M-K	123,400	243,000	114,300		206.1	

*M-K projections using distributions derived from 2010 projections.

Source: Department of Transportation, Preliminary Findings, Highway Needs Assessment, 1989, and Department of Business and Economic Development, Population and Economic Projections for the State of Hawaii, 1988.

The Office of State Planning is currently evaluating the M-K population projections, particularly the visitor industry projections. There is a concern that the visitor industry projections are too high, reflect an over-reliance on that industry and may become a self-fulfilling prophecy.

⁴ Department of Business and Economic Development, Population and Economic Projections for the State of Hawaii, 1988.

However, at the present time, these projections are still recommended for planning purposes and have been used in this review. According to the M-K projections, the average visitor census is projected to increase from 11,400 in 1990 to 39,600 in 2010. The number of hotel units will increase from 10,100 in 1990 to 16,400 in 2000 and 27,100 in 2010.

Growth in the visitor industry will be the primary impetus behind population and economic growth on the Big Island. However, agriculture which includes sugar cultivation and diversified crops such as coffee and macadamia nuts, construction, commercial fishing and manufacturing, are also important components of the island's economic base. High technology research and development in aquaculture, astronomy and energy has emerged as a new industry to further strengthen the economic base.

Most of the visitor growth is expected to occur in West Hawaii. Over one billion dollars of planned construction of resort-residential complexes have already been announced in addition to the substantial investment already in place. Many new world class luxury resorts have been built or are planned for the region.⁵

Hotels account for 6,000 jobs on the island or about 12 percent of the total number of jobs. However, a large number of indirect jobs are generated by the visitor industry in the services, trade, transportation and other industry sectors.⁶

The agricultural industry accounts for about 11 percent of the island's employment. Sugar is the primary agricultural activity. The long-term viability of sugar depends greatly on sugar prices which are determined by external economic factors. Big Island sugar plantations have reduced sugar acreages to cut costs and improve operating efficiencies and have converted some of their lands to macadamia nuts and other diversified crops.

Besides sugar cultivation and processing, local agricultural pursuits consist of the raising of cattle and other livestock, the growing of coffee, macadamia nuts, papaya, flowers and nursery products and vegetables.

Manufacturing or processing activities have been mainly related to the agricultural industry. About half of the employees in the manufacturing sector are involved in the processing of sugar. Other forms of manufacturing associated with agriculture include the processing of macadamia nuts and the production of jams and jellies and preserved vegetables.⁷

⁵ The General Plan, County of Hawaii, 1990, p. 9.

⁶ Ibid.

⁷ Ibid.

Research and development facilities include the Mauna Kea and Mauna Loa Observatories, University of Hawaii Cloud Physics Laboratory, Hawaiian Volcano Observatory and various agricultural research centers. The University of Hawaii at Hilo is also an important resource.

The 13,796-ft. summit of Mauna Kea is recognized as the best ground-based site in the world for astronomical observations. The University of Hawaii's Master Plan for the Mauna Kea Science Reserve calls for 13 telescopes by the year 2000.

The Natural Energy Laboratory of Hawaii (NELH) at Keahole is currently involved in research and development in energy, materials and aquacultural projects. Hawaii Ocean Science Technology (HOST) Park located adjacent to NELH is being developed for similar projects on a commercial scale.

Geothermal exploration and development is currently underway in the Puna district.

VI. COUNTY PLANS

Hawaii County General Plan

The County of Hawaii General Plan was adopted in November 1989 by the County Council. The General Plan is the policy document for the long-range comprehensive development of the island of Hawaii. It contains goals, policies and standards as well as a Land Use Pattern Allocation Guide (LUPAG) Map and Facilities Map.

The General Plan contains population projections. However, these projections are not intended to be used as goals. Rather, the General Plan uses the projected levels of population as a guideline in land use planning. The projections represent what could reasonably be expected to occur in the future. The goals, policies, standards and recommendations of the plan are intended to be flexible enough to cope with population levels below or above the projections.

Three sets of projections were developed. The major variable in each of these projections was the rate of growth of the visitor industry. Series A is the most conservative projection. It assumes the demise of the sugar industry and modest expansion in the visitor industry. The overall 1985-2005 rate of growth for Series A of 2.0 percent per annum is less than the 2.9 percent rate of growth of employment in the County during the last five years. Series B projections were developed as a medium series. These projections lie between Series A and C. Sugar employment is maintained and the overall per annum employment growth rate anticipated in Series B is approximately 3.7 percent. Series C is an optimistic outlook of the County's future. It is assumed that 17,800 hotel rooms plus additional condominium units will be built in the County by 2005. The average annual growth rate of employment in Series C is 4.7 percent.

The M-K series projects a population of 180,800 for Hawaii County by 2005. The Series A projection of 173,000 persons comes closest to this figure. The Series B and C projections exceed the M-K projection for 2005.

Table 2. COUNTY OF HAWAII GENERAL PLAN
POPULATION PROJECTIONS

Resident Population

1985	106,000	106,000	106,000
1990	122,000	124,000	129,000
2005	173,000	217,000	258,000

Source: The General Plan, County of Hawaii, 1990.

The County General Plan contains land use policies to direct growth through the year 2005 and proposes specific locations as urban and rural centers, industrial areas and resort areas in Hawaii County.

Analysis of County LUPAG Designations and Existing State Land Use Districts

Chapter 205-18, HRS, which requires the State Land Use District Boundary Review, provides that the Office of State Planning in conducting the review, shall focus its efforts on reviewing the Hawaii State Plan, County General Plans and County Development and/or Community Plans.

The County Plans and State Land Use District Review and Mapping Study, 1990, by PBR Hawaii, was conducted to address the requirement to review County plans. The study examines the relationship between existing State land use district boundaries and County General Plans and County Development and/or Community Plans.

The County of Hawaii LUPAG map designates areas for low density urban, medium density urban, high density urban, urban expansion, industrial, resort, university, agriculture, open area and conservation.

The LUPAG map was overlaid onto State land use district boundary maps using the State Geographic Information System to examine the relationship between State and County designations. Guidelines were developed to show which classifications were consistent with each of the State's Urban, Rural, Agricultural or Conservation Districts. A composite map was prepared identifying areas of inconsistency between State and County land use designations.

The following table summarizes the inconsistencies. The largest category is comprised of lands currently in the Agricultural District which are proposed for some type of urban use, e.g., Low Density Urban, Medium Density Urban, Residential, Industrial, etc., 57,558 acres of which 36,665 acres are for Urban Expansion (UE). The second largest category (36,925 acres) consists of lands currently in the Agricultural District which are designated open by the County.

Table 3. STATE AND COUNTY DESIGNATIONS

COUNTY OF HAWAII

STATE LAND USE	COUNTY LAND USE DESIGNATIONS										TOTAL
	LDU	MDU	HDU	UE	IND	RES	UNV	AG	OPEN	CONS	
Agriculture	19,774	807	111	32,649	3,763	127	327		36,925	5,662	100,145
Conservation	341	139		3,744	1,833	2,384		24,400			32,841
Rural	106			272				273			651
Urban								989	7,737	133	8,859
Total Acres	20,221	946	111	36,665	5,596	2,511	327	25,662	44,662	5,795	142,496

Source: PBR, Hawaii, County Plans and State Land Use District Review and Mapping Study, March 1991.

Each of the parcels mapped as inconsistent was reviewed to determine the appropriate State land use classification. Parcels which met the State land use district boundary review policies and criteria and have been recommended for reclassification are discussed in the sections of the report dealing with the Urban, Rural, Agricultural and Conservation, Districts.

Although the LUPAG designates over 50,000 acres in the Agricultural District for urban uses, analysis of the parcels using boundary review policies and criteria and the results of the baseline studies prepared for the review found that most of these parcels were inappropriate for urbanization during the boundary review. The analysis found that:

1. There is more than enough urban land in the County to meet population and economic growth needs to 2010;
2. Many of the areas proposed for urbanization lack adequate infrastructure;
3. Impacts on agricultural and environmental resources need to be further examined; and
4. Many of these areas were not identified for urbanization in more recently prepared regional plans.

Areas recommended for reclassification to urban during the boundary review are the result of further study utilizing additional information provided by the baseline and other studies and the guidance provided in more specific, recently prepared regional plans such as the Keahole to Kailua Development Plan, the West Hawaii Regional Plan and the Hamakua Regional Plan.

The Hilo Community Development Plan, 1975; Northeast Hawaii Community Development Plan, 1979; North Kohala Community Development Plan, 1984; and Kona Regional Plan, 1982; were also reviewed.

Keahole to Kailua Development Plan

The County of Hawaii's Keahole to Kailua Development Plan (K-K Plan), adopted in 1991, provides a framework for the future growth and development of the sub-region. The K-K Plan organizes the various land uses into three major bands or zones:

- The coastal zone which encompasses lands makai of Queen Kaahumanu Highway is planned primarily for public recreational facilities, parks, open spaces and resort development.
- The regional urban complex, a band of land about one-half to one mile in width immediately mauka of Queen Kaahumanu Highway, will be the area for denser urban uses, including a major new civic center, related office and retail commercial development and various uses that will serve the needs of all of West Hawaii.

- The upland residential zone from about elevation 400 ft. to the Mamalahoa Highway is planned primarily for residential development and related parks, schools and small village centers.

The plan also proposes a new regional center approximately two miles north of the center of Kailua Village, major new roadways and a regional greenbelt system.

VII. REGIONAL PLANS

West Hawaii Regional Plan

The West Hawaii Regional Plan, November 1989, prepared by the Office of State Planning, addresses critical topical issues which require the State's attention in order to meet the region's present and emerging needs and identifies strategies and actions to meet those needs. The plan projected the impacts of "maximum build-out" of all resorts proposed for the area. Potential adverse economic, social and environmental impacts pointed to a need to plan for an orderly mix of land uses to provide a preferred quality of life for West Hawaii residents. Strategies and actions relating to land use include the following:

- Cluster resorts in "Resort Destination Nodes" in the following areas:
 1. Mauna Kea Resort Node
 2. Mauna Lani/Waikoloa Resort Node
 3. Kaupulehu/Kona Village/Kukio Resort Node
 4. Keahole-Keauhou Resort Node
- Target major areas for government-assisted support communities at Kealahou, Signal Puako, Waikoloa, Lalamilo, and Kawaihae.
- Develop secondary support communities at Hawi, Waimea, Honokaa, and South Kona.
- Direct future regional urbanization to designated Subregional Planning Areas at Kailua-Kona to Keahole and Kawaihae to Waikoloa.
- Designate and protect the most productive lands for agriculture.
- Advocate preservation of viable coffee farms and potential coffee-growing areas through State and County land use regulatory processes.
- Implement recommendations from government agencies that high value coastal recreation sites be protected from conflicting uses.
- Identify and protect good, natural communities such as native dry forest, wetland bird habitat, native plant communities, critical habitat for endangered forest birds and anchialine ponds.
- Protect and effectively manage watersheds.
- Recognize and protect scenic areas, natural landmarks, open space, and viewsheds as amenities that: improve the quality of life for Hawaii's residents, support the visitor industry and influence land use patterns.
- Identify and protect scenic areas and open space areas that enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources.

- Identify and manage areas of cultural importance in ways that enhance and promote an appreciation of our cultural heritage.
- Designate the following areas as Heritage Areas:
 - ° Kohala Cliff and Valley for its value as important watershed areas, scenic resources, forest recreation areas, and natural communities.
 - ° Summit area and upper slopes of Hualalai for its values as watershed areas, scenic resources, forest recreation opportunities, and natural communities.
 - ° Awakee for its prominent Puu Kuili and the anchialine pond complex together with its relationship to adjacent proposed park areas at Makalawena and Maniniowali.
 - ° Aimakapa Pond, Kaloko Fishpond, and Opaepa (Kapoikahi) Pond for their values as important breeding and nesting habitat for endangered waterbirds.
- Support the establishment of wildlife sanctuaries at Aimakapa Pond and Opaepa (Kapoikahi) Pond.
- Retain lands having heritage values in the Conservation District; reclassifying other heritage areas (those not currently in the Conservation District) in order to provide maximum protection.
- Evaluate the potential impact of land use proposals on the visual quality of the landscape, including view plane and open space considerations.
- Protect the scenic qualities of the Kohala Cliff and Valley.
- Protect the views afforded from the Queen Kaahumanu Highway and from the shoreline.
- Protect the open space in West Hawaii through a variety of mechanisms, including the use of land use designations and conservation easements.
- Support Senate Concurrent Resolution No. 179 (1988 Session) which urges the State and County governments to ensure that the public view and open space makai of the Kawaihae-Mahukona-Hawi Road be preserved.
- Protect significant natural landmarks, including North Kohala volcanic cones along the Kohala Mountain Road, Puuwaawaa volcanic cone, Luahinewai, Kuili volcanic cone, Kaloko Fishpond, Aimakapa Fishpond, and Opaepa Pond (Kapoikahi Pond).
- Support the establishment of Kaloko-Honokohau National Historical Park and the expansion of Puukohola Heiau National Historic Site.
- Expand existing historical parks to include other significant cultural features or sites with appropriate buffer zones and view planes. State historical parks recommended for expansion include: Keolonahihi Point

Historical Park--expand to include Hauelani Heiau, also known as Pakiha and Keakealaniwahine's residence; Mookini Heiau State Monument and Kamehameha I Birthsite State Monument--expand to incorporate both monuments in one site with appropriate buffer zone and view planes; and Lapakahi State Park--expand to include the dryland field systems.

- Identify new historical/cultural areas such as Kukuipahu Heiau, Umiwai Bay, and the Halawa Village complex.
- Protect the forested mauka lands of Hualalai as a watershed. Encourage compatible uses of these areas and recognize their additional values of reducing flood hazards, creating forest recreation opportunities and protecting native wildlife habitat.
- Acquire mauka lands on Hualalai for watershed reserves and recharge areas.
- Consider the consolidation of about 24,000 to 25,000 acres of public and private land on Hualalai for the management of watersheds, forest recreation and wildlife protection.
- Support the land use reclassification of the mauka lands of Hualalai to the Conservation District and ensure that its subzone designation is consistent with its protection as a watershed.
- Discourage the conversion of mauka forested lands on Hualalai to agricultural or residential uses.

Hamakua Regional Plan

The Hamakua Sugar Company is the State's second largest producer of sugar and generates approximately 11.8 percent of the energy needs on the island through renewable sources. Severe financial difficulties threatened the shutdown of Hamakua Sugar Company and resulted in the need to sell approximately 9,500 acres of sugar lands. Because of the major potential impacts associated with the loss of Hamakua Sugar Company and the release of its lands, the County of Hawaii and the State administration convened a Steering Committee to develop a Hamakua Regional Plan, November 1990, to set forth a rational planning guide for the future long-range use of lands along the Hamakua Coast. Land use recommendations addressed three zones within the planning region: Zone 1, Kalaakea to Ookala; Zone 2, Ookala to Kukuihaele; and Zone 3, Kukuihaele to Waipio.

The land use recommendations serve to maintain the viability of the Hamakua Sugar Company by helping to retain approximately 25,000 acres of core plantation lands in the Honokaa area while proposing increased densities and multiple use development for the north and south ends of the plantation. Increased densities within the existing agricultural land use designation are proposed for Zone 1 and multiple use development is proposed for Zone 3. In addition, the plan recommends urban expansion around the existing towns of Paauilo and Honokaa in Zone 2. However, the

County General Plan indicates that growth in the urban core of Paauilo should proceed in a southerly direction. According to Hamakua Sugar Company, southerly growth will have a negative impact on cane haul circulation. The Hamakua Regional Plan recommends that the growth of Paauilo take place in a northerly direction. Only the urban expansion proposed for Zone 2 is anticipated to require changes to State land use district boundary designations. Finally, the plan provides for a Waipio Preservation Buffer to preserve the cultural and scenic integrity of the Waipio Valley rim by preventing development and view plane encroachment from private structures.

Since the completion of the plan, circumstances have changed significantly in the Hamakua region. Hamakua Sugar Company has filed for bankruptcy under Chapter 11. Litigation in the Third Circuit Court invalidated the Hawaii County Council's upzoning of Hamakua Sugar Company's Kukuihaele properties and there is uncertainty arising from the Greenpeace lawsuit regarding the company's properties.

VIII. EXISTING STATE LAND USE DISTRICTS

The Conservation District includes the peaks and upper slopes of Mauna Kea (at elevations of 7,000-8,000 feet) and Mauna Loa mountains (to the Saddle Road on the north, to the 5,000-foot contour at Kapapala and the 3,000-foot contour in Kau excluding the southern portion which extends only to the 6,000-foot contour; and to the 7,500-foot contour in South Kona) and the summit of Hualalai and its northwest and western slopes.

The windward side of the Kohala Mountains and coastline, palis and valleys are included in the Conservation District as are several major river valleys along the Hamakua Coast.

In the North and South Hilo districts, a band of Conservation District land extends from approximately the 2,000-foot contour to the 5,000-5,500 foot contour. This band includes State forest reserve lands and a Federal wildlife refuge. The Puna district also contains large acreages of Conservation District lands, much of which consists of the Hawaii Volcanoes National Park.

Conservation District lands in southeastern Kau and the South Kona district include coastal lands with scenic, wilderness and natural area resources.

In North and South Kona in the mauka areas, State forest reserve lands are included in the Conservation District and there is a band of Conservation zoning along the shoreline broken intermittently with Agricultural or Urban zoning. Also in North Kona, a band of Conservation District land extends inland from the shoreline to approximately the 1,000 ft. contour and includes beach, coastal scenic and environmental resources and open space areas.

In addition, numerous areas along the shoreline are in the Conservation District.

The Agricultural District includes former sugarcane lands in North Kohala and grazing lands on the leeward side of the Kohala Mountains. The sugarcane lands along the Hamakua Coast are also in this district.

The plateau between Mauna Kea and Mauna Loa and the Waimea area which includes Parker Ranch is largely in the Agricultural District. A band of Agricultural District land also extends along the eastern slopes of Mauna Kea in a low rainfall area from approximately 7,000 to 5,000 foot contour.

Sugar and macadamia nut lands in Hilo, former sugarcane lands and lands in papaya and other diversified crops in Puna are in the Agricultural District.

Agricultural District lands in the Kau district include sugarcane and former sugarcane lands and lands used for diversified crops and grazing. These lands form a band that runs approximately from the shoreline to the 2,500-3,000 foot contour except in the area of Kahuku Ranch and Hawaiian Oceanview Estates where the upper boundary is at the 5,500 foot contour.

A band of agricultural lands extends through North and South Kona and South Kohala and is used for diversified crops including coffee, macadamia nuts and cattle ranching.

The Rural District includes parts of Kapaau and Halawa in North Kohala; Ninole in North Hilo; Eleven-Mile Homestead and small areas near Pahoa in Puna; Kealia in South Kona and mauka Keauhou, Kahaluu and Holualoa in North Kona.

The Urban District includes the main commercial and residential areas of Hilo and Kailua (Keahole to Keauhou) and numerous residential communities and resort destination areas. In North Kohala, these include Hawi, Kapaau, Halaula and Niulii; along the Hamakua and North and South Hilo coast--Kukuihaele, Honokaa, Paauilo, Kukaiau, Laupahoehoe, Papaaloa, Hakalau, Honomu, Pepeekeo, Papaikou, Paukaa and Hilo. In Puna--Keaau, Kurtistown, Mountain View, Volcano Town, Olaa, Hawaiian Beaches Subdivision, Pahoa, Nanawale, Kapoho, Kaimu and Kalapana. In Kau--Punaluu, Naalehu, Waiohinu and the location of the proposed Hawaiian Riviera resort. In South Kona--Napoopoo, Captain Cook, Kealakekua. In North Kona--Kainaliu, Honalo, Keauhou, Holualoa and Keauhou to Keahole. In South Kohala--Waikoloa resort complex, the Mauna Lani resort complex, various inland resort/residential complexes, Puako, the Mauna Kea Beach resort complex, Kawaihae and Waimea.

The following table shows the number of acres in each land use district.

Table 4. ESTIMATED ACREAGE OF LAND USE DISTRICTS
January 1990

	<u>Total</u>	<u>Urban</u>	<u>Rural</u>	<u>Agricultural</u>	<u>Conservation</u>
Hawaii	2,573,400	45,767	626	1,232,306	1,294,701

Source: Department of Business, Economic Development & Tourism, The State of Hawaii Data Book, 1990.

STATE LAND USE DISTRICTS



Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Land Use Districts current as of February, 1991. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official.

IX. URBAN AND RURAL DISTRICTS

Existing Land Uses

Residential. Historically, communities and towns developed near sugar plantations (for example, Hilo, the Hamakua Coast communities, Pahala, Naalehu, Hawi and Kapaau), cattle ranches (Waimea, North Kohala and Hamakua) and coffee farms (South Kona). Newer residential areas are developing as a result of resort development in North Kona and South Kohala. Housing in Hawaii County has traditionally been characterized by single-family residential units. However, multiple residential uses are found in South Hilo, South Kohala, Kona and Kau and to a limited extent in Puna, Hamakua and North Kohala.

Resort. The primary resort areas on the island are located along the coastal areas of Hilo in East Hawaii and North Kona and South Kohala in West Hawaii. There are also visitor units on a smaller scale at Punaluu, the Volcano area, Waimea and North Kohala.

As of February 1989, the inventory of hotel and condominium units totaled 8,161 units (6,143 hotel units and 2,018 visitor units). According to projections by the Department of Business and Economic Development, the average visitor census will increase from 11,400 in 1990 to 39,600 in 2010. Hotel units are projected to increase from 10,000 to 27,100 over the same period. Nearly 90 percent of the island's existing units are located along the Kona-Kohala coast and over 85 percent of the total new units are proposed for West Hawaii.

Table 5. VISITOR INDUSTRY PROJECTIONS
1985 to 2010
(In Thousands)

	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>
Average visitor census	8.0	11.4	17.5	24.7	32.6	39.6
Occupied hotel units*	4.3	6.1	8.6	11.5	14.9	19.0
Total hotel units	7.5	10.1	13.2	16.4	21.3	27.1

*Includes condominiums.

Source: Department of Business and Economic Development, Population and Economic Projections for the State of Hawaii to 2010, Series M-K, November 1988.

Commercial and Industrial. The city of Hilo serves as the major commercial district of the island with secondary centers located in Honokaa, Waimea, Kealahou and Naalehu. There is a growing urban center around Kailua-Kona.

A significant portion of the County's industrial activity is related to agriculture. The major user of industrial lands is the processing of sugar and related industries. Other agricultural industrial activities include the processing of coffee, macadamia nuts, meat products, tropical fruits and vegetables. Service-related industries are found near population centers.

Military. The Pohakuloa training area is the largest military-related land use on the island and covers 108,863 acres. Other military land uses are smaller in acreage and include Kilauea Military Camp, Kawaihae Military Reservation, South Point AFS and the Army Reserve, Hilo.

State and Federal Lands. The State owns 817,391 acres on Hawaii. The Federal government owns 229,848 acres.⁸

Urban Land Requirements

The Urban Land Requirements Study conducted by Wilson Okamoto & Associates, Inc., for the Five-Year Boundary Review examined urban lands in order to determine whether there is sufficient urban-zoned land to accommodate population and economic growth. Key components in this analysis were the determination of the existing supply of vacant urban lands in each County, assessing the general suitability of these lands for development, and relating the supply to anticipated future demands for urban lands, including residential, industrial, commercial and resort uses.

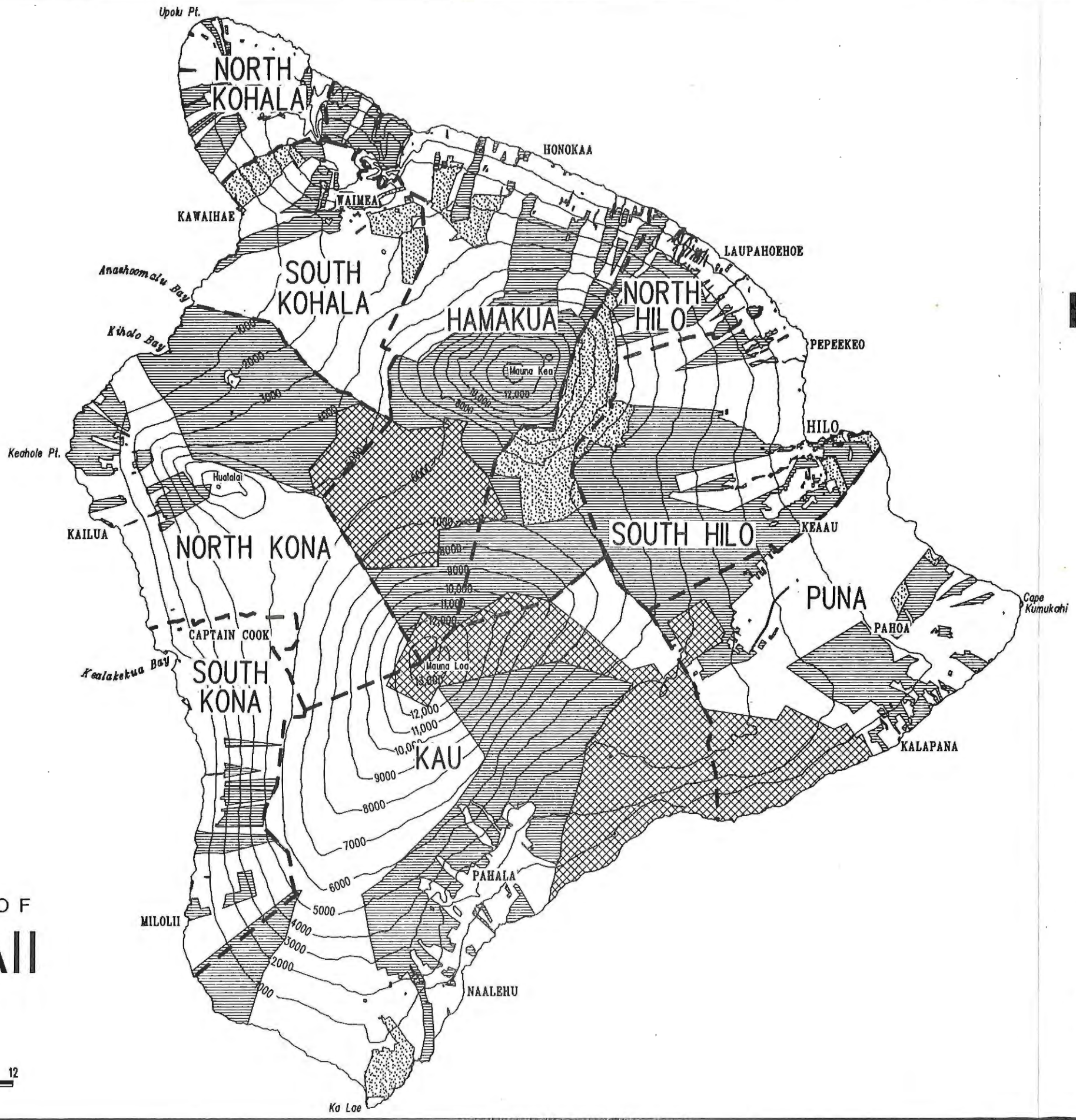
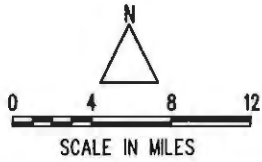
According to Land Use Commission records, there have been 53,414 acres of land reclassified to the Urban District since 1964 statewide, an increase of 45.3 percent. For the County of Hawaii during the 15-year period between 1976 and 1990, there were 12,540 acres reclassified to the Urban District. Nearly three-fourths of these lands were in the North Kona (3,288 acres) and South Kohala (5,764 acres) districts of West Hawaii. The last five-year period has been the most active, with 7,305 acres reclassified.

⁸ Department of Business, Economic Development & Tourism, State of Hawaii Data Book, 1990, Table 178.

Figure2

FEDERAL, STATE AND HAWAIIAN HOME LANDS

ISLAND OF
HAWAII



- Federal Lands
- State Lands
- Hawaiian Home Lands
- 1000 Ft. Contours
- Development Plan Area Boundaries

Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Federal, State, and Hawaiian Home land boundaries from USGS 1:100,000 GIRAS files, 1976. Development Plan boundaries derived from County General, Development, and or Community Plans, various scales, 1990. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official.

TABLE 6. URBAN DISTRICT RECLASSIFICATIONS
COUNTY OF HAWAII
1976-1990, BY DISTRICT
(IN ACRES)

	<u>1976-80</u>	<u>1981-85</u>	<u>1986-90</u>	<u>TOTAL</u>
Puna	5	1,729	0	1,734
South Hilo	221	23	0	244
North Hilo	0	77	0	77
Hamakua	43	0	0	43
North Kohala	9	79	1,288	1,376
South Kohala	1,279	1,439	3,046	5,764
North Kona	0	317	2,971	3,288
South Kona	13	1	0	14
Kau	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	1,570	3,665	7,305	12,540

Source: Wilson Okamoto & Associates, Inc., Urban Land Requirements Study, 1991.

The study identified vacant developable urban land in the County of Hawaii. Data on vacant lands was obtained from the County of Hawaii Planning Department's automated land use inventory. Detailed information is maintained for each parcel on land use, zoning, uses and structures. "Developable" is defined as land which is vacant of any permanent development, is relatively level with a slope of less than 20 percent and is otherwise free of readily identifiable environmental constraints, such as a wetland or waterway. Also excluded from the definition of developable lands were existing golf courses, parks and roadways. Parcels less than five acres were excluded from the analysis.

There are approximately 22,745 acres of vacant developable lands located on the island of Hawaii. This figure includes lands in the State Urban District which are County-zoned "Open." If County-zoned "Open" lands are excluded, this total is 19,071. These lands are located primarily in Puna, South Hilo, South Kohala and North Kona.

In South Kohala, developable areas are located west of Waimea Town, mauka of Queen Kaahumanu Highway in the vicinity of the Waikoloa Village, near the Hyatt Waikoloa and Mauna Lani Resorts, and in the Hapuna area in the vicinity of Mauna Kea Beach Hotel.

In North Kona, there are developable areas makai of Queen Kaahumanu Highway in the Kukio and Kohanaiki Resorts, at the Hawaii Ocean Science and Technology Park, in the Kaloko-Honokohau area, and at the Kealakehe Planned Community. There are also many undeveloped urban areas between Kailua and Keauhou Towns, primarily makai of Kuakini Highway.

In the Puna area, there are developable areas located in Kalapana, Kapoho, and in the vicinity of the Volcano Subdivision. In Kau, developable areas are in Punaluu near the Sea Mountain Resort and in Pahala. In South Hilo, there are areas north of Keaau and in Hilo, primarily in the Waiakea area and along Waianuenue Avenue. Other significant parcels are located in Pepeekeo and Honomu.

There are also scattered developable areas in Hamakua and in North Kohala's Hawi area along Akoni Pule Highway.

Table 7. VACANT DEVELOPABLE URBAN LANDS
COUNTY OF HAWAII

<u>District</u>	<u>Total Acres</u>
Puna	4,108
South Hilo	3,592
North Hilo	64
Hamakua	233
North Kohala	278
South Kohala	6,023
North Kona	7,485
South Kona	293
Kau	669
	<u>22,745</u>

Includes lands in the State Urban District which are County-zoned "Open."

Source: Wilson Okamoto & Associates, Inc., Urban Land Requirements Study, 1991.

The demand for residential, commercial, industrial and resort land was calculated based upon the Series M-K projections and using additional methodologies developed by the consultants. It should be noted that residential projections assumed that existing densities would continue into the future. This approach results in a high estimate of the demand for residential land. The extent and timing of density increases are difficult to forecast, but it may well be expected that single-family lot sizes will continue to become smaller and that residential densities will continue to increase in the future as more intensive use is made of urban lands. If this occurs, land required for residential purposes will be less than shown here. The analysis also assumed declining household size and a 5 percent vacancy rate and did not account for the redevelopment of existing urban areas.

In addition, census data was not available at the time of the study. Census data show a larger household size than used in the study. New projections will need to be developed for the next boundary review.

Population distributions to each judicial district were based upon distributions used in the Department of Transportation's Highway Needs Assessment which were developed through consultation with the County Planning Departments and which the Counties have agreed to use for planning purposes.

It should further be noted that recent census figures for 1990 show the resident population for Hawaii County at 120,317, a difference of 4,283 or 3.4 percent less than the M-K estimate.

The study assessed the supply of developable urban lands and the anticipated requirements for additional urban lands based on the demand projections.

With respect to assessing the balance of supply and anticipated need, it should be noted that a reasonable surplus rather than a shortage in the supply of urban lands is desirable. A reasonable allowance for flexibility is usually roughly 25 percent of the total amount of land estimated to go into use during the planning period. Such a flexibility factor allows for unanticipated choices of individuals and firms who may acquire land in excess of the estimated need, and it allows for land which may be held out of use because of personal preferences of property owners, unfavorable market conditions, or legal complications which make the land unavailable for immediate development.

The following tables show the relationship between the supply of developable urban land and the demand for urban land.

Table 8. URBAN LAND REQUIREMENTS
1995 - 2010
COUNTY OF HAWAII

	<u>1995</u>	<u>2000</u>	<u>2010</u>
Puna	3,550	3,262	2,493
South Hilo	2,214	1,841	1,082
North Hilo	61	61	60
Hamakua	29	(51)	(241)
North Kohala	109	(1)	(303)
South Kohala	4,441	3,765	2,611
North Kona	4,926	4,486	3,159
South Kona	79	24	(104)
Kau	482	410	240
Subtotal	15,891	13,797	8,997
25% Flexibility Factor	(795)	(1,319)	(2,519)
TOTAL	15,096	12,478	6,478

Surplus (Deficit) in Acres

Source: Wilson Okamoto & Associates, Inc., Urban Land Requirements Study, 1991.

TABLE 9

**AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
COUNTY OF HAWAII
2000
(IN ACRES)**

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-			OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/ (DEFICIT)
	ZONED			ZONED			ZONED			ZONED			ZONED							
	DEV.	2000	SURPLUS/	DEV.	2000	SURPLUS/	DEV.	2000	SURPLUS/	DEV.	2000	SURPLUS/	DEV.	2000	SURPLUS/					
	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN LANDS	DEV.	2000					
															1/					
PUNA	1,704	678	1,026	16	20	(4)	483	40	423	0	0	0	2,183	1,840	4,023	23	761	3,262		
SOUTH HILO	1,812	1,425	487	492	30	462	383	56	327	55	0	55	2,842	526	3,368	16	1,527	1,841		
NORTH HILO	47	0	47	2	0	2	0	0	0	0	0	0	49	12	61	0	0	61		
HAMAKUA	157	259	(102)	7	7	0	0	14	(14)	0	0	0	164	67	231	2	282	(51)		
NORTH KOHALA	220	269	(49)	10	4	6	0	3	(3)	0	0	0	230	48	278	4	280	(1)		
SOUTH KOHALA	3,402	647	2,755	187	78	109	123	22	101	200	322	(122)	3,912	940	4,852	18	1,087	3,765		
NORTH KONA	2,163	521	1,642	219	86	133	1,372	53	1,319	309	150	159	4,063	1,296	5,359	63	873	4,486		
SOUTH KONA	128	237	(109)	23	7	16	0	22	(22)	0	0	0	151	142	293	3	269	24		
KAU	380	178	202	21	5	16	0	10	(10)	42	0	42	443	162	605	2	195	410		
SUBTOTAL	10,113	4,214	5,899	977	237	740	2,341	220	2,121	606	472	134	14,037	5,034	19,071	131	5,274	13,797		
25% FLEXIBILITY FACTOR	1,054				59			55			118					33	1,310	(1,310)		
TOTAL	10,113	5,268	5,899	977	296	740	2,341	275	2,121	668	590	134	14,037	5,034	19,071	164	6,583	12,479		

1/ Includes County-zoned agricultural, rural and unplanned districts, but excludes open zones.

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

Overall, there is a projected surplus of developable lands in the County in each of the planning periods through the year 2010. There are projected surpluses of 15,096 acres in 1995; 12,478 acres in 2000; and 6,478 acres in 2010. Within the individual planning areas, ample urban supply exists in the growth areas of South Kohala, North Kona and South Hilo. By 2010, additional urban land needs are indicated for North Kohala, South Kona and Hamakua. (See Appendix A for detailed tables on urban land requirements.)

Infrastructure

In addition to housing requirements, a significant expansion of public infrastructure would be required to support anticipated population increases. The development of public infrastructure has not kept pace with growth. On many parts of the island, there are problems with traffic congestion, air and water quality, water supply and sewage and solid waste disposal. If the level of development exceeds the capacity of public infrastructural systems, problems with health and safety, environmental quality and community dissatisfaction may be expected.

The following discussion of infrastructure capacities and constraints is taken from a study conducted by Eugene Dashiell Planning Services for the Five-Year Boundary Review,⁹ except where otherwise noted.

Airports. The Hilo Airport is surrounded by Urban-zoned lands and no changes to State land use district boundaries are needed. At the Keahole Airport, airfield improvements including a 4,500 ft. runway extension and terminal and support facilities are planned to meet airport needs beyond the year 2005.¹⁰ It appears that the existing Urban area is adequate to accommodate needs to 2000 and no changes during the boundary review are required. No land use changes associated with the Waimea Airport are foreseen at this time.

Harbors. Hilo Harbor is the primary deep draft harbor on the island. While there are various improvements planned for the harbor, none of these improvements affect State land use district boundaries.

The Kawaihae Harbor serves the construction and sugar industries and provides service to the U.S. military primarily for the Pohakuloa training area. To serve projected increases in cargo, major expansion of the harbor area is proposed by the Department of Transportation. Harbor expansion will not require land use district boundary changes. However, there may be a need in the future to provide additional urban land for adjacent industrial and commercial uses.

⁹ Eugene P. Dashiell Planning Services, Infrastructure Capacities and Constraints, 1991.

¹⁰ Department of Transportation, State of Hawaii, Keahole Airport Master Plan, Environmental Impact Statement, 1988.

Solid Waste. In 1990, an estimated 189,000 tons of solid waste were generated island-wide. The County's solid waste operations are organized into three districts: Hilo-Puna, Honokaa, Kohala-Kona. Major landfills are located at Hilo and Kailua-Kona. Smaller sites are located at Anaehoomalu, Waiohinu and Pohakuloa. The landfills at Hilo and Kona are expected to close down by October 1993 and a new landfill site is proposed to be located in either Hilo and/or Kona.

Roads. Traffic congestion exists on a number of Hilo thoroughfares. A number of areas are experiencing low levels of service (D and E). Some 18 streets have been designated to be in need of improvement to meet existing conditions.

The Hamakua corridor extends from Hilo to Waimea. The level of service along the Hilo-Honolulu segment in 1986 was low (D). Demand along this corridor is projected to double by 2010 and levels of service are expected to drop (to D through F) if improvements are not made.

Levels of service along the Waimea corridor which is part of the Hawaii Belt Road are currently low (E). If improvements are not made, the capacity of this corridor will be reached by 2000. Two alternatives have been proposed, with and without the Waimea and Kawaihae bypasses. If the bypasses are constructed, capacities in the corridor will improve significantly since these routes function as reliever routes.

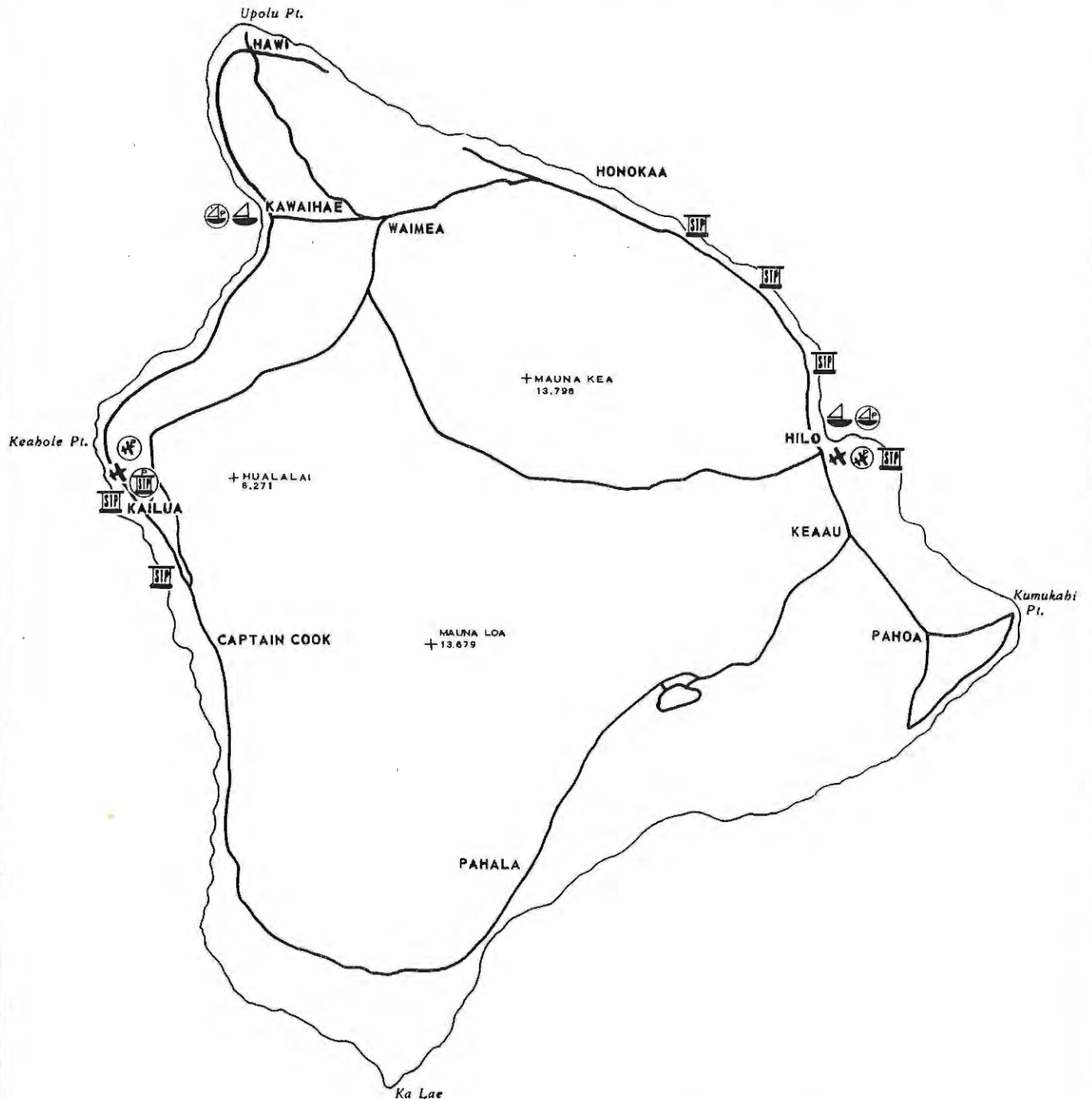
Capacities as of 1986 on the Kailua-Kona corridor approached or reached the maximum possible and levels of service were low (levels of E and D). Demand is projected to double on all segments of this corridor by 2010. On the Hualalai-Palani segment, demand is expected to triple. Levels of service will approach F on all segments without improvements. The Department of Transportation has proposed several projects, generally building four and six lanes of divided highway, to improve carrying capacity and raise levels of service to acceptable levels of C or better on all segments within the corridor.

The Kealahou corridor consists of two existing segments, Queen Kaahumanu Highway and Mamalahou/Palani Road. As of 1986, portions of these two segments were at capacity (level of service of E). Projected demand will result in significant congestion with more than three times the existing demand on the Queen Kaahumanu Highway segment. To alleviate this congestion, two new roads are proposed, a north-south collector and mauka-makai road.

The Kailua-Kona Corridor 2 has existing high levels of service of A or B. Demand projected for this corridor indicates that levels of service will drop to F by 2010. The Department of Transportation has proposed two alternative projects to address this situation. However, only the alternative involving a new 4-lane divided highway from Henry Street to Queen Kaahumanu Highway-Kuakini Highway will have a significant impact on capacity in the corridor.

Figure 3

INFRASTRUCTURE



ISLAND OF
HAWAII

PREPARED BY OFFICE OF STATE PLANNING
1991

- ✈ EXISTING AIRPORT
- ✈ (circle) PROPOSED AIRPORT IMPROVEMENTS
- ⚓ EXISTING HARBOR
- ⚓ (circle) PROPOSED HARBOR
- STP (rectangle) EXISTING SEWAGE TREATMENT PLANT
- STP (circle) PROPOSED SEWAGE TREATMENT PLANT

The four segments which make up the South Kona corridor are at or near capacity. Projected demand without improvements in the existing road network will result in lower levels of service by 2010. On the Route 180-Kam III segment, demand will double and level of service will drop to F. The old Mamalahoa Highway will have a three-fold increase and a level of service of E. Improvements to the existing network and a Hawaii Belt Road bypass have been proposed to manage projected travel volumes.

The Keaau corridor is a heavily traveled area route to Hilo and handles traffic from the Pahala and Volcano areas. Presently, it is a congested area and the level of service is D. Demand is expected to double by 2010 and the level of service drop to F without improvements. A Keaau bypass is proposed to improve capacity to C and D levels.

Sewer Facilities. Most residences are serviced by cesspools. Resorts usually provide their own wastewater treatment facilities. There are two main municipal sewerage service areas, Hilo-Puna and Kailua-Kona. There is a third small municipal system serving Kealahou.

Hilo's wastewater plant is a primary treatment system with an ocean outfall for disposal of the effluent. The plant handles about 2.2 mgd of sewage at present. It has been operating with less than optimal effluent inputs because many residents are still using cesspools and are not yet connected to the sewer line. Present capacity of the plant is 7.0 mgd.

By 2010, sewage flows have been projected to be 5.7 mgd. Proposed projects include construction of a new plant with secondary treatment to provide over 5 mgd capacity by 1995.

The Kailua-Kona area is divided into two sewage treatment zones. The northern zone is served by a municipal plant with a design flow capacity of 1.4 mgd. The actual flow is about 1.0 mgd. The plant is nearing its capacity. The southern zone is served by the Keauhou WWTP. Its design flow capacity is 1.0 mgd and the actual flow is about 0.3 mgd.

Sewage treatment is a problem in West Hawaii because of the widespread use of cesspools and their potential for contamination of coastal and groundwaters. The Department of Health (DOH) has encouraged the use of regional wastewater treatment systems for sewage disposal throughout the State. An additional concern arises from the possibility of contamination and pollution of the coastline from sewage effluent and its effect on the Hawaii Ocean and Science Technology Park and the Natural Energy Laboratory of Hawaii.

By 2010, combined sewage flows have been projected to be 4.3 mgd. Approvals for development proposals in this area have been conditioned on the provision of adequate sewage facilities.

A new plant to service the northern zone is planned at Kealakehe. The plant should be on-line by 1994. The initial capacity of this plant will be 2.8 mgd and it can be expanded later. The Keauhou plant is also being expanded to a capacity of 1.8 mgd. There is no firm construction schedule for the Keauhou plant.

Water. The Hawaii County Water Department owns and operates 26 water systems on the island. The tremendous growth projected for parts of the island will impact existing supplies of water and increase pressures on both the County and developers to develop additional water sources to meet the needs of the resort and housing developments proposed for the various districts. On the western side, the water sources for the districts of South Kohala and North Kona will be impacted heavily. The growth areas in the South Kohala district will be anchored around two resort destination nodes. The source of water for this area is the Lalamilo Well field serviced by the County's Kawaihae-Hapuna-Puako Well system. Future municipal water requirement is estimated at 15.8 mgd against the well field maximum production of 3.8 mgd.¹¹ Another growth area in the district centers around the upper region of Waimea Village and the surrounding residential/agriculture uses. The present capacity of the municipal system is 3.6 mgd. The Parker Ranch 20/20 Master Plan will increase the domestic water supply for the Waimea Village area. Water needs for Hawaiian Home Lands farm and ranch lots at Puukapu and at the State's Lalamilo agricultural park will be met by expanding the Waimea irrigation system. Total future requirement is estimated at about 5.0 mgd.

Surface water derived through the streams and springs on the windward side of the island provide the water source for many of the municipal systems from North Kohala to Kau. Due to the abundance of these streams on the eastern side, no major increases in water needs have been projected. However, changes in the Federal Safe Drinking Water Act which impacts all public water systems, will most heavily impact municipal water systems. The act will require strict monitoring procedures to test for contaminants in municipal systems relying on surface water. Federal regulations require water-derived sources designated by the Department of Health to be filtered and disinfected prior to distribution. By June 1990, DOH must determine which systems using surface water must filter their water.¹²

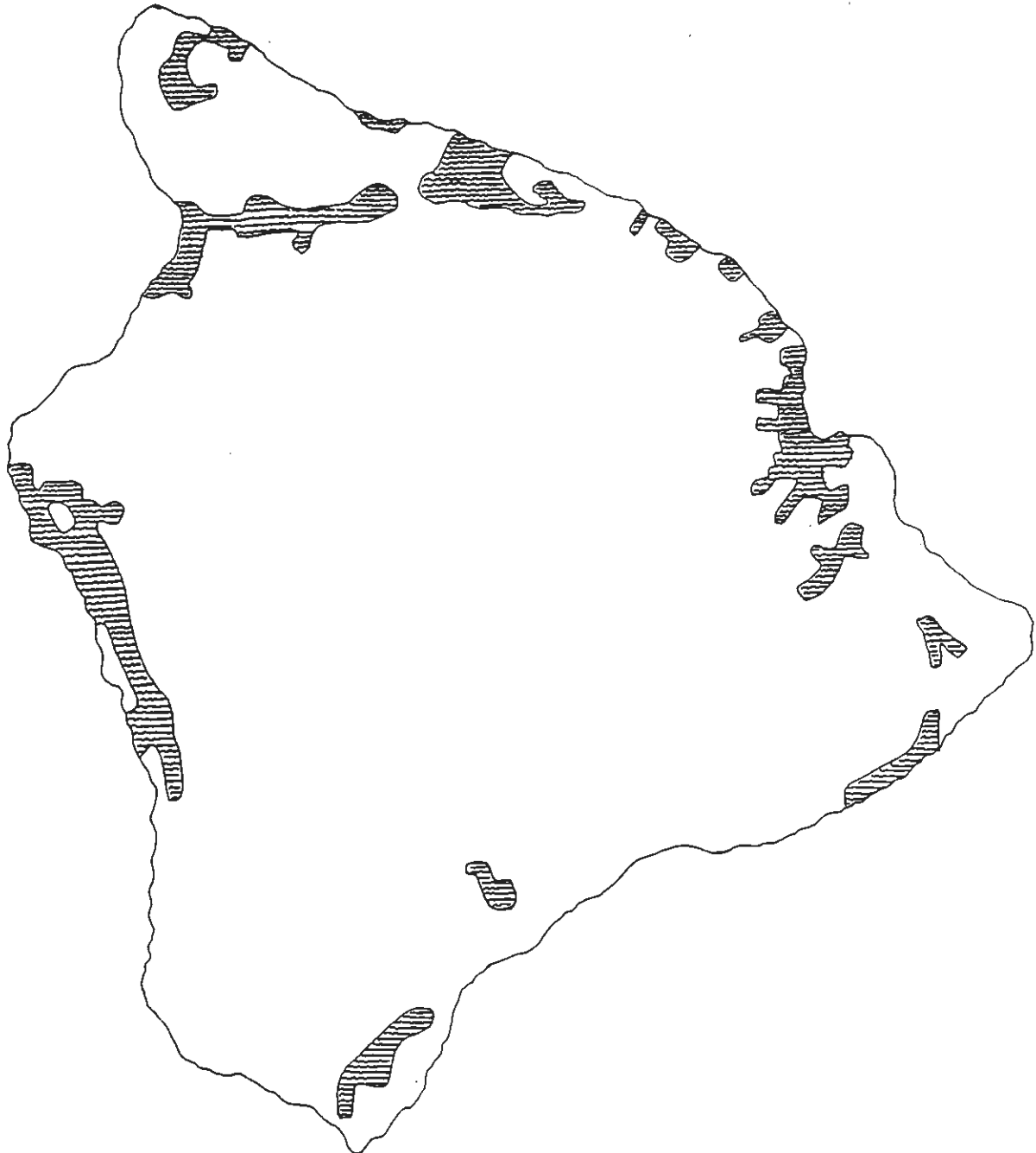
A large number of the Hawaii County homes are without a reliable water supply. More than 8,000 homes in the Puna, Kau and South Kona districts depend on water catchments and storage systems to supply their domestic water needs.

¹¹ Megumi Kon, Inc., Hawaii County Water Use and Development Plan, December 1989, pp. 1-17.

¹² Ibid., pp. 1-21.

Figure 4

MUNICIPAL WATER SERVICE AREAS



ISLAND OF
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 MUNICIPAL WATER SERVICE AREA

The leeward side of the island, more specifically the districts of South Kohala and North Kona, is facing the problem of huge demands versus limited supply of groundwater. The windward side, although not faced with the problem of huge future water demands, is facing the problem of bringing its spring and surface water sources into compliance with Federal safe drinking water regulations and water quality standards and upgrading many of its older systems.¹³

Although the coastal region of the South Kohala district is seen as the focal point of resort hotel and condominium projects, the mauka Waimea Village and surrounding areas are also blossoming into a bustling community. The mauka areas must continue to rely on high level water supplies, primarily from the Kohala Mountain streams. However, because of its limited supply during dry weather, alternative sources such as high-level, dike-impounded waters need to be explored and tapped. In the makai coastal areas, the demand may possibly exceed the capacity of the Lalamilo Well field. Although further explorations in the region may discover additional water, the projected demand of about 16 mgd will require considerable aquifer resource. Alternative means such as transfer of water from the Hawi area must be considered if growth is to continue in the makai area.¹⁴

The unprecedented growth of the North Kona district is taxing the existing well sources to near capacity. The existing North Kona basal water table source was developed only after exhaustive studies.

However, it appears that the success of the Kahaluu Well site cannot be duplicated elsewhere in Kona. Even at the lower section of this site, the Kahaluu inclined shaft well source is precariously close to overpumping. The chloride content has risen to a dangerously high level. New well sites must be found to supplement the Kahaluu site.¹⁵

Power. Due to fuel and transportation costs, a relatively large service area and widely dispersed communities, electricity rates for the island are among the highest in the nation. The constraints of the adequacy and distribution of electrical power generation systems and back-up power generation systems for proposed urban development will need to be assessed for both normal and disaster situations. The island has been experiencing rolling blackouts for approximately a year. Various reasons for the blackouts have been offered, including the failure of geothermal energy to come on line in a timely manner and the lack of periodic maintenance by the utility.

¹³ Department of Land and Natural Resources and State Water Commission, Hawaii Water Plan, An Introduction, Draft, March 1990.

¹⁴ Ibid.

¹⁵ Ibid.

Recreation. Recreational opportunities in the County are as varied as the island's climatology and geographic environment and represent an important part of the island's lifestyle for both residents and visitors to the Big Island. The island's recreational opportunities extend from its offshore waters along the varied coastline to the upper reaches of the Kohala and Hualalai mountains, Mauna Loa and Mauna Kea. Although the County has limited sandy beach areas, the island has a large expanse of inland areas used for both passive and active recreational activities. In 1985, of the island's total land area of 2,582,528 acres, 1,126,643 acres were in the State recreation inventory with about equal amounts used for passive and active recreation. Opportunities abound for activities which include fishing, snorkeling, scuba diving, swimming, boating, hiking, camping, hunting and exploring volcanoes around Mauna Kea and Mauna Loa. During the winter months, it is even possible to ski the slopes of Mauna Kea. Access to outdoor recreation opportunities becomes increasingly more important as more lands are developed for resorts, subdivisions and golf courses.

The projected overall need for actions to meet recreation demands to the year 2000 include: a high need for action for swimming/sunbathing, picnicking, walking and bicycling; and a medium need for camping, diving, boating, fishing, field games, playground equipment and jogging.

The growth in the visitor and resident populations will also increase the demand for a wider spectrum of recreational activities that can be carried out in considerably less congested areas and in more natural or wilderness-type surroundings. There will be increased demand to provide opportunities for family-oriented activities, good swimming beaches for children and novice swimmers, surfing, windsurfing, diving, fishing, camping and wilderness recreation experiences.

Schools. From 1979 to 1989 (with the exception of 1987), the Hawaii school district has had the distinction of leading in enrollment growth. In 1991, the Hawaii school district had the highest total district enrollment growth of 908 students. Enrollment projections continue to project a high growth requiring the need to plan many new schools.

Hawaii district schools projected to have the most rapid growth are shown in the following table:¹⁶

¹⁶ Department of Education, Office of Business Services/Information Systems Services Branch, Enrollment Projections of the Public Schools in Hawaii, 1989-1994.

Table 10. ENROLLMENT PROJECTIONS
HAWAII DISTRICT SCHOOLS

<u>School</u>	<u>1988 (Sept.) Enrollment</u>	<u>1994 Projection</u>
Keaau	895	1,381
Waiakea High	1,761	2,387
Pahoa	1,698	1,474
Konawaena High & Inter.	1,574	2,297
Kealakehe	779	1,221
Kealakehe Inter.	711	1,154
Waimea	1,025	1,589
Honokaa	1,195	1,572

Health Services. Hospitals are located in Hilo, Honokaa, Kau, Kohala and Kona. A West Hawaii Community Hospital has been proposed.

Urban Land Use Issues

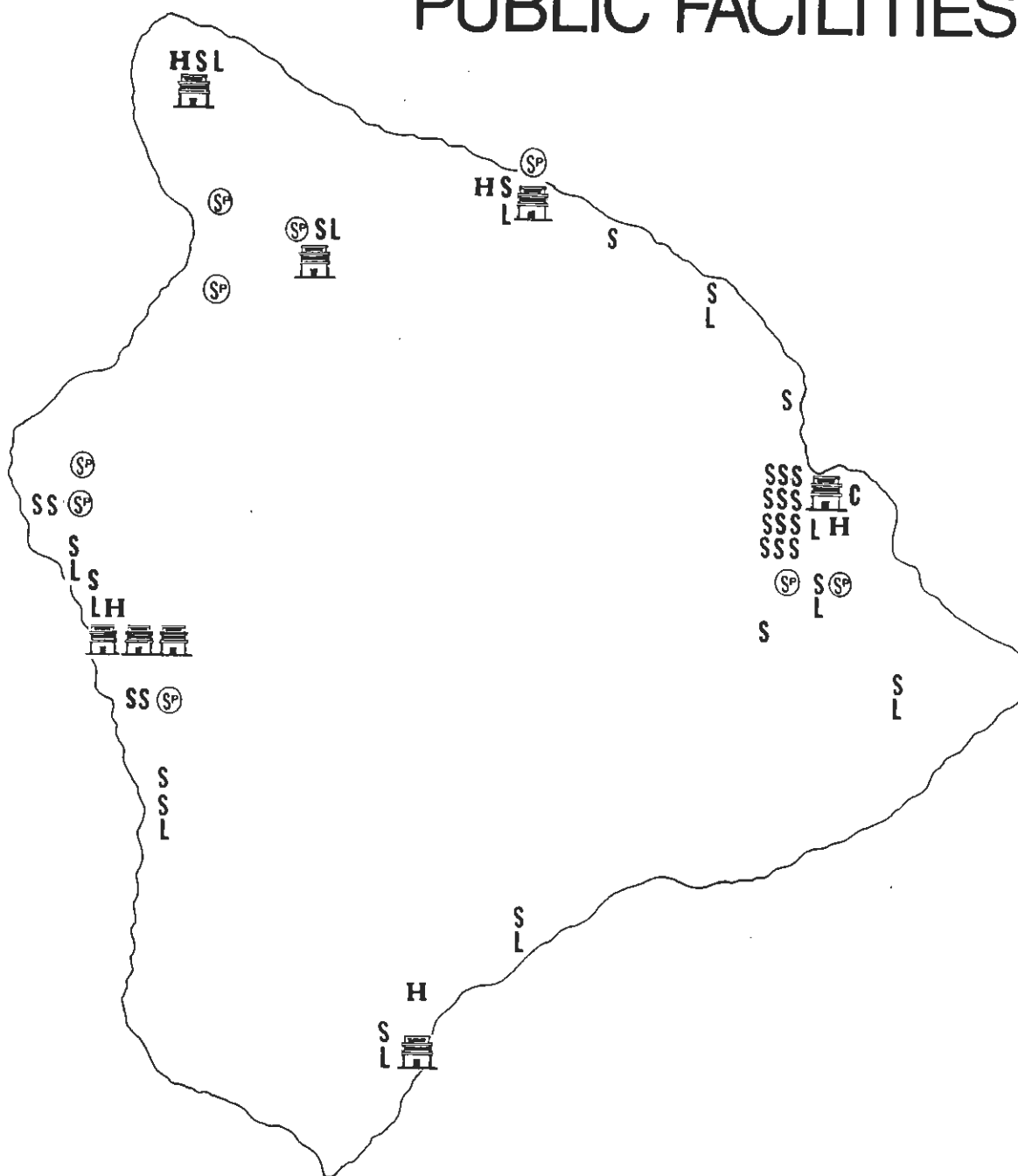
Major urban land use issues center around projected growth and development, infrastructure, affordable housing and environmental concerns. The population is expected to increase tremendously by 2010 with most of the growth occurring in West Hawaii. The adequacy of infrastructure is a key concern for West Hawaii with water and sewerage systems and solid waste disposal facilities already strained. During the land use boundary amendment process, State and County agencies may require infrastructure improvements as a condition of approval. Affordable housing will also become even more critical with population growth pressures. Statewide, it has been estimated that 64,000 units would be needed by low and moderate income families by 2000.¹⁷


The island's best white sand beaches are located in West Hawaii and there will continue to be proposals to develop these areas for visitor use. At the same time, there will be countervailing pressures to protect these beaches for resident recreational use. Proposals to develop golf courses and marinas may also have potential environmental impacts including impacts on coastal water quality. There are at least 15 golf courses proposed in Hawaii County.¹⁸ OSP is conducting a separate golf course policy analysis in response to legislative mandates. Protection of coastal water quality is important for recreation and also for the operations of the Natural Energy Laboratory of Hawaii and HOST Park.

There have also been resort proposals for the less developed areas of the island. Opening up large new visitor destination areas on the island is not desirable at this time given concerns about the adequacy of infrastructure, labor shortages, quality of the environment and impacts on lifestyles.

¹⁷ State Housing Functional Plan, 1989.

PUBLIC FACILITIES

ISLAND OF
HAWAII

S EXISTING PUBLIC SCHOOL
(SP) PROPOSED PUBLIC SCHOOL
C EXISTING COLLEGE
L EXISTING LIBRARY
H EXISTING STATE HOSPITAL
 EXISTING STATE OFFICE BUILDING

A related issue is the growth in large lot agricultural subdivisions built away from existing urban areas. Government services cannot be efficiently provided to these new settlements, yet they will require more services as they become more built up.

The new agricultural subdivisions are generally found in West Hawaii. However, Puna and Kau face similar problems with between 70,000-90,000 lots subdivided in the years prior to the establishment of the State Land Use Law. These subdivisions are also located in areas which are not in close proximity to existing urban areas. Further, unlike the newer agricultural subdivisions, these subdivisions, in many cases, lack improved roads, water, electricity and other basic infrastructure.

Analysis of Urban Lands

The designation of lands for urban use must take many factors into consideration including proximity to existing urban areas, proximity to centers of employment except where the development would generate new centers of employment, adequacy of existing and planned infrastructure, areas of urban growth as indicated in State and County plans, topography, presence of natural hazards and impacts on agricultural and conservation resources.

The adequacy of infrastructure is a major concern in Hawaii County. In West Hawaii, the impacts of a full build-out of proposed resort developments have been well-documented through the West Hawaii Regional Plan. The plan recommends to cluster resorts in Resort Destination Nodes. This will allow the State and County time to expand existing infrastructure and develop new infrastructure while minimizing public costs and maximizing limited resources. The development of primary support communities (at Kealahou, Waikoloa, Lalamilo and Kawaihae) and secondary support communities (at Hawi, Waimea, and Honokaa) to house employees working at the Resort Destination Nodes and other employment generators in West Hawaii is also supported.

There are sufficient urban lands in North Kona, South Kohala and North Kohala to meet population and economic needs to 2000. However, some reclassification of lands in the Kailua to Keahole area is recommended to implement the West Hawaii Regional Plan and K to K Plan and encourage the development of this area as Hawaii's Second City.

Although the Hamakua Regional Plan recommends additional urbanization adjacent to Honokaa and Paauilo, urbanization would be premature at this time. The recommendations in the plan were intended to maintain the viability of Hamakua Sugar Company. However, circumstances have changed significantly since the completion of the plan. Hamakua Sugar Company, Inc., has filed for Chapter 11 bankruptcy and the County's upzonings of the company's Kukuiahae lands have been invalidated. Therefore, no urban reclassifications are recommended at this time.

18 Hawaii Real Estate Research and Education Center, Analyzing the Market and Environmental Impacts of the Golf Industry in Hawaii, 1990.

North and South Hilo have adequate Urban District lands available to meet projected growth. However, Hilo is an appropriate area for future growth. Although traffic improvements are needed, water and sewerage systems are adequate and there are existing health, police, fire and social services. In the rural communities along the coast in South and North Hilo, additional urban lands do not appear to be needed or desirable given infrastructure constraints.

In the Puna District, the presence of numerous non-conforming agricultural subdivisions and the danger from volcanic hazards is a major concern. The area has sufficient urban land to meet urban growth needs to 2010. No increase in density is recommended for Lava Hazard Zones 1 and 2. Further, it is proposed that future growth be directed away from these lava hazard zones toward Keaau. Urbanization around Keaau is recommended to facilitate the development of an urban core in Keaau.

The Kau and South Kona area have infrastructure constraints. Equally important are concerns regarding the impacts of additional development on lifestyle, on the social fabric of the existing rural communities, on coastal resources and environmental and historic/archaeologic resources. In Kau, there is a need to maintain the viability of the sugar plantation. There is sufficient urban land to meet Kau's urban land requirements to 2010, particularly with the 1,172 acres recently reclassified to Urban for the Hawaiian Riviera Resort.

The protection of the Kona Coffee Belt is a major objective in South Kona. The review finds that there is a 156-acre parcel in Captain Cook, South Kona, above Kealahou Bay which is no longer appropriate for Urban classification. At one time, Captain Cook was planned as a governmental and commercial center. However, land use policies have changed and Kailua and the Kailua to Keahole areas are now the major growth centers. The County General Plan was changed to designate this area as Orchard. It is also located in the Kona Coffee Belt. South Kona has sufficient urban lands and major infrastructure problems. Although reclassifying this area out of urban would create a deficit in urban land requirements to 2000, this projection is a high projection and urban lands are not required to meet population and economic needs. In addition, there are surplus urban lands elsewhere that could accommodate these needs.

However, the Historic Sites Preservation Division of the Department of Land and Natural Resources has also identified this area as containing numerous significant historic sites. Therefore, reclassification to the Conservation District may also be appropriate. Further information is needed on this site before a determination can be made to reclassify this area to the Agricultural or Conservation District.

X. AGRICULTURAL DISTRICT

Existing Land Uses

Cattle operations are the largest users of agricultural lands on the Big Island. There are approximately 370 cattle operations on the island, with ranches located in North and South Kohala, North and South Kona, Kau, and the upper elevations of North Hilo and Hamakua.¹⁹

Sugar plantations are the second largest users of agricultural lands on the Big Island, with 59,024 acres planted in sugarcane. The major plantations are Hamakua Sugar Company (Hamakua Sugar), located in the North Hilo and Hamakua districts (28,955 acres cultivated); Mauna Kea Agribusiness Company (Mauna Kea), which is located in the South Hilo district (16,570 acres cultivated); United Cane Planters' Cooperative (UCPC) which is also located in the South Hilo district (1,259 acres cultivated); and Kau Agribusiness Company located in the Kau district (12,240 acres cultivated).²⁰

There were approximately 12,300 acres in diversified agricultural crops in the County of Hawaii, excluding macadamia nuts and aquaculture, according to the Department of Agriculture. Included in this acreage are anthuriums (13.6 million sq. ft., which represents 98 percent of the State's total sq. ft. in anthuriums), guava (525 acres, of which 310 acres are harvested), orchids, papaya (2,373 acres, which represent 95 percent of the State's total papaya acreage), and potted foliage. There are 63 acres in aquaculture on the Big Island.²¹

Agricultural Land Requirements

Lands rated A and B by the Land Study Bureau are located in Hilo and along the Hamakua Coast, in the Volcano Area, in Kau, north and west of Punaluu, in pockets along the Kona coffee belt area, in Waimea, North Kohala and to some extent in Puna. A and B rated lands represent those lands with the highest agricultural productivity according to the Land Study Bureau's rating system.

However, A and B rated lands represent a minor portion of lands in agricultural use on the Island of Hawaii. There are highly successful agricultural operations on lands designated C, D and E by the Land Study Bureau, for example, on lands in the Kona coffee belt and Puna papaya and anthurium lands.

¹⁹ Deloitte and Touche, Agricultural Resources Study, 1991.

²⁰ Ibid.

²¹ Ibid.

The Land Evaluation and Site Assessment Commission (LESAC) in 1986 developed a rating system to identify important agricultural land. This rating system was based upon a composite of five soil rating systems (LE) and site assessment (SA) factors which expressed the relative quality of a site or area based upon its non-physical characteristics or attributes. The LESAC further projected that approximately 377,733 acres (including a contingency figure of an additional 2,760 acres or approximately 4.03 percent) will be required for the County of Hawaii to meet desired agricultural production goals for 1995.

Table 11. AGRICULTURAL PRODUCTION ACREAGE REQUIREMENTS
FOR HAWAII COUNTY, 1983 (Actual), 1990, 1995

	<u>1983</u>	<u>1990</u>	<u>1995</u>
Acreage required	686,300	356,500	363,100
w/contingency		370,867	377,733

Source: Land Evaluation and Site Assessment Commission, "Report on the State of Hawaii Land Evaluation and Site Assessment System," February 1986.

Agricultural Land Use Issues

The Agricultural Resources Study prepared by Deloitte & Touche analyzed issues and trends in the State's major agricultural industries. Agricultural industries were selected for analysis based on the value of sales reported by the Hawaii Agricultural Statistics Service in its Statistics of Hawaiian Agriculture, 1988. The criterion for selection was a value of sales of \$10.0 million or greater in 1988. Crops which met this criterion were sugar, pineapple, macadamia nuts, beef and cattle, anthuriums, orchids, potted foliage and papaya. Aquaculture and papaya were added later.

Surveys were sent to individuals who owned or operated agricultural operations in the various industries and experts in each industry.

The following is a summary of the survey results.

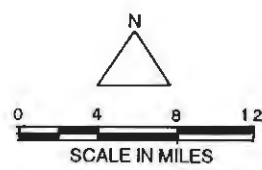
The cost and availability of land are the major land-related issues that are inhibiting the growth and success of agriculture on the Big Island. Largely due to pressures from urban development, agricultural land values have increased beyond their value for agricultural uses. The cost of land reflects the non-agricultural uses and values. Although there are many legitimate reasons for allowing zoning and use conversions of agricultural land, the high cost of land is a major factor that must be overcome for agriculture on the Big Island to expand.

A consequence of the increasing property values is the increased value assigned to pasture land by the County of Hawaii. The 1990 property tax bill for some of the Big Island ranchers increased dramatically over the previous year due to the increased value.

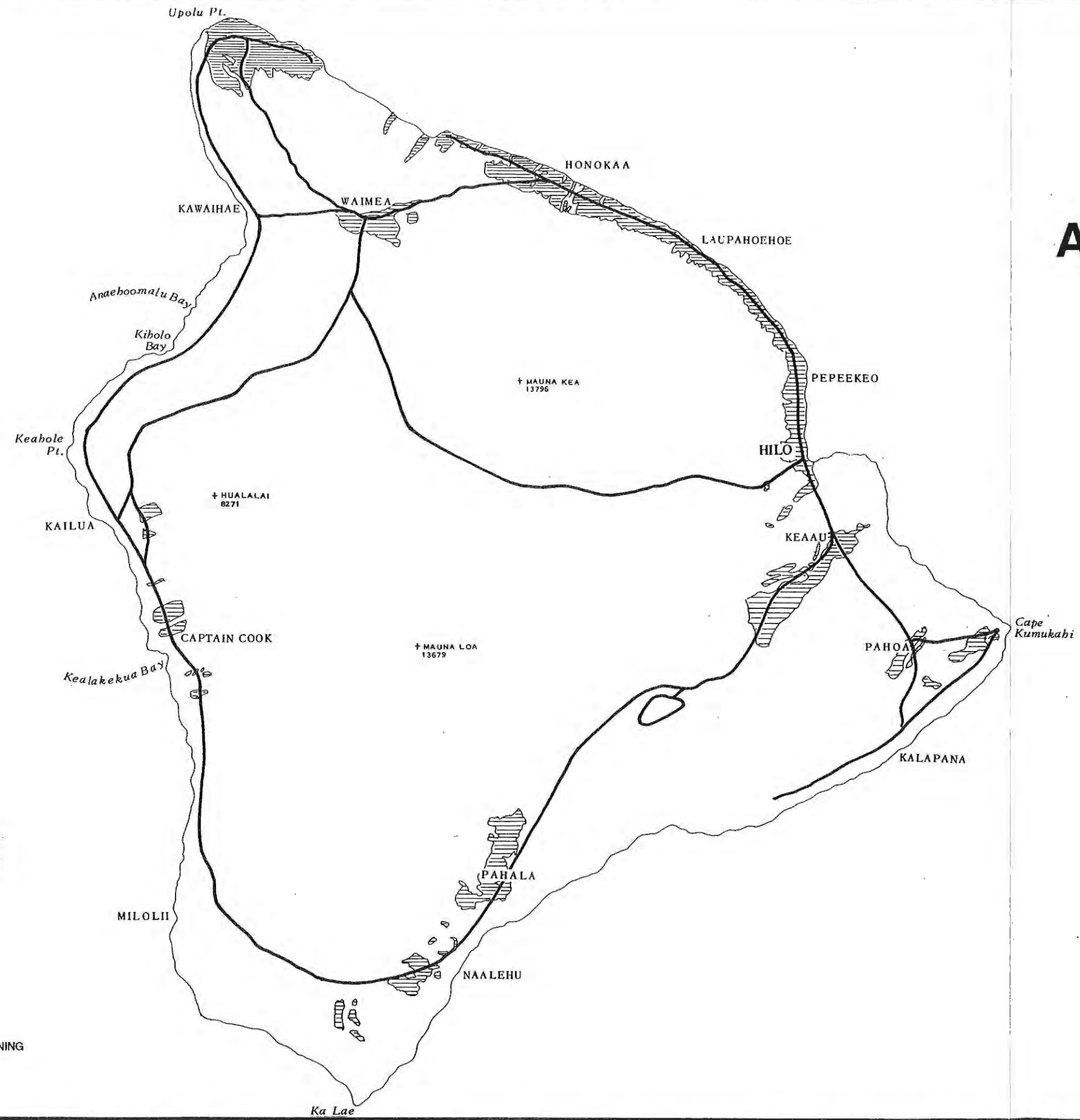
Figure 6

“A” & “B” AGRICULTURAL LANDS

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Source: Land Study Bureau.

One of the major problems facing agriculture on the island of Hawaii, as well as throughout the State, is the availability of labor. Agriculture is facing increasing competition from the visitor industry. There is also a demand for a greater number of employees with technical and professional agricultural training. The sugar plantations who are in financial trouble have a difficult time recruiting as the workers are very wary of joining an operation which may shut down in the near future. This is a perception problem, as the sugar plantations have not indicated any plans to shut down operations. In fact, they are investing a significant amount of resources to make the plantation as efficient as possible.

Two problems related to the supply of labor include the high cost of labor and the lack of affordable housing. Other resource factors that are important for the County of Hawaii are the availability and cost of capital, increasing cost of materials and supplies, and revenues not keeping pace with costs. From an operational standpoint, the impact of inclement weather on harvesting is a major issue.

While overall the cost and availability of capital are not factors inhibiting success (although it is already a limiting factor for certain crops), it may become more of a critical issue for the entire State if the recession that is currently affecting the mainland has a significant impact on the State of Hawaii.

While capital is available to aquaculture operators through the Department of Agriculture (DOA), the experience with aquaculture statewide has not been very good. The DOA can loan up to \$75,000 for operational capital. Most aquaculture loans are for high-risk, start-up ventures. The DOA has many problem loans outstanding, indicating that many borrowers lack business experience and resources with which to deal with contingencies and unforeseen problems. Most borrowers are accurate in predicting expenses, but not revenues. In addition, many commercial aquaculture ventures have had disappointments due to problems in achieving projected productions yields. The experts suggest that extension service expertise and assistance along with further research will alleviate some of these problems.

Sugar Industry

Hamakua Sugar has been faced with severe financial difficulties which have resulted in the need to sell approximately 9,500 acres of surplus sugar lands. The company has recently gone into Chapter 11 bankruptcy proceedings with the aim of restructuring its debt.

The Hilo Coast sugar operations consist of three entities--two sugar growers and one sugar-processing cooperative:

- Sugar growers include Mauna Kea Agribusiness, Inc., a subsidiary of C. Brewer & Company, Ltd., and United Cane Planters' Cooperative (UCPC), a cooperative of independent growers.
- The sugar-processing cooperative is Hilo Coast Processing Company, a nonprofit sugar-processing cooperative which is jointly owned by Mauna Kea Agribusiness and UCPC.

The average yields of Mauna Kea Agribusiness and UCPC have been among the lowest in the State, and Hilo Coast sugar operations are experiencing considerable financial difficulty.

Improved yields was the only operational factor, other than acreage, that was indicated as essential for Mauna Kea and Hilo Coast Processing Company (HCPC) to remain an economically viable operation. The HCPC mill was designed to operate most efficiently at 115,000 tons of sugar per year. As a result of C. Brewer downsizing Mauna Kea (due to the conversion of some of its acreage to macadamia nuts and the UCPC growers discontinuing planting), only 70,000 to 75,000 tons are produced annually. The result is high fixed costs relative to the production level; and, therefore, a high cost per ton for milling. The only way for Mauna Kea to become profitable (assuming the prices remain at the current levels) is to increase its yield and reduce the cost per ton.

In 1992, Mauna Kea Agribusiness announced that it would discontinue its sugar operations. The company intends to plant macadamia nuts and to grow eucalyptus for wood chips. The company is also exploring the possibility of operating a fiberboard plant with a mainland company.

Kau Agribusiness has had low average yields but historically has been a low-cost producer. The maximum acreage that could be economically cultivated was indicated as 13,000 acres. The minimum acreage necessary for economic viability was identified as 12,500 acres. Thus, Kau is currently operating at a level that is slightly less than the required minimum. Kau Agribusiness provided information for withdrawal plans involving approximately 5,700 total acres for housing and urban development. Only 460 acres will come from sugar. The majority of these acres (5,290) will come from diversified agriculture. The withdrawal date was not provided.

Analysis of Agricultural Lands

State goals include maintaining the viability of sugar operations, supporting diversified agriculture and protecting important and unique agricultural lands.

In 1987, the sugarcane industry in Hawaii County generated \$99.2 million in earnings, 4,460 direct and indirect jobs, and 25.9 percent of the electricity.²²

The agricultural industry, including diversified agriculture as well as sugarcane, is important to the County providing revenue, employment, an alternate energy source and open space.

²² Decision Analysts Hawaii, Inc., Hawaii's Sugar Industry and Sugarcane Lands: Outlook, Issues and Options, 1989.

Lands shall be maintained in the Agricultural District to support agricultural activities. In addition to sugarcane lands, these include but are not limited to agricultural lands in the Kona coffee belt, truck farms in Waimea, macadamia operations in Hamakua, North and South Hilo, Kau and South Kona, and flower and nursery operations in Hilo, Puna, Waimea and Kona.

Although there appear to be ample agriculturally zoned lands in the County to meet agricultural needs, there are also more than enough urban lands in Hawaii County to meet urban land requirements to 2010. Any proposal to reclassify agricultural lands must be carefully examined to determine the impact that reclassification of a specific parcel will have on existing agricultural operations and on the agricultural industry in the County.

There have been urban proposals for both Hamakua Sugar Company, Ltd., lands and Mauna Kea Agribusiness lands. However, future land uses for these areas need to be assessed within the context of a plan for the economic future of these areas.

While Kau Agribusiness has future plans for conversion of some of its lands for urban development, it is premature at this point to reclassify the lands without more detailed development plans. In addition, concerns regarding infrastructure and environmental impacts must be addressed for that region.

The Lanihau area in Kona has been designated as agriculture (orchard) in the County General Plan and has value as unique agricultural land, but is currently designated State Urban. As discussed previously, this area may be appropriate for reclassification to the Agricultural District to conform to the County General Plan and because of its value as unique agricultural land. However, the area also contains historic sites and further information is needed to determine whether it should be in the Agricultural or Conservation District.

There are many areas within the Agricultural District on the Big Island which have low agricultural value but high conservation value. These areas have been proposed for reclassification to the Conservation District. In addition, there are lands with low agricultural value which provide scenic vistas, a greenbelt buffer area between communities and open space. These areas should be retained in the Agricultural District to provide open space.

XI. CONSERVATION DISTRICT

Watersheds

The Hawaii Water Code and the State Water Resources Protection Plan call for increased protection of watersheds. The State Water Resources Protection Plan states:

Adequate management and control of watersheds is a prerequisite for our two major concerns--retaining sufficient acreage of watersheds to insure infiltration into groundwater aquifers to meet our needs, and to protect the quality of our raw water . . .

For many years watershed lands have been carefully guarded and increased in acreage, particularly on Oahu. In the not too distant future, this practice must be followed in the other counties. One example is in the Kona highlands where the maintenance and protection of the watershed should be a high priority consideration in view of the increasing need for more water in the Kona area . . .

It is vital that a minimum area of conservation lands be set aside for watersheds for infiltration.

The availability of water is a pressing concern for Kona because of the unprecedented growth of the North Kona district. The Hawaii Water Plan indicates that the existing North Kona basal water table source, the Kahaluu well, was developed only after exhaustive studies. The chloride content at the well has risen to a dangerously high level.

There have been recent findings of new well sources but it is uncertain whether the flow can be maintained over the long term.

The Kona watershed is the sole source of that water and it is important to assure that the water coming in balances the water taken out. In addition, water quality is a consideration. Land uses should not contaminate or compromise water quality.

As on the other islands, the interior forested portions of the Big Island have served as watershed or water recharge areas. Moisture-laden trades are cooled as they rise up the mountain slopes and deposit moisture as rain. The heaviest rainfall occurs on the eastern or windward side of the island. For example, the Hilo Forest Reserve averages 300 inches of rain per year. Rain in the leeward side is generally the result of convective-type showers. An associated feature of the leeward side's up-slope convectional rainfall is the frequent development of fog and mist at mid to high elevations which may form a locally significant hydrological component undetected by standard rainfall measurements. Reports on forest protection on Hualalai indicate that interception of fog by trees can contribute more water than rainfall.

While the watersheds on the eastern side of the island are protected through Conservation zoning, many of the watershed areas on the western side of the island are in the Agricultural District. Only the summit and

eastern slopes of Hualalai are in the Conservation District; its north, south and eastern slopes are in the Agricultural District. The protection of water recharge areas is particularly critical inasmuch as the unprecedented growth of the North Kona district is taxing the existing well source to capacity.

In addition, South Kona has few upland areas protected within the Conservation District. Most of the upland areas along the slopes of Mauna Loa are in the Agricultural District.

The North Kohala Mountains are another important water source. While much of the windward side of the mountain range is in the Conservation District, the area was examined to assure that the watershed was protected.

The University of Hawaii Water Resources Research Center studied high priority watershed areas in the Kohala Mountains and mauka Kona and has identified watershed areas which should be added to the Conservation District in these districts to protect water resources.

Forest Reserves

The island of Hawaii has approximately 422,100 acres within the State Forest Reserve System managed by the Department of Land and Natural Resources (DLNR). This includes over 15,000 acres of State-owned lands added to the Forest Reserve System in 1990. These areas provide important benefits such as enhancing and protecting watersheds, providing habitats for rare and endangered species, protecting native forests, increasing recreational opportunities and allowing forestry uses. Forest reserve lands not presently in the Conservation District have been recommended for inclusion into the Conservation District.

Public and Private Protected Natural Areas

Many of the State's outstanding natural, scenic, and cultural treasures, recreation sites and wildlife habitats are on lands which are part of specially preserved systems. These include State Natural Area Reserves, Marine Life Conservation Districts, National Parks, U.S. Fish and Wildlife Refuges and Nature Conservancy Preserves.

Natural Area Reserves and Marine Life Conservation Districts. Natural Area Reserves System (NARS) sites are areas which the Board of Land and Natural Resources designates as having unique natural resources and manages and regulates use to assure their protection.

There are eight Natural Area Reserves on the island of Hawaii ranging from lowland rain forests to alpine communities. These include the Puu O Umi, Mauna Kea Ice Age, Laupahoehoe, Kahaualea, Puu Makaala, Manuka, Namanuahaalou Swamp and Kipahoehoe NARS. With the exception of a narrow sliver of land in the northern part of the Manuka Natural Area Reserve, the NARS sites are within the Conservation District. However, care must be exercised to assure that adjacent land uses do not negatively impact Natural Area Reserves.

Figure 7

HIGH RECHARGE AREAS

- Agricultural District
- ▨ Conservation District
- ▤ Rural District
- ▧ Urban District
- 1000 Ft. Contours
- Project Boundary
- - Watershed Boundary
- - Rain-Fog Boundary
- Well

ISLAND OF
HAWAII

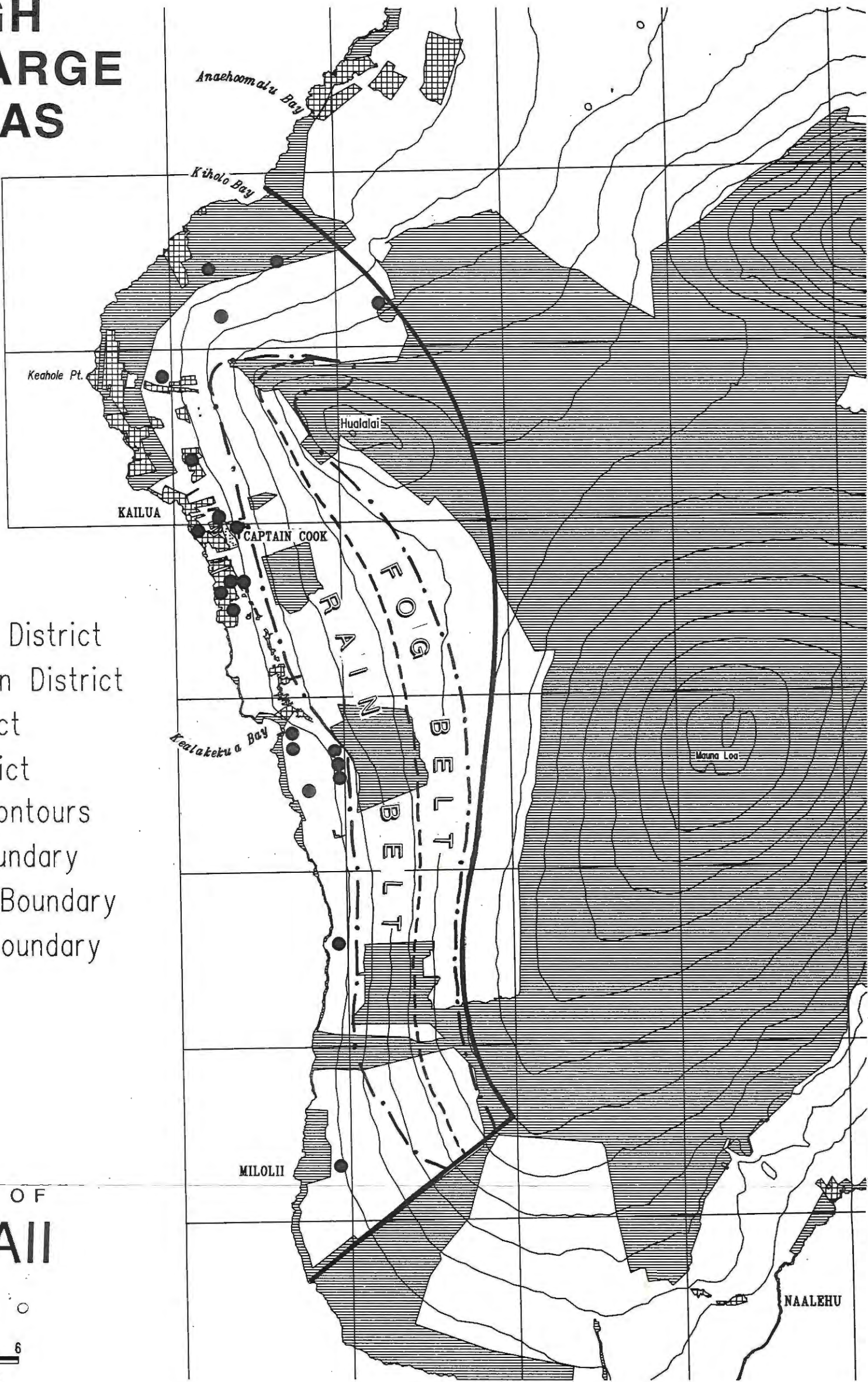
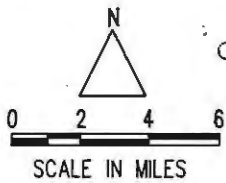
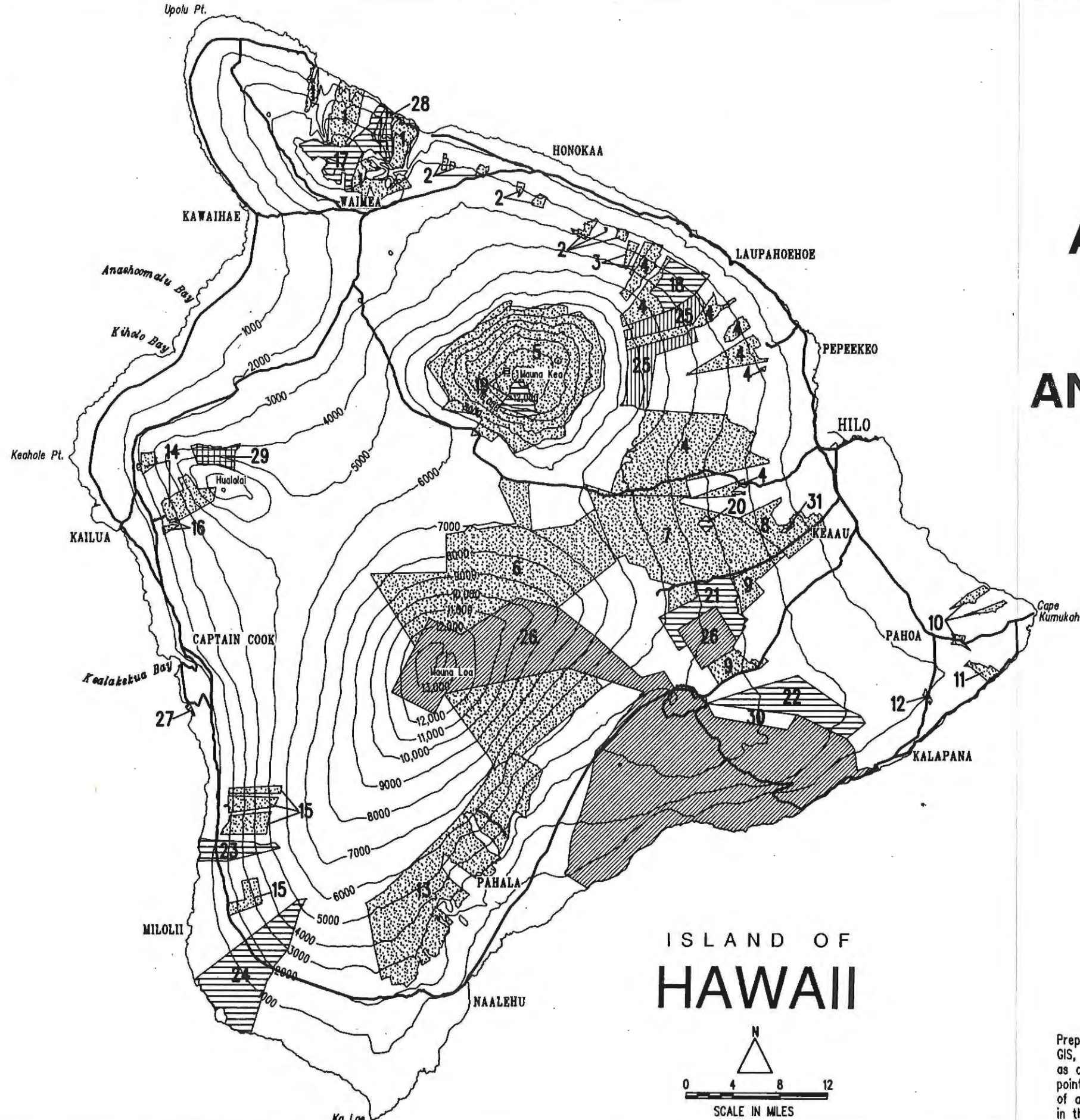


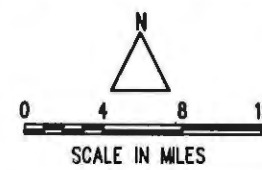
Figure 8

FEDERAL, STATE AND PRIVATE RESERVES REFUGES AND PRESERVES

STATE FOREST RESERVES	MAP-ID
Kohala Forest Reserve	1
Hamakua Forest Reserve	2
Manowaikee Forest Reserve	3
Hilo Forest Reserve	4
Mauna Kea Forest Reserve	5
Mauna Loa Forest Reserve	6
Upper Waialeale Forest Reserve	7
Waialeale Forest Reserve	8
Olaa Forest Reserve	9
Nanawale Forest Reserve	10
Malama Ki Forest Reserve	11
Keauohana Forest Reserve	12
Kau Forest Reserve	13
Honuaula Forest Reserve	14
South Kona Forest Reserve	15
Waialea Springs Forest Reserve	16
NATURAL AREA RESERVES	
Puu O Umi Natural Area Reserve	17
Laupahoehoe Natural Area Reserve	18
Mauna Kea Ice Age Natural Area Reserve	19
Waialeale 1942 Lava Flow Natural Area Reserve	20
Puu Makaala Natural Area Reserve	21
Kahaulea Natural Area Reserve	22
Kipahoehoe Natural Area Reserve	23
Manuka Natural Area Reserve	24
WILDLIFE REFUGES	
Haleakala National Wildlife Refuge	25
NATIONAL PARKS	
Hawaii Volcanoes National Park	26
Puu O Hanaunau National Park	27
WILDLIFE SANCTUARIES	
Waimanu National Estuarine Research Reserve	28
Puu Waawaa Wildlife Sanctuary	29
OTHER	
State Owned, Tract 22	30
Private Inholding	31



- Forest Reserves
- Natural Area Reserves
- Sanctuaries
- Wildlife Refuges
- National Parks
- 1000 Ft. Contours
- Major Roads



Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Reserve, Refuge, and Preserve boundaries current as of May, 1991. Contours interpolated from 1983 USGS digital point data. Managed area boundaries on this map are a compilation of a variety of primary and secondary data sources which are listed in this report. Boundaries depicted on this map are not official.

In addition, nine natural communities have been identified as candidate NARS additions. These include:

Leeward Mauna Kea. Mamane/naio forest and other rare, dry, montane communities of leeward Mauna Kea. Critical habitat for the endangered palila.

Hualalai. Rare, subalpine, koa/ohia/sandalwood forest community. Includes best remaining habitat for alala (Hawaiian crow) and other forest birds, and would stabilize an essential watershed.

Puuwaawaa. Rare, dryland and mesic forest community.

Malama Ki Forest Reserve. Lowland, wet, ohia and hala forests.

Olaa Forest Reserve. Montane, wet, ohia forest. Rare plants, forest birds and insects.

Kulani (Puu Makaala extension). An extension of the Puu Makaala NAR in the vicinity of Kulani cinder cone would expand coverage of an excellent example of montane, koa and ohia forest and habitat for forest birds.

Kapapala. Montane, dry shrub lands and forests of koa, mamane and ohia and forest bird habitat.

Kau Forest Reserve. One of the largest and most viable montane, koa and ohia forests, rare forest birds and plants.

Upper Waiakea. An unusual bog community containing Mauna Loa silversword lies adjacent to patches of older montane and subalpine, wet and mesic forest communities.

The boundaries of the candidate NARS sites have not been delineated. Therefore, it is difficult to exactly determine the existing land use classification of the candidate NARS. However, portions of the Hualalai and Puuwaawaa candidate sites may be in the Agricultural District while the other candidate sites appear to be in the Conservation District.

Hawaii has three Marine Life Conservation Districts--Wailea Bay, Lapakahi and Kealahou Bay. These marine areas are already protected within the Conservation District. However, adjacent land uses should be compatible with the preservation and protection of the underwater features and marine life forms which inhabit these areas.

National Parks and U.S. Fish and Wildlife Refuges. National Parks include the Hawaii Volcanoes National Park, Puuhonua O Honaunau National Historic Park and Kaloko-Honokohau National Historic Park. The Hakalau Forest National Wildlife Refuge provides a protected habitat for endangered forest birds.

Native Ecosystems and Rare Species

Hawaii has flora and fauna which are found nowhere else in the world. The State's volcanic origin, distance from other land masses, diversity of its physical environments and many other factors have resulted in the evolution of flora and fauna to meet their special environments.

The State of Hawaii has approximately eighty (80) endangered species. Among the species are great species such as the whales, and diminutive species such as the forest birds referred to as honeycreepers. Many more species are classified as threatened or appear on State lists as endangered or threatened.

Approximately 75 percent of species extinctions recorded in the United States have occurred in Hawaii. Currently 25 percent of all rare and endangered plants and animals in the United States are found in Hawaii.²³

The attached maps show the locations of rare species as identified by the Heritage Program of The Nature Conservancy of Hawaii as of June 1990. Information regarding the location of rare and endangered species has been provided by The Nature Conservancy of Hawaii, Hawaii Heritage Program (HHP). The data points on the workshop maps distinguish between older, often historical information (pre-1960), and more recent observations (1960-1990).

The HHP data base is dependent on the research and observations of many scientists and individuals. In most cases, this information is not the result of comprehensive site-specific field surveys and is not confirmed by HHP staff. Many areas in Hawaii have never been thoroughly surveyed, and new plants and animals are still being discovered. Hence, the data base information provided here should never be regarded as final statements about the resources present, or substituted for on-site surveys required for environmental assessments. Data provided by HHP do not represent a position taken by The Nature Conservancy of Hawaii.

In addition, The Nature Conservancy of Hawaii assisted the Office of State Planning in the Five-Year Boundary Review by conducting a series of workshops with biologists and others with field or local knowledge of significant biological resources in order to identify the locations of these resources. The findings of these workshops are presented in the Proceedings of the Native Ecosystems and Rare Species Workshops, 1991.

Thirty-eight sites outside of the current Conservation District were identified as potentially containing biologically significant resources on the island of Hawaii. Many of the areas were identified from historic records, and further study is needed to determine the current status and significance of the resources present.

²³ The Honolulu Advertiser, "Ecology Funds for Isle Bases," May 21, 1991.

Mauna Kea/South Hilo. Upper Paauhau and Kaohe constitute a band of mamane and naio forest with remnant koa patches that encircle Mauna Kea and provide a continuous stretch of habitat around the mountain for endangered palila and other native forest birds. The forests of Kanakaleonui link these upper mamane-naio forests to the lower koa ohia forest types to form a biological bridge for migrating forest birds. The area also provides essential habitat for endangered palila, akiapolaau, and io. The koa-ohia forests of Hakalau are an extension of the existing national wildlife refuge and support at least ten species of native forest birds.

Manowaialee-Mauka provides habitat for endangered Hawaiian hoary bats and koloa, and two rare forest types in Waipunalei connect the Hilo Forest Reserve with the Laupahoehoe NAR. Honolii Stream contains habitat for native insects and aquatic species, but needs further study. The lava flows at Kaumana are dominated by native vegetation at higher elevations and support native plants and invertebrates all the way to Hilo. Portions of Lelewi contain native forests, wetlands, and coastal strand.

Puna. The native ohia forests throughout the Puna area provide habitat for the io and contain many rare plant species, especially in the HAVO area. The lava flows at Olaa and Keonepoko support scattered native forests and contain lava tubes with native invertebrates.

A small coastal area at Kapoho Point provides nesting and foraging habitat for endangered hawksbill turtles and contains examples of 70 percent of the coral species found in Hawaii. Anchialine pools in the area support rare anchialine species. The recent lava flows at Kalapana will eventually support native plants, and the beach offshore may still contain foraging habitat for endangered hawksbill turtles.

Kau. Keauhou is a former ranch inholding within HAVO and contains regenerating ohia woodland that is being managed by National Parks staff for native forest recovery. The native rain forests of Kilauea-Keauhou, Kapapala, and the lands below the Kau Forest Reserve are all parts of important watersheds and many areas are known or believed to provide habitat for endangered forest birds. Kilauea-Keauhou has been proposed for a national wildlife refuge. Ocean View Estates, though heavily subdivided, still contains small patches of native vegetation, with large populations of apapane.

The "Great Crack" on the coast contains the greatest known concentration of nesting sites for the endangered hawksbill turtle in the Hawaiian Islands and foraging habitat for the threatened green sea turtle. There are anchialine pools and native pockets of coastal strand vegetation scattered along the south Kau coast.

Kona. Few of the native forests of Kona are in the Conservation District, though they support many rare native species and natural community types. In the higher elevations, the dry zone supports forests dominated by ohia and mamane mixed with koa and sandalwood. Lower areas are wetter and the resources are more scattered, except on

the 'a'a lava flows. The mid-elevation forests have been thinned or eliminated in areas by grazing and logging, but some areas still provide excellent habitat for several rare birds. Five endangered bird species have been reported from the Kona area: akepa, akiapolaau, alala, Hawaiian creeper, and io.

The slopes of Kona are also important watersheds, even above the forested areas. Unlike watersheds throughout most of the State, many watershed areas in Kona are zoned for agricultural use rather than being placed within the Conservation District. This is because lands in Kona were zoned vertically (by ownership of ahupuaas), while the native plants and animals of Kona are distributed horizontally in elevation bands. As a result, conservation areas are separated by large gaps. Bridging these gaps to provide habitat management in key areas is considered essential for the long-term survival of Kona's native species.

Upper Kapua, Kaapuna, Kona Forests and Hualalai all contain scattered koa-ohia forests, and many provide past or present habitat for the five endangered birds reported from Kona. Upper Kapua, Kona Forests, and Hualalai are also designated essential forest bird habitat by the USFWS, and Hualalai may be the best place on the island to reintroduce alala to the wild. The lower wet forests of this region have ohia, uluhe, and hapu'u. There are also patches of very rare koa-sandalwood forest that was once widespread in Kona. Mamane, lama, sandalwood, Hawaiian hoary bats, native spiders, and lava tubes are also reported in scattered locations from these forests.

In the lowlands, the South Kona forest and Waiea contain some intact ohia forests and may represent the only remaining extensions of the Kona forests to the coast. The lava flows of Puu Anahulu in North Kona support native vegetation down to approximately 1,000-foot elevation. Kealakehe contains a rare, lowland dry shrub land with rare plants and a population of endangered uhiuhi trees. Kaloko-Honokohau National Park and Kohanaiki on the Kona coast contain low-salinity anchialine pool complexes meriting special attention.

Kohala. Puu Kohola NHS contains a rare fern and an anchialine pool. Other areas in Kohala include an extension to the Koaia Plant Sanctuary, scattered rare plants and native forests believed to persist in the western gulches of the Kohala Mountains, and at Kehena adjacent to the Puu O Umi Natural Area Reserve. These areas all contain rare koai'a and have good potential for restoration. There have also been recent reports of rare tree snails in the West Kohala gulches and Kehena.

The sites identified in the report were assessed and examined by the Office of State Planning. In general, they fell into two categories--those that had been studied and/or surveyed or were known to contain significant biological resources and those that were suspected to contain significant biological resources but needed further work to verify these resources. For the County of Hawaii, those which fell into the former category and met the following were recommended for inclusion into the Conservation District:

- Relatively intact native forest.
- Areas designated essential endangered forest bird habitat.
- Rare or endangered plants or forest birds in abundance or relatively high concentrations.
- Areas that are an important part of a critical core area for protection of endangered forest bird habitat.
- Areas surrounded by or in-between Conservation District lands containing biological resources which may not be of the highest quality but Conservation designation would assist in protecting the integrity of a larger conservation resource area.
- Streams which meet the criteria for Special Streams.

Table 12 summarizes the assessment of these sites and actions recommended.

Table 12. ASSESSMENT OF AREAS IDENTIFIED AS CONTAINING OR SUSPECTED OF CONTAINING BIOLOGICAL RESOURCES

<u>SITE</u>	<u>ASSESSMENT</u>	<u>RECOMMENDATION</u>
1. Upper Paaupau/Waikii	Contains remnant mamane forest and forest bird habitat. Waikii is essential habitat for the endangered palila. ¹	Reclassify to Conservation.
2. Kaohe	Contains remnant mamane, sub-alpine dry forest and scattered koa. Endangered palila habitat. ²	Reclassify to Conservation.
3. Kanakaleonui and Keanakolu Tract	Provides an important biological bridge for migrating native forest areas between Mauna Kea and Hakalau NWR. Essential feeding and nesting habitat for three endangered forest birds. ³	Merits Conservation status. However, DHHL land.

1, 2, 3 Meeting with Jim Jacobi, Thane Pratt, USFWS, November 5, 1991.

Table 12. ASSESSMENT OF AREAS IDENTIFIED AS CONTAINING OR
SUSPECTED OF CONTAINING BIOLOGICAL RESOURCES (cont.)

<u>SITE</u>	<u>ASSESSMENT</u>	<u>RECOMMENDATION</u>
4. Hakalau Forest NWR and Adjacent Areas	A core area was identified as including the Hakalau NWR and adjacent areas with a heavy concentration of forest birds. The lower southern portion above the Hilo Forest Reserve is not forested and not important for forest birds. However, there are a number of ponds providing nene & koloa habitat. ⁴	Separate into two recommendations. The core area with a heavy concentration of forest birds is a high area for reclassification. The area above the Hilo Forest Reserve also has Conservation value but is of secondary priority.
5. Manowaialelee-Mauka	The biological significance of this parcel is uncertain.	No change.
6. Waipunalei	Contains native forest, although degraded. Located between Conservation District lands. In area designated essential forest bird habitat.	Reclassify to Conservation.
7. Honolii	Stream and gulch already in Conservation District.	No change.
8. Kaumana	Although this area contains native vegetation, its significance in terms of containing rare or endangered species is undetermined.	No change. Further survey work needed.
9. Leleiwi	This area does contain native plants. However, its biological significance in terms of quality of the ecosystem and presence of rare or endangered species is not well-documented. Further survey work necessary.	No change.

⁴ Meeting with Jerry Leineke, USFWS, October 25, 1991, and Jim Jacobi, Thane Pratt, Jack Jefferies, USFWS, November 5, 1991.

Table 12. ASSESSMENT OF AREAS IDENTIFIED AS CONTAINING OR
SUSPECTED OF CONTAINING BIOLOGICAL RESOURCES (cont.)

<u>SITE</u>	<u>ASSESSMENT</u>	<u>RECOMMENDATION</u>
10. Olaa West	A portion of this area is actively managed by HAVO National Park.	Reclassify Olaa West Unit to Conservation.
11. Mauna Loa Estates	Native ohia forest with under-story. Currently in the Urban District and subdivided. Relatively small acreage (39) acres). This area may merit reclassification but is not being considered because of its relatively small size (for Hawaii County).	No change.
12. HAVO NP/Olaa Reservations	Reported to be mostly grazed.	No change.
13. Olaa/Keaau	More information is needed on this site.	No change.
14. Keonepoko	More information is needed on this site. Biological significance unclear.	No change.
15. Kapoho Point and Bay	Most of the biological resources appear to be offshore. Marine waters are already in the Conservation District. If development is proposed for the area, the anchialine pools should be protected.	No change.
16. Kalapana/Pulama Flows	This area has recently been covered by lava and was identified because it will eventually support native vegetation. Since it does not currently contain rare or endangered species or ecosystems of biological importance, it is not recommended for reclassification on the bases of biological resources. However, the fact that this area is in a lava hazard zone is discussed elsewhere.	No change.

Table 12. ASSESSMENT OF AREAS IDENTIFIED AS CONTAINING OR
SUSPECTED OF CONTAINING BIOLOGICAL RESOURCES (cont.)

<u>SITE</u>	<u>ASSESSMENT</u>	<u>RECOMMENDATION</u>
17. Keauhou (Aina Hou Ranch)	Part of HAVO National Park.	Reclassify to Conservation.
18. Kilauea-Keauhou	The high quality Kilauea Forest is in the Conservation District. Keauhou contains koa and ohia trees, five rare plant species including the endangered <i>Vicia menziesii</i> and three plant species being considered for listing. The area also provides habitat for endangered forest birds and is designated essential habitat for these birds. ⁵	Reclassify to Conservation.
19. Kapapala	Contains State Forest Reserve (FR) additions.	Reclassify FR additions to Conservation.
20. Kau Forest Reserve Lower Boundary	Contains State Forest Reserve additions. Boundaries and site information for other areas less clear.	Reclassify FR additions to Conservation.
21. Kahuku Ranch	The significance and presence of biological resources in the Agricultural District are not well-documented.	No change.
22. Ocean View Estates	The significance of biological resources is not well-documented.	No change.
23. Great Crack	Terrestrial biological resources appear to be scattered. Further survey work needed, especially for coastal resources.	No change.
24. South Kau Coast	Further survey work necessary.	No change.

⁵ Meeting with James Jacobi and Thane Pratt, USFWS, November 5, 1991.

Table 12. ASSESSMENT OF AREAS IDENTIFIED AS CONTAINING OR
SUSPECTED OF CONTAINING BIOLOGICAL RESOURCES (cont.)

<u>SITE</u>	<u>ASSESSMENT</u>	<u>RECOMMENDATION</u>
25- North and South 30. Kona Forests	A band on the slopes of Hualalai and Mauna Loa from approximately 3,000-7,000 ft. in elevation contains forests which range in quality from relatively intact to highly grazed. Forest areas have been identified as essential habitat for four endangered forest birds. Rare plants and invertebrates have been reported in the area. It has also been identified as an important watershed area.	Recommend protection of this area as a Conservation resource.
31. Puu Anahulu	There are rare plants in this area, but they are scattered. Native ohia forest goes down to approximately 2,000 ft. elevation but most of this is already within the Conservation District. Further survey work or documentation needed. ⁶	No change.
32. Kealakehe	Protection of endangered uhiuhi trees is warranted as has occurred on the urbanized portion of this parcel. Recommend further surveys before any further reclassification occurs.	No change.
33. Koloko-Honokohau National Park	Reclassification appears consistent with designation of this area as a national park.	Reclassify to Conservation.
34. Kohanaiki	The anchialine pools may merit protection. The abundance and quality of the other biological resources is unclear.	No change.

⁶ Meeting with Ron Walker, DLNR, October 1991.

Table 12. ASSESSMENT OF AREAS IDENTIFIED AS CONTAINING OR
SUSPECTED OF CONTAINING BIOLOGICAL RESOURCES (cont.)

<u>SITE</u>	<u>ASSESSMENT</u>	<u>RECOMMENDATION</u>
35. Puu Kohola NHS	Change is appropriate based on park status but not on biological resources. However, no change is recommended because of the relatively small size of the parcel.	No change.
36. Koaia Sanctuary	Less than 15 acres.	No change.
37. West Kohala Gulches	Biological resources not well-documented.	No change.
38. Kehena	High quality ohia wet forest. Adjacent to existing Conservation District.	Reclassify to Conservation.

Native Forests

Act 82, SLH 1987, requires that high quality native forests be placed within the Conservation District. The Act states that the Legislature finds that Hawaii has several rare species of plants, animals, and fish that are found nowhere else in the world. The Legislature also finds that Hawaii has sizable areas of high quality native forests which are not in the Conservation District. To the maximum extent practical, it is the intention of the Legislature to preserve Hawaii's unique native flora and fauna by reclassifying such areas as Conservation Districts. To this end, the Act calls for reclassifying high quality native forests and the habitat of rare native species of flora and fauna into the Conservation District.

Information from the "Hawaiian Forest Bird Survey" (1976-1983), U.S. Fish and Wildlife Survey, and from the Native Ecosystems and Rare Species Workshops were used to identify areas with native vegetation including native forests. An important by-product of the "Hawaiian Forest Bird Survey" was the creation of vegetation maps for the montane areas of all of the islands except Oahu. Lower elevations (generally below 2,500 ft. elevation) were not mapped because birds are no longer found there. Although incomplete, the USFWS vegetation maps comprise the most comprehensive and recent vegetation maps available for the Hawaiian Islands.

The USFWS vegetation maps have three levels of specificity, from complex to more general. All levels provide excellent information regarding forest type, predominance of forest canopy, understory vegetation type, and vegetation cover.

Three general vegetation maps were derived from the USFWS vegetation information for the workshop maps: Native, Native-Exotic Mix and Exotic. Native vegetation is defined as 50 percent or greater native vegetation cover in the canopy or understory. Native-Exotic Mix is defined as less than 50 percent but greater than 34 percent native vegetation coverage in the canopy or understory. The Exotic designation indicates less than 34 percent native vegetation in both the canopy and the understory. Areas that were coded as "bare" and areas outside the study area are also shown on these maps.

Areas with predominately native vegetation, areas where native and exotic species are co-dominant and areas with predominately exotic vegetation are shown on the attached maps. However, since the survey focused on forest bird habitats and large areas of the State were not surveyed, there may be other areas where native vegetation may be found which are not shown on the attached maps.

Bird habitat ranges have been digitized from maps in the USFWS "Hawaii Forest Bird Recovery Plan." The "bird habitat ranges" shown on the maps in this report represent a combination of individual ranges. For example, on the island of Hawaii, the Hawaiian hawk ('io) has an extensive range which encompasses all of the other forest bird ranges and therefore represents the outer boundary of forest bird ranges.

For these maps, a "managed area" was defined as an area that is being managed to protect its biological resources under legal mandates and authority or through management plans and activities. The maps include as managed areas: National Wildlife Refuges (NWR), National Parks (NP), and National Historic Sites (NHS); State Forest Reserves (FR), Natural Area Reserves (NAR), Marine Life Conservation Districts (MLCD), Wildlife Sanctuaries, Plant Sanctuaries and selected State Parks; and privately-owned or managed preserves or watersheds. State Game Management Areas (GMA) were not included because these areas require further investigation and boundary delineation. The majority of State Parks were not included, because these areas are not managed specifically for their biological resources.

The managed area boundaries, specifically those of the State FRs, NARs, and MLCDs, are still preliminary in nature. These boundaries were drafted from digital information from the USGS and a variety of base maps with varying scales. Assistance was provided by staff from the Division of Forestry and Wildlife (DOFAW), Department of Land and Natural Resources (DLNR), on each island.

The Native Ecosystem and Rare Species Workshops conducted by The Nature Conservancy of Hawaii for the State Land Use District Boundary Review obtained input on these areas from biologists and others with field knowledge of these biological resources. Additional areas of biological significance are described in the "Proceedings of the Native Ecosystems and Rare Species Workshop."

It is clear from the following maps, that large areas of native vegetation including native forests located in North and South Kona and Kau are in the Agricultural District. In addition, the Keauhou-Kilauea forest is located in the Agricultural District.

Critical and Essential Forest Bird Habitats

Ten species of native birds found in the forests of Hawaii have become extinct since Cook's first voyage to Hawaii. Eight others are currently on the U.S. Department of Interior's Endangered or Threatened Species List, as of 1980. Four of these species are members of the Hawaiian honeycreeper family and have been determined to be endangered within their native range on the island of Hawaii. These four species--Hawaiian Akepa, Hawaiian Creeper, Akiapolaau, and Ou are entirely dependent upon native Hawaiian forest ecosystems for food, shelter and nesting sites. They are completely dependent on the limited remaining native forests.

The "bird habitat ranges" shown on the maps represent a combination of individual ranges contained in the USFWS "Hawaii Forest Bird Recovery Plan." "Essential" habitat identifies the areas which would provide the space necessary for the continued existence and growth of these species by providing for the maintenance of the various disjunct populations as an insurance against catastrophic loss within portions of the range. The areas encompass primarily portions of ohia, ohia-koa, koa and mamane-naio forest ecosystems ("Hawaii Forest Bird Recovery Plan").

This concept has been described as forming:

"a necklace of big koa and ferns, of rainbow-hued native birds, of dryland forest and Hawaiian insects.

"It would be draped across the island from the northern Hamakua woods of Mauna Kea down through the saddle and around Mauna Loa, rising up and over Kilauea, and on around into southwest Kau.

"A band tens of thousands of acres large, home to hundreds of native life forms, singing and chirping and swaying in the tradewinds."²⁴

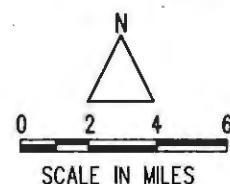
A few of the pieces are already in place. The region is now anchored to the north by the Hakalau National Wildlife Refuge and to the south by a complex of preservation areas--Hawaii National Park, Puu Makaala State Natural Area Reserve and Olaa Forest Reserve. Most of these areas are already in the Conservation District.

²⁴ Honolulu Star-Bulletin and Advertiser, "Proposed Big Isle Refuge Has Grand Scale," Jan Tenbruggencate, December 1990.

Figure 9

NATIVE ECOSYSTEMS AND RARE SPECIES

ISLAND OF
HAWAII



Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official. Species data provided for informational purposes only. See accompanying report.



- | | | | | |
|---|---|-------------------|---|---|
| A | C | | R | U |
| | | Native Vegetation | | |
| | | Native/Exotic Mix | | |
| | | Exotic Vegetation | | |
| | | Bare | | |
| | | Out of Study Area | | |
- 1000 Ft. Contours
 - Bird Habitat Ranges
 - Managed Areas
 - Rare and Endangered Species (pre-1960) Hawaii Heritage Program
 - + Rare and Endangered Species (post-1960) Hawaii Heritage Program

Figure 9

NATIVE ECOSYSTEMS AND RARE SPECIES

ISLAND OF HAWAII



Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official. Species data provided for informational purposes only. See accompanying report.

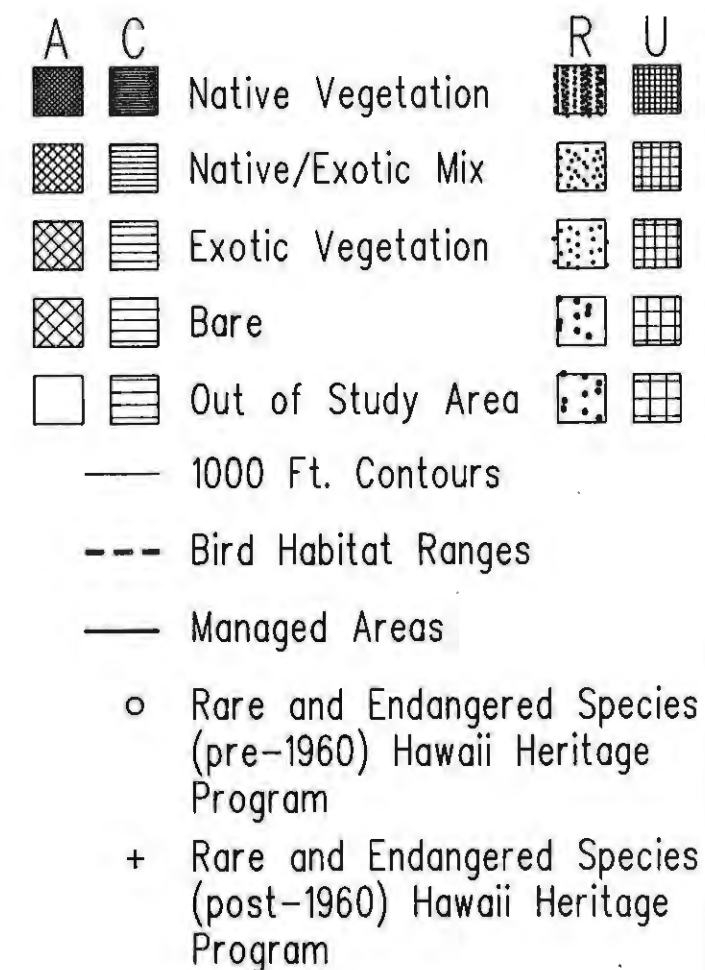
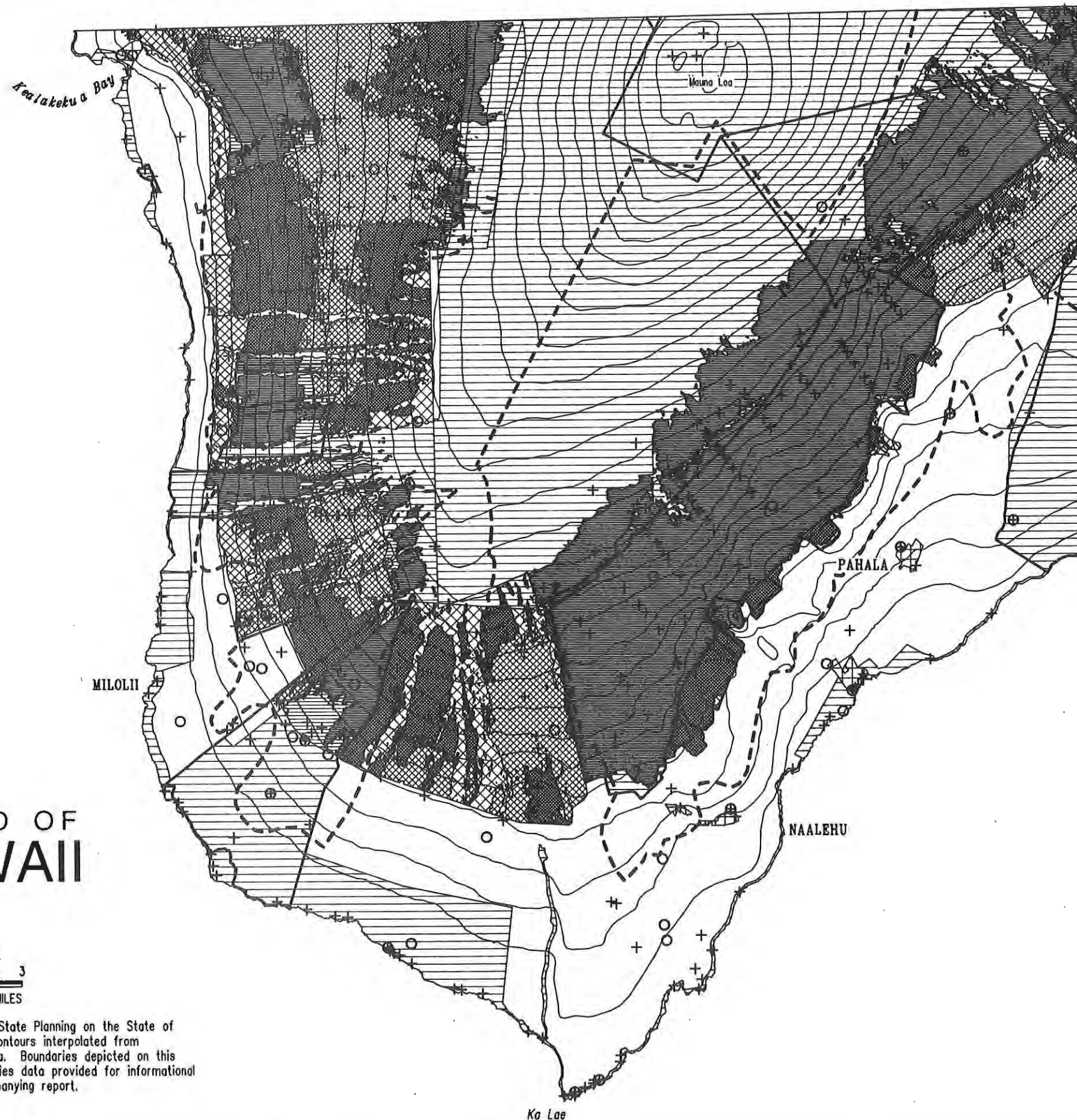
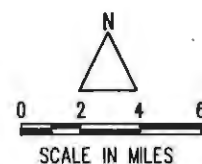


Figure 9

NATIVE ECOSYSTEMS AND RARE SPECIES

ISLAND OF HAWAII



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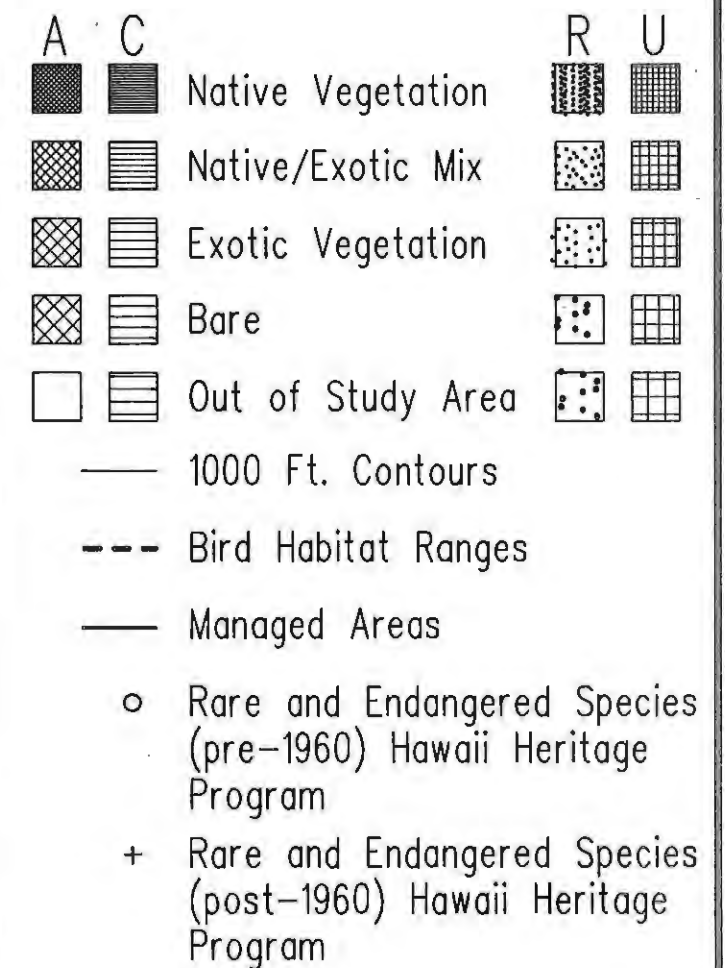
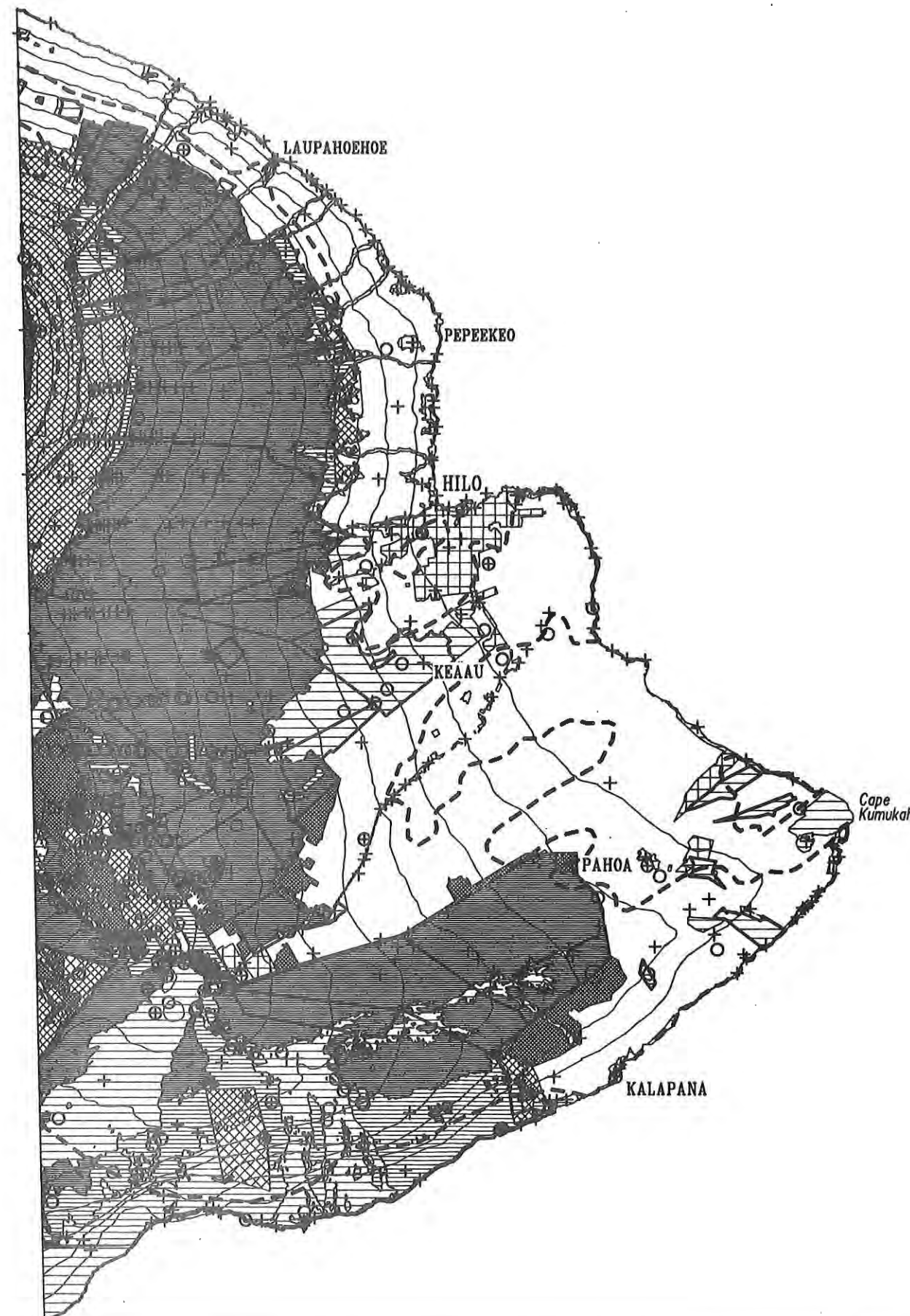
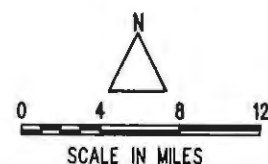


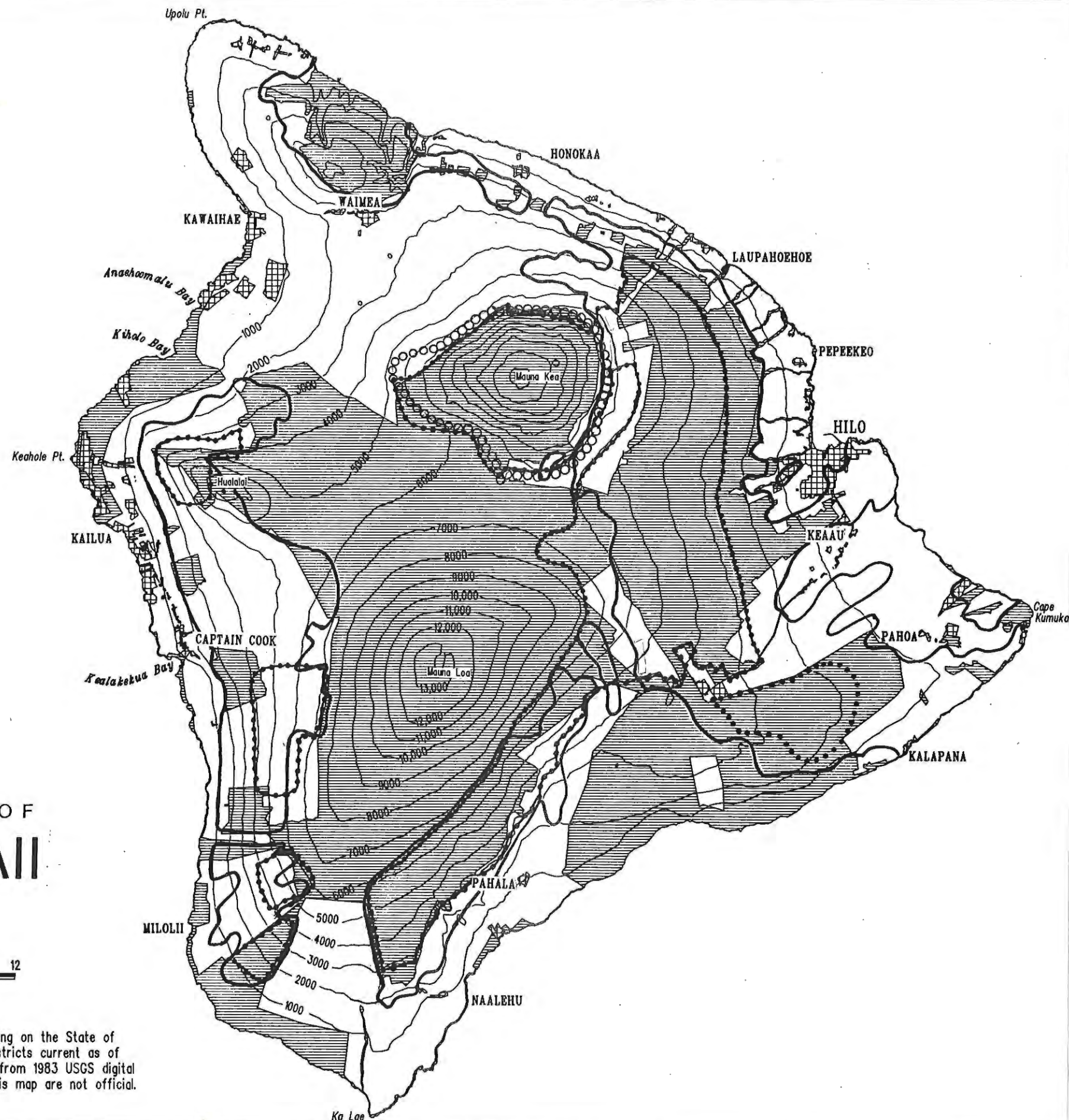
Figure 10

ESSENTIAL HABITAT FOR THE HAWAIIAN HONEYCREEPERS AND THE HAWAIIAN HAWK

ISLAND OF
HAWAII



Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Land Use Districts current as of February, 1991. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official.



- Hawaiian Hawk Habitat Range
- Honeycreepers Habitat Range
- oooo Palila Habitat Range
- Agricultural District
- ▨ Conservation District
- ▤ Rural District
- ▧ Urban District
- 1000 Ft. Contours

However, important linkage areas are in the Agricultural District including portions of the Manowaialee Forest Reserve, portions of the Humuula and Laupahohoe sections of the Hilo Forest Reserve and the lands of Waipunalei and Maulua Nui (all above 3,000 feet). Another critical piece is the Keauhou-Kilauea Forest also in the Agricultural District and has been identified as a habitat for native insects and plants as well as endangered forest birds.

Much of the essential habitat in Kau is in the Kau and Kapapala Forest Reserves and for the most part are in the Conservation District. There are some recent additions to the forest reserves that are in the Agricultural District.

The South Kona-Papa and Central Kona-Kealia forest bird essential habitats are largely in the State Agricultural District. Finally, major portions of the Hualalai essential forest bird habitat are in the Agricultural District.

The palila is another Federally listed endangered species. It is currently found only on the mamane-naio forests on the upper slopes of Mauna Kea, although historically its range was much larger. The critical habitat for the palila is shown in Figure 10. Much of the critical habitat appears to be in the Conservation District except for the upper Waikii parcel. However, further examination is required to determine exact boundaries.

The alala or Hawaiian crow is also endangered. It is found in limited numbers in Kona. In addition, a research project is underway at the Olinda Endangered Species Propagation Facility on Maui to propagate the species.

Wetlands

Wetlands provide habitats for endangered waterbirds and for migratory seabirds. They assist in controlling floods and soil erosion. They also provide scenic, open space areas. The following wetlands are identified in the State Conservation Lands Functional Plan, the State Recreation Functional Plan, Hawaiian Waterbirds Recovery Plan and Hawaiian Wetlands National Wildlife Refuge Complex Master Plan--Aimakapa Fishpond, Haena Marsh, Kahua, Kiholo, Lokoaka and Kionakapahu Ponds, Opaepala Pond (Makalawena), Pololu, Puu Oo, Wailoa, Waipio Valley and Waimanu Valley. Additional wetlands have been identified as significant through the Native Ecosystems and Rare Species Workshops and staff analysis. Figure 11 shows the location of these wetlands.

Some of these wetlands are already in the Conservation District and should remain in that district. Those that are not in the Conservation District should be included in the Conservation District except where current agricultural use is appropriate, since it does not negatively impact the wetland, e.g., Kahua, Wailoa, Waipio Valley, and there are no development threats, and the wetland is not associated with a special stream.

There are other wetlands on the island of Hawaii but it was not possible to identify and evaluate all of these wetlands. However, some of them may be important conservation resources and changes in the use of these wetland sites should be carefully evaluated.

Beaches and Coastal Areas

Swimming beaches which have been rated by the Department of Land and Natural Resources as having high statewide or island-wide significance are: Pololu Beach, Honokane Iki Bay, Waimanu Bay, Waipio Bay, Kapoho Tidepools, Puu Hou, Pohue Bay, Humuhumu Beach, Awili Beach, Okoe Bay, Honomalino Bay, Kaelehuluhulu Beach, Mahaiula Bay, Makalawena, Maniniowali, Kahuwai Bay, Kiholo Bay, Keawaiki Bay, Wailea Bay, Hapuna Bay and Ohaiula Beach (Spencer Beach Park).²⁵ Areas which the West Hawaii Regional Plan recommended as having high outdoor recreation resource potential included: Kohala Cliff and Valley, Akoakoa Point, Hapuna Beach State Recreation Area to Wailea Beach, Kapalaoa to Kiholo Bay, Maniniowali Beach and Makalawena to Mahaiula Bay. Beaches and coastal areas in the Conservation District should remain in that district with a large buffer area for protection against adjacent land uses.

Streams

Freshwater streams have a multitude of values. They provide irreplaceable habitat for aquatic and riparian flora and fauna. They support and define estuarine ecosystems. They are the key to maintaining quality and productivity in our nearshore marine waters. Streams link the mountains with the sea. They carry the lifeblood of all of our living ecosystems. Their health is critical not only for the survival of the unique biota which they support, but also for the future welfare of human society in our isolated island environment.

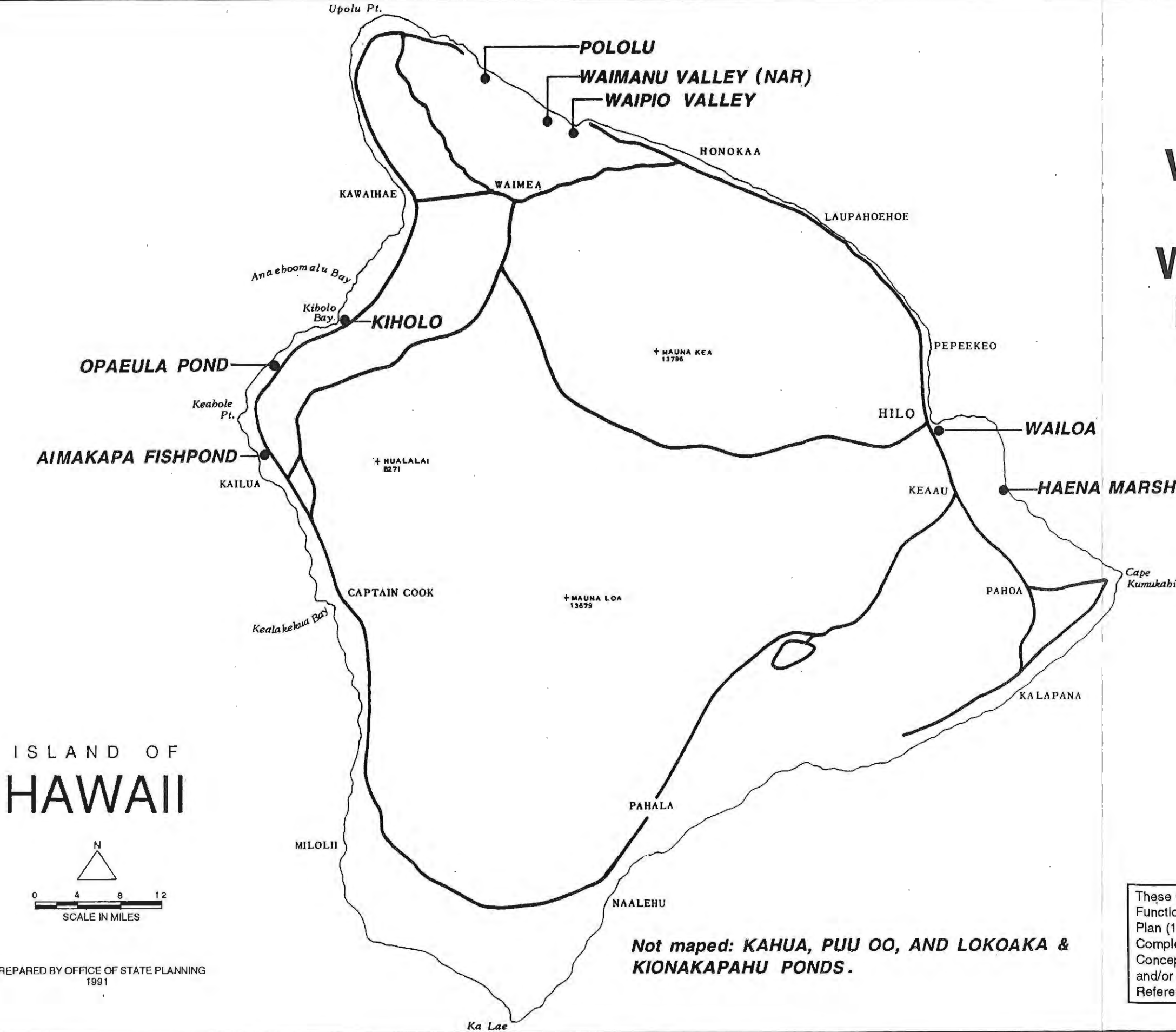
The availability of freshwater is the quintessential commodity in human commerce and development. It is the primary determinant in defining the carrying capacity of our islands for plants, animals, and humans. If the carrying capacity is being exceeded, we would expect to see it reflected in a degradation of our stream habitats and a corresponding decline in our native freshwater biota. In fact, these trends are dramatically evident.

Urbanization and agricultural practices have severely altered the natural terrain in lower and middle elevations on all the major islands. Native ecosystems in these areas have been degraded.

²⁵ Department of Land and Natural Resources, Recreation Resources Inventory, Swimming Sites, State of Hawaii.

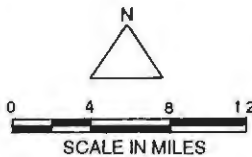
Figure 11

WETLANDS AND WATERBIRD RECOVERY HABITAT



These wetlands are identified in State Conservation Lands Functional Plan (1990), Hawaiian Waterbirds Recovery Plan (1985), Hawaiian Wetlands National Wildlife Refuge Complex Master Plan (1985), Regional Wetlands Concept Plan: Emergency Wetlands Resource Act (1990), and/or State Recreational Functional Plan and Technical Reference Document.

ISLAND OF
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1991

Not mapped: KAHUA, PUU OO, AND LOKOAKA & KIONAKAPAHU PONDS.

Such unchecked development is reflected in obvious modifications to stream habitats such as impoundment, diversion, and channelization and less obvious but equally serious effects such as sedimentation and other changes in the nature of runoff into the streams. Chemical toxins, inorganic and organic nutrients, and solid wastes expelled by human society are weakening the basic structure of stream ecosystems. The native stream biota are now much less abundant than in the past, and the altered habitats have proven especially favorable for an eruption of alien species, which are further threatening the stability of the system. At the ocean end, the result is dying coral and declining fish populations.

All marine waters are protected by conservation zoning. This protection is meaningless, however, if the freshwater streams with which they are inextricably linked are not given equal consideration.

With the help of local stream experts and examples from various mainland states and municipalities, the following Conservation District stream protection options were developed.

The optimum solution identified is the protection of entire watersheds from activities that lead to increased sediment loads, pollution, and other harmful changes to flowing stream waters and ultimately our coastal waters. Ongoing research supported by DLNR's Division of Aquatic Resources is indicating that our island stream ecosystems function differently than aquatic ecosystems in continental situations. Ours are simpler in structure and are absolutely dependent upon runoff from relatively natural areas. They lack features that elsewhere help to stabilize ecosystems when upsets occur. A disturbance at any point in a stream may echo throughout the stream, from the highest reaches to the lowest. Disturbances which might not be significant in a continental situation could cause a Hawaiian stream ecosystem to collapse. The ridge-to-ridge "watershed" approach would help stabilize these ecosystems and would offer native species the greatest chance of survival. It has been recommended for streams wherever possible in this report.

However, ridge-to-ridge Conservation District protection is not always possible due to existing land use activities, e.g., residences. In these cases, we have recommended a 100-foot Conservation District corridor on both sides of the streams as measured from the scoured bank. Conservation designation would provide for the regulation of uses adjacent to the stream (e.g., grading and construction of structures) to help assure stream protection. A number of studies have found that natural corridors are effective in reducing the amount of pollution delivered to a waterway. A continuous strip of vegetation also provides habitat for wildlife along the stream and when composed of tall shrubs, can protect a waterway from overheating due to sunlight.²⁶ The U.S. Department of Agriculture's Soil Conservation Service Conservation Reserve Program encourages the

²⁶ Klein, Richard D., Community and Environmental Defense Associates, "Protecting the Aquatic Environment from the Effects of Golf Courses."

establishment of specially designed vegetative filter strips along watercourses through cash and regulatory incentives to landowners.²⁷ These areas are designed to absorb pollutants that could otherwise end up in the stream. Natural corridors can also absorb and help keep development away from flood waters.

This report recommends that Conservation District corridors be established along Special Streams. Streams that flow through the Agricultural District and identified as containing outstanding aquatic resources or riparian values that include waterbird recovery habitat, either in the Hawaii Stream Assessment or through more current aquatic information provided by DLNR or the U.S. Fish and Wildlife Service, have been recommended for inclusion in the Conservation District. These are streams with known and documented outstanding resources. However, this does not mean that these are the only streams in need of protection. As field studies continue, undoubtedly additional streams with similar resources will be identified.

"With only five species comprising the native stream fish fauna, the loss of a single one would result in a dramatic reduction of diversity in Hawaiian fresh waters"²⁸. These species are not yet on the brink of extinction, but the decisions made now will determine the future of all of our native aquatic organisms and ecosystems. Hawaii is in the fortunate position of being able to prevent the inexorable slide to extinction in aquatic ecosystems, if favorable decisions to protect essential habitat are made now, before the otherwise inevitable crisis stage arrives.

Significant Scenic Resources

Scenic resources are vital to maintaining Hawaii's natural beauty and enrich our quality of life. They are also important to the continued health of the visitor industry.

The island of Hawaii contains many areas of natural beauty including its mountains, valleys, waterfalls, streams, beaches, hills, forests and natural areas. Significant scenic resources, meaning the physical feature itself rather than the view plane which is covered under open space, not already in the Conservation District have been recommended for inclusion into that district. Examples of significant scenic resources include: Kohala Cliff and Valley; Hamakua Sea Cliffs; Mauna Kea Summit, Cone and Crater; Mauna Loa Upper Slope, Cone and Crater; Hualalai Upper Slope, Cone and Crater; Puu Waawaa Cone; Kilauea Caldera Complex; Kohala Cone and Crater; Kapoho Crater; Kapoho Lava Trees; Akaka Falls; Rainbow Falls; Kua Bay; Makalawena Beach; Kealakekua Bay; Hapuna Bay; Anaehoomalu Bay; Kiholo Bay; and Honomalino-Kapua Coast.

²⁷ U.S. Environmental Protection Agency, "Vegetative filter Strips, brochure prepared by the Soil and Water Conservation Society, July 1988.

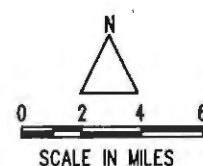
²⁸ Department of Land and Natural Resources, "Conservation of Hawaii Freshwater Fishes," prepared by William S. Devick, J. Michael Fitzsimmons and Robert T. Nishimoto, April 1992.

Figure 12

PERENNIAL STREAMS



- Agricultural District
- ▨ Conservation District
- ▤ Rural District
- ▧ Urban District
- Perennial Streams in Agricultural Districts
- Perennial Streams in Urban and Rural Districts
- Perennial Streams in Conservation Districts



ISLAND OF
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Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Land Use Districts current as of February, 1991. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official.

Table 13

**Special Streams:
Stream Corridor Guidelines**

**Conservation District Stream Corridor Guidelines
for lands in the Agricultural* District**

1. Minimum 100 foot corridor except for channelized streams.
2. Conservation district protection was delineated from ridge-to-ridge for steep valleys (slopes over 20%) and those free of development.
3. If the valley was currently in an agricultural use that could be accommodated in a conservation district, then the conservation district was delineated from ridge-to-ridge. If not, then a 100 foot corridor was recommended.
4. If a stream had no definable ridgeline or other identifiable boundary or there were numerous nearby residences, then a 100 foot stream corridor was recommended.
5. One hundred foot corridors were delineated for streams that only met the criteria for outstanding riparian values, determined in part by the presence of waterbird recovery habitat.
6. If a stream met the criteria necessary to warrant ridge-to-ridge conservation district protection, and the land was currently under the management of DLNR's State Parks Division, the final recommendation for land use districting and corridor determination was made by that agency.

* Priority 1 Conservation District corridors are only proposed for streams in the Agricultural District. Corridors are proposed for areas in the Rural and Urban Districts as Priority 2 recommendations but will not be petitioned for reclassification in an effort to keep residential uses out of the Conservation District.

Table 14

Special Streams: Hawaii

Legend	
Special Stream Criteria	1. Outstanding Aquatic according to the Hawaii Stream Assessment 2. Outstanding Riparian according to the Hawaii Stream Assessment 3. High Quality Estuary according to OSP/Coastal Zone Management 4. Outstanding Aquatic according to the Hawaii Stream Assessment criteria using new information provided by DLNR or USFWS. * Not applicable here. Stream already in Conservation District.
Values	Characteristics that resulted in special stream designation

Stream Name	Special Stream Criteria	Values
Aamakao	*	
Pololu	*	
Honokane Nui	*	
Honokane Iki	*	
Kalele Gl.	*	
Waipahi	*	
Honokea	*	
Kailikaula	*	
Honopue	*	
Kolealiili	*	
Ohiahuea	*	
Nakooko	*	
Waiapuka	*	
Waikalua	*	
Waimaile	*	
Kukui	*	
Paopao	*	
Waiaalala	*	
Punalulu	*	
Kaimu	*	
Pae	*	
Waimanu	*	
Wailoa/Waipio	*	
Lalakea	1	Abundance of native aquatic species.
Kaawalii	*	
Kilau	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Manowaiopae	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Kuwaikahi	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Kihilani	4	Presence of Lentipes concolor ('o'opu alamo'o).
Kaiwilahilahi	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).

Kapehu	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Paeohe	4	Presence and spawning of Lentipes concolor and other native aquatic species ('o'opu alamo'o)
Maulua	1	Abundance of native aquatic species
Pohakupuka	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Manoloa	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Ninole	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Waikaumalo	4	Diversity and spawning of native aquatic species including presence of Lentipes concolor ('o'opu alamo'o).
Nanue	*	
Opea	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Peleau	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Umauma	4	Diversity of native species.including presence of Lentipes concolor ('o'opu alamo'o).
Hakalau	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Kolekole	*	
Paheehee	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Honomu aka Malamalamaiki	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Kapehu	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Makea	4	Diversity of native species.including presence of Lentipes concolor ('o'opu alamo'o).
Kawainui	4	Abundance and diversity of native species.including all four species that are indicators of good quality habitat.
Hanawi	1	Abundance of native aquatic species including all four species that are indicators of good quality habitat.
Kaieie	4	Diversity of native species.including presence of Lentipes concolor ('o'opu alamo'o)
Kaapoko	1	Abundance of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Kapue	4	Abundance of native aquatic species including all four species that are indicators of good quality habitat.
Pahoehoe	4	Diversity of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).
Honolii	*	
Maili	*	
Wailuku R.	2,4	Diversity and spawning of native aquatic species including presence of Lentipes concolor ('o'opu alamo'o). Presence of four threatened and endangered bird species.
Waikoloa	4	Diversity of native aquatic species, presence of Lentipes concolor ('o'opu alamo'o).

State Parks

There are 18 State parks on the Big Island. These include: Kalopa State Recreation Area, Akaka Falls State Park, Wailuku River State Park, Wailoa River State Recreation Area, Mauna Kea State Recreation Area, Kealakekua Bay State Historical Park, Keolonahihi State Historical Park, Kona Coast State Park, Kohala Historical Sites State Monument (Kamehameha I Birthsite, Mookini Heiau, and Kukuipahu Heiau). The Department of Land and Natural Resources which administers State parks was consulted regarding the appropriate land use classification for each park. The department recommended reclassifying portions of Hapuna Beach State Recreational Area and Lapakahi State Historical Park from the Agricultural District to the Conservation District.

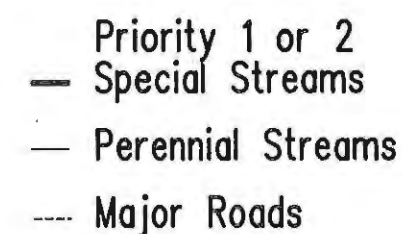
Historic Sites

There is not a complete inventory of historic sites for the State. According to the Historic Preservation Division, Department of Land and Natural Resources, only about 5-10 percent of the land in the State has undergone archaeological survey. The Division uses five criteria to evaluate a site's significance and place in history. A site's significance is based on an evaluation of its association with famous people or deities; its association with a broad pattern of prehistory; its cultural significance; its information content; and its evaluation as an excellent example of site type.

About 25,000 historic sites have been identified, and most of these are significant for at least one of the five legal criteria used in their evaluation. In many cases, however, there is insufficient information to evaluate a site's significance. In most of these cases, the sites will be found significant solely for their information content. In perhaps 20-30 percent of the cases, the sites will be found to be significant based on their evaluation as excellent examples of site types, for cultural significance, for association with famous people or deities, and for association with broad patterns of prehistory. However, general patterns of historic sites are known and many of the most significant sites are found in all of the land use districts: Urban, Rural, Agricultural, and Conservation. Where extensive historic sites are found on Agricultural lands (for example, the more than 20-mile long prehistoric field systems in upland Kona, the equally large prehistoric field systems in Kohala, Waimea and Kau), it does not appear feasible to reclassify these lands which contain small farm and house areas to the Conservation District.

Conservation District status may better protect certain specific historic sites, particularly those which are significant, meet multiple criteria for historic preservation and contain other conservation resources as well. Examples of these are the recommendations to reclassify to the Conservation District the mauka extensions of Lapakahi State Historical Park in North Kohala and Keolonahihi State Historical Park in North Kona. These proposed reclassifications will preserve sites evaluated for their historic, archaeological and cultural content within traditional Hawaiian land divisions.

PRIORITY 1 & 2 SPECIAL STREAMS



NOTE: Special Streams occurring totally within the conservation district are not listed here as Priority 1 or 2 recommendations.



It is vital to get ahead of the development to initiate long-range planning and identify sites that merit preservation for cultural reasons, for interpretation in historic parks, and for long-range scientific research. The State's Historic Preservation Program reviews projects in all the districts under a wide range of actions and a permit process which effectively enables the program to address historic preservation concerns.

In the face of development, historic sites must be acceptably inventoried and significant sites identified. The significant sites must then be properly treated, either the data recovered (such as in the case of sites significant solely for their information content), or preserved.

Many of the historic sites mentioned in this document have primarily been identified through public input. No separate study was conducted for the boundary review on historic sites. The Historic Preservation Division of the Department of Land and Natural Resources was consulted as to the significance of these sites.

Game Management Areas

There are hundreds of acres of game management areas in the Conservation District that are a significant recreational resource. Some of these areas have other values as well, such as providing watershed protection and wilderness, natural and open space areas. Game management areas are also found in the Agricultural District and the general rule followed was to retain game management areas in their existing classification unless some other characteristic or physical resource was present which warranted reclassification to the Conservation District, e.g., high watershed value.

Open Space and Natural Areas

Open space areas provide a buffer between communities, provide scenic vistas and provide a pleasing aesthetic quality to the landscape. On the Big Island, there are large expanses of lava fields or dry grasslands which provide open space and should be retained in the Conservation District.

Senate Concurrent Resolution No. 179 (1988 session) urges State and County governments to ensure that the public view and open space makai of the Kawaihae-Mahukona-Hawi Road be preserved. The West Hawaii Regional Plan calls for protecting views afforded from the Queen Kaahumanu Highway and from the shoreline. Some of the more outstanding areas along this shoreline have been recognized and cited in the County of Hawaii General Plan as areas with vistas of extraordinary natural beauty which shall be protected for future generations. These include Kaiopae Point, Waiakailio Bay area, Keawanui Bay area, Mahukona Harbor and Park, Kapaa Park, Old Honoipu Landing, Upolu Point, Kauhola Point, Keokea Beach, Kalalae Point, Kapania Bay area, Neue Bay area, and Akoakoa Point. The Conservation District along this coastline should be preserved and in some cases extended to insure and protect the scenic and historic resources of these areas. The Urban District at Waiakailio Bay to Honokaa Gulch is inappropriate for Urban designation. Senate Concurrent Resolution No. 179 (1988 session) urges State and County governments to assure that the

public view and open space makai of the Kawaihae-Mahukona-Hawi Road be preserved and no development be allowed. The West Hawaii Regional Plan also calls for protection of these views. The Hawaii County General Plan maintains policies towards increasing public pedestrian access to these natural areas and acquiring access easement to public or private lands having natural and scenic resources which should be provided or acquired for public use.

These areas which combine scenic resources with historical and archaeological resources provide opportunities for recreation and educational pursuits which include hiking, picnicking, fishing and historical interpretation/theme parks.

The Hamakua Regional Plan recommends protecting the Waipio Rim viewshed to preserve the cultural and scenic integrity of the rim.

Open and natural areas also include Conservation District lands between the resort nodes of Mauna Kea, Mauna Lani/Waikoloa, Kaupulehu and Keahole/Keauhou. These lands provide open space buffer areas between the Urban Districts and serve to protect important natural and cultural heritage areas along the coast. The Conservation District between the Mauna Kea and Mauna Lani Beach Resorts includes Hapuna Beach State Park and a large area mauka of the urban coastal strip at Wailea Bay and Puako. The coastal areas have high recreational resource value. Conservation District lands between Waikoloa and Kaupulehu protect the significant scenic, recreational, cultural and environmental resources of Kiholo Bay and its fishponds. Conservation District lands between Kukio and the Keahole Airport protect similar resources associated with the bays, beaches and inland areas between the two points.

In addition, there are lands in the Agricultural District which may have low agricultural value but should be retained as open space for their natural, scenic and greenbelt qualities. Many of these areas are not appropriate for development as they are not in proximity to existing urban areas, lack infrastructure or are not indicated for growth on State or County Plans. Some of the open and natural areas with high scenic value and other environmental resources have been recommended for inclusion into the Conservation District. Others should remain in the Agricultural District unless there are statutory changes to establish a new open space district.

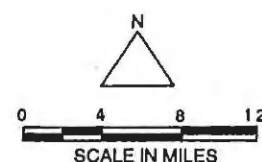
Steep Slopes

Hawaii has relatively few areas of steep slopes when compared to the geologically older islands of Kauai and Oahu. The attached map shows areas of steep slopes on the island of Hawaii. Most areas of steep slopes appear to be in the Conservation District with the exception of the pali at Kealahou Bay which extends up to approximately the 3,000-foot contour and the slopes of Hualalai between the 6,000- and 4,000-foot contour on the north and the 6,000- and 5,000-foot contour on the southwest.

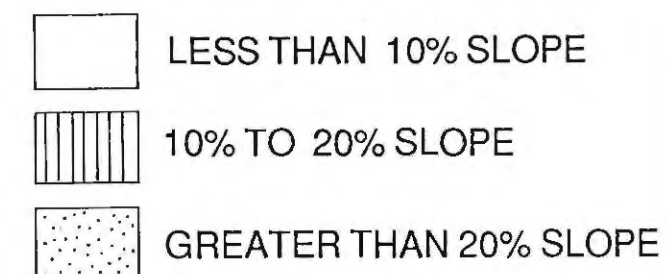
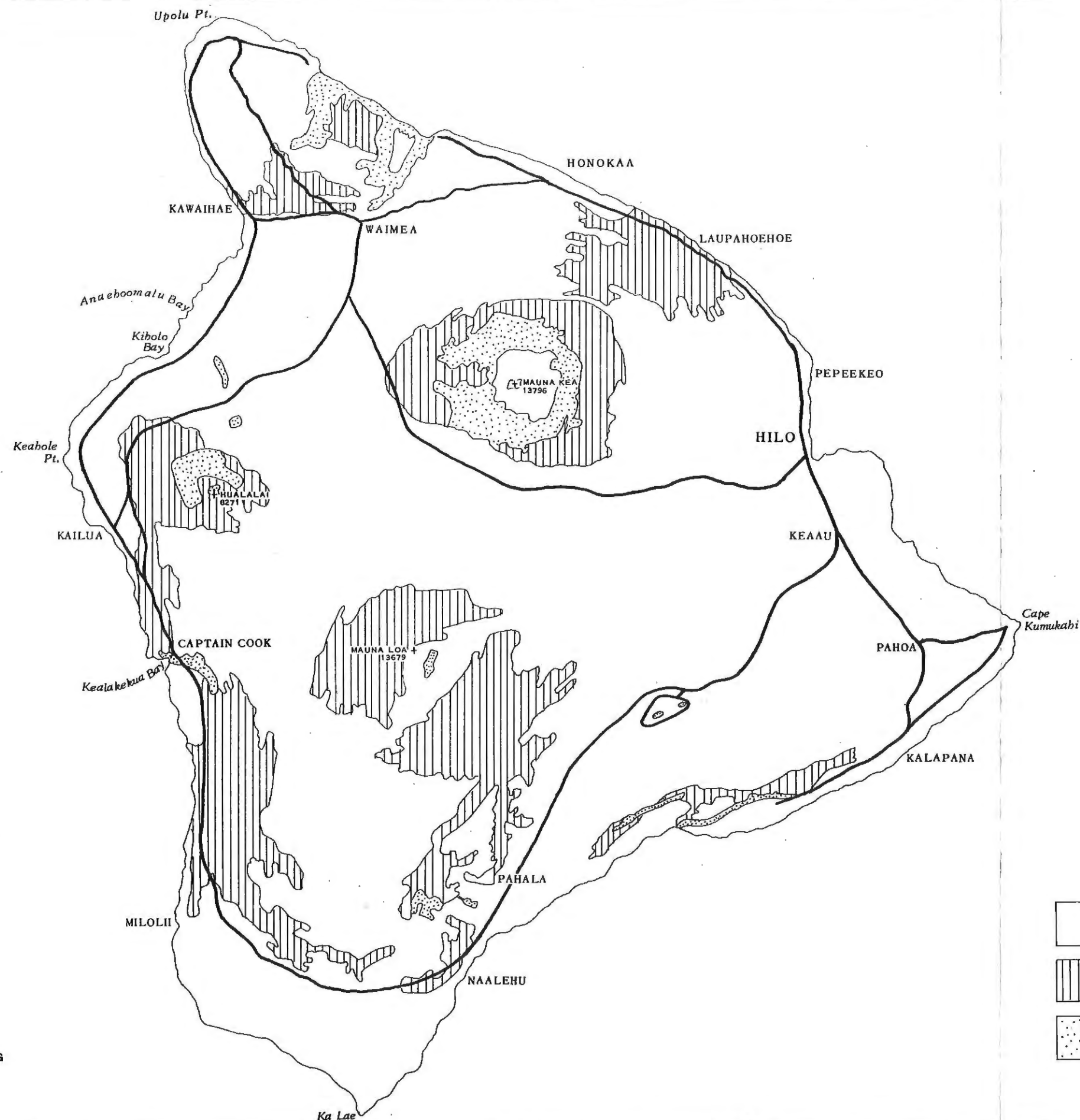
Figure 14

SLOPE OF LAND

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HAWAII



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1991



Source: U.S. Geological Survey Map

Lava Hazard Areas

The island of Hawaii has been built by five volcanoes--Kohala, Mauna Kea, Hualalai, Mauna Loa and Kilauea. Only two of the island's five volcanoes, Kilauea and Mauna Loa, have erupted in the last 150 years. The behavior of Kilauea and Mauna Loa during the last 150 years indicates that they will be the source of Hawaii's future eruptions.

The U.S. Geological Survey's Volcano Hazards Program has prepared a volcanic hazard map for lava flows on the island of Hawaii.²⁹ This map distinguishes areas in which the general level of hazard is different from that of adjacent areas. However, the level of hazard can vary considerably within any hazard zone, either gradually or abruptly. The magnitude of hazard assigned to a zone applies only to that zone as a whole, and differences within it are not shown. Such differences can best be determined by specific site studies.

Zone 1 consists of the summit areas and active parts of the rift zones of Kilauea and Mauna Loa. These areas contain the sites of most historical eruptions, and a large majority of the lava flows that will affect other zones on Kilauea and Mauna Loa in the near future probably will originate in Zone 1.

Zone 2 consists of several areas that are adjacent to and down slope from the active rift zones of Kilauea and Mauna Loa and, therefore, are subject to burial by lava flows even if small volumes erupted in those rift zones.

Zones 3-9 indicate zones of decreasing hazard.

Lands in Lava Hazard Zones 1 and 2 are generally in the Conservation District with the exceptions of Kalapana, Kaimu and the coastal area near Kapoho Point which are located in the Urban District.

The Kilauea eruption which began in 1983 and continues to the present, has destroyed over 175 structures, caused over \$60 million worth of damage and caused emotional pain and suffering to those who lost homes, buildings and possessions. In addition, there could have been even greater damage if homes had been constructed on the approximately 2,500 empty lots which were covered with lava during the eruption.

The Hazard Mitigation Team Report for the Kilauea Volcano eruption contained recommendations to reduce potential future problems associated with lava flow hazards.³⁰ The recommendations included the following:

²⁹ U.S. Department of Interior/Geological Survey, Volcanic and Seismic Hazards on the Island of Hawaii, 1990.

³⁰ Hazard Mitigation Team Report for the Kilauea Volcano Eruption, Hawaii County, October 1990.

- Federal, State and County agencies and departments should not promote or encourage higher density development in the Lava Flow Hazard Zones 1 and 2 in the east rift zone of Kilauea unless 1) information can be provided by the U.S. Geological Survey that the area in question is of lower risk to lava flow inundation, or 2) a strong case can be made that to do otherwise would not be in the best public interest.
- The State and the County of Hawaii should examine the appropriateness and feasibility of reclassifying lands in Kilauea Lava Flow Hazard Zone 1 to Conservation, giving consideration to existing uses in the area.

Currently, lands in Lava Flow Hazard Zones 1 and 2 are generally in the State Agricultural and Conservation Districts with the exception of Kalapana, Kaimu and the coastal area near Kapoho Point which are in the Urban district.

While much of Lava Flow Hazard Zones 1 and 2 are still undeveloped, there are several well-established and built-up subdivisions within these zones, e.g., Leilani Estates. It does not appear feasible to eliminate existing residential and commercial uses within these zones. Further reclassification of already built-up areas into the Conservation District would not be consistent with proposals to discourage new residential developments in the Conservation District.

Moreover, the Puna and Kau districts have between 70,000 and 90,000 subdivision lots which were established prior to statehood, many of which are in the Agricultural District. While agricultural uses may be an appropriate use within Lava Flow Hazard Zones 1 and 2, problems with public safety may arise if residences are built on a majority of these lots. Mitigating lava flow hazards involve being able to 1) avoid any possibility of loss of life, and 2) guarantee orderly evacuation in case of an eruption. As such, it is prudent land use policy to discourage higher density development in Lava Flow Hazard Zones 1 and 2. However, no changes to the Agricultural designations are proposed because they contain existing residential uses.

Lands at Kaimu and Kalapana are in the Urban District. This designation may no longer be appropriate as these areas were recently covered by lava. A special subzone designation within the Conservation District for this area similar to Milolii should be explored.

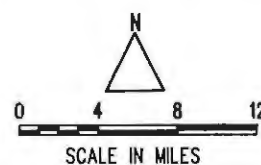
Ground Fractures and Subsidence Hazard Zones

The island of Hawaii is divided into four hazard zones for ground fractures and subsidence. The zone of highest hazard, Zone 1, includes the summit areas and rift zones of Mauna Loa and Kilauea where fractures and subsidence occur most frequently. Zone 2 consists of the south flank of Kilauea where fracturing and subsidence occur somewhat less frequently than in the summit and rift zone areas. Hazard Zone 3 embraces the areas of Kaoiki and Kealakekua fault systems on Mauna Loa where fractures and subsidence caused by magma movement are less frequent than on Kilauea. Zone 4, in which these hazards are least, includes the remainder of the island.

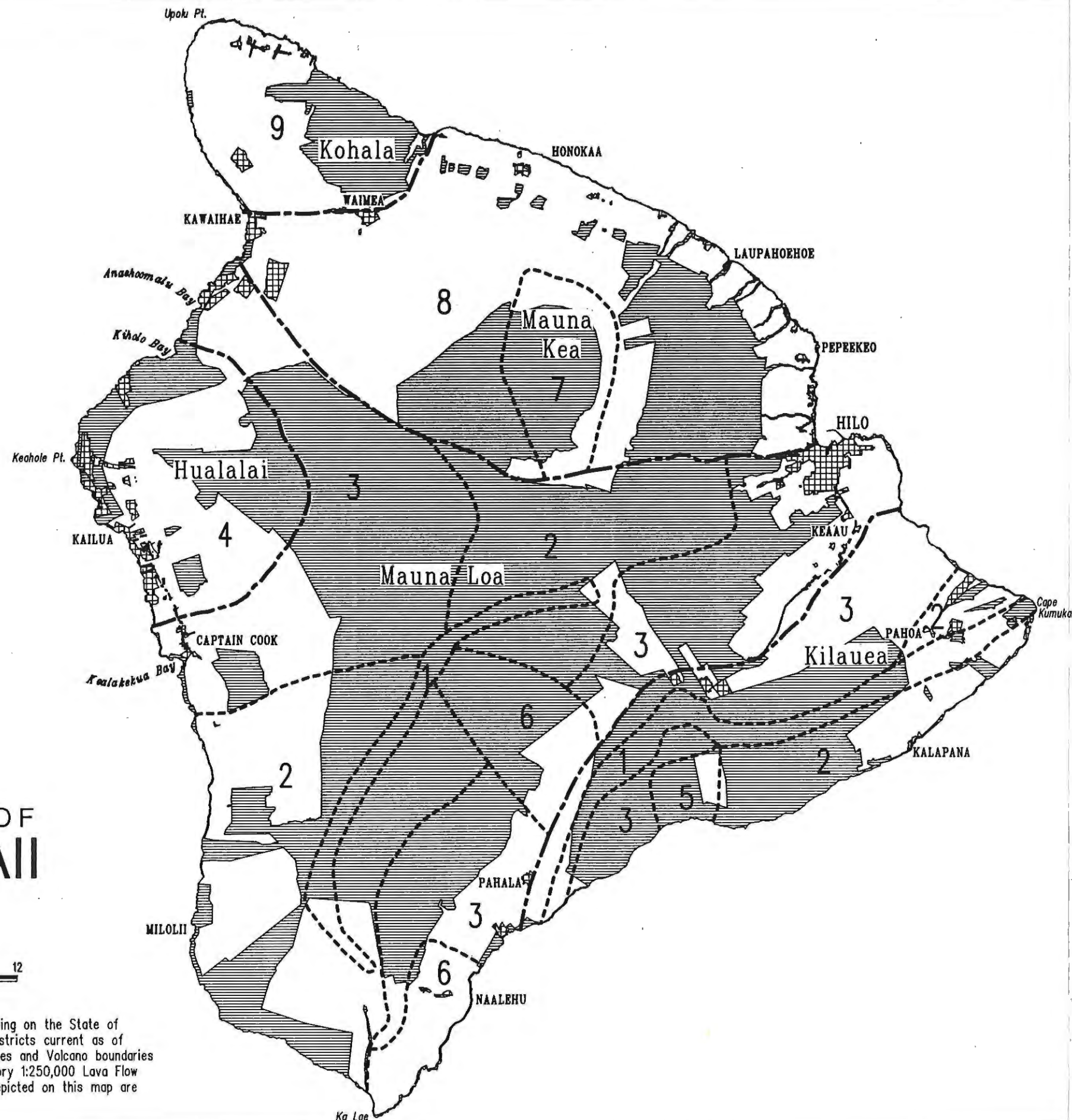
Figure 15

LAVA FLOW HAZARD ZONES

ISLAND OF
HAWAII



Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Land Use Districts current as of February, 1991. Lava Flow Hazard Zones and Volcano boundaries from USGS Hawaiian Volcano Observatory 1:250,000 Lava Flow Hazard map, May, 1991. Boundaries depicted on this map are not official.



- Agricultural District
- Conservation District
- Rural District
- Urban District
- Volcano Boundaries
- Lava Hazard Zone Boundaries
- 1-9 Lava Flow Hazard Zones

Most of the high hazard zones for ground fractures and subsidence are located in the Conservation and Agricultural Districts. A major exception is the Kealahou area which is in the Urban District. Many new homes have been built overlooking the bay. It does not appear feasible to reclassify this area. However, uses should be monitored.

Other Uses

There are a number of other uses of Conservation District lands including quarries, golf courses, residential use and agricultural use (largely pasture). There are residential areas in the Conservation District. Many of the areas were subdivided before the adoption of the State Land Use Law. A comprehensive inventory of residences in the Conservation District was not conducted. However, generally where such residential areas were found on the Big Island in the Conservation District, they were in areas which were not appropriate for reclassification to the Urban District, e.g., not in proximity to the Urban District; lacking infrastructure and public services and/or containing sensitive environmental, scenic or recreational resources.

As discussed in the issues section, there have been concerns raised as to what are appropriate uses in the Conservation District and appropriate uses within each subzone. It was not feasible to examine this issue under the boundary review but this is a worthwhile topic for further examination.

Conservation District Issues

In 1961, the State Land Use Commission was established and given the responsibility to preserve, protect and encourage development within areas in the State by directing uses where they are best suited. Towards that end, the Commission established three land use districts: Agricultural, Urban and Conservation. The Rural District was added later. In establishing the boundaries of the Conservation District, the forest and water reserve zones were included. The Conservation District was further defined to include areas necessary for providing watersheds and water sources; preserving scenic areas; providing parklands, wilderness and beach reserves; conserving endemic plants, fish and wildlife; preventing floods and soil erosion; forestry and related activities; and other permitted uses not detrimental to a multiple use concept.

The designation of Special Subzones within the Conservation District is a more recent land use planning tool. The objective of creating Special Subzones is to provide for areas which possess unique developmental qualities which complement the natural resources found within the area. On the Big Island, there are two Special Subzones: the Milolii-Hoopulua Special Subzone and the Hale O Hooponopono Special Subzone. The Special Subzone designation for the Milolii-Hoopulua area provides for fishing activities, residential, education, cultural and recreational uses. The Special Subzone for the Hale O Hooponopono area provides for education purposes.

In addition to the creation of Special Subzones, four other subzones were created to protect resources. These are the General, Protective, Limited and Resource subzones. The objective of the General Subzone is to designate open space where specific conservation uses may not be defined but where urban use would be premature. Protective Subzone designations are to protect valuable resources in designated areas such as restricted watersheds, marine plant and wildlife sanctuaries, significant historical, archaeological, geological and volcanological features and sites. Limited Subzone designations are areas where natural conditions such as floods, soil erosion, tsunami, landslides and volcanic activity place constraints on human activities. Resource Subzone designations allow the development and management of certain areas in a manner which would sustain the natural resources of those areas.

For whatever resources the subzones are established to protect, the resources must compete with uses which are allowed to continue under the law and a permitting process which could expand those uses and/or allow new uses.

Conservation District issues include discussions as to appropriate uses in the district and within each of the four subzones. The permitting of homes in the Conservation District is a big issue on this island and Oahu. A review of subzone criteria and permitted uses may be desirable. Management is another key issue. Environmental groups cite the need for better management of these lands. Landowners express concern that placing lands in the Conservation District may inhibit their ability to manage the resources on the land.

The need for enforcement and education regarding permitted uses in the district has also been raised.

There are two important areas statewide that warrant conservation land management and protection but are not covered in the Recommendations section of this report. These areas are an expanded shoreline and perennial streams and their corridors.

Shoreline

In 1970, the State Legislature enacted the shoreline setback law as part of the State Land Use Law, Chapter 205, HRS. In 1986, this law was transferred to Chapter 205A, Coastal Zone Management. However, the purpose which was to avoid permanent loss of valuable resources remained.

Currently, the shoreline setbacks range from 20-40 feet inland from the shoreline. These setbacks can be increased through County rule changes. The OSP proposed legislation in 1991 to change the setback to 40 feet in the Urban District and 150 feet in non-Urban Districts with exceptions for small lots. This bill did not pass, however, and so the responsibility for an increased shoreline setback rests with the County governments.

Perennial Streams

Perennial streams may have either continuous or interrupted flows. Perennial streams that have continuous flows, flow to the ocean all year round. Streams with interrupted flows, flow year round in the upper reaches and intermittently at the lower elevations. Although portions of some streams may be dry during parts of the year, aquatic biologists are finding Lentipes concolor in the upper reaches indicating that recruitment appears to be occurring during periods of continuous flow.

Perennial streams provide the link between our mountains and coastal waters. They provide unique and essential habitat for flora and fauna, have been an integral part of Hawaii's agricultural past and present, provide important recreational and scenic opportunities and play an essential role in determining the integrity of the local ecology and the quality of the nearshore waters.

Conservation District corridors have been identified and proposed for those streams identified as providing unique and essential habitat for flora and fauna, or specifically, those with outstanding aquatic or riparian values in the Agricultural District. These are included as Priority #1 recommendations in this report. The portions of those recommended streams that flow through the Urban or Rural Districts are considered Priority #2 areas.

The inclusion of these selected streams does not suggest that the rest of Hawaii's perennial streams should not be protected. In fact, there are many streams statewide whose aquatic and riparian resources have not been fully identified. Excluding them now may threaten our statewide aquatic resource system. In addition, there are other values (e.g., recreational, cultural and aesthetic, that may also justify the protection of Hawaii's streams. Stream protection may well be warranted for these important stream values, but no corridor recommendations have been solely based on them in this report because of the need to provide justification which would withstand potential challenges in a contested case proceeding. Urban areas were not included as Priority #1 areas for which we plan to initiate petitions because to do so statewide would have meant including a number of buildings in the Conservation District.

Protection can be achieved through Conservation District designation established by the Legislature, through special management area designations by the Counties, or through conditions or easements negotiated during the reclassification process. Corridors of at least 100 feet extending from each side of the stream bank would serve to provide a buffer to protect these streams. Corridors such as these have been established in states, counties and municipalities nationwide for river protection and should be considered for Hawaii.

Anchialine Pools

Anchialine pools are actually small windows into an extensive underground aquatic ecosystem containing many unique aquatic animals. Anchialine pools have not been recommended for reclassification during the boundary review but the following guidelines are proposed.

- 1) Protect all anchialine pools with a 40-foot setback from the water's edge classified in the Conservation District (based on the State's standard shoreline setback); and
- 2) Develop site-specific boundaries for pool clusters or complexes that contain resources of special note. These would include rare pool types or an unusual abundance and diversity of pools, pools with rare or endangered birds or anchialine species, or pools with a high diversity of anchialine plants and animals.

Analysis of Conservation Lands

The focus of the review was on identifying areas not currently in the Conservation District which contain conservation resources and should be reclassified to the Conservation District. The following guidelines for Hawaii County were developed to identify and recommend lands which should be reclassified to the Conservation District during the Five-Year Boundary Review. The following lands were recommended for inclusion in the Conservation District:

1. Watershed and Water Recharge Areas identified in the Watershed Protection Study, Adjustments to Conservation Zone Boundaries, Kona and Kohala, Hawaii, University of Hawaii Water Resources Research Center, 1991. However, a Natural Resources Roundtable is planned to discuss protection of the Kona and Kohala Mountains watersheds.
2. State Forest Reserve Additions (Moaula, Kaalaiki-Ninole, Kapapala, Honomalino, Oleomoana, Kaohe, Kukuiope, Kealakehe, Honuaula and Makaula-Ooma).
3. Public and Private Natural Areas including Natural Area Reserves and proposed Natural Area Reserves where boundaries were known, National Parks and USFWS Refuges (Hakalau NWR, Hawaiian Volcano National Park and Kaloko/Honokohau NHP).
4. Areas containing native ecosystems and rare species meeting the following criteria:
 - Relatively intact native forest.
 - Areas designated essential endangered forest bird habitat.
 - Rare or endangered plants or forest birds in abundance or relatively high concentrations.
 - Areas that are an important part of a critical core area for protection of endangered forest bird habitat.

- Areas that are surrounded by or in-between Conservation District lands containing biological resources which may not be of the highest quality but Conservation designation would assist in protecting the integrity of a large conservation resource area.

These include Upper Paauhau/Waikii, Kaohe, Kanakaleonui and Keanakolu Tract, Hakalau NWR and adjacent forest bird habitats, Kilauea-Keauhou, Puuwaawaa/Kaupulehu, Kehena, Waipunalei, area above Hilo Forest Reserve and Kona Forests.

5. Streams which meet the criteria for Special Streams.
6. Wetlands identified for protection as important to the recovery of endangered waterbirds in the State Conservation Lands Functional Plan, State Recreation Functional Plan, Hawaiian Waterbirds Recovery Plan, and Hawaiian Wetlands National Wildlife Refuge Complex Master Plan or recommended by DOWAW, DLNR OR USFWS. Exceptions were made on Hawaii County for wetlands in beneficial agricultural use and were not associated with a special stream or other resource attributes, e.g., taro farming in Waipio Valley which did not appear to be subject to development pressures. As a result, no wetlands were recommended for inclusion into the Conservation District for Hawaii County.
7. Beaches or coastal areas having high statewide or island-wide significance for swimming and recommended by DLNR (area fronting Wailea Bay and Portion of Hapuna Beach State Recreation Area).
8. Significant scenic resources identified primarily through public input or State agencies and assessed by staff (Waipio Valley Rim, Akoakoa Point, Kohala Cliffs and Valley, Hills of Waimea, Puus of North and South Kohala).
9. Historic sites identified through public input and significance and reclassification confirmed by DLNR (Lapakahi State Historical Park and Keakealaniwahine Complex).
10. Areas necessary for preserving parkland, primarily as recommended by DLNR.
11. Open space and natural areas as discussed in the text.
12. Slopes over 20 percent (none for Hawaii County).

An assessment of lands which should be taken out of the Conservation District was not undertaken during the review and the above criteria are not intended to be used to help identify lands which should be taken out of the Conservation District.

XII. POLICIES TO GUIDE THE STATE LAND USE DISTRICT BOUNDARY REVIEW

1. There are more than enough lands in the Urban District in Hawaii County to accommodate population and economic growth needs to the year 2010. However, lands in the Kailua to Keahole area have been recommended for reclassification to the Urban District to implement the Kona State Lands Plan and to promote the Keahole to Kailua area as the island's Second City.

Reclassification of lands at Panaewa to accommodate DHHL housing project is recommended.

Reclassification of Agricultural District lands adjacent to Keaau is also recommended to develop an urban core in the Puna planning area.

2. No other reclassifications to the Urban District are recommended during the State Land Use District Boundary Review. However, future resort and residential growth shall be directed to the areas identified in the following policies.
3. Future resort growth shall be directed to the Waiakea Peninsula area in Hilo and to the resort destination nodes identified in the West Hawaii Regional Plan:
 - Mauna Kea Resort Node
 - Mauna Lani/Waikoloa Resort Node
 - Kaupulehu/Kona Village/Kukio Resort Node
 - Keahole/Keauhou Resort Node
4. The existing small-scale resort development at Punaluu is supported.
5. Hilo and the Keauhou to Keahole area in Kona shall be supported as the major urban centers on the island. The Keahole to Kailua area shall become the Big Island's "Second City."
6. Support communities shall be developed at Kealahou, Waikoloa, Lalamilo and Kawaihae.
7. Waimea, Honokaa and Keaau shall be secondary commercial and residential urban centers.
8. The rural character and quality of South Kona, North Kohala, the Hamakua coast communities, Volcano communities, Naalehu, Pahala and Waiohinu shall be maintained.
9. Support the development of affordable housing.
10. The continued viability of sugar operations in Hilo, along the Hamakua coast and in Kau shall be supported.
11. Maintain the viability of the Hamakua Sugar Company by helping to retain approximately 25,000 acres of cane plantation lands in the Honokaa area. Retain as much Hamakua Sugar Company lands as possible in the Agricultural

and/or Conservation district. Retain as much Hamakua Sugar Company lands as possible in the lower density classification of the Hawaii County Zoning Ordinance.

12. Support diversified agricultural activities by providing sufficient land for their operations.
13. Protect the lands of the Kona coffee belt as unique agricultural lands.
14. Preserve the unique temperate climate crop-growing area in Waimea in agriculture.
15. Protect watershed and water recharge areas within the Conservation District. Expand the Conservation District in North Kohala and North and South Kona to provide protection for watershed and water recharge areas.
16. Maintain native forests, endangered bird habitats and rare and endangered ecosystems in the Conservation District. Expand the Conservation District to include a band connecting the Mauna Kea Forest Reserve, Hakalau National Wildlife Refuge, the Hilo Forest Reserve, Waiakea Forest Reserve, the Keauhou-Kilauea Forest and the Kapapala and Kau Forest Reserves. Expand the Conservation District on Hualalai and the western slopes of Mauna Loa.
17. Protect important wetlands including Aimakapa Fishpond, Haena Marsh, Kahua, Kiholo, Lokoaka and Kionakapahu Ponds, Opaepa Pond, Pololu, Puu Oo, and Waimanu Valley.
18. Protect streams and stream corridors.
19. Protect beaches with significant natural beauty and public recreational value particularly those rated as having statewide or island-wide significance.
20. Enhance scenic views including mauka and makai views along the Hawaii Belt Road in North and South Hilo and Hamakua, coastline view plane from Akoni Pule Highway, coastline view plane from Kohala Mountain Road, Waipio Valley and mauka/makai view plane along Queen Kaahumanu Highway.
21. Enhance the scenic beauty of Mauna Kea, Mauna Loa, the North Kohala Mountains and Hualalai.
22. Protect areas with heritage resources including rare and endangered species habitat; native forests; scenic, historic, archaeological and cultural resources; unique natural land formations, beaches and coastal resources and open space.
23. Discourage higher density development in Lava Flow Hazard Zones 1 and 2 of Mauna Loa and Kilauea volcanoes.
24. Discourage development in areas prone to tsunamis, earthquakes and subsidence, erosion and flooding or require mitigating measures.

XIII. FINDINGS

HAMAKUA

Urban District. The existing Urban District includes the small towns and communities of Kukuihaele, Honokaa, Paauilo and Kukaiau.

Land uses in Hamakua are in transition with the pending sale of substantial portions of Hamakua sugar lands. However, this area shall remain predominantly rural and agricultural in character. Honokaa shall continue to serve as the commercial and residential center of the district with commercial uses also provided at Paauilo.

Agricultural District. The Agricultural District includes large acreages in sugar cane cultivation and ranching operations on the higher slopes. The district also includes small truck farms and taro farming in Waipio Valley.

Sufficient lands shall be maintained in the Agricultural District to assure the viability of the sugar cane industry and promote diversified agriculture.

Conservation District. Most of the Conservation District in Hamakua is at the northeastern end of the district from the North Kohala/Hamakua district boundary to Waipio Valley. Conservation District lands also include the forest reserves and Mauna Kea. The natural and scenic beauty of Waipio Valley and the forest areas are valuable resources of the district. Six (6) areas in the Agricultural District are being proposed for reclassification to the Conservation District. One of these areas includes a 300-800 foot buffer to extend the Conservation District boundary along the Waipio Valley rim. Proposed additions to the Conservation District include: Upper Paauhau/Waikii and Kaohe along Mauna Kea which contain habitat for endangered forest birds. Also, several streams in the area (from Kohalaele Landing to Ookala) are recommended for reclassification to the Conservation District because of their outstanding aquatic or riparian resources and because they are comprised of steep gulch areas.

NORTH HILO

Urban District. The existing Urban District includes the coastal towns of Laupahoehoe, Ookala and Papaaloa. The Rural District includes Ninole.

There will be a surplus of 61 acres of developable urban lands available for urban growth in the North Hilo district to meet needs up to the year 2000.

Agricultural District. The Agricultural District in North Hilo includes lands in sugar cultivation, ranching and diversified agriculture including macadamia nuts. Although several thousands of acres of Hamakua sugar lands will be sold and taken out of sugar production in this area, lands shall remain in the Agricultural District consistent with the Hamakua Regional Plan. Diversified agricultural activities are encouraged.

Conservation District. The existing Conservation District includes forest reserves, major gulches and portions of Mauna Kea. Waipunalei and the Kanakaleonui and Keanakolu Tracts are recommended for inclusion into the Conservation District because of their biological significance. Recommended for reclassification to the Conservation District are several streams from Laupahoehoe to Hakalau Bay which have been identified for their outstanding aquatic or riparian resources.

SOUTH HILO

Urban District. The Urban District includes the city of Hilo, the communities of Honomu, Pepeekeo and Papaikou. Hilo shall continue to serve as the island's major commercial, industrial, governmental and service center consistent with the County General Plan. There are adequate lands in the Urban District to meet needs beyond the year 2000.

The recommendation to reclassify Panaewa (Waiakea) House Lots to the Urban District immediately adjacent to the Hilo Urban District, would be consistent with the existing uses and low density urban designation in the County General Plan.

Agricultural District. The Agricultural District includes lands in sugar and macadamia nuts and other diversified agricultural crops. Lands shall be maintained in the Agricultural District to assure the viability of the sugar industry, protect diversified agricultural activities and provide open space and scenic views.

Conservation District. The Conservation District includes forest reserves, major gulches and some coastal areas. Lands adjacent to the Hakalau Forest National Wildlife Refuge are recommended for inclusion into the Conservation District because of their biological significance. Several streams identified as special streams which are identified as having outstanding aquatic or riparian values are recommended for reclassification to the Conservation District. These streams are found from Lehuawehi Point to Mau Mau Point.

PUNA

Urban District. The Urban District includes the towns of Keaau, Kurtistown, Mountain View, Pahoa, Hawaiian Beaches Subdivision and the subdivision around Volcano. The Rural District includes lands within the Olaa Reservation Homesteads and east of Kurtistown. There are more than enough urban lands to meet requirements to 2000. However, reclassification of agricultural lands adjacent to Keaau is recommended to establish an urban core in Puna. The town of Keaau is located along a major highway with adequate infrastructure, close to Hilo, and is relatively central in its location to other widely dispersed villages. Directing urban expansion around the town of Keaau would make it easier for State and County to meet the social and physical infrastructure needs of a rapidly growing population.

Agricultural District. The Agricultural District includes lands in macadamia nuts, flowers (anthuriums and orchids), papaya, bananas and truck farming. The Puna district is the major papaya growing region in the State. Diversified agriculture shall continue to be supported in this planning area.

Conservation District. The Conservation District includes forest reserves, the Hawaii Volcanoes National Park and some coastal areas. There are four areas proposed for reclassification to the Conservation District. The Olaa West unit of Hawaiian Volcano Observatory has been recommended for reclassification to the Conservation District. The area has been fenced and cleared of pigs by the National Park Service and the native forest is starting to recover. Urban lands covered by lava flows should also be reclassified to the Conservation District.

Approximately 6,284 acres in the Hawaii Volcanoes National Park which are in the Agricultural District are recommended for reclassification to the Conservation District. Portions of this parcel are also within the Kau district.

KAU

Urban District. The Urban District includes Punaluu, Naalehu, Waiohinu, Pahala and the recently approved Hawaiian Riviera resort. There is more than enough urban land to meet population and economic growth requirements to 2000. There are major infrastructure constraints including highways, sewerage, water systems and public services. The existing small-scale resort development at Punaluu is supported. Expansion of the large urban area comprising the Hawaiian Riviera resort is not recommended.

Agricultural District. The Agricultural District includes lands in sugar and macadamia nut cultivation. In addition, cattle operations utilize the vast acreages of grazing lands. Other crops include aquaculture and nursery plants. Lands shall be maintained in the Agricultural District to assure the viability of the sugar industry and promote diversified agriculture.

Conservation District. The Conservation District includes forest reserves and forested lands and coastal areas. There are three recommendations for reclassification to the Conservation District. The first is a portion of Hawaii Volcanoes National Park land currently in the Agricultural District. The second recommendation involves additions to the State forest reserve system to protect wildlife habitats, watershed, recreational opportunities, wilderness experience and scenic amenities. The third recommendation, Kilauea-Keauhou, recommended for reclassification to the Conservation District, has natural communities which provide habitat for six endangered bird species, endangered Hawaiian bats and five rare plant species. This area is located on the lower slopes of Mauna Kea bordered by Kilauea Forest Reserve, the Hawaiian Volcano Observatory and Mauna Loa Forest Reserve.

SOUTH KONA

Urban District. The Urban District includes the towns of Captain Cook and Kealahou and the community of Napoopoo. The Rural District includes the communities of Honaunau, Keokea, Kealia and Hookena. The fishing village of Milolii is in the special subzone of the Conservation District.

Urban expansion within the South Kona area needs to be considered within the developmental constraints of the terrain, insufficient infrastructure, and its impact on diversified crops such as coffee in the area. Reclassification of land to the Urban District is not recommended for South Kona. South Kona shall remain primarily rural and agricultural in character.

Agricultural District. Major agricultural activities center around the growing and processing of coffee and macadamia nuts. Other agricultural commodities include bananas, papayas, oranges, tangerines, beans, tomatoes, flowers, foliage and nursery plants. Cattle ranching is also prominent in this district.

Conservation District. The Conservation District includes Pu'uuhonua O Honaunau National Historical Park (City of Refuge) at Puuhona Point. Conservation District land also extends along the shoreline from approximately Kapulau Point above Honomalino Bay to Okoe Bay and includes the community of Milolii. State forest reserve lands are also included in the Conservation District.

Recommendations are proposed for reclassification to Conservation for additions to the State Forest Reserves to provide recreational opportunities, protect watersheds, provide wilderness experiences and scenic amenities.

A large area known as the Kona Watershed is being recommended for protection. In addition to providing watershed protection, the area also contains rare natural communities with koa, ohia, mamane, remnant sandalwood and essential habitat for five endangered forest birds. A Natural Resources Roundtable is planned to discuss ways to protect this area.

NORTH KONA

Urban District. The Urban District includes the area of Kailua-Keauhou, Keahole and Kealahou. The Rural District includes Holualoa Mauka, Keolu and Kainalo-Honalo. The entire Kona area has experienced tremendous growth in urban development in the last decade. Much of this growth is a direct result of the planning area's popularity as a major visitor destination. North Kona has sufficient urban lands to meet needs to 2000, with 3,159 acres of surplus urban land available to meet needs beyond 2000. The Kailua-Keahole area is supported as the Big Island's "Second City." Resort growth is directed to the resort destination nodes identified in the West Hawaii Regional Plan.

The West Hawaii Regional Plan directs future urbanization to the Kailua-Kona to Keahole subregional planning area. The County of Hawaii's Keahole to Kailua Development Plan designates this area for residential, commercial and industrial use. State lands are proposed for reclassification to Urban to support the development of this area as the Big Island's Second City. This change is consistent with the County's Development Plan and the West Hawaii Regional Plan.

Agricultural District. The major agricultural industries include macadamia nuts, cattle ranching, coffee and avocados. Other crops include aquaculture, nursery plants and orchids. Unique agricultural lands in the Kona coffee belt shall be protected consistent with the West Hawaii Regional Plan and diversified agriculture supported.

Conservation District. The Conservation District includes coastal areas and the summit and eastern slopes of Hualalai. Areas on the north, west and east slopes of Hualalai are recommended for reclassification to the Conservation District to protect watershed, scenic and recreational and wildlife resources. The entire area is critical for watershed, erosion, and flood protection for developed areas down slope.

An area east of Kaloko and Honokohau Fishponds and designated as a National Cultural Park is recommended for reclassification from the Urban District to the Conservation District. The proposed reclassification would be consistent with the area's existing use as Kaloko-Honokohau National Historic Park.

An area mauka of Alii Drive at Kamo Point is recommended for reclassification to the Conservation District in order to protect Hauielani Heiau, also known as Pakiha and Keakealaniwahine's residence and associated features. The archaeological sites at Keolonahihi and Keakealaniwahine's residential complex are significant resources meeting all five historic preservation criteria and are considered part of the same prehistoric complex associated with the chiefesses of Kona in the 17th century.

There is a recommendation to reclassify four areas in the Agricultural District to Conservation for additions to the North Kona Forest Reserves to protect wildlife habitats, watershed, recreational opportunities, wilderness experience and scenic amenities.

SOUTH KOHALA

Urban District. The Urban District includes Kawaihae Harbor, Puako, Waikoloa, Waimea, and Kohala Ranch. Resort growth is directed to the resort nodes identified in the West Hawaii Regional Plan. Waikoloa, Lalamilo and Kawaihae shall be developed as support communities consistent with the West Hawaii Regional Plan. Waimea is supported as a secondary commercial center.

There are sufficient urban lands to meet population and economic growth requirements to 2000 with an additional 2,611 acres available to meet needs beyond 2000.

Agricultural District. Although the cattle ranching industry still uses most of the agricultural lands in the district, other agricultural uses are on the rise. Waimea is one of the most productive areas on the island for the cultivation of truck farming produce such as celery, daikon, pepper, carrots, lettuce, cabbage and broccoli which are grown for both local and export markets. Diversified agricultural activities shall be encouraged in this planning area.

Conservation District. The Conservation District includes Puukohola Heiau and surrounding lands, Hapuna Beach Park to south of Puako but excluding a strip along the coastline at Wailea Bay and Puako and the slopes of the Kohala Mountains. Three areas are recommended for reclassification to the Conservation District.

The coastline area fronting Wailea Bay is recommended for reclassification from the Urban District to the Conservation District. The irregular and curved white sand beach comprising the shoreline at Wailea provides excellent opportunities for swimming, snorkeling, and nearshore scuba diving and provides more protection from the sea than the longer, straighter Hapuna Beach to the north.

A small portion at the northern end of Hapuna Beach is recommended for reclassification from the Agricultural District to the Conservation District. This piece was omitted when the boundary lines of the park were drawn.

The hills and cinder cones in the Waimea area not only provide the scenic backdrop so characteristic of the area but are important to the underground water resources of the district. In areas of high rainfall, their geophysical composition of cinder and ash and vegetation cover help to contribute substantially to the underground water supply and should be protected as watershed. These hills are relatively close to Waimea town and have been included under the Hills of Waimea. They include Hokuula, Puu Owaowaka, Puu Ki, Puu Kakanihia, Puu Maile and Puu Manu. Both the North and South Kohala districts have scenic vistas which when viewed from the coastal or mountain highways, incorporate many outstanding puus in the area. Many of these should be included in the Conservation District to not only preserve and enhance their water recharge resource potential but their scenic resource value as well. In the South Kohala district, these include Puu Makela, Puu Loa, Puu Lapalapa, Puu Iki, and Puu Honu.

NORTH KOHALA

Urban District. The Urban District includes the towns of Hawi, Halaula, Kapaau, the Kohala Ranch development and a coastal area from Waiakailio Bay to Honokoa Gulch. North Kohala shall remain primarily a rural residential area with commercial uses at Hawi, Halaula and Kapaau. Although the area will experience a modest deficit of urban lands in 2000, no reclassifications to Urban are recommended during the boundary review. There are infrastructure constraints to further development including roads, sewerage and water systems and public services.

Agricultural District. Lands shall be maintained in the Agricultural District to support diversified agriculture and provide open space.

Conservation District. Reclassification to and/or extension of the Conservation District boundary for several coastline and valley resources is recommended to protect indigenous and endemic plants, bird habitats, valued scenic wildland and historic areas, historic sites, and areas with high outdoor recreation potential. In the North Kohala district, these areas include Kohala Cliff and Valley, and Akoakoa Point.

Both the North and South Kohala districts have scenic vistas which when viewed from the coastal or mountain highways, incorporate many outstanding hills or puus in the area. Many of these should be included in the Conservation District to preserve and enhance their water recharge and scenic resource value. In the North Kohala district, these hills include: Kehoni, Puu Ulai, Puu Pili, Puu Ahunua, Lahikiola, Puu Aeia, Puu Iki, and Puu Mamo.

An area has also been identified as necessary for protection of the Kohala Mountain watershed.

11

XIV. PRIORITY LISTING

The following explains the types of recommendations included in this report.

Reclassifications to the Conservation or Agricultural District

Priority 1. These are areas that OSP will likely petition for in FY 92-93 and beyond. These include areas which require protection, i.e., conservation resources for which there are sufficient documentation and justification to support a petition under contested case proceedings.

Priority 2. These are areas that are recommended as lower priority. They include, for example, conservation resources: a) which are already protected because of government or non-profit ownership with conservation objectives such as national parks; b) that are significant but not of as high quality or abundance as other areas or not as critical to meeting a specific conservation objective such as protecting endangered birds; c) which are believed or known to contain conservation resources but further survey work is necessary to either verify resources or determine appropriate boundary lines; d) which are of high quality but resource constraints limit the number of petitions which can be prepared; e) but other methods are available to protect the identified conservation values.

Reclassifications to the Urban and Rural Districts

Recommendations for areas appropriate for reclassification to the Urban and Rural Districts are identified. OSP may initiate petitions for certain State, County and private lands which are recommended in the State Land Use District Boundary Review reports for reclassification to the Urban and Rural Districts. The decision as to which petitions OSP will initiate will be based on policy considerations, additional information, conditions of development, and the availability of manpower and financial resources.

Areas of Critical Concern

Two Areas of Critical Concern have been identified for Hawaii County. Natural Resources Roundtable discussions are to address these areas. Petitions to reclassify these lands to the Conservation District will not be initiated if landowners submit a letter of agreement promising not to develop their lands for five years or until a mutually agreeable solution to the resource problem is reached, whichever is shorter. These are areas which require attention and alternative methods of regulation or management to protect the resources which are present. Some of these areas are in agricultural use and that agricultural use is generally compatible with protection of the conservation resources. However, these areas are subject to development pressures and more intensive uses which are allowed in the Agricultural District.

Department of Hawaiian Home Lands (DHHL)

DHHL lands containing conservation resources and lands proposed for urbanization have been identified in the report. However, these lands are not subject to the State Land Use Law according to the Hawaiian Homes Commission Act of 1920, and action will not be taken on these lands.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #1

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>HAMAKUA</u>			
1. Lalakea Stream	A to C	159.7	Aquatic and riparian resources, scenic and recreation area.
2. Waipio Valley Rim Buffer	A to C	456.38	Scenic sites with physiographic features, high potential recreation area.
3. Upper Paauhau (Mauna Kea)	A to C	4,161.61	To preserve a continuous stretch of forest bird habitat around Mauna Kea. Upper Paauhau has remnant woodlands of mamane and naio and is forest bird habitat. Upper Waikii contains remnant mamane forest with patches of koa. In addition, Waikii has been identified as essential habitat for palila.
4. Kaohe (Mauna Kea)	A to C	5,306.71	The entire area lies between breeding areas for endangered palila and comprises a segment of the mamane forest band that encircles Mauna Kea. Protection of this area would help preserve a continuous stretch of habitat around the mountain.

¹ The National Wildlife Refuge portion is a Priority #2 area because it is under government ownership with conservation objectives. A portion of this area is also DHHL land for which petitions will not be initiated.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #1 (cont.)

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>NORTH AND SOUTH HILO</u>			
5. Hakalau Forest National Wildlife Refuge (Humuula) & Adjacent Forest Bird Habitats (Portion) ¹	A to C	13,521.6	The area supports at least 10 species of native forest birds and is one of the last areas containing reasonably high densities of akepa, Hawaiian creeper, akiapolaau and io. Portions of the site support koa-ohia and koa-mamane forests.
6. North and South Hilo Streams	A to C	3,440	Outstanding aquatic resources, scenic and recreational values.
<u>KAU</u>			
7. State Forest Reserves			
- Moaula	A to C	809	Watershed protection, maintain relatively intact native forest, native bird habitat, public hunting for pigs.
- Kaalaiki-Ninole	A to C	3,661.21	Watershed protection, intact native forest, native bird habitat and public hunting for pigs.
<u>SOUTH KONA</u>			
8. South Kona Forest Reserves			
- Honomalino	A to C	2,701.08	Maintain intact native forest with less common and rare native species, native forest bird habitat, public hunting for pigs.
- Oleomoana	A to C	104	Forestry management, native forest bird habitat, public hunting area for pigs and goats.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #1 (cont.)

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>SOUTH KONA (cont.)</u>			
- Kaohe	A to C	408.41	Forestry management, native forest bird habitat, public hunting area for pigs and goats.
- Kukuipae	A to C	604	Forestry management, native forest bird habitat, public hunting area for pigs and goats.
<u>NORTH KONA</u>			
9. Keakealaniwahine Complex	A to C	32	To protect several archaeological sites for incorporation into and expansion of the existing State historical park makai of Alii Drive.
10. North Kona Forest Reserves			
- Honuaula Tract 3 Extension	A to C	78.4	Watershed protection, public hunting and recreation, reestablish koa forest on mauka portion, reforest with non-native species on makai portion, native forest bird habitat on mauka portion.
- Honuaula Tract 2	A to C	1,608.5	
- Honuaula Tract 3	A to C	2,976.1	
- Makaula-Ooma Mauka Tract	A to C	1,252	
11. Puuwaawaa	A to C	12,634.33	Protection of rare and endangered plants and native forest.
<u>NORTH KOHALA</u>			
12. Kehena	A to C	3,897.78	The site has good ohia wet forest. Watershed protection.*

*A major landowner has submitted a subdivision application to the County for his property (20-acre parcels; Subdivision No. 92-115). However, OSP and the landowner are discussing options including withdrawal of the subdivision and alternative methods of protection for the property. OSP will not initiate a petition while progress is being made in these discussions.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #2

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>NORTH AND SOUTH HILO</u>			
1. Waipunalei	A to C	1,476.28	The site contains a degraded example of two rare native forest types: mixed montane mesic koa-ohia forest and koa-mamane montane dry forest with a native understory in places. The rare pilokea plant and endangered Hawaiian hoary bats are found in this area. It is surrounded on two sides by Conservation District lands. *(B)
2. Kaapoko and Hakalau Streams	A to C		Each reclassification area is less than 15 acres.
3. Area above Hilo Forest Reserve (Waikoloa Ponds) (Portion)	A to C	7,048	Waterbird habitat. *(A)
<u>PUNA</u>			
4. Olaa West	A to C	445	Native forest managed by the National Park Service. *(C)
<u>KAU</u>			
5. Kilauea-Keauhou	A to C	18,627.99	Native forest, endangered bird and rare plant habitat. *(A) Landowner has agreed to management plan.
6. Hawaii Volcanoes National Park	A to C	6,324	Parkland. *(C)

*(A) - Further information needed.

*(B) - Manpower/funding constraints.

*(C) - Government ownership with conservation objectives.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #2 (cont.)

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>NORTH KONA</u>			
7. Area east of Kaloko & Honokohau Fishponds	U to C	564.74	Consistent with use as National Historic Park. *(C)
8. Kaupulehu	A to C	3,201.12	Protection of rare and endangered plants and native forest. *(A) Developer has committed to management plan for the area.
<u>SOUTH KOHALA</u>			
9. Area fronting Wailea Bay	U to C	6.3	State funds available for planning coastal recrea- tional area for this area which provides more protection from sea than Hapuna Beach. Also a continuation of recreation area fronting Puako (see above). *(C)
10. Hapuna Beach State Recreation Area	A to C	9.61	Reclassification of these portions to Conservation District would make the areas consistent with remainder of park which is in the Conservation District. *(C)
	U to C	5.69	

*(A) - Further information needed.

*(B) - Manpower/funding constraints.

*(C) - Government ownership with conservation objectives.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #2 (cont.)

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>SOUTH KOHALA (cont.)</u>			
11. Hills of Waimea (6 hills on Quad #H-25)	A to C	various	Puus necessary for water recharge areas, watershed protection, physiographic and orographic features. *(B)
- Hokuula	A to C		
- Puu Owaowaka	A to C		
- Puu Ki	A to C		
- Puu Kakanihia	A to C		
- Puu Maile	A to C		
- Puu Manu	A to C		
12. Puus--South Kohala	A to C	various	Conserve, preserve and enhance scenic sites and to protect water recharge areas. *(B)
13. Waikoloa Stream/ Waiulaula Gulch	A to C	839.28	Aquatic and riparian resources. Scenic and recreation area. *(B)
<u>NORTH KOHALA</u>			
14. Lapakahi State Historical Park	A to C	11	Portion which was omitted when area first set aside in the Conservation District. *(C)
15. Lapakahi State Historical Park	A to C	1,332.4	Would extend park to mauka portion of what has been identified as part of Lapakahi complex. *(B)
16. Puus--North Kohala	A to C	various	Conserve, preserve and enhance scenic sites and to protect water recharge areas. *(B)

*(A) - Further information needed.

*(B) - Manpower/funding constraints.

*(C) - Government ownership with conservation objectives.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #2 (cont.)

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>NORTH KOHALA (cont.)</u>			
17. Extension of Conservation District at Akoakoa Point	A to C	322	To protect scenic and recreational resources. *(A)
18. Kohala Cliffs and Valley	A to C	720	The area contains lands necessary for the conservation, preservation, and enhancement of scenic sites. *(B)

*(A) - Further information needed.

*(B) - Manpower/funding constraints.

*(C) - Government ownership with conservation objectives.

RECLASSIFICATIONS TO THE URBAN DISTRICT

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
1. Keaau	A to U	660	To establish an urban core in Puna.
2. K-K State lands to support Second City	C to U A to U	1,200 1,440 (approx.)	To urbanize State-owned land to facilitate development of the K-K area as the County's Second City. Includes lands for University purposes. The West Hawaii Regional Plan (WHRP) directs future urbanization to the Kailua-Kona to Keahole Subregional planning area. The County's K-K Development Plan designates this area for residential, commercial and industrial use. Proposed changes of selected area will direct growth consistent with the County's Plan and WHRP.
3. Keahole to Kailua	A to U C to U	6,738.45 2,825	Urbanization of the Kailua to Keahole area consistent with the K to K Development Plan and West Hawaii Regional Plan is supported.

AREAS OF CRITICAL CONCERN

<u>AREAS</u>	<u>ACREAGE</u>	<u>REASONS</u>
1. Kona Watershed	113,112	Watershed. Native forest (koa, sandalwood, lama, ohia), and forest bird habitat.
2. Kohala Mountain Watershed	22,500	Watershed and native forest.

DEPARTMENT OF HAWAIIAN HOME LANDS

<u>AREAS</u>	<u>DESCRIPTION</u>
1. Area Adjacent to Hakalau NWR	Area supports native endangered forest bird species.
2. Kanakaleonui and Keanakolu Tract	Essential feeding and nesting habitat for akiapolaau, palila, and Hawaiian hawk. Forms an important biological bridge for migrating forest birds between Mauna Kea and Hakalau NWR.
3. Area above Waikoloa Ponds (portion)	Waterbird habitat.
4. Panaewa Residence Lots	Reclassification from A to C of the Panaewa Residence House Lots immediately adjacent to the Hilo Urban District would be consistent with the existing uses and low density urban designation in the County General Plan.

Action will not be taken on DHHL lands.

**RECOMMENDATIONS
FOR
STATE LAND USE DISTRICT
BOUNDARY AMENDMENTS**

HAMAKUA

1. Lalakea Stream, 159.7 acres (A to C)

The 159.7-acre subject property is located east of Waipio Valley and flows in a northerly direction from the South Kohala/Hamakua district boundary on the south, to Hiilawe Falls at the rim of Waipio Valley at the northern boundary. From here, the stream flows down into Waipio Valley as Hiilawe Stream. The proposed reclassification area extends from ridge to ridge for Lalakea Stream.

The proposed reclassification of Lalakea Stream from the Agricultural District to the Conservation District meets the following standards and criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; and preventing floods and soil erosion.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued, cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(5) The area includes lands necessary for . . . conserving natural ecosystems of endemic plants, fish and wildlife . . .

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

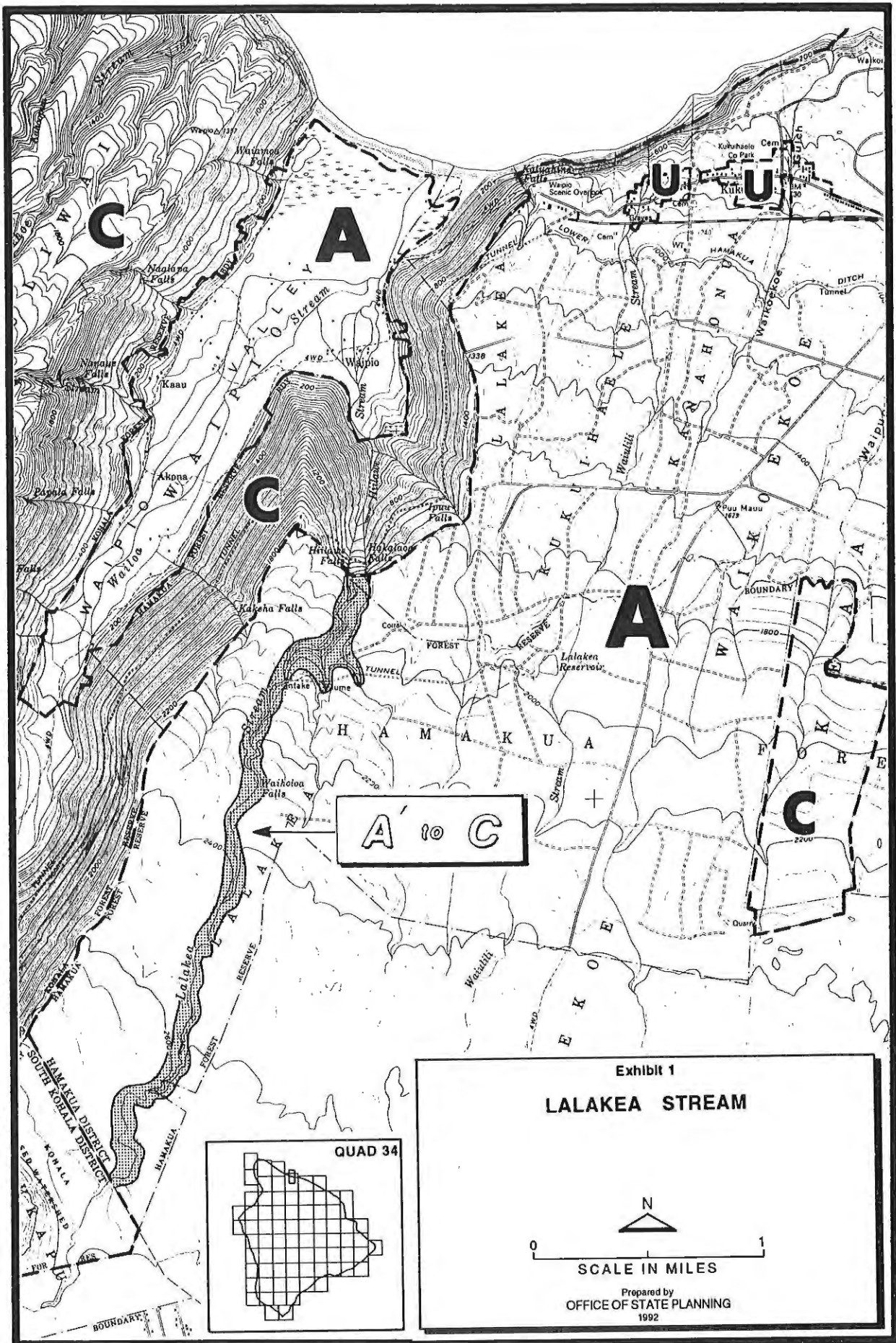
Lalakea Stream has been identified as a Special Stream using the Hawaii Stream Assessment and input from stream experts. It has outstanding aquatic values according to the Hawaii Stream Assessment and contains an abundance of native aquatic species.

Reclassification of Lalakea Stream from the Agricultural to the Conservation District will conserve indigenous or endemic plants, fish and wildlife; preserve or maintain important natural systems and habitats and conserve and preserve sites of unique ecological significance.

The proposed area for reclassification includes lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use because it contains slopes of greater than 20 percent. The proposed reclassification will assist in preventing floods and soil erosion by regulating uses adjacent to the stream.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, reducing the threat to life and property from erosion and flooding, and to conform to the Priority Guidelines for population growth and land resources, Sec. 226-104, HRS, including but not limited to, utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring protection of the environment and the availability of the shoreline, conservation lands and other limited resources for future generations.

The proposed reclassification also addresses the State Recreation Functional Plan which contains an action to maintain wetland and stream systems including all perennial streams in the Kohala Mountains and windward side of Mauna Kea, and the State Conservation Functional Plan which contains a policy to identify and assess high quality and other streams for preservation.



2. Waipio Valley Rim, 456.38 acres (A to C)

The 456.38-acre subject property includes a 300-foot setback and 300-acre parcel which begins from Honokaape Landing at the 300-foot level above Waipio Bay and extends along the Waipio Valley Rim to the 1,600-foot level at Ipuu Falls. The 300-acre portion extends from approximately the 1,600-foot level to the 2,200-foot level, includes a portion of Lalakea Stream, and is bounded by Waipio Valley Rim, Hiilawe Falls, Hakalaoa Falls and Ipuu Falls on the north, and Waiholoa Falls on the southeast.

The proposed reclassification of Waipio Valley Rim from the Agricultural District to the Conservation District meets the following standards and criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for preserving scenic and historic areas; providing wilderness areas; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; and open space areas whose existing openness, natural condition or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; and areas of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Land Use Commission Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness and for conserving natural ecosystems of endemic plants, fish and wildlife . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The proposed reclassification of the Waipio Valley Rim will provide a buffer area to preserve the cultural and scenic integrity of the rim by preventing development and view plane encroachment from private structures consistent with the Hamakua Regional Plan. The buffer overlooks an area of rich scenic, cultural and historic importance. In addition, the many scenic vistas of Hiilawe Falls and the Pacific Ocean add to the natural wilderness of the area.

The area includes lands necessary for the conservation, preservation and enhancement of scenic sites and sites of unique physiographic and ecological significance. The reclassification to the Conservation District will protect an area containing scenic resources and for providing wilderness areas and preserving open space areas which will maintain or enhance the present value of Waipio Valley by preserving natural and scenic resources around the rim of the valley.

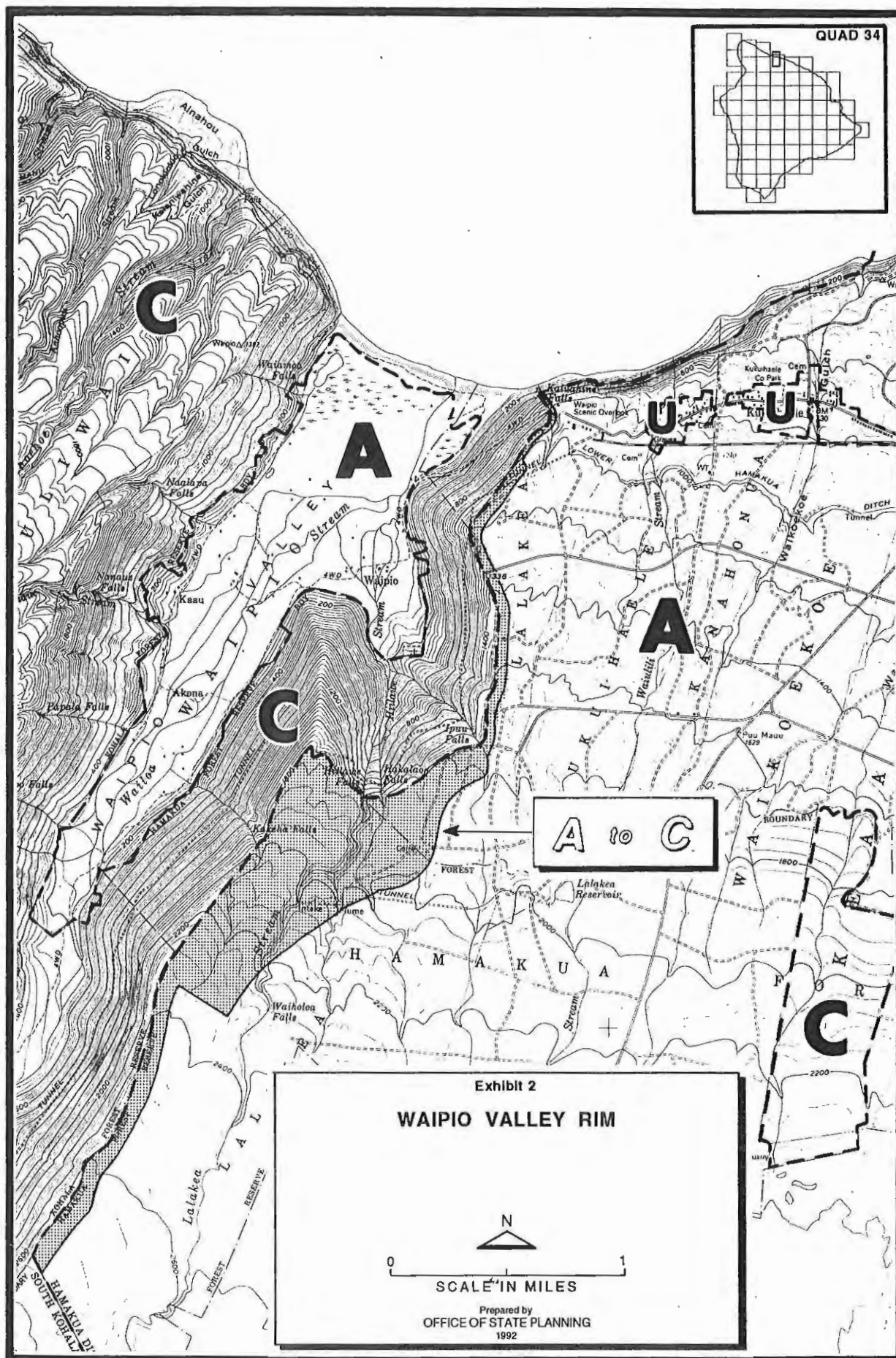
The area also contains a high potential recreation area. Some of the more outstanding scenic resources are Kaluahine Falls, Hiilawe Falls, Kakeha Falls, Ipuu Falls, Hakalaoa Falls and Waihaloa Falls.

The reclassification area includes a portion of Lalakea Stream. Reclassification of Waipio Valley Rim will help to conserve indigenous or endemic plants, fish and wildlife; preserve or maintain important natural systems or habitats; conserve natural ecosystems and prevent flooding and soil erosion.

The proposed area for reclassification includes lands with topography and soils that are not presently needed for urban, rural or agricultural use.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, protecting and enhancing Hawaii's . . . open spaces and scenic resources.



3. Upper Paauhau/Waikii, 4,161.61 acres (A to C)

The 4,161.61-acre subject property is located between the 6,000-foot and 8,000-foot levels along the northwestern slopes of Mauna Kea. The long, rectangular parcel extends from a southwest to a northeasterly direction for nearly seven miles along the northern boundary of the Mauna Kea Forest Reserve and bounded on the southwest by the North Kohala district boundary and the Kilohana Girl Scout Camp, and by Kuupahaa Gulch on its northeastern boundary.

The proposed reclassification of Upper Paauhau/Waikii from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting wilderness; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; open space area whose existing openness, natural condition, or present use, if retained, would maintain or enhance the conservation of natural resources; area of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing wilderness and for conserving natural ecosystems of endemic plants, fish and wildlife; for forestry . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The Upper Paauhau/Waikii area around Mauna Kea has been identified as important forest bird habitat by the U.S. Fish and Wildlife Service (USFWS). The area constitutes a segment of the band of mamane forest that encircles Mauna Kea. The entire area lies between breeding areas for endangered palila, and Waikii has been identified as critical habitat for the palila, according to the Hawaii Forest Bird Recovery Plan, USFWS. Maintaining native forest in this area could help to preserve a continuous stretch of habitat around the mountain and permit birds to move between habitat patches.

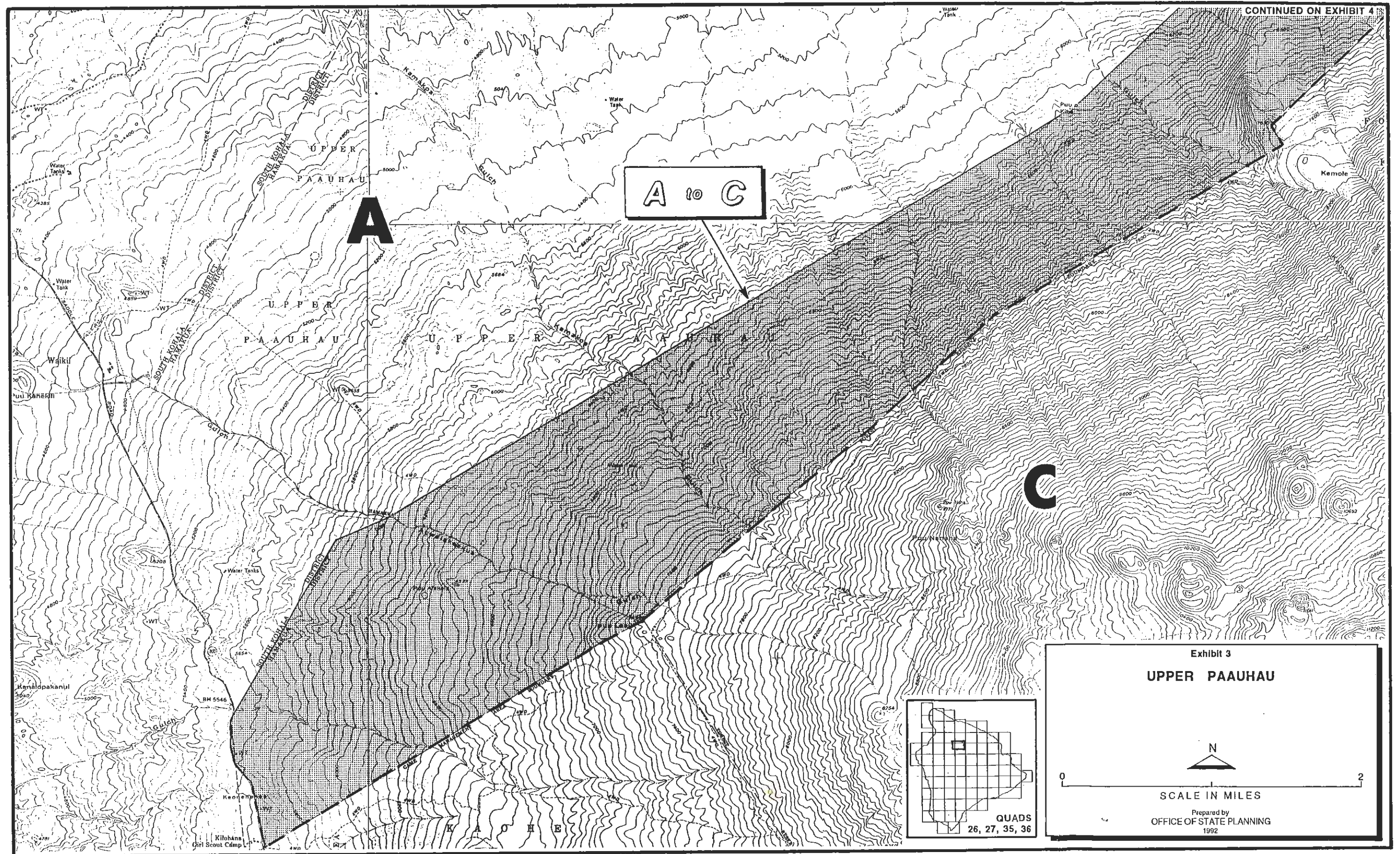
The area has also been identified as having high concentrations of endemic plant taxa which are listed or under review for endangered or threatened status for the island of Hawaii, according to the Threatened and Endangered Plant Fire Map, DLNR.

The area includes lands necessary for conserving natural ecosystems of endemic plants, wildlife and for forestry. A major portion of the area has been identified as essential bird habitat. The proposed recommendation contains lands necessary for conserving indigenous or endemic plants and wildlife including those which are threatened or endangered. The proposed reclassification would preserve/maintain important natural systems and habitat for the endangered palila.

The proposed area for reclassification includes lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use.

The proposed reclassification further addresses the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, exercising an overall conservation ethic in the use of Hawaii's natural resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and . . . limited resources for future generations.



4. Kaohe (Mauna Kea), 5,306.71 acres (A to C)

The 5,306.71-acre subject parcel is located between the 8,000-foot and 5,800-foot levels of the northern slopes of Mauna Kea. The parcel is a continuation of the Paauhau parcel and extends for approximately 6 miles east. The parcel is bounded on the east approximately by Kohoale Gulch and on the south by the Mauna Kea Forest Reserve.

The proposed reclassification of Kaohe from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting wilderness; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would maintain or enhance the conservation of natural resources; areas of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing wilderness and for conserving natural ecosystems of endemic plants, and wildlife; for forestry . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

Kaohe has been identified by the U.S. Fish and Wildlife Service as important to preserve and promote regeneration of essential habitat for the endangered palila. The area is a significant ecosystem of mamane, naio and euphorbia.

This entire area lies between breeding areas for endangered palila and constitutes a segment of the band of mamane forest that encircles Mauna Kea. Protection of this area would help preserve a continuous stretch of habitat around the mountain and permit birds to move between habitat patches.

The area has been identified as having medium and high concentrations of endemic plant taxa which are listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

Kaohe contains pasture with remnant mamane, subalpine dry forest and scattered koa. Kaohe 2 is pasture land with very little grazing activity.

The proposed reclassification complies with the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered animal species and habitats native to Hawaii.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.

NORTH HILO

5. Kanakaleonui and Keanakolu Tract (Mauna Kea), 8,307.73 acres (A to C)

The 8,307.73-acre area extends from approximately the 5,200-foot level to approximately the 8,000-foot level and is bounded by the Hamakua/North Hilo district boundary and the Mauna Kea Forest Reserve on the northwest, the Hakalau National Wildlife Refuge on the east, the Keanakolu Ranger Station on the north, and approximately by Puu Ula'ula to the south.

As stated earlier in this report, lands having status as Hawaiian Home Lands are not subject to the State Land Use Law. This report, however, identifies the resources on these lands which warrant protection in the hopes that future plans implemented by the Department of Hawaiian Home Lands for these areas will take into consideration the conservation values of these lands.

Conservation resources within the Kanakaleonui and Keanakolu Tract from the Agricultural District to the Conservation District meet the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting and preserving scenic areas; providing wilderness; conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would maintain or enhance the conservation of natural resources; areas of value for recreational purposes. The area is essential feeding and nesting habitat for three endangered forest birds and contains the only remnant of a transitional forest type forming a biological bridge for migrating native forest birds.

Retention of the conservation resources on the Kanakaleonui and Keanakolu Tract will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed conservation resources within this area meet the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for preserving wilderness and for conserving natural ecosystems of endemic plants, and wildlife; for forestry and other related activities to these uses . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

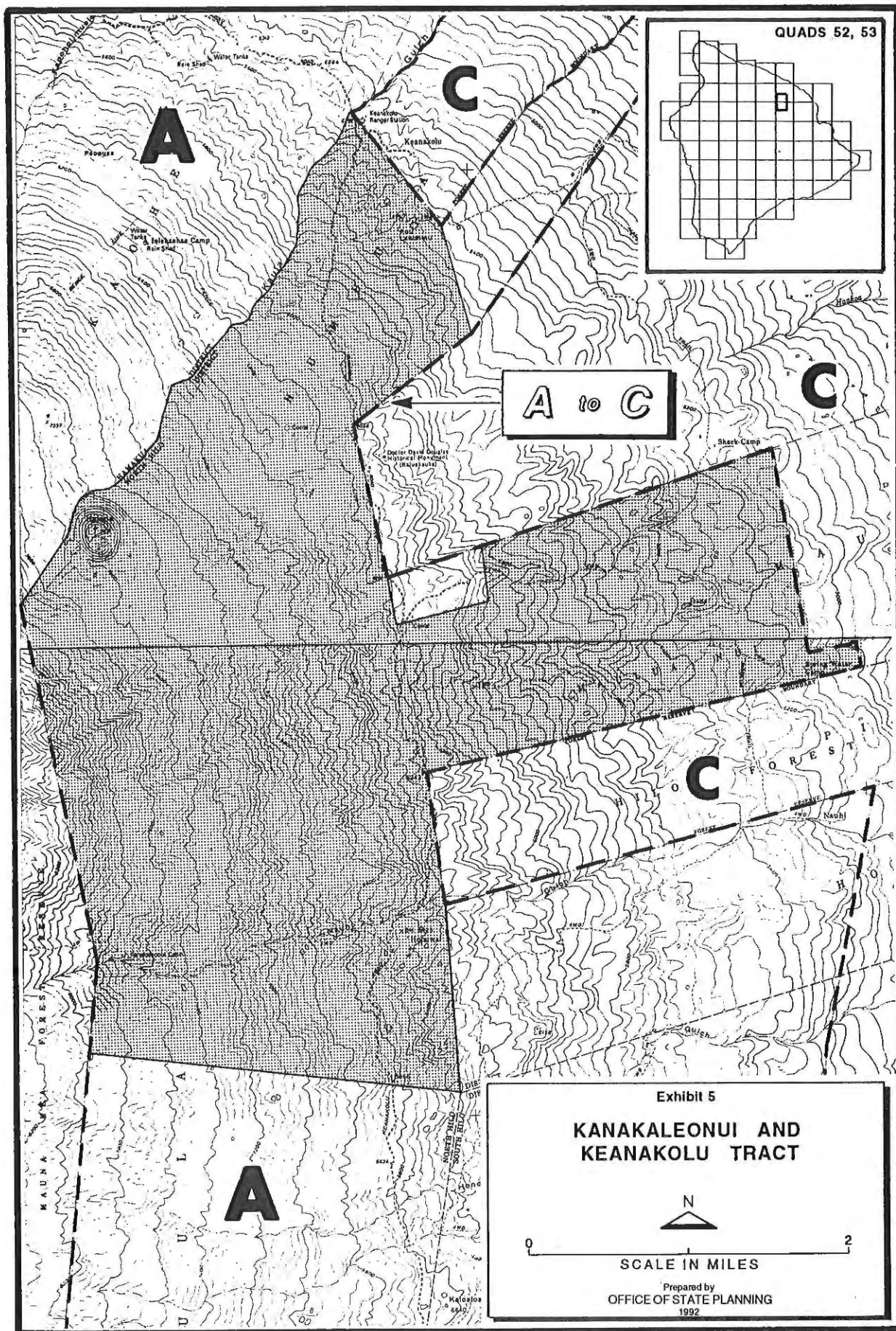
The area includes lands necessary for conserving natural ecosystems of endemic plants and wildlife and sites of unique physiographic or ecological significance. The area has been identified in the Hawaii Forest Bird Recovery Plan as essential feeding and nesting habitat for the akiapolaau (with fewer than 100 birds left on Mauna Kea), palila, and the Hawaiian hawk, according to the Hawaii Forest Bird Recovery Plan, U.S. Fish and Wildlife Service. The site also has been identified in the Nene Recovery Plan as an important breeding site for the nene. The area has been identified as having both high and medium concentrations of endemic plant taxa which are listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR. The proposed reclassification would preserve, maintain important natural systems and habitats for three endangered forest birds.

This site contains the only remnant of a transitional forest type between the upper mamane-naio woodlands and the lower koa-ohia forests, forming an important biological bridge for thousands of migrating native forest birds. It would provide a habitat corridor along the migratory route, providing shelter and food for the travelling birds. It would also connect disjunct populations of akiapolaau and amakihi, two species of non-migratory birds. The area is currently used for grazing and although the forest has been damaged by grazing, it could recover. Rare plants may still be found in the gulches.

Protecting these resources conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources; promoting increased accessibility and prudent use of inland areas for public recreational, education, and scientific purposes; achieving greater awareness and appreciation of Hawaii's environmental resources; and fostering educational activities that promote a better understanding of Hawaii's limited environmental resources.

Conservation resources within this area conform to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.

Conservation of these resources also addresses the State Recreation Functional Plan which contains an implementing action to plan and implement forest recreation projects at Keanakolu.



6. Waipunalei, 1,476.28 acres (A to C)

The 1,476.28-acre area is located approximately between the 2,000-foot and 5,400-foot level and is bounded by Kaawalii Stream and the Hilo Forest Reserve on the northwest, by Kahoahuna Homesteads to the northeast, Hilo Forest Reserve on the southeast, and Puu Lahohinu to the southwest.

The proposed reclassification of Waipunalei from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas and wilderness reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities; and other permitted uses not detrimental to a multiple use conservation concept.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness reserves, and for conserving natural ecosystems of endemic plants, and wildlife; for forestry and other related activities.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use.

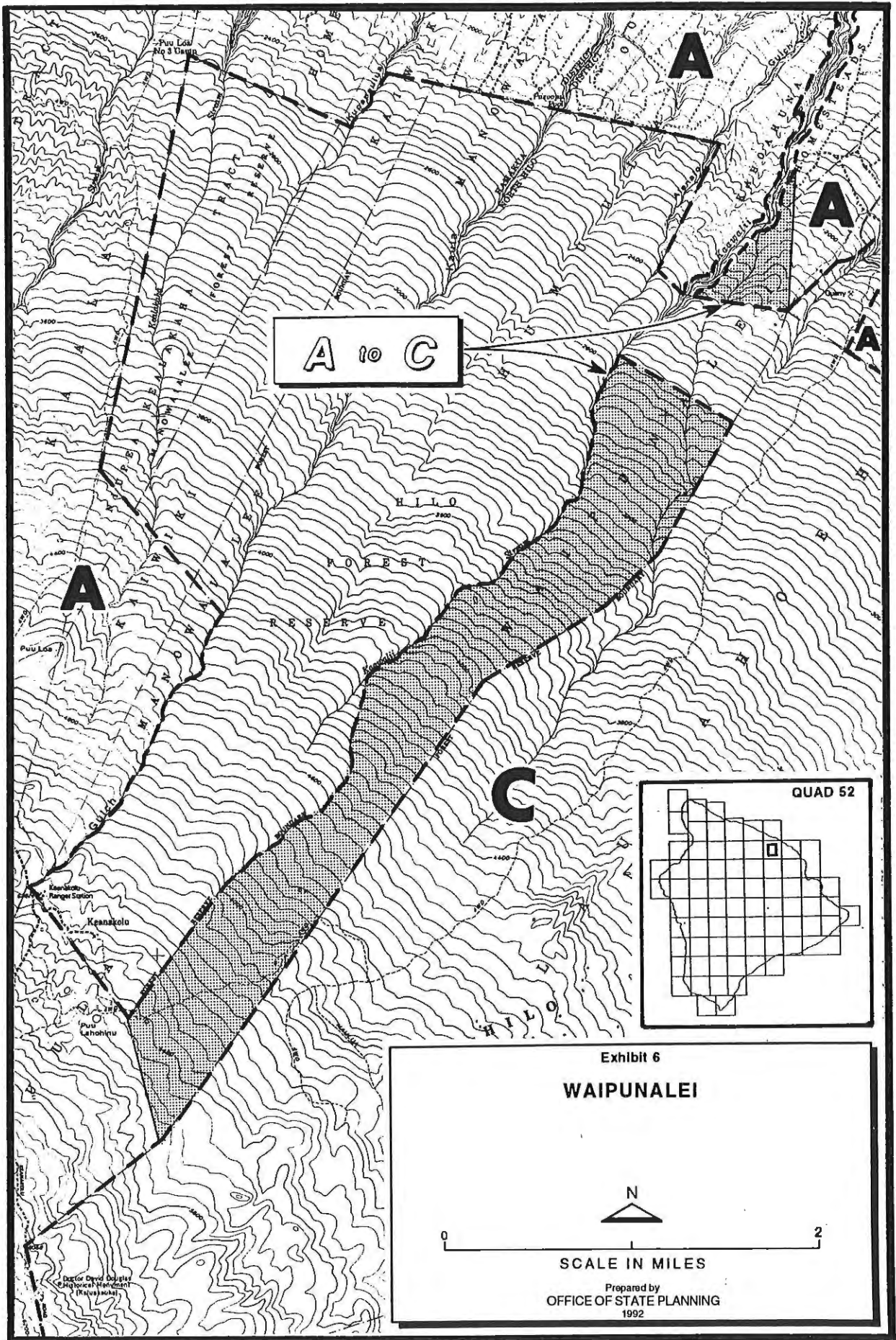
The area includes lands necessary for the conservation, preservation and enhancement of scenic sites and for conserving natural ecosystems of endemic or indigenous plants and wildlife and forestry. The area contains habitats for the endangered Hawaiian hoary bat, endangered forest birds, including the Hawaiian creeper and the akiapolaau. The area contains examples of two rare forest types mix-montane mesic, koa-ohia forest and koa-mamane montane dry forest. The area has been identified as having high concentrations of endemic plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR. The area is within the southern

subregion of Region 2-Hamakua, and described in the report Flood Hazard Information, Island of Hawaii. The coastal areas below Waipunalei are subject to flooding from occasional sheet flows. Sheet flow flooding is deterred by the vegetation throughout the region, particularly between 1,500 and 6,000 ft. elevation. The proposed recommendation would preserve/maintain important natural systems and habitat for native forest birds and lands for preventing floods and soil erosion. The area includes lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use.

Reclassification to the Conservation District would protect an area adjacent to Conservation District lands on the north and south. Waipunalei contains a degraded example of two rare types of native forest--mixed montane mesic koa-ohia forest and koa-mamane montane dry forest with a native understory in places. This parcel also supports a population of one rare plant, pilo kea, and endangered Hawaiian bats. Waipunalei provides an important link between the two forest reserves for native forest birds that currently utilize the area. Cattle have been removed from the pasture area for approximately three years and koa regeneration is underway. Reclassification to the Conservation District would protect these habitat areas and would connect two areas that are already zoned Conservation.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; exercising an overall conservation ethic in the use of Hawaii's natural resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



7. Laupahoehoe to Maulua Bay (North Hilo Streams), 441 acres (A to C)

Eight streams in this area have been identified as Special Streams having outstanding aquatic values. From north to south from Laupahoehoe, the streams are: Kilau, Manowaiopae, Kuwaikahi, Kihalani, Kaiwilahilahi, Kapehu, Paeohe, and Maulua. Only three streams extend into Conservation District lands: at 2,120 feet (Kilau), 2,040 feet (Kaiwilahilahi), and at 1,720 feet (Kapehu). The recommendations for the remaining five streams extend to the following elevations at 1,640 feet (Manowaiopae and Kuwaikahi); 1,690 feet (Kihalani); 1,660 feet (Paeohe); and 1,000 feet (Maulua). Kilau, Manowaiopae, Kuwaikahi, Kihalani and Kaiwilahilahi pass through the Urban District from sea level up to approximately 800 feet.

8. Maulua Bay to Haiku Point (North Hilo Streams), 582 acres (A to C)

Three streams in this area have been identified as Special Streams having outstanding aquatic values. From north to south from Maulua Bay, the streams are Pohakupuka, Manoloa, and Ninole. Two tributaries of Pohakupuka Stream extend from the Conservation District and Hakalau Wildlife Refuge. They come together at Kaoheanui Falls at the 1,900-foot level and divide again into two distributaries which then come together at 1,100 feet above sea level. The Special Streams are generally within an area bounded by the National Wildlife Refuge to the west, Laupahoehoe Natural Area Preserve and Maulua Stream to the northeast. The proposed reclassification area extends from ridge to ridge for each stream.

9. Nahaku Point to Hakalau Bay (North Hilo Streams), 444 acres (A to C)

Four streams in this area have been identified as Special Streams having outstanding aquatic values. The streams are Opea, Peleau, Umauma, and Hakalau. The middle of Hakalau Stream establishes the North Hilo/South Hilo district boundary up to about 800 feet above sea level or Hakalau Falls. Hakalau Stream is districted Conservation up to approximately 1,300 feet above sea level. The recommendation proposes reclassification from the Agricultural District to the Conservation District for approximately 2,000 feet of the stream outside of the Conservation District from the 1,300 foot level to the 1,500 foot level, or the existing Conservation District boundary. Opea and Umauma are recommended for reclassification to the Conservation District from mauka of the highway to the existing Conservation boundary at 1,500 feet. Peleau extends from sea level to approximately the 1,000-foot contour. The proposed reclassification area for each of the streams extends from ridge to ridge.

The proposed reclassification of North Hilo Streams from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting water sources; preserving scenic and historic areas; wilderness reserves; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would

enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving wilderness reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

North Hilo Streams (Kilau, Manowaiopae, Kuwaikahi, Kihilani, Kaiwilahilahi, Kapehu, Paeohe, Maulua, Pohakupuka, Manoloa, Ninole, Opea, Peleau, Unauma, and Hakalau) have been identified as Special Streams using the Hawaii Stream Assessment and input from stream experts. The streams have outstanding aquatic values according to the Hawaii Stream Assessment and contain an abundance of native aquatic species.

The proposed reclassification will assist in preventing floods and soil erosion by regulating uses adjacent to the streams.

The proposed recommendation to extend the district boundary from ridge to ridge would protect lands necessary for the protection of water resources and water supplies and lands necessary for preserving wilderness and conserving natural ecosystems of endemic plants, fish and wildlife.

The proposed recommendation would maintain lands necessary for protecting and conserving indigenous and endemic plants, fish and wildlife. The proposed recommendation would impact favorably the State's concern to protect lands necessary for the preservation or maintenance of important natural systems and habitats. The streams have been identified as having abundance of native aquatic species including Lentipes concolor (oou alamoo).

The proposed areas for reclassification include lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use because they contain slopes of greater than 20 percent. North Hilo Streams which are identified as Special Streams should be classified as Conservation because of their aquatic, riparian, wetland, scenic and recreational values. The Conservation District boundary line should extend from ridge to ridge for these streams.

The proposed reclassification addresses the State Conservation Functional Plan which contains a policy to identify and assess high quality and other streams for preservation.

The proposed areas for reclassification include lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use. The area south of Kaiwilahilahi Stream has been identified as a flood problem area (Flood Hazard Information-Report #37). The proposed reclassification will mitigate further problems from floods and soil erosion by regulating uses adjacent to the streams.

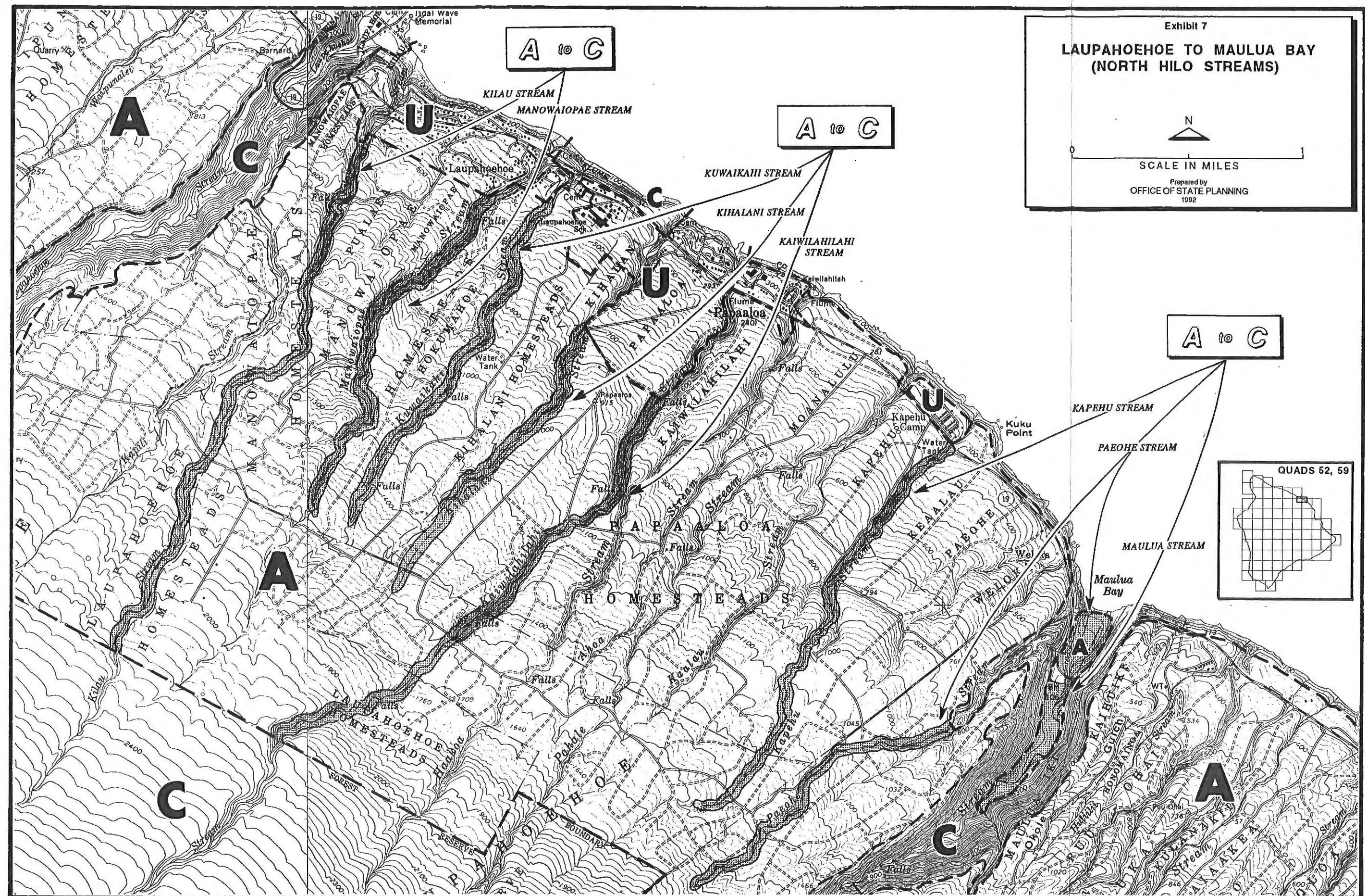
The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources; promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

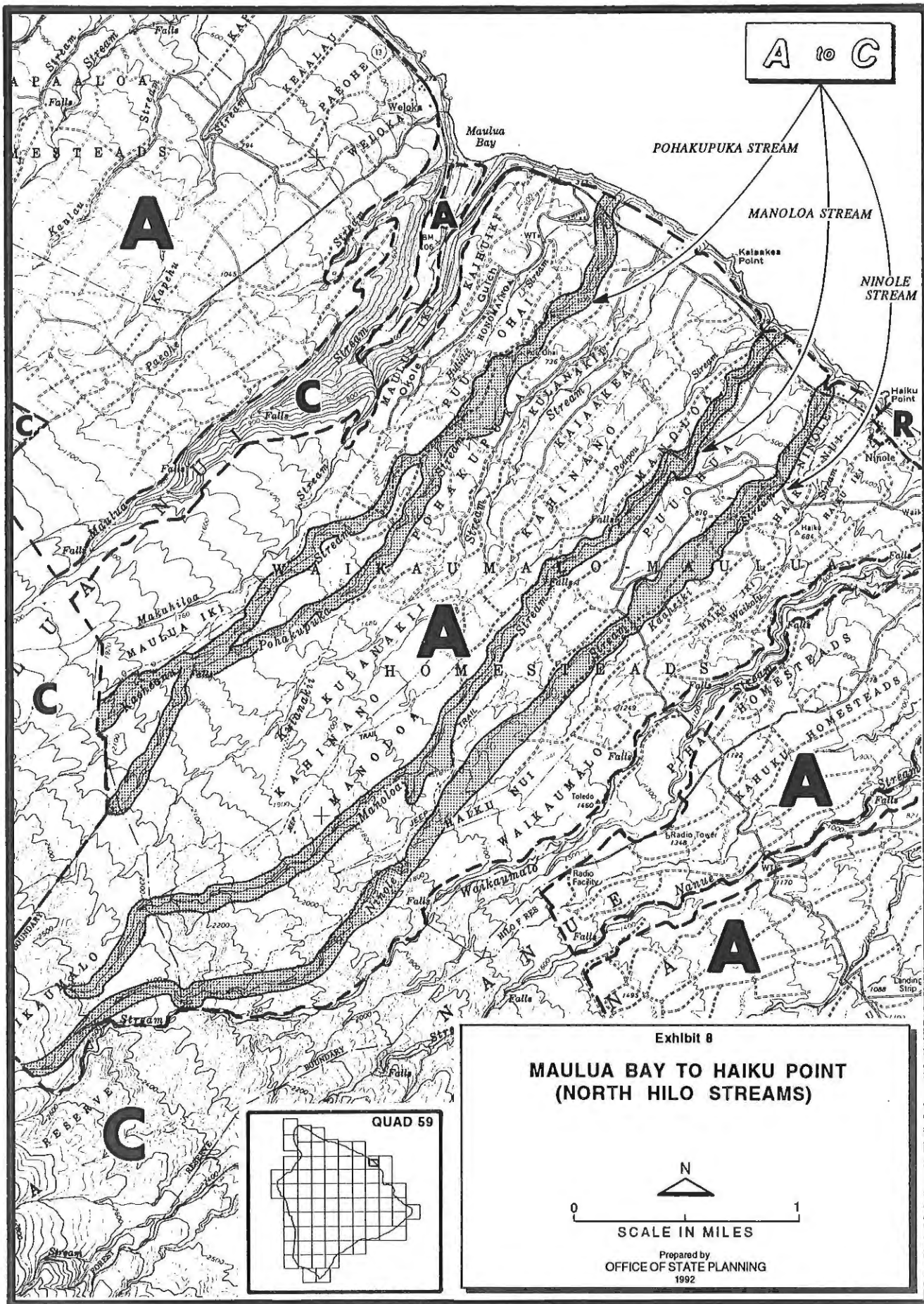
The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.

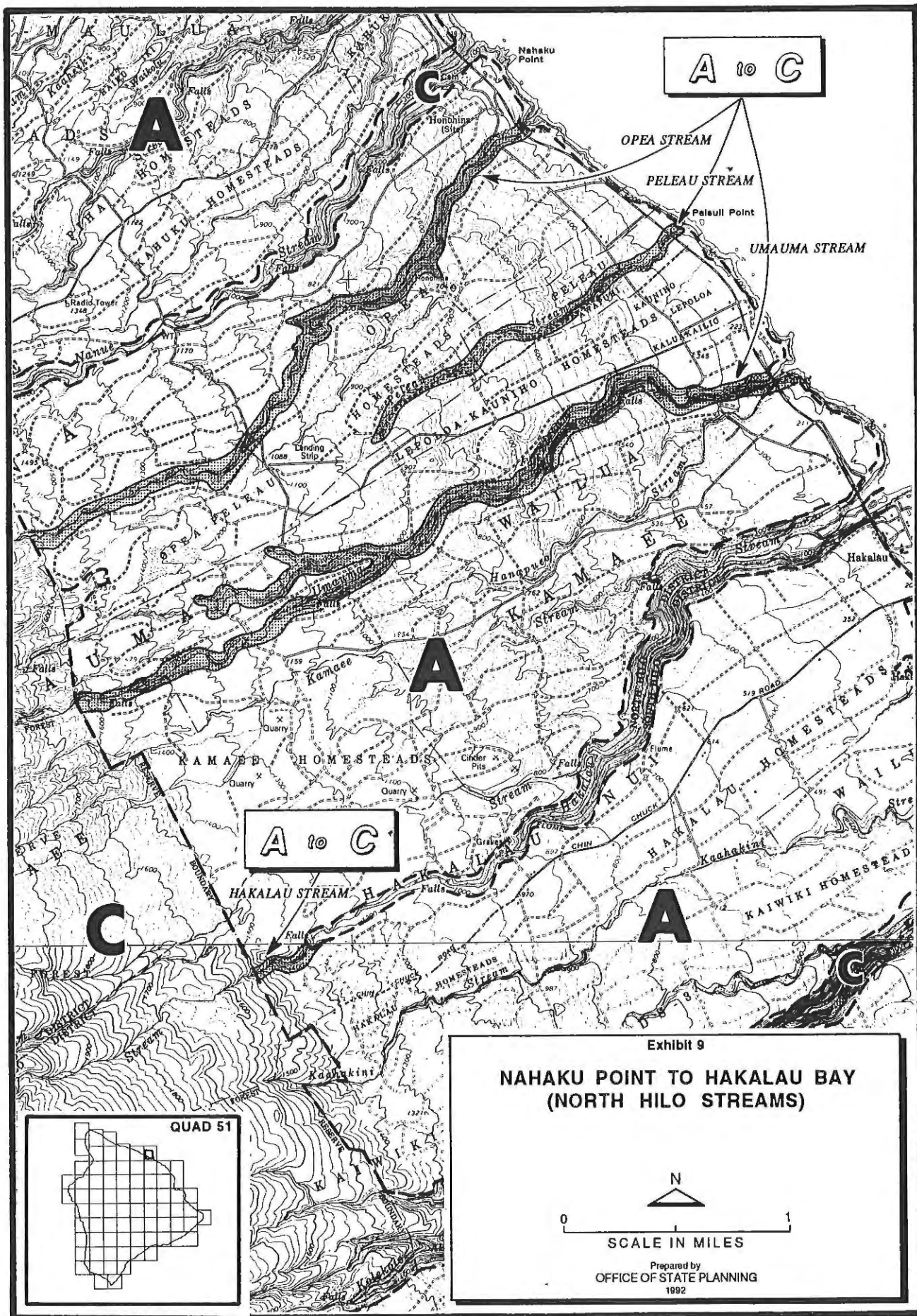
As stated earlier in this report, Conservation District stream protection corridors have been recommended for lengths of streams that pass through the Agricultural District. However, because protection of the entire stream course is very important to the health of the stream, we are also recommending stream corridors within the Urban or Rural Districts as Priority #2 areas.

This recommendation affects Kilau, Manowaiopae, Kuwaikahi, Kihalani and Kaiwilahilahi Streams.

Although reclassification of the Urban or Rural portions of these streams to the Conservation District is not recommended at this time, any development in these areas that might have a negative impact on a stream's aquatic resources should be thoroughly and critically reviewed.







SOUTH HILO

10. Hakalau Forest National Wildlife Refuge (Humuula) and Adjacent Forest Bird Habitat Areas, 13,521.6 acres (A to C)

The 13,521.6-acre area is located east of Mauna Kea bounded by the Hilo Forest Reserve on the north and Waiama Gulch on the south, and the Hilo Watershed and Forest Reserve on the east. Several streams recommended for reclassification into the Conservation District for their aquatic and riparian resources flow through this area: Wailuku River, Kapue Stream and Hakalau Stream.

As stated earlier in this report, lands having status as Hawaiian Home Lands are not subject to the State Land Use Law. A portion of this recommendation area is DHHL land and no action will be taken on the DHHL portion of this area. This report, however, identifies the resources on these lands which warrant protection in the hopes that future plans implemented by the Department of Hawaiian Home Lands for these areas will take into consideration the conservation values of these lands.

The proposed reclassification of Hakalau and Adjacent Forest Bird Habitat Areas from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; and areas of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; Maintenance of valued cultural, historical, or natural resources; and Maintenance of other natural resources relevant to Hawaii's economy, including but not limited to, agricultural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands and wilderness reserves, and for conserving natural ecosystems of endemic plants, and wildlife . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use.

The proposed reclassification would preserve important natural systems and habitats identified in the Hawaii Forest Bird Recovery Plan for four endangered forest birds (akepa, Hawaiian creeper, akiapolaau and ou).

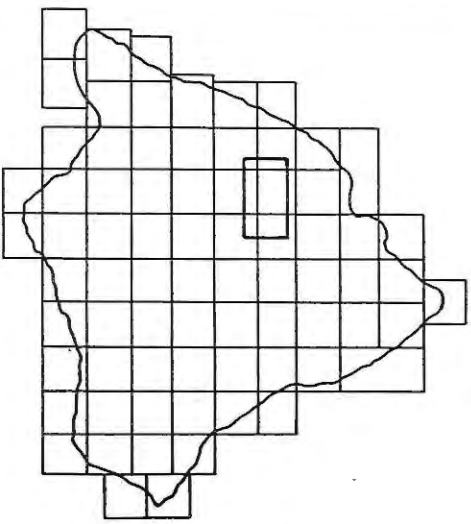
The area supports at least 10 species of native forest birds and has been identified by the U.S. Fish and Wildlife Service as one of the last areas containing reasonably high densities of four endangered forest bird species: akepa, Hawaiian creeper, akiapolaau, and io. The refuge and adjacent areas are dominated by closed to open canopy mesic koa-ohia forest with mostly native understory. The heavily grazed pasture at higher elevations contains scattered koa and mamane. The area also contains many rare plants in a lava flow.

It also has been identified as having medium concentrations of endemic plant taxa which are listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

The proposed reclassification area includes the Hakalau Forest National Wildlife Refuge and adjacent areas with high concentrations of forest birds that are currently in pasture or ranch use.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; encouraging the protection of rare or endangered animal species and habitats native to Hawaii; and exercising an overall conservation ethic in the use of Hawaii's natural resources.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.



QUADS 45,46,52,53,54

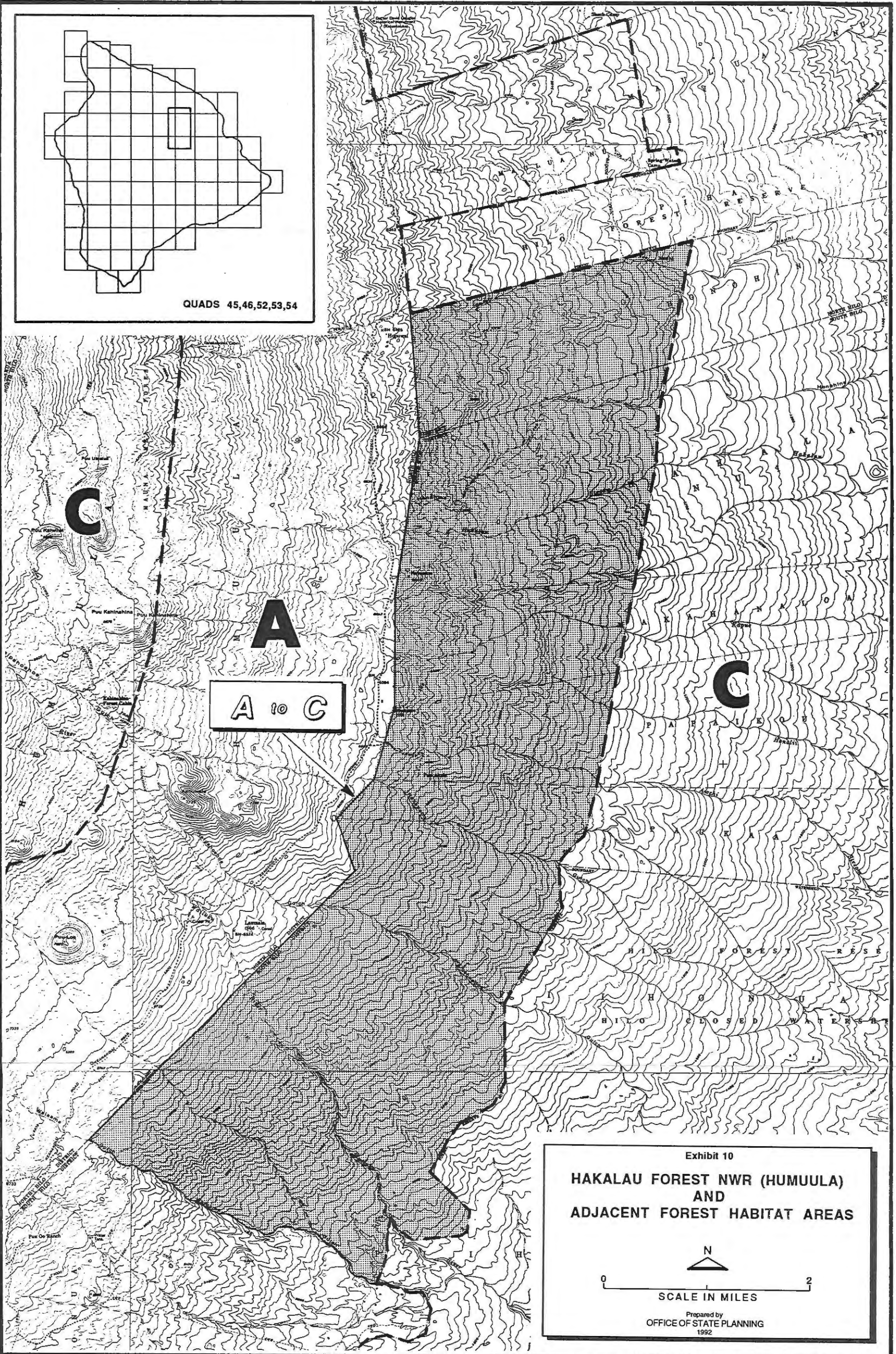


Exhibit 10

**HAKALAU FOREST NWR (HUMUULA)
AND
ADJACENT FOREST HABITAT AREAS**



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11. Area above Hilo Forest Reserve (Waikoloa Ponds), 7,048 acres

The 7,048-acre site is adjacent to Waiaama Gulch to the north, bounded by the Kipuka-Ainahou State Nene Sanctuary and the Upper Waiakea Forest Reserve boundary to the south, and the Hilo Forest Reserve on the east.

A portion of this area (approximately 700 acres) is under the management of the Department of Hawaiian Home Lands and the remaining acreage (approximately 6,348 acres) is a Priority #2 recommendation. As stated earlier in this report, lands having status as Hawaiian Home Lands are not subject to the State Land Use Law. This report, however, identifies the resources on these lands which warrant protection so that the Department of Hawaiian Home Lands may take into consideration the conservation value of these lands in their future planning.

The proposed reclassification of the area above the Hilo Forest Reserve (Waikoloa Ponds) from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; forestry; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; and other related activities.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter. The area includes lands necessary for conserving natural ecosystems of endemic plants, and wildlife.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness reserves, and for conserving natural ecosystems of endemic plants, and wildlife; for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

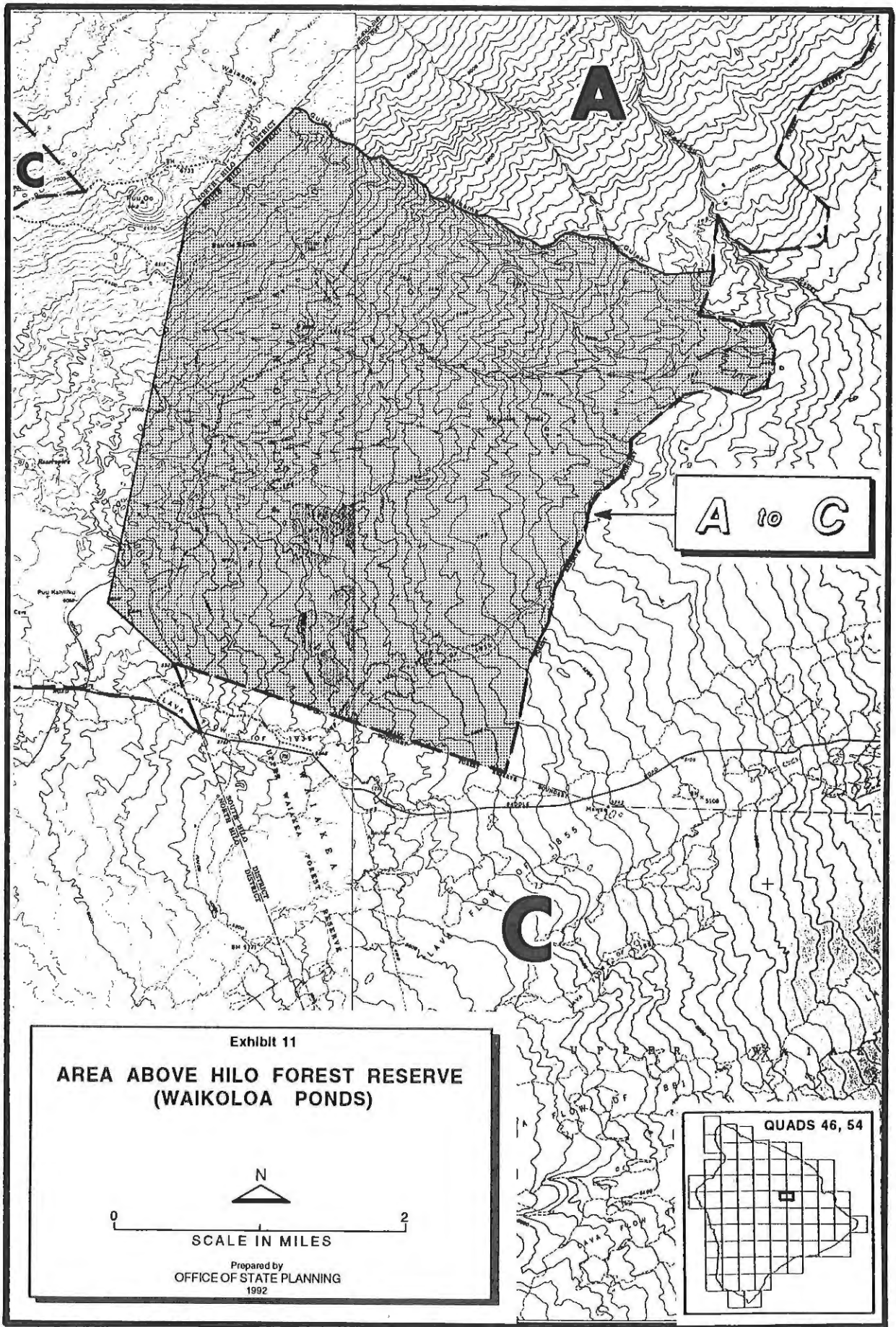
Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use.

The area includes lands necessary for the conservation, preservation and enhancement of sites of unique physiographic or ecological significance; and lands necessary for providing and preserving wilderness. The area has been identified as habitat for the nene and koloa. The area has been identified as having medium concentration of endemic plant taxa which are listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

Reclassification of the area above the Hilo Forest Reserve would protect an area containing the Wailuku River and a series of natural and man-made ponds that offer excellent habitat for native and migratory waterbirds and provide important breeding sites for endangered Hawaiian ducks or koloa. The surrounding pasture area provides habitat for endangered nene. The area also contains closed to open canopy mesic koa-ohia forest with mostly native understory which dominates the area.

The proposed reclassification further conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, promoting and protecting intangible resources in Hawaii, such as scenic beauty and the aloha spirit which are vital to a healthy economy; seeking effective protection of Hawaii's unique and fragile environmental resources; exercising an overall conservation ethic in the use of Hawaii's natural resources; promoting increased accessibility and prudent use of inland areas for public recreational, educational and scientific purposes; promoting the preservation and restoration of significant natural and historic resources; encouraging the protection of rare or endangered animal species and habitats native to Hawaii; and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



12. Lehuawehi Point to Alia Point (South Hilo Streams), 653 acres (A to C)

Four streams in this area have been identified as Special Streams having outstanding aquatic values. The streams are Paheehee, Honomu, Kapehu, and Makea. Paheehee Stream borders the northwestern boundary of the Urban District of Honomu from sea level to approximately 400 feet above sea level, then extends to approximately the 1,580-foot level. Kapehu Stream extends from sea level to approximately 1,300 feet and Makea Stream to approximately the 1,260-foot contour. The proposed reclassification area for each of the streams extends from ridge to ridge.

13. Onomea Bay to Maumau Point (South Hilo Streams), 1,209 acres (A to C)

Six streams have been identified as having outstanding aquatic values. The streams are Kawainui, Hanawi, Kaieie, Kaapoko, Kapue and Pahoehe. While Kawainui Stream is within the Conservation District, a tributary which feeds into Kawainui at about the 700-foot level and extends to the 1,480-foot level, is within the Agricultural District. Hanawi Stream extends to the existing Conservation District boundary line at approximately the 1,960-foot level. Two tributaries branch off at approximately the 700-foot level and the 900-foot level and extend to the 1,050-foot and 1,700-foot levels, respectively. Conservation reclassification is recommended for Kaieie Stream from the western Urban District boundary beginning at the 200-foot level to the 1,990-foot level and the boundary of the existing Conservation District. The recommendation for Kaapoko Stream extends from approximately the 200-foot level where it enters the town of Papaikou, to the 380-foot contour. Kapue borders the Urban District for the town of Papaikou at the town's southern boundary mauka of the highway. Conservation reclassification is proposed for this stream and its tributary which begins at approximately the 1,400-foot level to the existing Conservation District boundary at approximately 1,990 feet. Pahoehe Stream flows through the Urban District at Puueopaku at its southern boundary from approximately the 300-foot level. From here, Pahoehe Stream extends to the existing Conservation District boundary at 1,990 feet. Its tributary, Waikoana, breaks off at approximately the 1,100-foot level and extends to the 1,600-foot contour. The proposed reclassification area for each of the streams extends from ridge to ridge.

14. Wailuku River-Waiau (Awehi) Streams (South Hilo Streams), 84 acres (A to C)

The Wailuku River has been identified as possessing outstanding aquatic values. Although most of the river and tributaries are in the Conservation District, the Waiau (Awehi) tributary is within the Agricultural District. Waiau Stream extends from the Conservation District at approximately 1,500 feet above sea level, flows southeasterly into the Wailuku River as Kaimukanaka Falls at approximately the 600-foot level. The proposed reclassification extends from ridge to ridge.

The proposed reclassification of South Hilo Streams from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting water sources; preserving scenic and historic areas; wilderness reserves; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic, cultural sites and sites of unique physiographic or ecologic significance.

Section 15-15-20(5) The area includes lands necessary for providing and preserving wilderness reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife; for forestry and other related activities to these uses . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

South Hilo Streams (Paheehee, Honomu, Kapehu, Makea, Kaieie, Kaapoko, Kapue, Pahoeheo and Wailuku) have been identified as Special Streams using the Hawaii Stream Assessment and input from stream experts. The streams have outstanding aquatic values according to the Hawaii Stream Assessment and contain an abundance of native aquatic species.

The proposed areas for reclassification include lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use. The proposed reclassification will assist in preventing floods and soil erosion by regulating uses adjacent to the streams.

The proposed recommendation to extend the district boundary from ridge to ridge would protect lands necessary for the protection of water resources and water supplies and lands necessary for preserving wilderness and conserving natural ecosystems of endemic plants, fish and wildlife.

The proposed recommendation would maintain lands necessary for protecting and conserving indigenous and endemic plants, fish and wildlife. The proposed recommendation would impact favorably the State's concern to protect lands necessary for the preservation or maintenance of important natural systems and habitats. The streams have been identified as having abundance of native aquatic species, including Lentipes concolor (ooupu alamoo).

The proposed areas for reclassification include lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use because they contain slopes of greater than 20 percent. South Hilo Streams which are identified as Special Streams should be classified as Conservation because of their aquatic, riparian, wetland, scenic and recreational values. The Conservation District boundary line should extend from ridge to ridge for these streams.

The proposed reclassification addresses the State Conservation Functional Plan which contains a policy to identify and assess high quality and other streams for preservation.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; exercising an overall conservation ethic in the use of Hawaii's natural resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.

As stated earlier in this report, Conservation District stream protection corridors have been recommended for lengths of streams that pass through the State Agricultural District. However, because protection of the entire stream course is very important to the health of the stream, we are also recommending stream corridors within Urban or Rural Districts as Priority #2 areas.

Kaieie, Kapue and Pahoehe Streams flow through the Urban District and those streams should be protected from ridge to ridge.

Although the initiation of petitions to reclassify these corridors to the Conservation District is not recommended at this time, any development in these areas that might have a negative impact on a stream's aquatic resources should be thoroughly and critically reviewed.

Exhibit 12

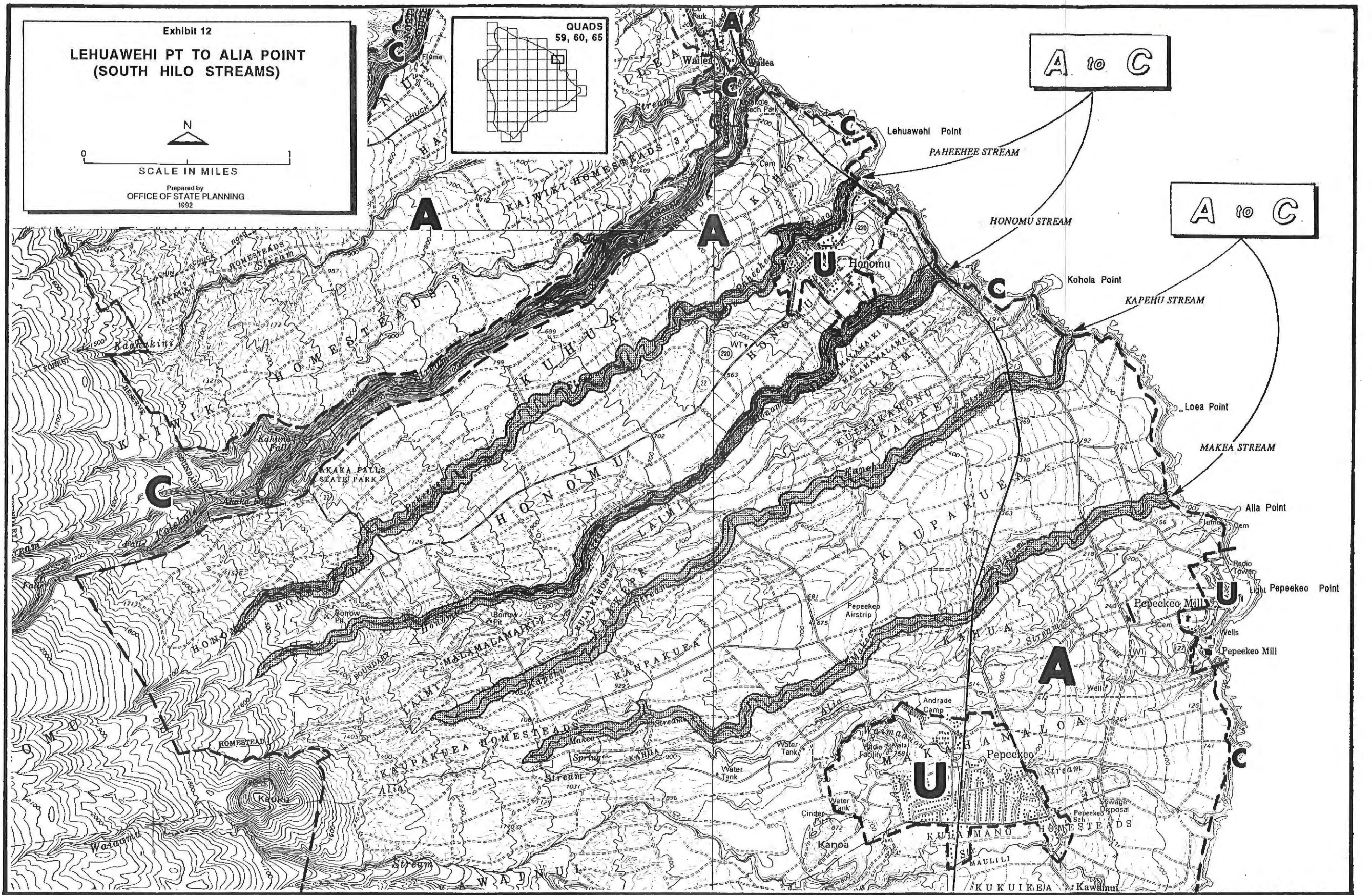
**LEHUAWEHI PT TO ALIA POINT
(SOUTH HILO STREAMS)**

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1992



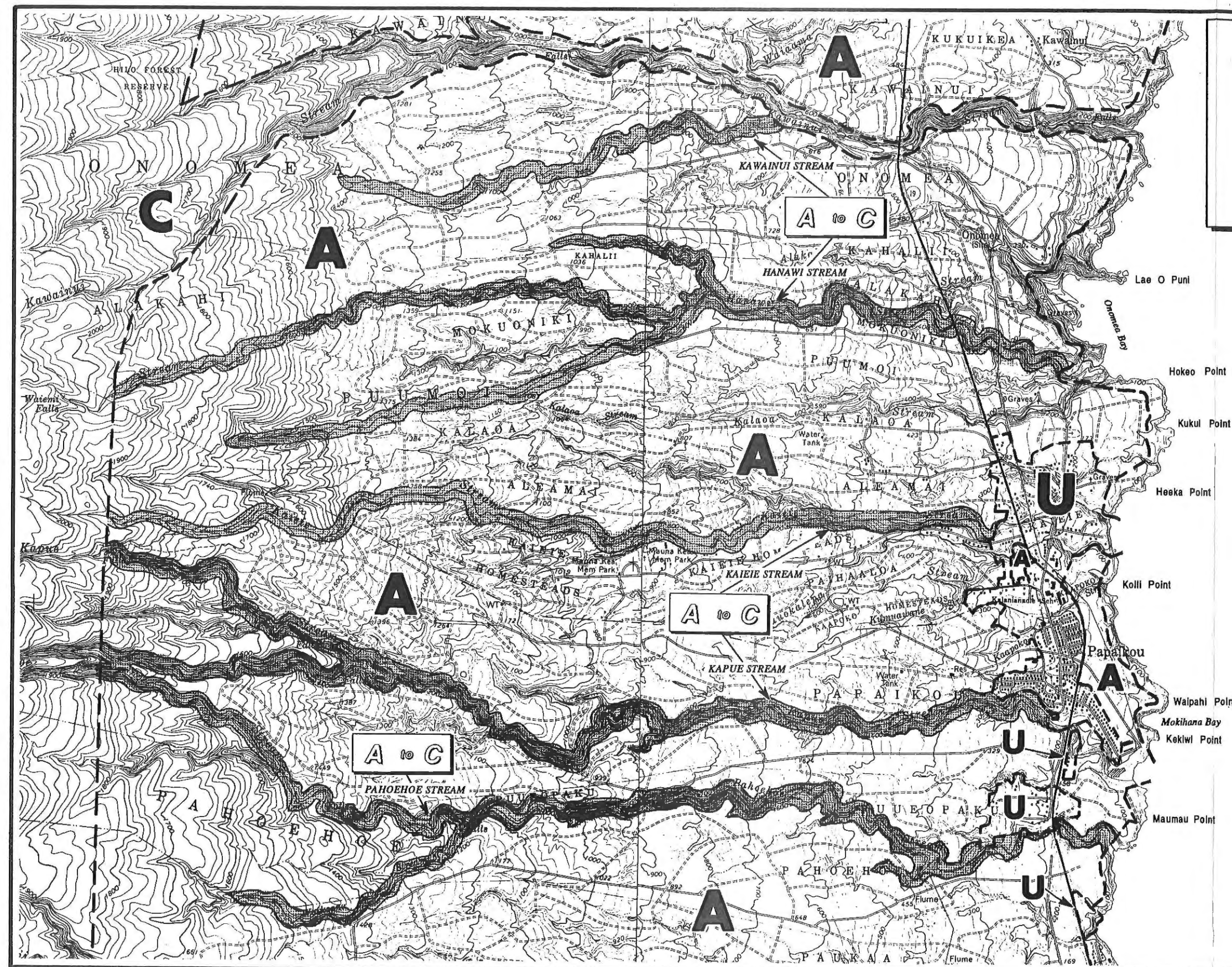


Exhibit 13

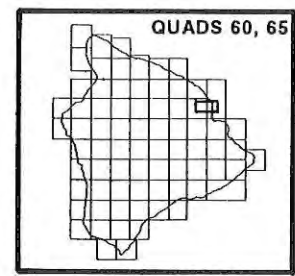
**ONOMEA BAY TO MAUMAU POINT
(SOUTH HILO STREAMS)**

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Prepared by
OFFICE OF STATE PLANNING
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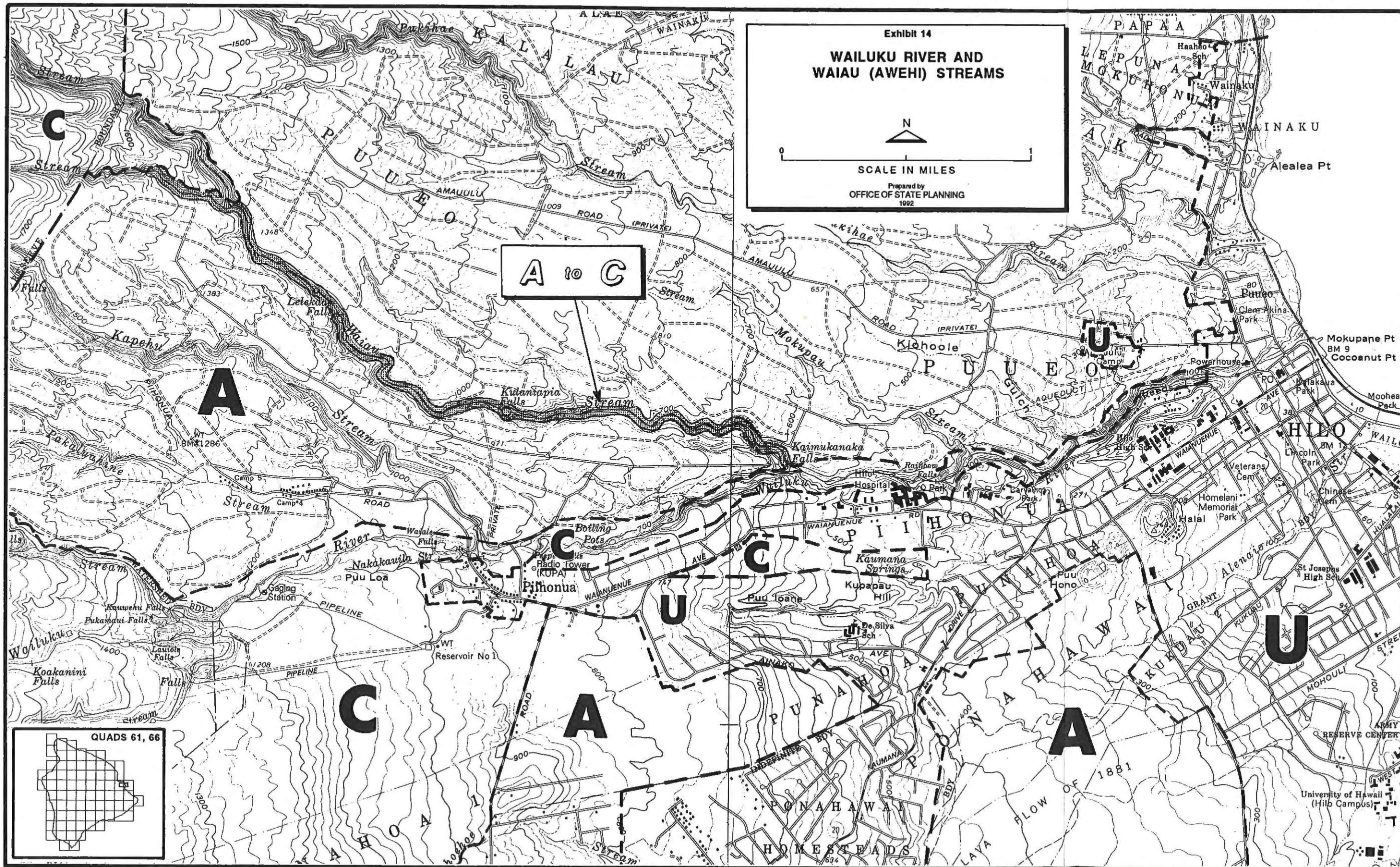


Exhibit 14

**WAILUKU RIVER AND
WAI'AU (AWEHI) STREAMS**

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15. Panaewa (Waiakea) Residence Lots, 60 acres (A to U)

The 60-acre site is located in East Hilo bounded by Railroad Avenue on the east, Hirose Nurseries (Garden) to the southwest, Ohuonu on the east, and Puainako Street on the north.

As stated earlier in this report, lands having status as Hawaiian Home Lands are not subject to the State Land Use Law. Therefore, no action will be taken on this recommendation. This recommendation is a "housekeeping" measure as many of these lots are already in urban use.

The proposed reclassification of the Panaewa (Waiakea) Residence Lots from the Agricultural District to the Urban District meets the residential criteria for Urban Districts contained in Section 205-2(b), HRS: Urban districts shall include . . . a reserve area for foreseeable urban growth.

The planned urban uses impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Provision of employment opportunities and economic development and provisions for housing opportunities for all income groups, particularly the low, low-moderate and gap groups.

The Panaewa Residence Lots meet the following standards for determining Urban District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-18(2) The area includes taking into consideration the following specific factors:

- (A) proximity to centers of trading and employment except where the development would generate new centers of trading and employment;
- (C) proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks and police and fire protection; and
- (D) sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection.

Section 15-15-18(3) The area includes lands with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami, unstable soil conditions, and other adverse environmental effects.

Section 15-15-18(4) In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on State or County general plans.

Section 15-15-18(5) The area includes lands in appropriate location for new urban concentrations and shall give consideration to areas of urban growth as shown on State and County general plans.

Section 15-15-18(6) The area may include lands which do not conform to the standards in paragraphs (1) to (5):

- (A) When surrounded by or adjacent to existing urban development; and
- (B) Only when those lands represent a minor portion of this district.

The reclassification of this area to the Urban District is intended as a "housekeeping" measure. The Panaewa (Waiakea) Residential Lots are a DHHL housing project which is underway. Many of the lots are already developed. DHHL is exempt from the requirements of the State Land Use Law. The area is adjacent to the existing Urban District and is in proximity to public facilities and services.

The planned urban uses conform to the objectives and policies of the Hawaii State Plan for the socio-cultural advancement-housing, Section 226-13 and 19, HRS, including but not limited to, encouraging urban developments in close proximity to existing services and facilities; achieving orderly development of residential areas sensitive to community needs and other land uses; and promoting design and location of housing developments, taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

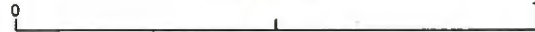
The planned urban uses conform to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to encouraging planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resources capacities and reflect the needs and desires of Hawaii's people, encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present such as protection of important agricultural land or preservation of lifestyles, making available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the Agricultural District.

The existing and proposed reclassification conforms to the Priority Guideline for the provision of affordable housing, Section 226-106, HRS, including but not limited to seeking to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap group households.

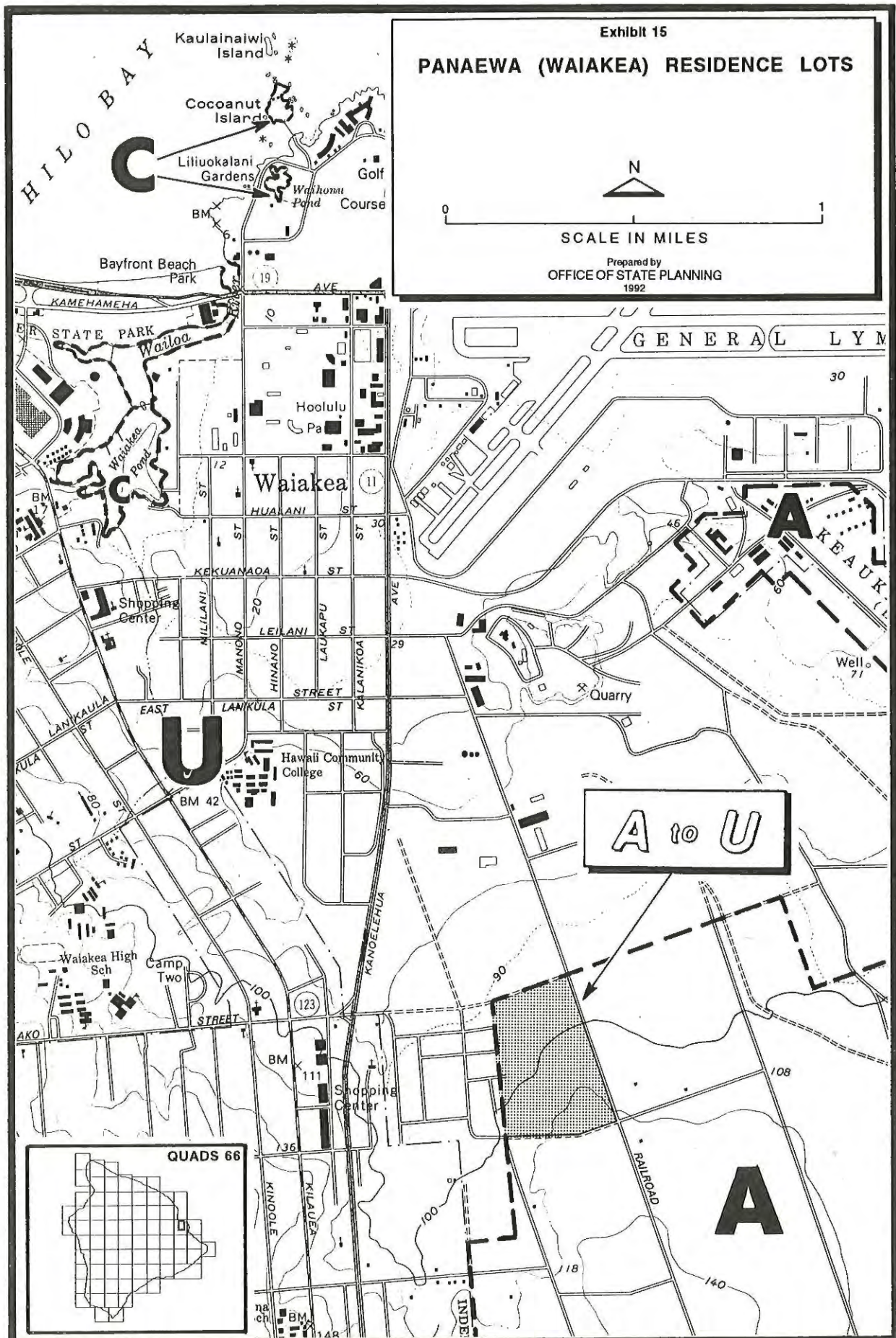
The area is designated for low density urban on the County LUPAG map and bounded on two sides by the State Urban District.

The urban uses will favorably impact the provision for employment opportunities and economic development and housing opportunities for all income groups. Urbanization uses will be adjacent to existing urban areas and, therefore, close to basic services and centers of trading and employment and will not generate scattered development.

PANAEWA (WAIAKEA) RESIDENCE LOTS



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PUNA

16. Keaau, 660 acres (A to U)

The 660-acre site comprises three areas which surround the existing town of Keaau and is bounded on the north by Haena Road, on the northeast by the Puna Sugar Company Mill and 8-1/2 Mile Camp, on the southwest by 9-1/2 Mile Camp, on the west by the University of Hawaii Experimental Farm.

The proposed reclassification of Keaau from the Agricultural District to the Urban District meets the criteria for Urban Districts contained in Section 205-2(b), HRS: Urban districts shall include . . . a reserve area for foreseeable urban growth.

The proposed reclassification will impact favorably the following area of statewide concern set forth under Section 205-17, HRS, Provision of employment opportunities and economic development; and Provision for housing opportunities for all income groups, particularly the low, low-moderate and gap groups.

The proposed land use district boundary amendment meets the following standards for determining Urban District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-18(2) The area includes taking into consideration the following specific factors:

- (A) proximity to centers of trading and employment except where the development would generate new centers of trading and employment;
- (B) proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks and police and fire protection; and
- (C) sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection.

Section 15-15-18(3) The area includes lands with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami, unstable soil conditions, and other adverse environmental effects.

Section 15-15-18(4) In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on State or County general plans.

Section 15-15-18(5) The area includes lands in appropriate location for new urban concentrations and shall give consideration to areas of urban growth as shown on State and County general plans.

Section 15-15-18(6) The area may include lands which do not conform to the standards in paragraphs (1) to (5):

- (A) When surrounded by or adjacent to existing urban development; and
- (B) Only when those lands represent a minor portion of this district.

Although the area proposed for reclassification to the Urban District does not include lands characterized by "city like" concentrations of people, structures, streets, urban level of services and other uses, the lands are adjacent to urban lands having these "city like" characteristics.

Section 15-15-18(7) The area includes lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services.

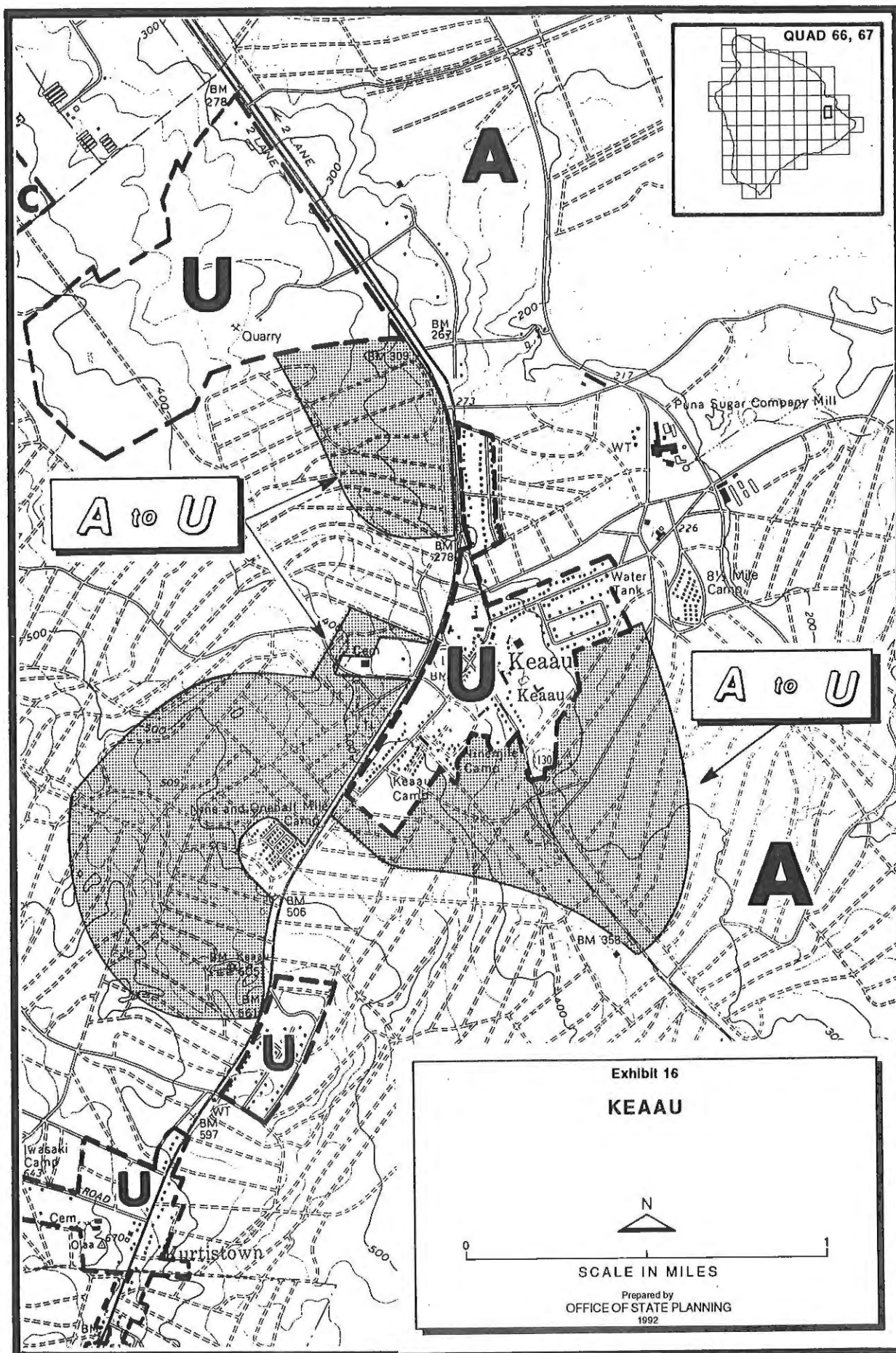
The proposed reclassification to Urban will favorably impact the provision for employment opportunities and economic development and housing opportunities for all income groups. The proposed reclassification is consistent with the Puna Community Development Plan, 1979³¹. The proposed urbanization will be adjacent to existing urban areas and, therefore, close to basic services and centers of trading and employment and will not generate scattered development.

With an 83 percent increase in population from 1980 to 1990, the Puna district is the second fastest growing region on the island of Hawaii. This rapid growth is expected to continue and even to accelerate. Due to the youthfulness of the population, the fertility rate is the highest in the State, averaging four children per family. Responding to the needs of this rapidly growing population is all the more difficult with the population so widely dispersed throughout the district and in areas where most of the lots are zoned for agriculture and serviced by inadequate infrastructure. The town of Keaau is located along a major highway with adequate infrastructure, close to Hilo, and relatively central in its location to other widely dispersed villages. Reclassification of agricultural lands adjacent to the town and directing urban expansion around the town of Keaau would make it easier for State and County to meet the social and physical infrastructure needs of a rapidly growing population.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the socio-cultural advancement-housing, Section 226-13 and 19, HRS, including but not limited to, encouraging urban developments in close proximity to existing services and facilities; achieving orderly development of residential areas sensitive to community needs and other land uses; and promoting design and location of housing developments, taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

³¹ Puna Community Development Plan, prepared for Planning Department, County of Hawaii, 1979, by a joint venture of Hiroshi Kasamoto, Inc. & P. Yoshimura, Inc.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to encouraging planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resources capacities and reflect the needs and desires of Hawaii's people, encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present such as protection of important agricultural land or preservation of lifestyles, and making available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the Agricultural District.



17. Olaa West, 445 acres, (A to C)

The 445-acre parcel is located northeast of Kilauea Crater and is bounded on the southwest by the Kau/Puna district boundary, on the north by Upper Olaa Forest Reserve, on the northeast by Wright Road and Kilauea Settlement Lots, and Olaa Summer Lots on the southeast.

The proposed reclassification of Olaa West from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for parklands, wilderness reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; forestry; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing wilderness reserves, and for conserving natural ecosystems of endemic plants, and wildlife, for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The area contains habitat for at least 10 species of native forest birds and essential habitat for high densities of the endangered Hawaiian creeper, Hawaiian akepa, akiapolau and ou. The area has been identified as having medium concentrations of endemic plant taxa which are listed or under review for endangered or threatened status.

The reclassification area includes the Olaa West unit of Hawaiian Volcano Observatory in the Kilauea Crater and Volcano quadrangles. The Olaa West unit has been fenced and cleared of pigs by the National Park Service and the native forest is starting to recover. Other portions of the proposed area are mapped as native forest by the USFWS and are surrounded by Conservation District lands in Olaa Forest Reserve, Puu Makaala Natural Area Reserve, and the Observatory.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources; promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.

Exhibit 17

OLAA WEST

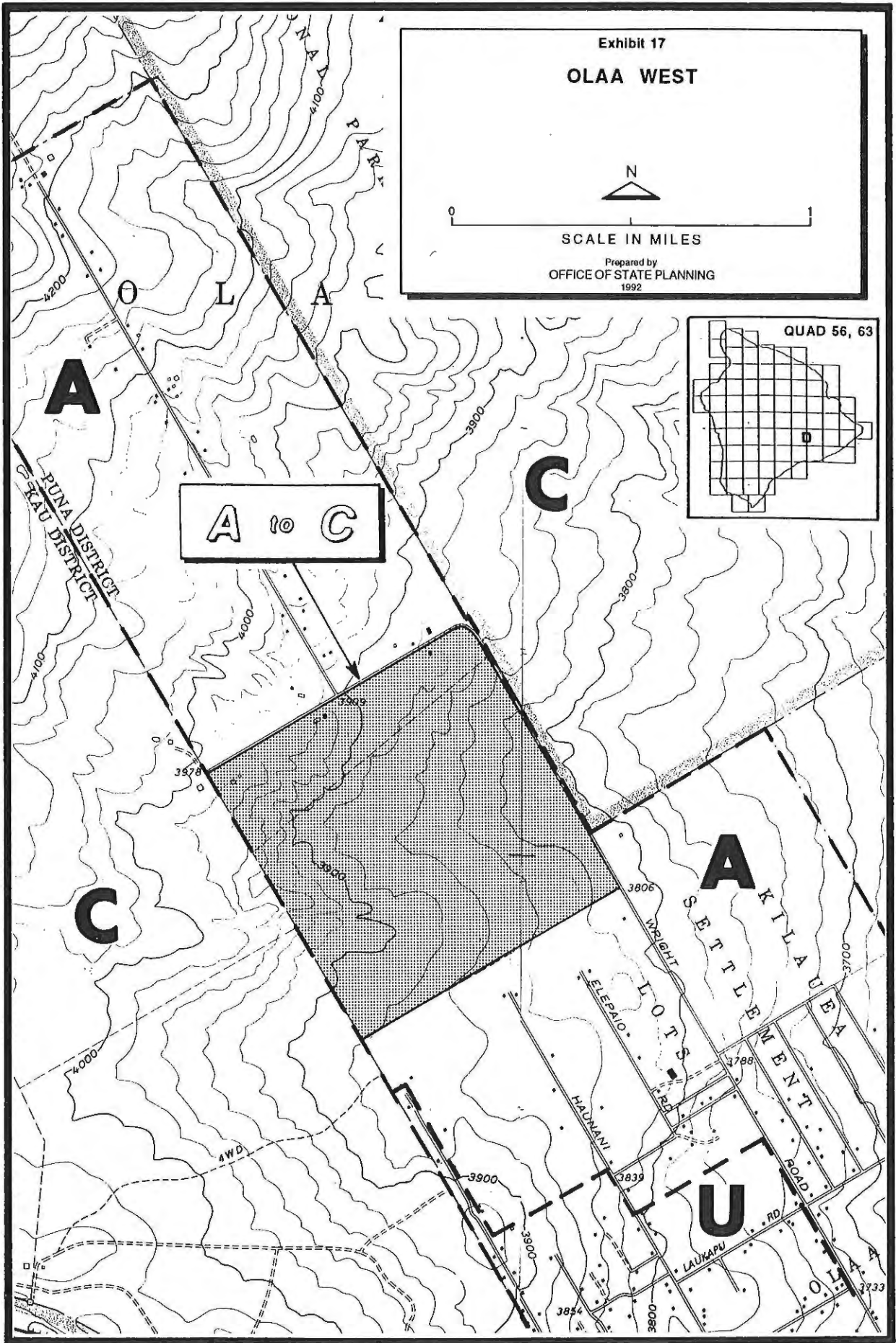
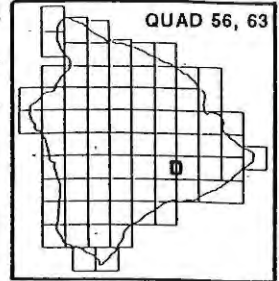


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SCALE IN MILES

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QUAD 56, 63



KAU

18. Kilauea-Keauhou, 18,627.99 acres (A to C)

The 18,627.99-acre area is located northwest of Kilauea Crater and is bounded on the northwest by the North Hilo/Kau district boundary and the lava flow of 1942, and on the northeast and southeast by the existing Conservation District boundary.

The proposed reclassification of Kilauea-Keauhou from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; wilderness reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; forestry; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance. The area includes lands necessary for conserving natural ecosystems of endemic plants, and wildlife.

Section 15-15-20(5) The area includes lands necessary for providing wilderness reserves, and for conserving natural ecosystems of endemic plants, and wildlife, for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use, except when those lands constitute areas not contiguous to the Conservation District.

The area contains intact native forest and essential habitat for six endangered bird species and five rare plant species.

Kilauea-Keauhou forms the core area lying at the center of a critically important unit of managed native ecosystems. Natural communities provide habitat for six endangered bird species, endangered Hawaiian bats, and five rare plant species, including the endangered Vicia menziesii and

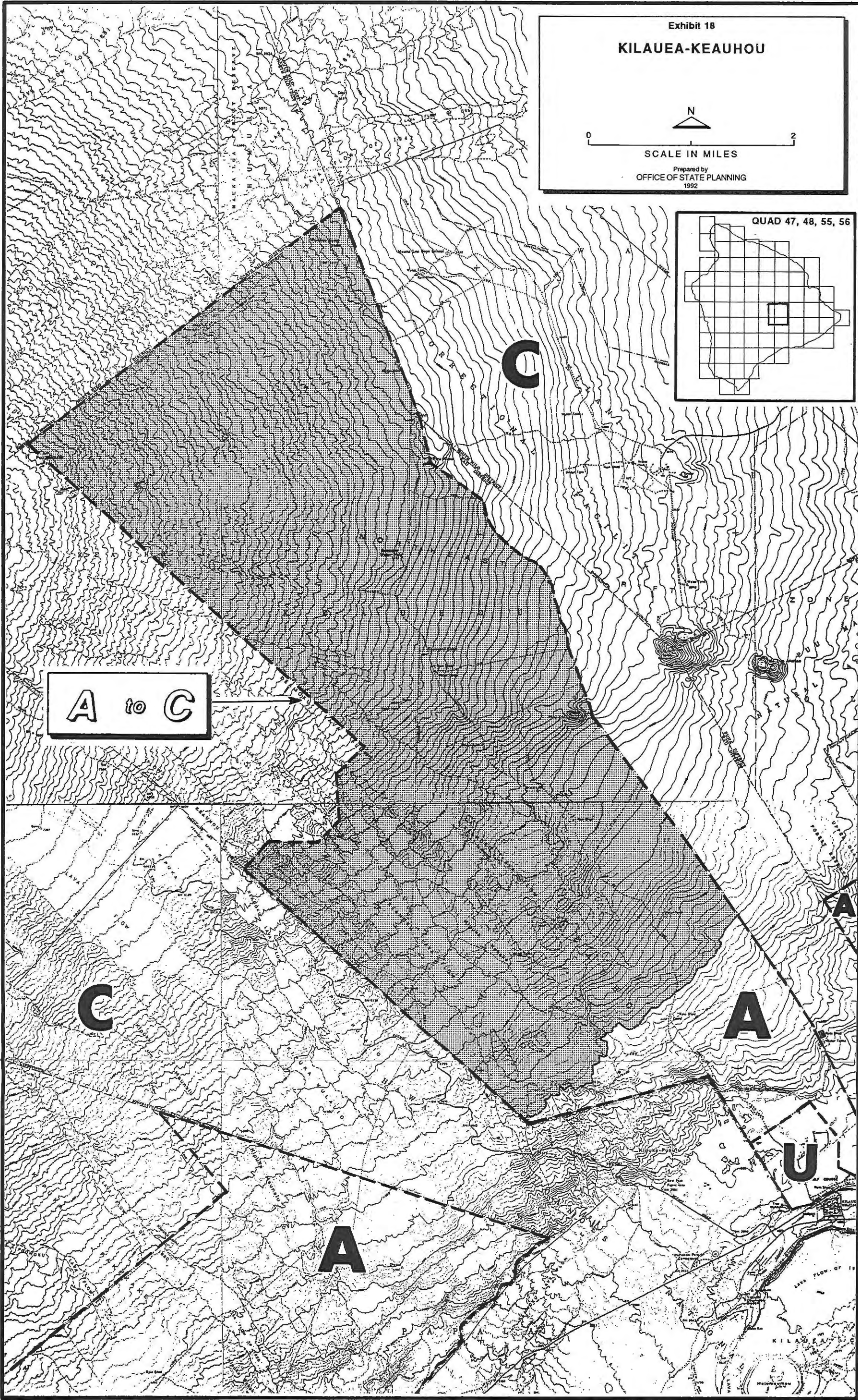
three plant species being considered for listing (Clermontia lindseyana, Phyllostegia racemosa and Asplendium schizophyllum). The area has medium and high concentrations of plant taxa which are listed or under review for endangered or threatened status according to DLNR's Threatened and Endangered Plant Fire Map. Three endangered forest birds--akepa, akiapolaau and Hawaiian creeper--maintain a stronghold population above approximately 4,500 ft. elevation. The reclassification would provide contiguous conservation land from the Mauna Loa Strip section of the National Park across Keauhou Ranch, to the proposed USFWS Kilauea Forest Refuge, the Puu Makaala Natural Area Reserve to the Olaa Forest section of the National Park. This would constitute the largest and perhaps the most significant area of upper elevation protected native forest in the State. More common native birds--amakihi, apapane, elepaio, iiwi, omao, and the endangered io--occupy the forest below 5,000 ft. in elevation. This area would provide a habitat corridor for birds passing between Puu Makaala Natural Area Reserve, Kulani, and Ainahou, and it would halt ongoing fragmentation of this otherwise intact native ecosystems. Kilauea-Keauhou has been proposed for a national wildlife refuge (Environmental Assessment, Proposed Keauhou-Kilauea Forest National Wildlife Refuge, USFWS, 1989), and its protection is called for by the Hawaii Forest Bird Recovery Plan.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources; promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The portion of this area known as the Kilauea Forest is already in the Conservation District. The portion known as Keauhou Ranch is in the Agricultural District and is recommended for reclassification to the Conservation District. The proposed area is currently in ranch use.

However, the Kamehameha Schools/Bernice Pauahi Bishop Estate has initiated plans to actively manage this area for forestry and biological, educational and research purposes. In 1992, the Kamehameha Schools/Bernice Pauahi Bishop Estate announced that it would stop logging in this area. Therefore, this area is identified as a Priority #2 recommendation.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.



19. Hawaii Volcanoes National Park - Portion, 6,324 acres (A to C)

The 6,324-acre parcel is located between the 800-foot and 3,500-foot level within the Hawaii Volcanoes National Park situated below the Kilauea Caldera and bounded on the east by the Puna/Kau district boundary, on the southeast by Holei Pali, on the southwest by the Makahanu Pali and Pueo Pali, and on the west by the Halape Trail.

The proposed reclassification of this portion of the Hawaii Volcanoes National Park from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; Maintenance of valued cultural, historical, or natural resources; and Maintenance of other natural resources relevant to Hawaii's economy.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance.

Section 15-15-20(5) The area includes lands necessary for providing wilderness reserves.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The proposed reclassification would conform with surrounding Conservation classification of lands within the Volcanoes National Park and County General Plan Conservation designation for the area. The Hawaii County General Plan designates the area "Open."

This nearly rectangular shape is a part of the Hawaii Volcanoes National Park. The proposed reclassification would make this area consistent with the surrounding Conservation land use designation.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking the preservation and conservation of significant natural resources, and promoting the

preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.

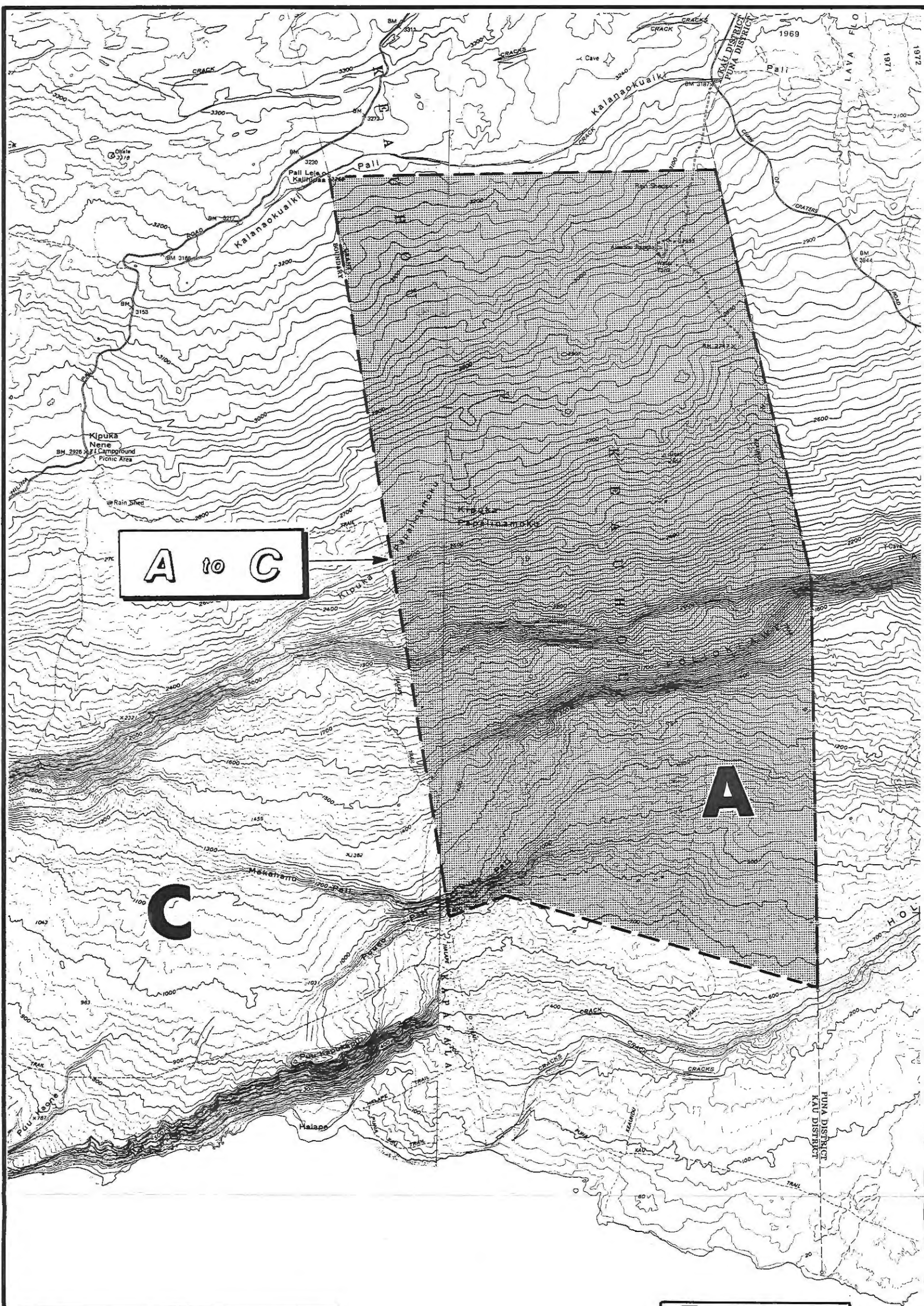
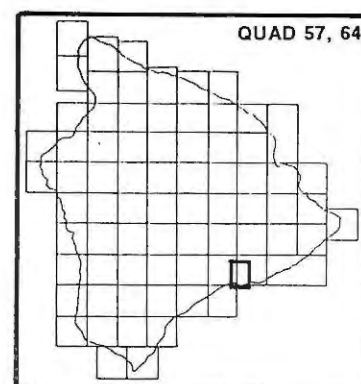


Exhibit 19
HAWAII VOLCANOES NATIONAL PARK
(PORTION)



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20. Moaula (Kau Forest Reserve Additions), 809 acres (A to C)

The 809-acre parcel is located approximately between the 2,400-foot and the 2,900-foot level within the Makaka Kopu Moaula ahupuaa. The parcel is below Paauau Gulch on the north, is slightly above Moaula Gulch on the southwest, and is approximately bounded by the Kau Forest Reserve on the northwest.

21. Kaalaiki-Ninole (Kau Forest Reserve Additions), 3,661.21 acres (A to C)

The four parcels totalling 3,661 acres are bounded on the northeast by Enuhe Ridge, by the eastern boundary of the Kau Forest Reserve, and by Ninole Wailau Homesteads on the east.

The proposed reclassification of additions to the Kau Forest Reserve from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; providing wilderness reserves; conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness reserves, and for conserving natural ecosystems of endemic plants and wildlife, for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The area contains intact native forest with less common and rare native forest bird habitat, public hunting for pigs and goats and areas for forestry management.

Additions to the State forest reserves provide wildlife habitats, watershed, recreational opportunities, wilderness experience and scenic amenities.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.

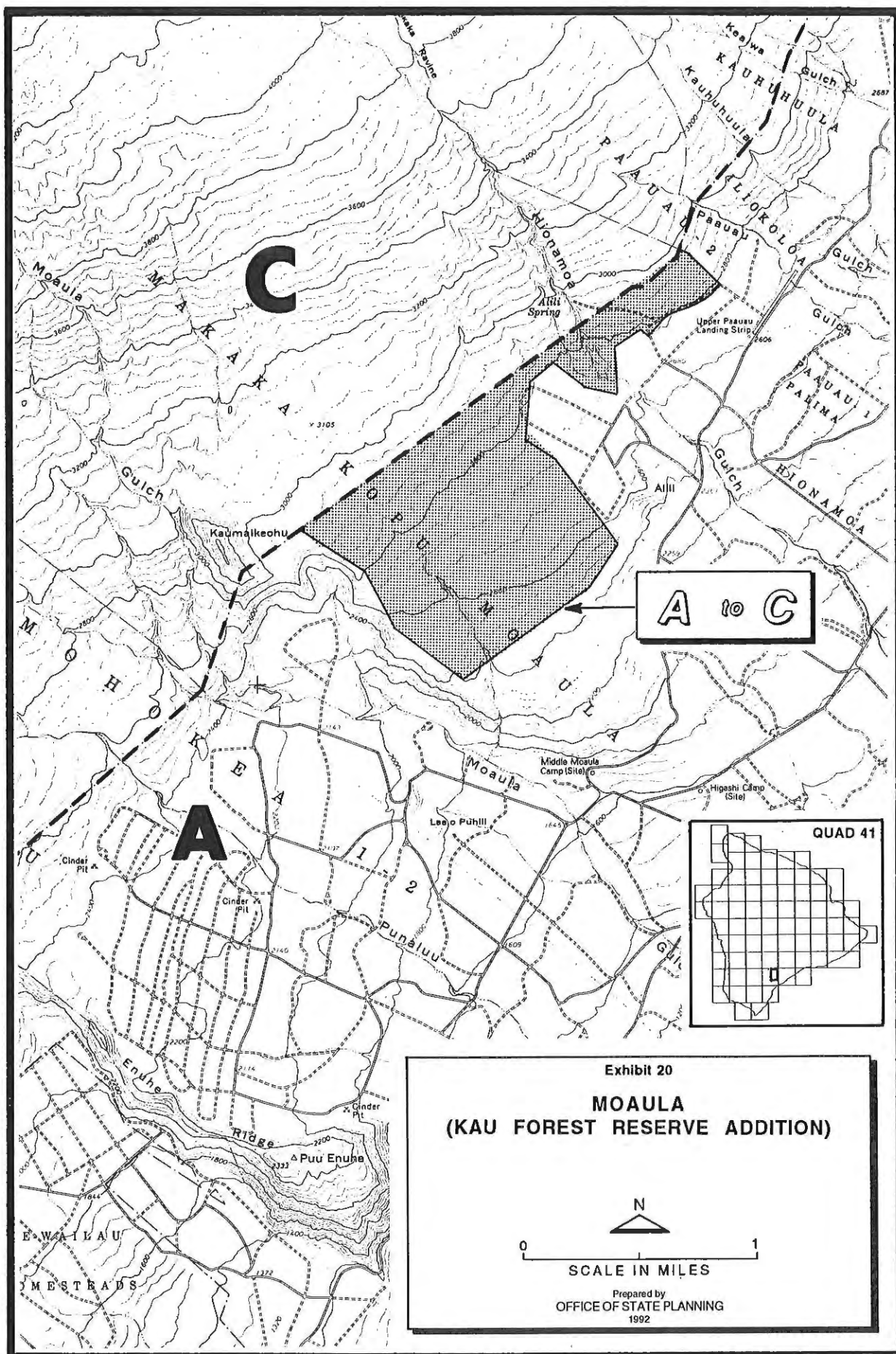
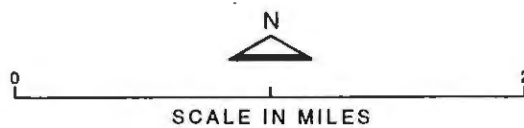
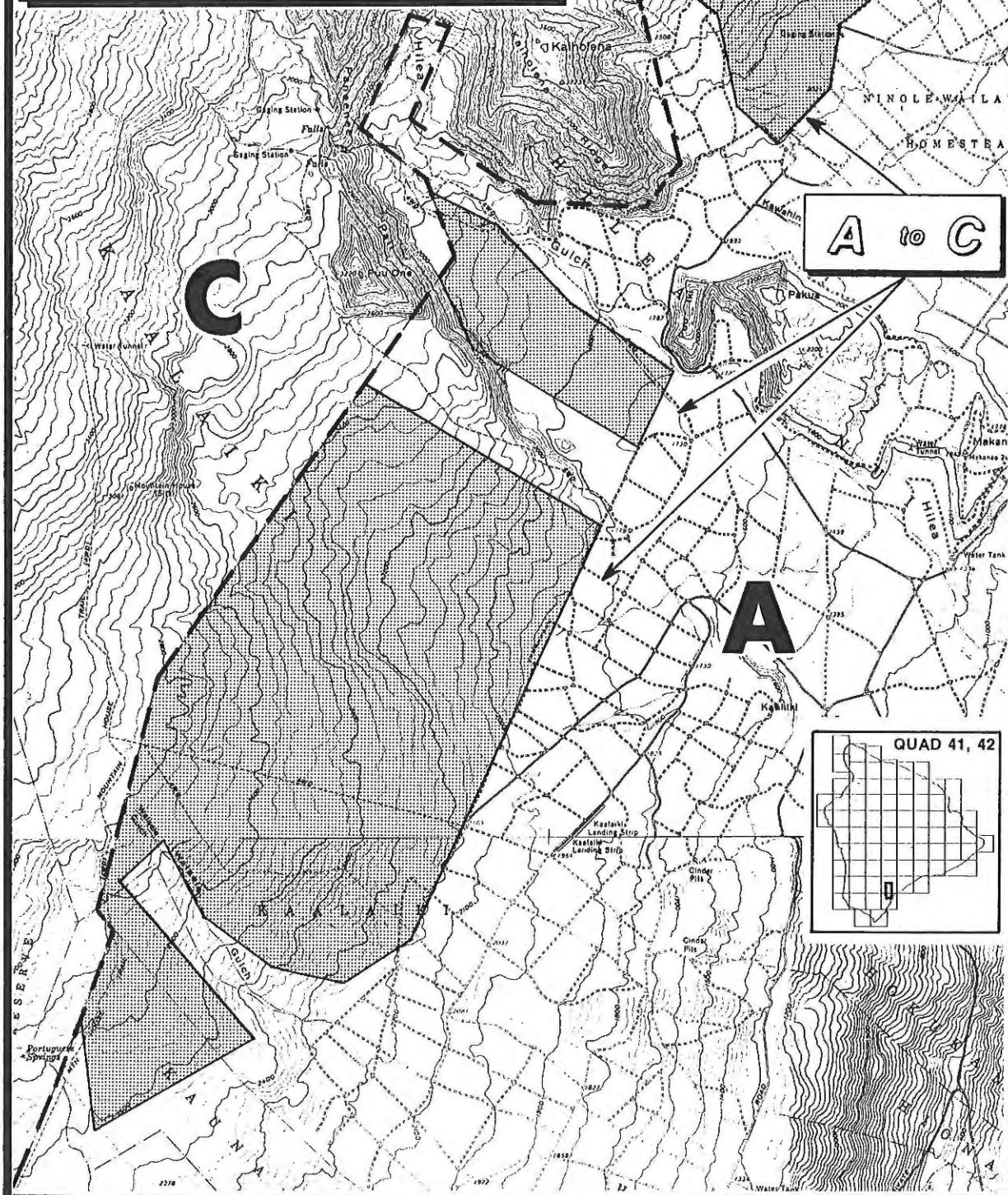


Exhibit 21

KAALAIKI-NINOLE
(KAU FOREST RESERVE ADDITIONS)



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SOUTH KONA

22. Honomalino (South Kona Forest Reserve Addition), 2,701.08 acres (A to C)

The 2,701.08-acre parcel is found within the ahupuaas of Hoopuloa and Honomalino, situated approximately between the 1,600-foot and 3,600-foot level bounded on the west by Mamalahoa Highway, on the north by the Papa 2 ahupuaa and on the south by the Kapua ahupuaa. The parcel's boundaries are not contiguous with any established forest reserve.

23. Oleomoana (South Kona Forest Reserve Addition), 104 acres (A to C)

The 104-acre parcel is located between the 5,040-foot and 5,240-foot level bounded on the west by the South Kona Forest Reserve, on the south by the Kaapuna Lava Flow of 1950, and on the east by the Kau/South Kona district boundary.

24. Kaohe-Kukuioape (South Kona Forest Reserve Addition), 1,012.41 acres (A to C)

The two parcels totalling 1,013 acres are contiguous with the eastern boundaries of the South Kona Forest Reserve. Kaohe, the smaller of the two parcels, is 408 acres and is located between the 5,080-foot and 5,920-foot level within the ahupuaa of Kaohe 1-3, bounded on the east by the Kau/South Kona district boundary, on the south by Kaohe 4 ahupuaa, on the west by the South Kona Forest Reserve, and on the north by Pahoehe ahupuaa. Directly to the south is the Kukuioape parcel totalling 604 acres. This parcel is bounded on the north by Kaohe 4 ahupuaa, on the east by the Kau/South Kona district boundaries, by Oleomoana ahupuaa to the south and the South Kona Forest Reserve on the west.

The proposed reclassification of additions to the South Kona Forest Reserve from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; providing wilderness reserves; conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness reserves, and for conserving natural ecosystems of endemic plants and wildlife, for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

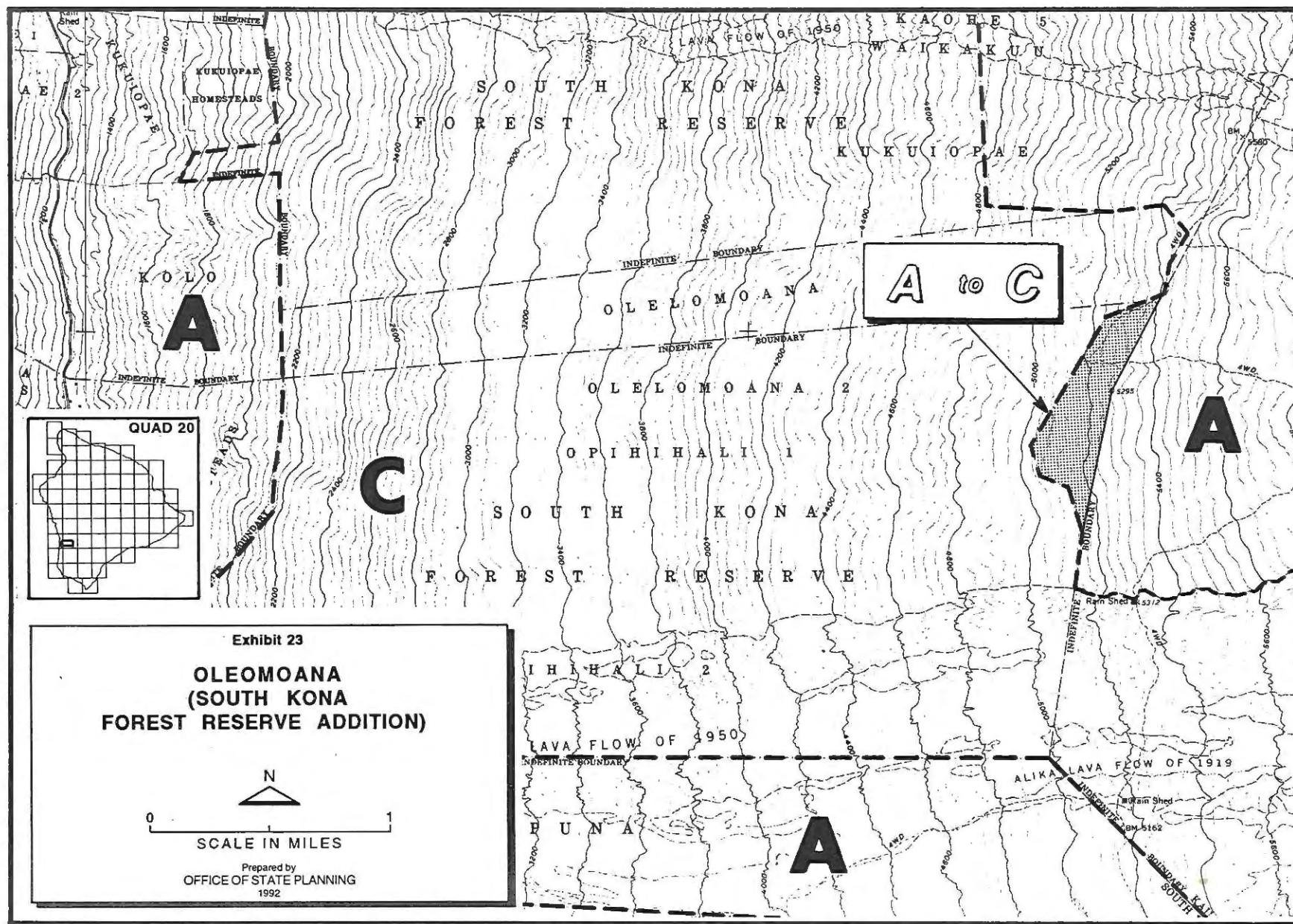
Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

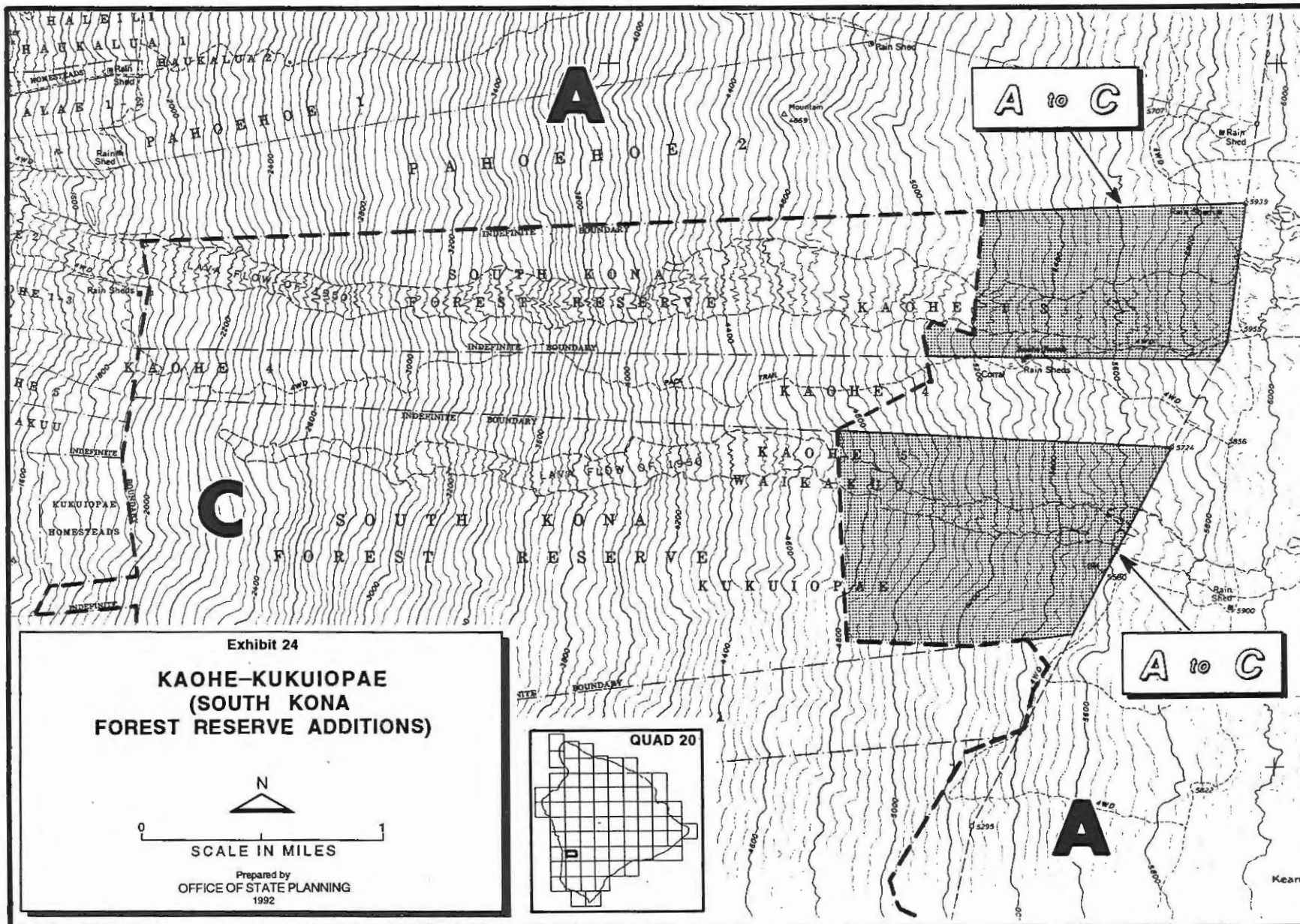
The area contains intact native forest with less common and rare native forest bird habitat, public hunting for pigs and goats and areas for forestry management.

Additions to the State forest reserves provide wildlife habitats, watershed, recreational opportunities, wilderness experience and scenic amenities.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.





NORTH KONA

25. Honuaula Tract 3 Extension, (North Kona Forest Reserve Addition), 78.4 acres (A to C)

The 78.4-acre parcel is located between the 1,680-foot and 2,400-foot level within the Hienaloli ahupuaa. An intermittent stream bed defines its southern boundary. The northern boundary of the parcel is defined by the southern boundary of Honuaula ahupuaa. The one-mile long by approximately 500-foot wide parcel is located approximately a quarter of a mile east of Keopu Cemetery and Mamalahoa Highway.

26. Honuaula Tract 3 (North Kona Forest Reserve Addition), 2,976.1 acres (A to C)

The 2,976.1-acre parcel is located approximately one and a quarter mile mauka of Palani Road, bounded on the north by Keahuolu ahupuaa, on the east by Honuaula Tract 2, on the south by the ahupuaa of Puaa 1 and the North Kona Forest Reserve and extends west to east from the 2,400-foot level to the 4,600-foot level.

27. Honuaula Tract 2 (North Kona Forest Reserve Addition), 1,608.5 acres (A to C)

The 1,608.5-acre parcel is located adjacent to and east of Honuaula Tract 3. Starting at the 4,600-foot level, the parcel is bounded on the north by the Honokohau ahupuaa, by Puaa ahupuaa to the south, the Honuaula Tract 3 to the west, and the Kaupulehu and Honuaula Forest Reserve on the east.

28. Makaala-Ooma Mauka Tract (North Kona Forest Reserve Addition), 1,252 acres (A to C)

The 1,252-acre parcel is located mauka of the Hawaii Belt Road and bounded north to south on the west by the Haleohiu Homesteads, Hamanamana Homesteads, Kalaoa Homesteads, Kalaoa-Ooma Homesteads, and Kohanaiki Homesteads, to the south by the Kohanahiki Homesteads and Kaloko Mauka and bounded by Kau ahupuaa to the north, and extends east to approximately the 3,240-foot to 3,400-foot level.

The proposed reclassification of the North Kona Forest Reserve Additions from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving and providing wilderness reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; forestry; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities; and other permitted uses not detrimental to a multiple use conservation concept.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness reserves, and for conserving natural ecosystems of endemic plants, and wildlife, for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The lands contain areas for watershed protection, public hunting and recreation and opportunities to reestablish koa forest on the mauka portion, and reforest with non-active species on the makai portion. The Alala Recovery Plan identifies portions of the area as essential habitat for the alala. According to the Threatened and Endangered Plant and Fire Map, DLNR, the area has been identified as having high concentration of plant taxa listed or under review for endangered or threatened status.

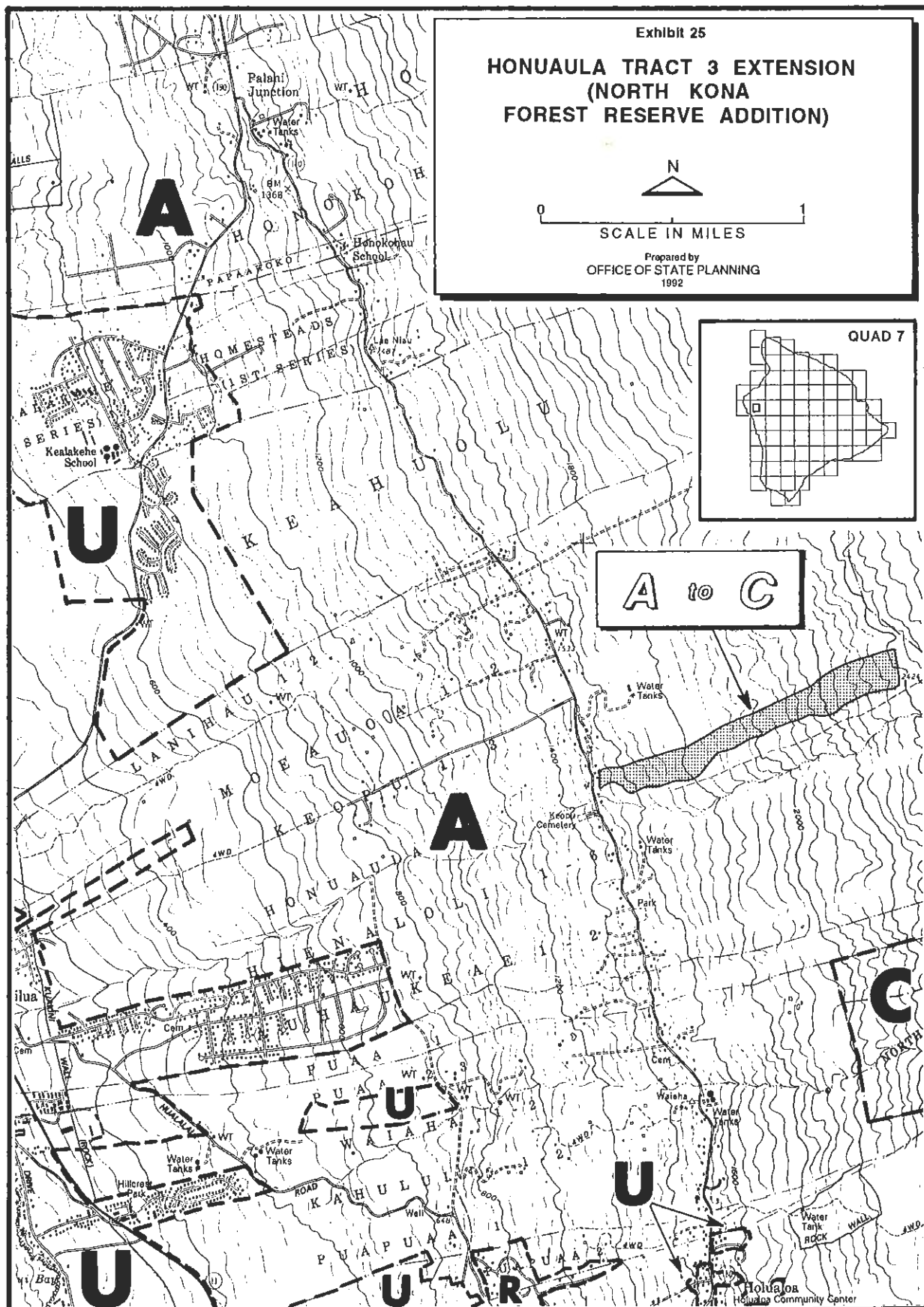
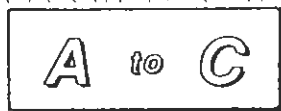
The proposed additions to the North Kona State forest reserves will protect wildlife habitats and watersheds, and provide recreational opportunities or wilderness experience and scenic amenities.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with

endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.

**HONUAULA TRACT 3 EXTENSION
(NORTH KONA
FOREST RESERVE ADDITION)**



A to C

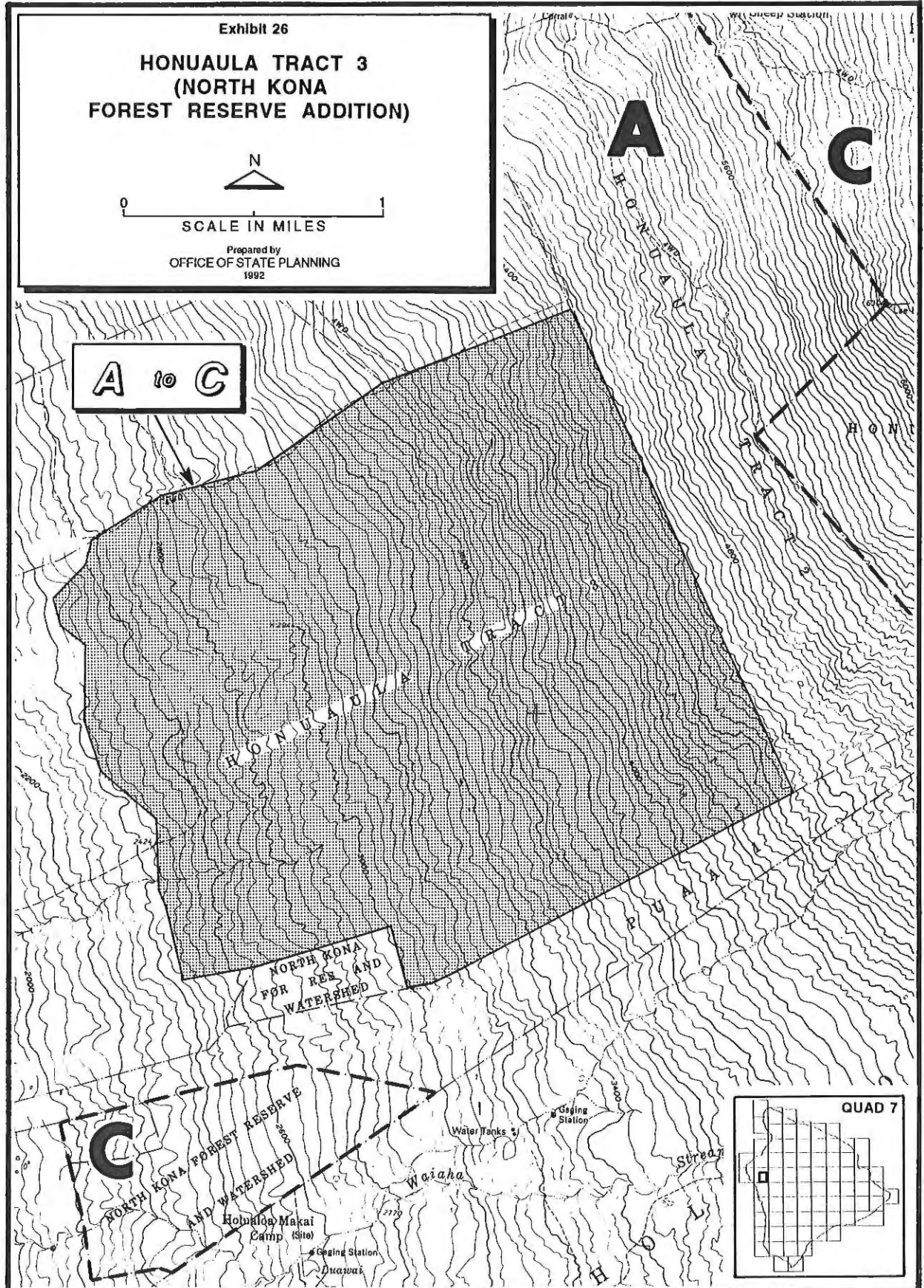
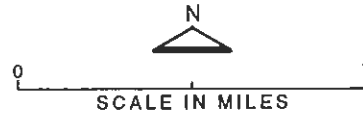
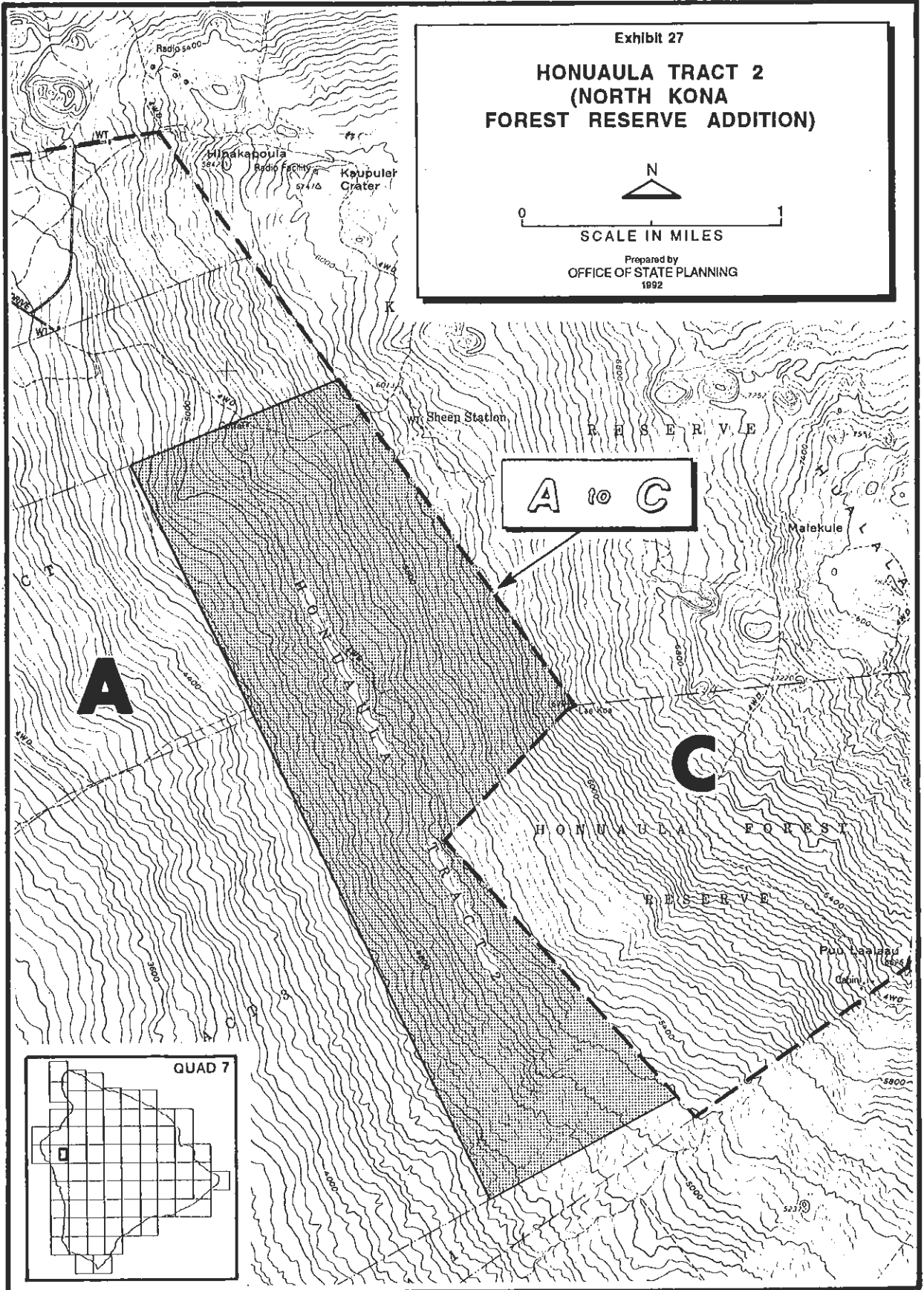


Exhibit 27

**HONUULA TRACT 2
(NORTH KONA
FOREST RESERVE ADDITION)**



Prepared by
OFFICE OF STATE PLANNING
1992



29. Keolonahihi/Keakealaniwahine Complex, 32 acres (A to C)

The 32-acre parcel is located mauka of Alii Drive at Komoa Point, bounded on the east by Komoa Point State Historical Park, on the south by Kaumalumalu ahupuaa, on the north by Holualoa 3, and extends north to a little beyond the 40-foot level.

The proposed reclassification of the mauka portion of Keolonahihi/Keakealaniwahine Complex from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include . . . areas necessary for preserving scenic and historic areas . . . and areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

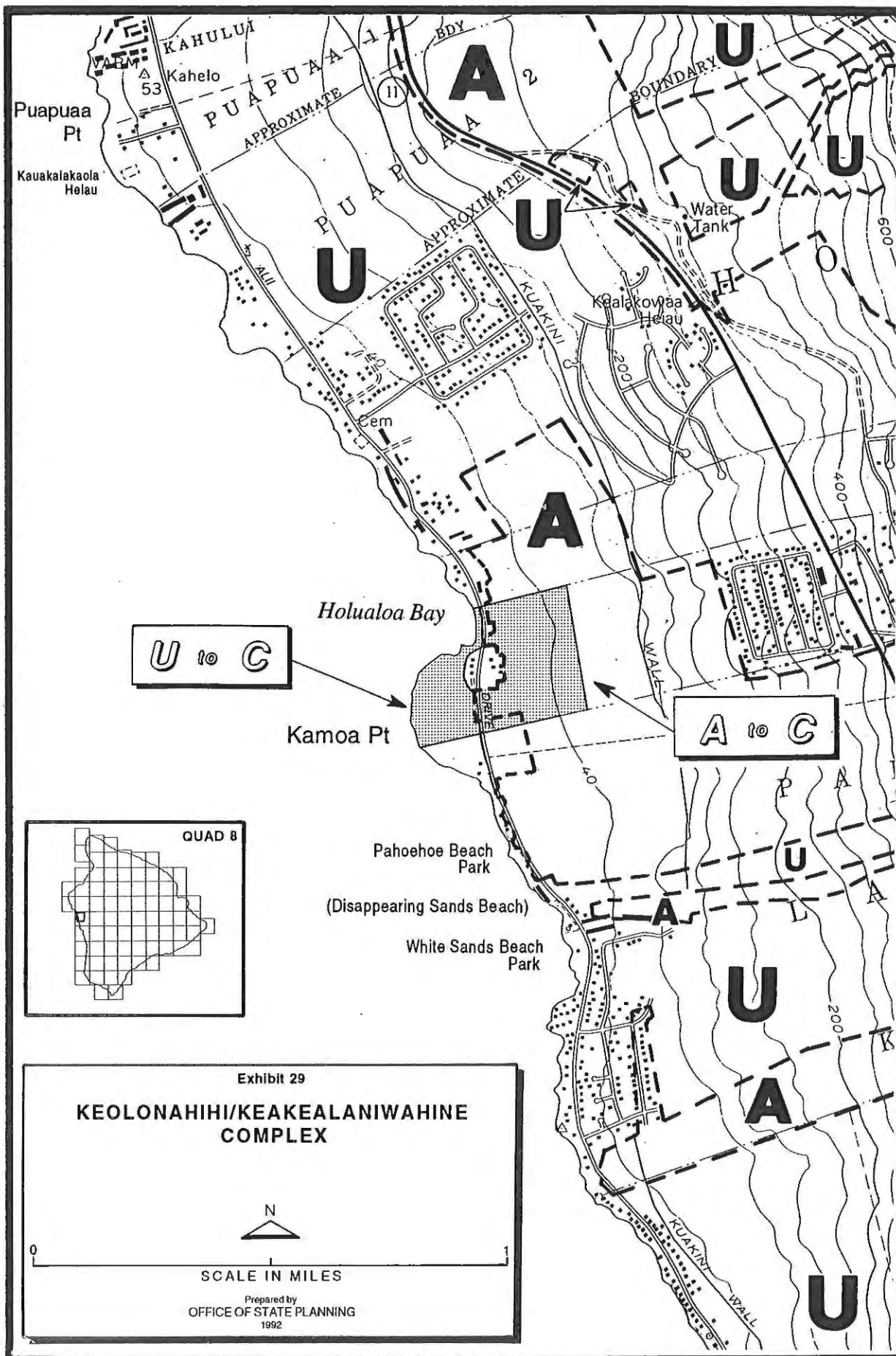
Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of cultural, historic or archaeological sites . . .

Section 15-15-20(5) The area includes lands necessary for providing parklands . . .

Keolonahihi/Keakealaniwahine Complex comprises the existing Keolonahihi State Historical Park which is on the National and Hawaii Registers of Historic Places where there are the remains of five heiaus, surfing-related sites, bathing pools, and other important archaeological sites, and an area adjacent to and mauka of the park known as Keakealaniwahine Residence. Keolonahihi State Historical Park located on Komoa Point within the ahupuaa of Holualoa contains five major heiaus and related structures associated with the royal center once located at Holualoa. According to oral histories, the center was predominantly used in the reigns of the rulers Keakamahana and her daughter, Keakealaniwahine. This center was one of a set of royal centers along the Kona coast used by the rulers of Hawaii during the later prehistoric period. These areas usually included the ruler's residence, nearby residences of high chiefs, and residences of the priests. Keakealaniwahine's residential site is located just inland of Alii Drive. The site includes a large enclosure, and oral histories indicate that this was the residential area of two chiefesses--Keakamahana and Keakealaniwahine--in late prehistory. Oral histories also made references to the presence of a place of refuge or puuhonua.

The Keakealaniwahine residential site has been determined to be significant and meets all five criteria used in evaluating a site significance: association with famous people or deities (e.g., Keolonahihi, Keakamahana, Keakealaniwahine and Kamehameha I); association with a broad pattern of prehistory (the complex religious/political systems of West Hawaii during the prehistoric period); cultural significance (the significance of the ruler's residence and royal centers); information content (vital information on ruler's residence and royal centers); and its evaluation as an excellent example of site type (a royal residential site possibly including a refuge area contained within a royal center).

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment-scenic, natural beauty, and historic resource, Section 226-12, by protecting special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.



30. Puuwaawaa, 12,634.33 acres (A to C)

The proposed reclassification of the Puuwaawaa area from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas, providing wilderness reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, and wildlife, for forestry and other related activities to these uses . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The Puuwaawaa area has scenic, recreational and wildlife resources. The area contains ohia, koa, lama/kauila and mamane forests, clusters of uhiuhi trees and a unique geological trachyte flow--natural resources which combine to provide a wilderness experience and an environment of natural beauty. Expansion of the Conservation District at Puuwaawaa is recommended to protect these resources.

The quality of the forests in the area ranges from relatively intact to highly grazed and fire impacted. According to the Threatened and Endangered Plant Fire Map, prepared by the Forestry and Wildlife Division, Department of Land and Natural Resources, Puuwaawaa has been identified as having a very high concentration of plant taxa listed or under review for endangered or threatened status for the island of Hawaii. The area is critical for erosion and flood protection for developed areas down slope.

Three areas within the Puuwaawaa parcel have been established as critical habitat for the Kokia drynarioides by the U.S. Fish and Wildlife Service. The area provides habitat for two rare and endangered plant species--Kokia drynarioides and Caesalpinea kawaiiensis. Other plants--Colubrina oppositifolia, Pleomele hawaiiensis, Acacia koaia, Chamesyce olowaluana, Hibiscadelphus hualaiensis, Zanthoxylum hawaiiense, and Nothocestrum breviflorum--are listed by the USFWS as either Candidate 1 or are already proposed for the endangered species status. Puuwaawaa is one of only two places on the island where remnants of native dry, lowland forest can be found. Lama/kauila and wiliwili trees are dominant in this area.

The Puuwaawaa Wildlife Sanctuary may represent the best long-term prospect for the re-introduction of crows to the wild. The area above 3,000-foot elevation provides habitat for ten native birds and several endangered wildlife (including nene, io, alala, Hawaiian creeper, akepa, and bat) and plants (Hawaiian vetch, Stenogyne augustifolia, Exocarpos gaudichaudii, Neraudia ovata and Eragrostis deflexa). The area also has potential for passive recreational use provided that this area is compatible with the conservation of rare and endangered plants.

The proposed reclassification area also includes portions of the Kaupulehu lava flow (1800-1801). These lands have poor soils and are of low value for agricultural use. They are also not suitable for Urban designation because of their distance from existing urban areas and lack of infrastructure. The lava flows serve as a buffer area for the rare plants and therefore have been included in the area proposed for reclassification into the Conservation District.*

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with

* Based on discussions with and reviews completed by Dr. Carolyn Corn and Dr. Wayne Takeuchi, Botanists, and Ronald Walker, Wildlife Biologist, Division of Forestry and Wildlife, Department of Land and Natural Resources, September 1991 through February 1992.

endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.

31. Kaupulehu, 3,201.12 approximate acres (A to C)

The proposed reclassification of the Kaupulehu land area from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas, providing wilderness reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, and wildlife, for forestry and other related activities to these uses . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The Kaupulehu area has scenic, recreational and wildlife resources, the area contains ohia, koa, lama/kauila and mamane forests, clusters of uhiuhi tree and a unique geological trachyte flow--natural resources which combine to provide a wilderness experience and an environment of natural beauty. Expansion of the Conservation District at Kaupulehu is recommended to protect these resources.

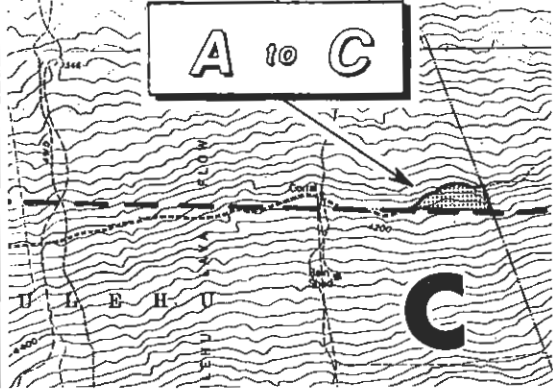
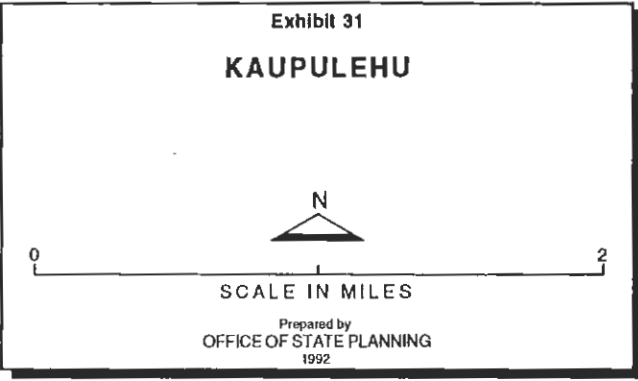
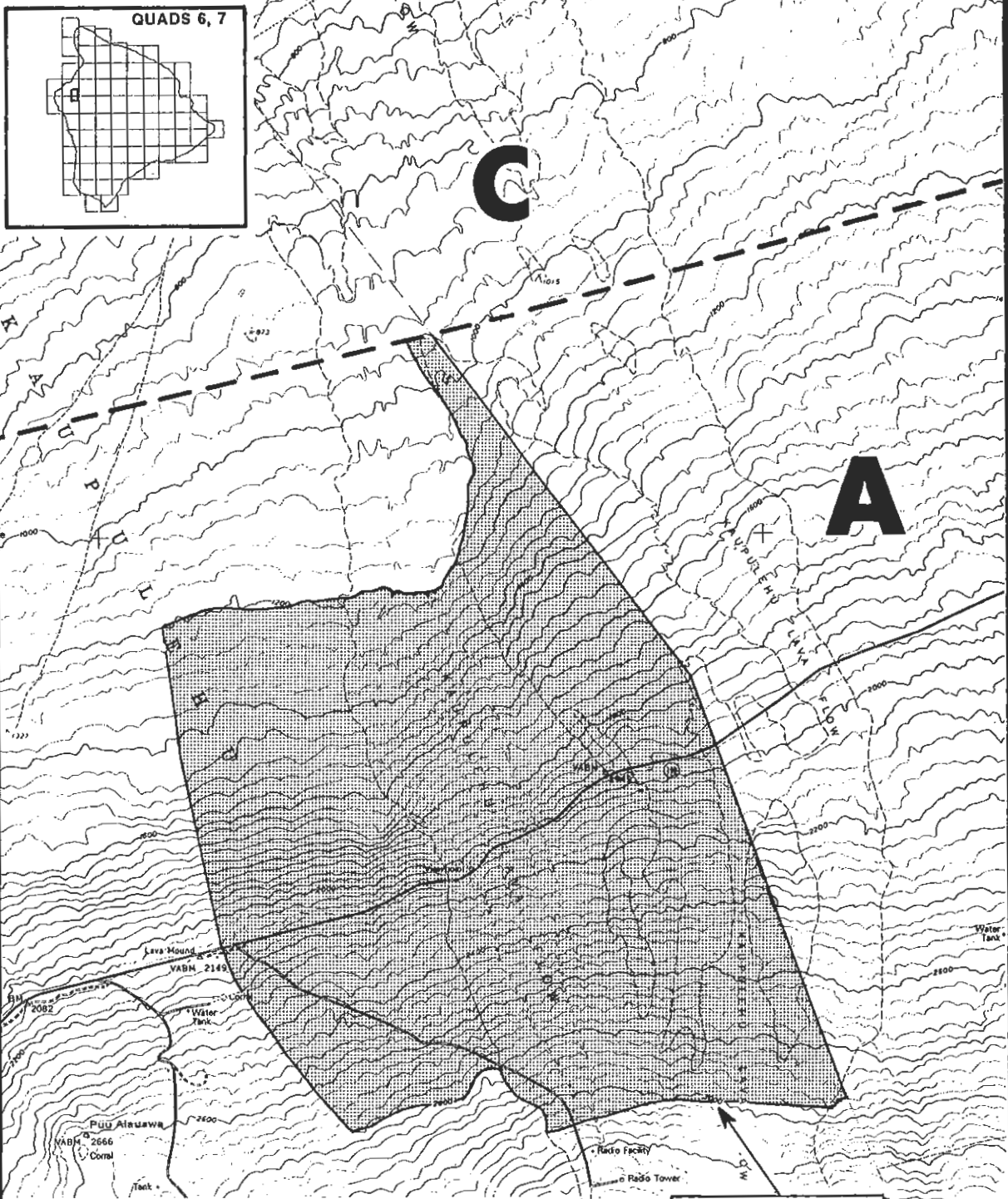
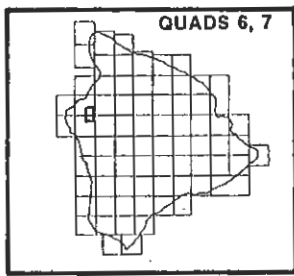
The quality of the forests in the area ranges from relatively intact to highly grazed and fire impacted. According to the Threatened and Endangered Plant Fire Map, prepared by the Forestry and Wildlife Division, Department of Land and Natural Resources, Kaupulehu has been identified as having a very high concentration of plant taxa listed or under review for endangered or threatened status for the island of Hawaii. The area is critical for erosion and flood protection for developed areas down slope.

Three areas within the Kaupulehu parcel have been established as critical habitat for the Kokia drynarioides by the U.S. Fish and Wildlife Service. The area provides habitat for two rare and endangered plant species--Kokia drynarioides and Caesalpinea kawaiiensis. Other plants--Colubrina oppositifolia, Pleomele hawaiiensis, Chamesyce olowaluana, Zanthoxylum hawaiiense, and Nothocestrum breviflorum--are listed by the USFWS as either Candidate I or are already proposed for the endangered species status. Lama/kaula and wiliwili trees are dominant in this area.

The proposed reclassification area also includes portions of the Kaupulehu lava flow (1800-1801). These lands have poor soils and are of low value for agricultural use. They are also not suitable for Urban designation because of their distance from existing urban areas and lack of infrastructure. According to Dr. Carolyn Corn, botanist with the Department of Land and Natural Resources, Division of Forestry and Wildlife, the lava flows serve as a buffer area for the rare plants and therefore have been included in the area proposed for reclassification into the Conservation District.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



32. Area East of Kaloko Fishpond and Honokohau Fishpond, 564.74 acres (U to C)

The 565-acre parcel located makai of Queen Kaahumanu Highway is bounded on the west by Kaloko Fishpond, Honokohau Bay and Honokohau Fishpond, on the south by Kealakehe Homesteads, on the east by Queen Kaahumanu Highway and north by Kohanaiki ahupuaa.

The proposed reclassification of Kaloko and Honokohau Fishponds from the Urban District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for preserving scenic and historic areas, providing parklands, wilderness and beach reserves; conserving indigenous or endemic plants, and wildlife, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes; other related activities. . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic or archaeological sites and sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter. The area includes lands necessary for conserving natural ecosystems of endemic plants, fish and wildlife.

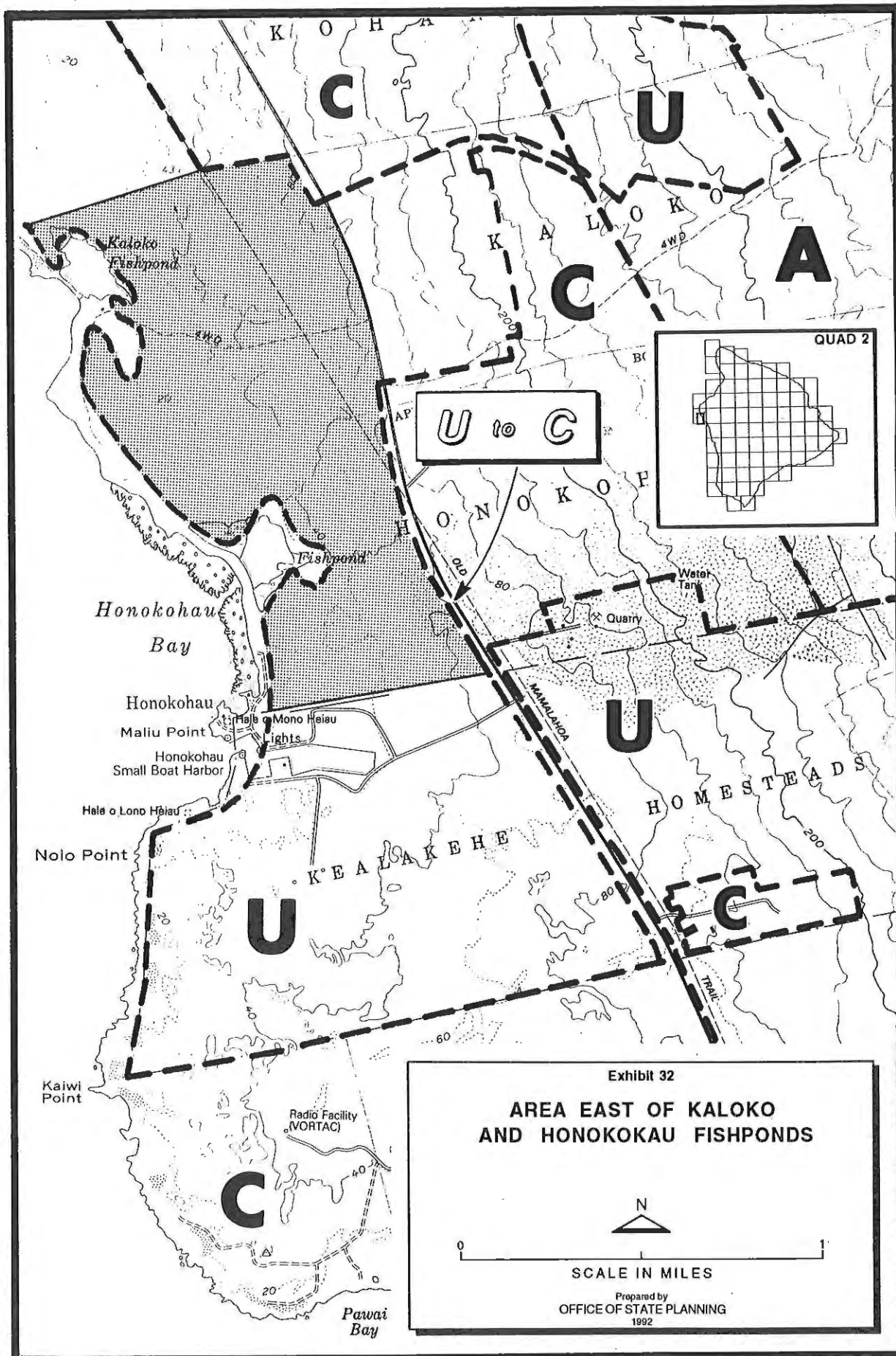
Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife, for forestry and other related activities to these uses . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use, except when those lands constitute areas not contiguous to the Conservation District.

While Kaloko and Honokohau Fishponds and a coastal strip connecting the two are in Conservation, adjacent areas inland of the fishponds are in Urban designation. The area from the proposed Kohanaiki Resort to Mailu Point and inland to Queen Kaahumanu Highway is designated as a National Cultural Park on the County of Hawaii Keahole to Kailua Development Plan. Conservation designation would be consistent with the area's existing use as Kaloko-Honokohau National Historic Park.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, achieving effective protection of Hawaii's unique and fragile environmental resources, managing natural resources and environs to encourage their beneficial and multiple uses without generating costly or irreparable environmental damage, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, seeking the preservation and conservation of significant natural and historic resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



33. Keahole to Kailua, State-owned lands, 1,440 (approx.) acres (A to U) and 1,200 acres (C to U)

The subject properties are located mauka of Keahole Airport bounded on the west by Queen Kaahumanu Highway, Kohanaiki ahupuaa to the south and Kau ahupuaa to the north. The State lands are separated by the urbanized communities in the Kalaoa ahupuaa and the Kona Palisades subdivision.

The proposed reclassification of parcels within the K-K region from the Agricultural and Conservation Districts to the Urban District meets the following standards and criteria for the Urban District contained in Section 205-2, HRS: Urban Districts shall include " . . . a sufficient reserve area for foreseeable urban growth."

The proposed reclassification will impact favorably the following area of statewide concern set forth under Section 205-17, HRS, Provision of employment opportunities and economic development; and Provision for housing opportunities for all income groups, particularly the low, low-moderate and gap groups.

The proposed land use district boundary amendment meets the following standards for determining Urban District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-18(2) The area includes taking into consideration the following specific factors:

- (A) proximity to centers of trading and employment except where the development would generate new centers of trading and employment;
- (C) proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks and police and fire protection; and
- (D) sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection.

Section 15-15-18(3) The area includes lands with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami, unstable soil conditions, and other adverse environmental effects.

Section 15-15-18(4) The land areas are contiguous with existing urban areas and are indicated for future urban use on County general plans.

Section 15-15-18(5) The area are in appropriate location for new urban concentrations and County general plans.

Section 15-15-18(6) The area may include lands which do not conform to the standards in paragraphs (1) to (5):

- (A) When surrounded by or adjacent to existing urban development; and
- (B) Only when those lands represent a minor portion of this district.

Although the area proposed for reclassification to the Urban District does not include lands characterized by "city like" concentrations of people, structures, streets, urban level of services and other uses, the lands are adjacent to urban lands having these "city like" characteristics.

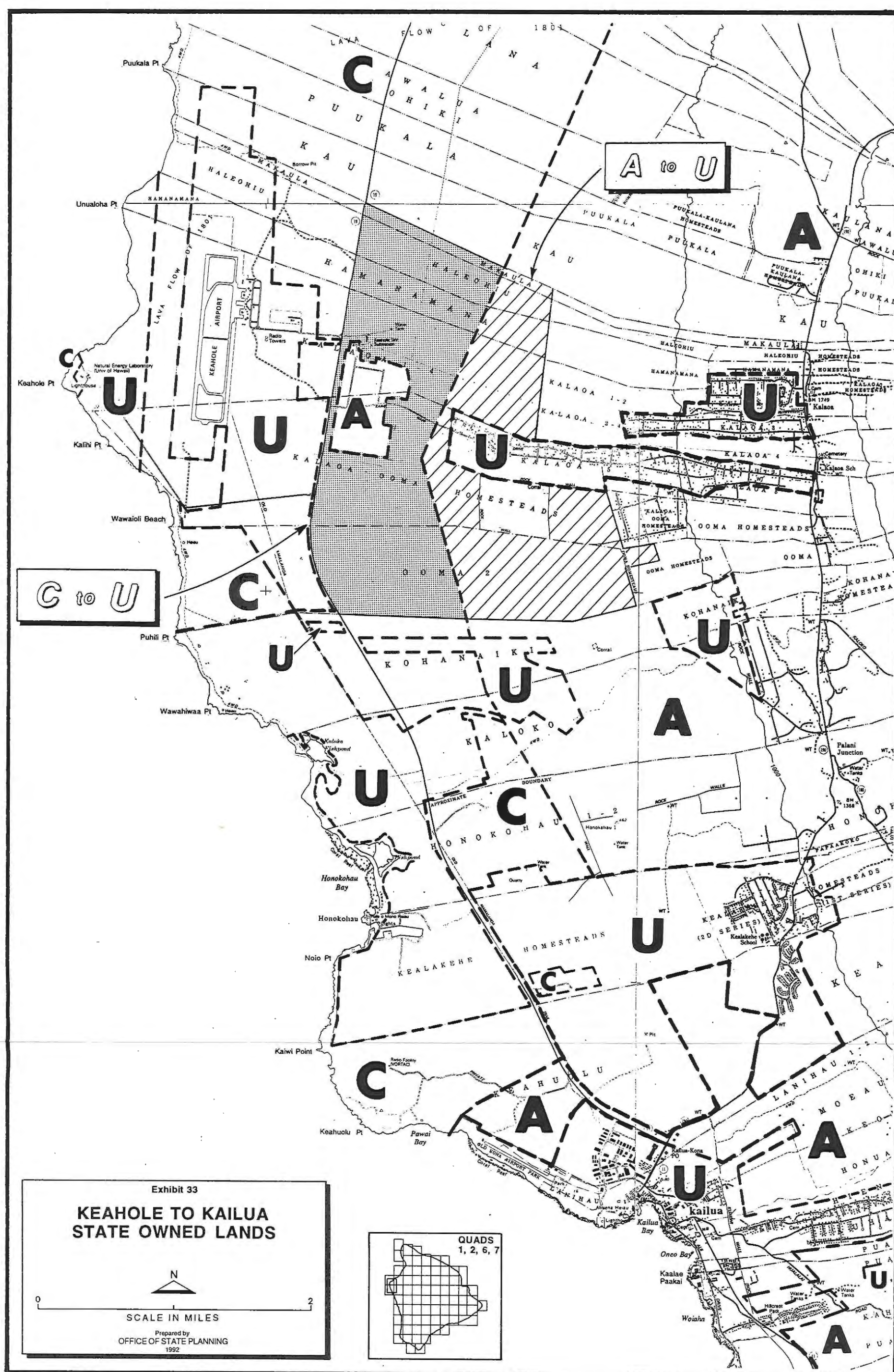
Section 15-15-18(7) The area shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services.

The proposed reclassification to Urban will favorably impact the provision for employment opportunities and economic development and housing opportunities for all income groups.

These are State lands that are recommended for reclassification to Urban to support the development of this area as the Big Island's Second City. Included within the area is the proposed site for the University of Hawaii's second campus in Hawaii County.

The West Hawaii Regional Plan directs future urbanization to the Kailua-Kona to Keahole subregional planning area. The County of Hawaii Keahole to Kailua Development Plan designates the Kailua to Keahole area for residential, commercial, industrial and open/recreation use. Change in designation of this area from Agricultural and Conservation to Urban is consistent with the County's Development Plan and the West Hawaii Regional Plan.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the socio-cultural advancement-housing, Section 226-13 and 19, HRS, including but not limited to, encouraging urban developments in close proximity to existing services and facilities, achieving orderly development of residential areas sensitive to community needs and other land uses, promoting design and location of housing developments, taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.



34. Keahole to Kailua Urban Area, 6,738.45 acres (A to U)
2,825 acres (C to U)

The properties include State and private lands south and northeast of the airport on the makai side of Queen Kaahumanu Highway and mauka lands generally bounded on the west by Queen Kaahumanu Highway and Mamalahoa Highway on the east. A parcel owned by Liliuokalani Trust is bounded on the north by Kealakehe Homesteads, on the west by the coast, the old Kona Airport and Kailua Town to the south, and Queen Kaahumanu Highway to the east.

The proposed reclassification of parcels within the K-K region from the Agricultural and Conservation Districts to the Urban District meets the following standards and criteria for the Urban District contained in Section 205-2, HRS: Urban Districts shall include " . . . a sufficient reserve area for foreseeable urban growth."

The proposed reclassification will impact favorably the following area of statewide concern set forth under Section 205-17, HRS, Provision of employment opportunities and economic development; and Provision for housing opportunities for all income groups, particularly the low, low-moderate and gap groups.

The proposed land use district boundary amendment meets the following standards for determining Urban District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-18(2) The area includes taking into consideration the following specific factors:

- (A) proximity to centers of trading and employment except where the development would generate new centers of trading and employment;
- (C) proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks and police and fire protection; and
- (D) sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection.

Section 15-15-18(3) The area includes lands with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami, unstable soil conditions, and other adverse environmental effects.

Section 15-15-18(4) The land areas are contiguous with existing urban areas and are indicated for future urban use on County general plans.

Section 15-15-18(5) The area are in appropriate location for new urban concentrations and County general plans.

Section 15-15-18(6) The area may include lands which do not conform to the standards in paragraphs (1) to (5):

- (A) When surrounded by or adjacent to existing urban development; and
- (B) Only when those lands represent a minor portion of this district.

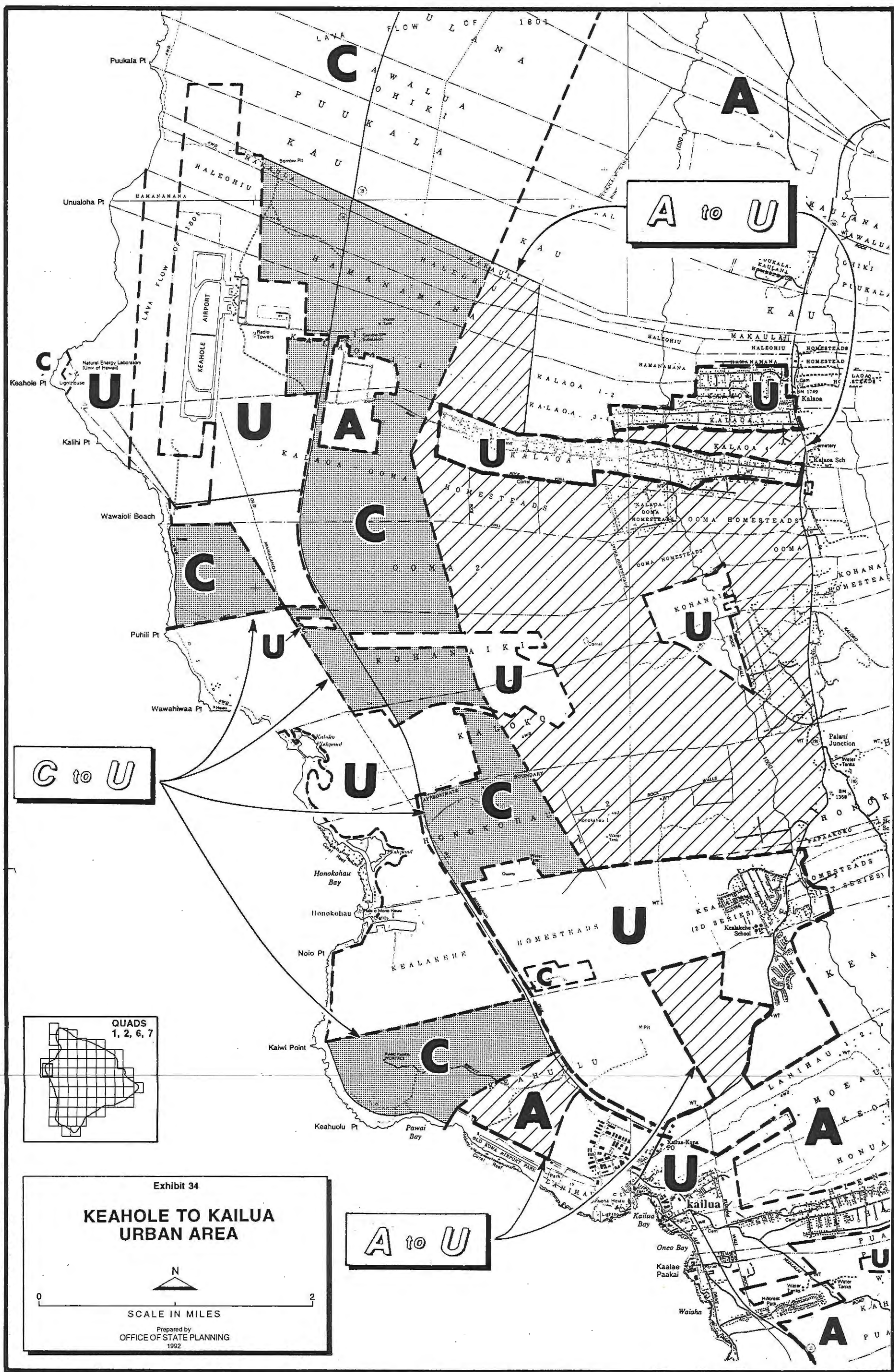
Although the area proposed for reclassification to the Urban District does not include lands characterized by "city like" concentrations of people, structures, streets, urban level of services and other uses, the lands are adjacent to urban lands having these "city like" characteristics.

Section 15-15-18(7) The area shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services.

The proposed reclassification to Urban will favorably impact the provision for employment opportunities and economic development and housing opportunities for all income groups.

The West Hawaii Regional Plan directs future urbanization to the Kailua-Kona to Keahole subregional planning area. The County of Hawaii Keahole to Kailua Development Plan designates the Kailua to Keahole area for residential, commercial and industrial use. Change in designation of this area from Agricultural and Conservation to Urban is consistent with the County's Development Plan and the West Hawaii Regional Plan.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the socio-cultural advancement-housing, Section 226-13 and 19, HRS, including but not limited to, encouraging urban developments in close proximity to existing services and facilities, achieving orderly development of residential areas sensitive to community needs and other land uses, promoting design and location of housing developments, taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.



SOUTH KOHALA

35. Wailea Bay, 6.3 acres (U to C)

The properties extend along the coast between an area just north of Ohai Point and south of Kanekanaka Point. The parcels are bounded on the west by the ocean; Puako Bay and Ohai Point to the south; Kanekanaka Point and Hapuna Bay to the north and generally by a beachfront road on the east.

The proposed reclassification of the area fronting Wailea Bay from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for preserving scenic areas, providing parklands and beach reserves; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; and areas of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Maintenance of valued cultural, historical, or natural resources; and Maintenance of other natural resources relevant to Hawaii's economy, including but not limited to, agricultural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

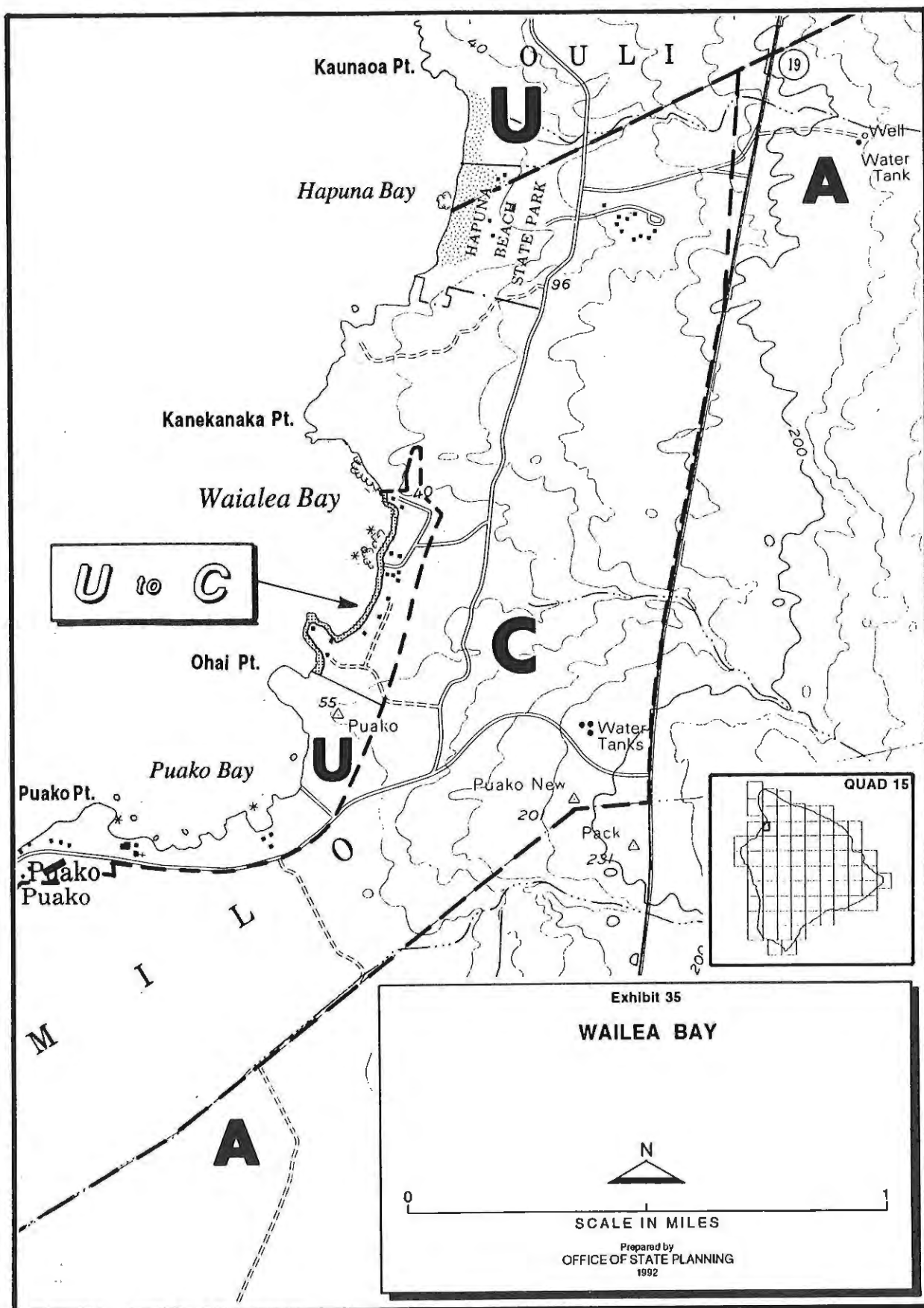
Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands and beach reserves . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The area contains lands needed for beach and shoreline recreation. The master plan update for Hapuna Beach State Recreation Area which incorporates the Wailea Beach area is underway. State funds are currently available for planning a coastal recreational area on lands surrounding Wailea (Waialea) Bay. More popularly known to residents as "Beach 69," the area is popular with families with small children because the white sand beach of Wailea provides more protection from the sea than the longer and straighter beach at Hapuna. Wailea Bay is a Marine Life Conservation District and the irregular and curved shoreline at Wailea provides excellent opportunities for swimming, snorkeling, and nearshore scuba diving.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, promoting and protecting intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy, achieving effective protection of Hawaii's unique and fragile environmental resources, managing natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



36. Hapuna Beach State Recreation Area, 9.61 acres (A to C) and 5.69 acres (U to C)

The subject proposal consists of two parcels. The first parcel (5.69 acres) is located at the northern end of the beach, is bounded on the north by a rock wall, on the east by Puako and Wailea Bay Access Road, on the south by Hapuna Beach Park, and the ocean on the west. The second parcel (9.61 acres) is immediately adjacent to Queen Kaahumanu Highway and east of Hapuna Beach State Recreation Area, bounded on the west by the Conservation District, on the north by the Urban District and by Queen Kaahumanu Highway on the east.

The proposed reclassification of parcels at Hapuna Bay from the Urban and Agricultural Districts to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for preserving scenic areas, providing parklands and beach reserves; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems; Maintenance of valued natural resources; and Maintenance of other natural resources relevant to Hawaii's economy, including but not limited to, agricultural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands and beach reserves . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

Reclassification would make these areas consistent with the remainder of the park.

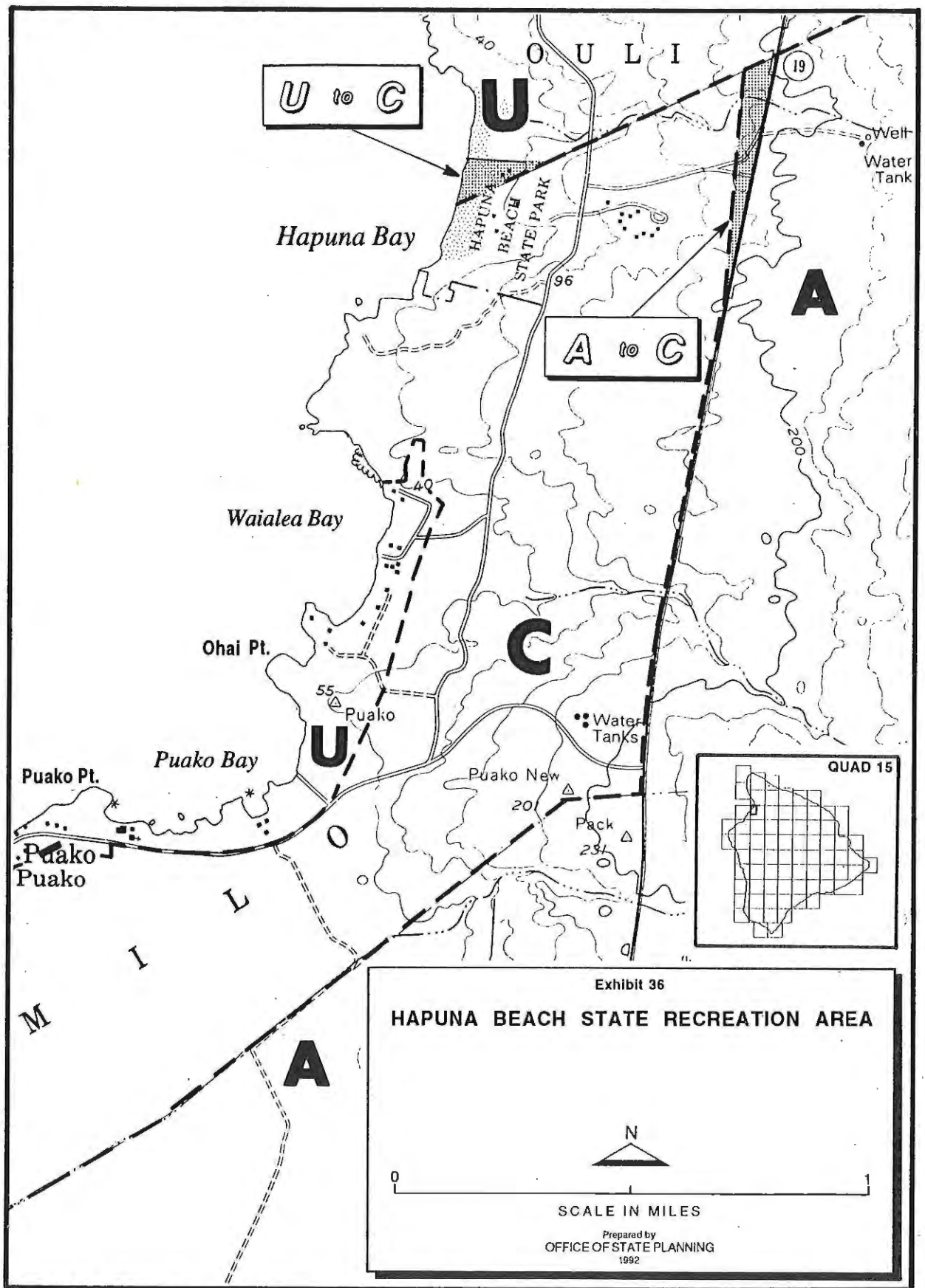
The 15.30 acres proposed for reclassification include a small triangular portion at the northern end of the park (5.69 acres, U to C) and an area along the eastern mauka portion (9.61 acres, A to C). When the territory first set aside the area at Hapuna Bay for park purposes in 1951, it did not have title to the 5.69-acre portion located immediately south of a rock wall promontory at the northern end of the park. This parcel,

situated in the Ouili ahupuaa, belonged to the Parker Ranch estate. State land use boundaries were drawn in 1964, and since this parcel belonged to the Parker Ranch, it was left in the Urban District. During the interim between the time the boundaries were drawn and the park came under State ownership through cancellation of an Executive Order, Richard Smart donated the parcel to the County. In 1966, the County dedicated the parcel to the State but the boundary lines were not amended to include this portion of the park within the Conservation District. The recommendation to reclassify 9.61 acres at the eastern end of the park from the Agricultural District to the Conservation District would rectify the omission of this portion of the park from the Conservation District which was to have extended to the highway. However, as in the case with the Ouili parcel, the Conservation boundary was decided prior to the construction of the highway. Consequently, both of these parcels were omitted from the Conservation District. Reclassification will make these areas consistent with the Conservation classification of the park.

The parcels contain lands needed for beach and shoreline recreation. During the summer months, the beach is the widest (more than 200 ft.) on the island. It is also the driest with more sunny days at this location than at other beaches on the island.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-6, 11, 12 and 13, HRS, including but not limited to, promoting and protecting intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy, achieving effective protection of Hawaii's unique and fragile environmental resources, managing natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage, seeking the preservation and conservation of significant natural and historic resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



37. Hills of Waimea (Hokuula, Puu Owaowaka, Puu Ki, Puu Kakanahia, Puu Maile, and Puu Manu) (A to C)

The Hills of Waimea comprise six puus--Hokuula (3,377 ft.), Puu Owaowaka (3,449 ft.), Puu Ki (3,201 ft.), Puu Kakanihia (3,157 ft.), Puu Maile (approximately 3,000 ft.), and Puu Manu (3,013 ft.). The hills are located in South Kohala, above the 3,000-foot level and make up the outstanding physiographic features distinctive of Waimea's scenic resources. Hokuula Hill, Puu Owaowaka, Puu Ki and Puu Kakanihia can be seen from the Kawaihae-Waimea Road looking north. Hokuula Hill, Puu Owaowaka, and Puu Ki are located northeast of the Hawaii Preparatory Academy and north of Waimea Homesteads. Puu Kakanihia is located west of Lanimaumau Stream and south of Hauani Gulch. Puu Maile and Puu Manu are located south of the Kawaihae Road at the southeasterly end of Puukapu Homesteads.

The proposed reclassification of the Hills of Waimea from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; conserving indigenous or endemic plants, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing conserving natural ecosystems of endemic plants . . .

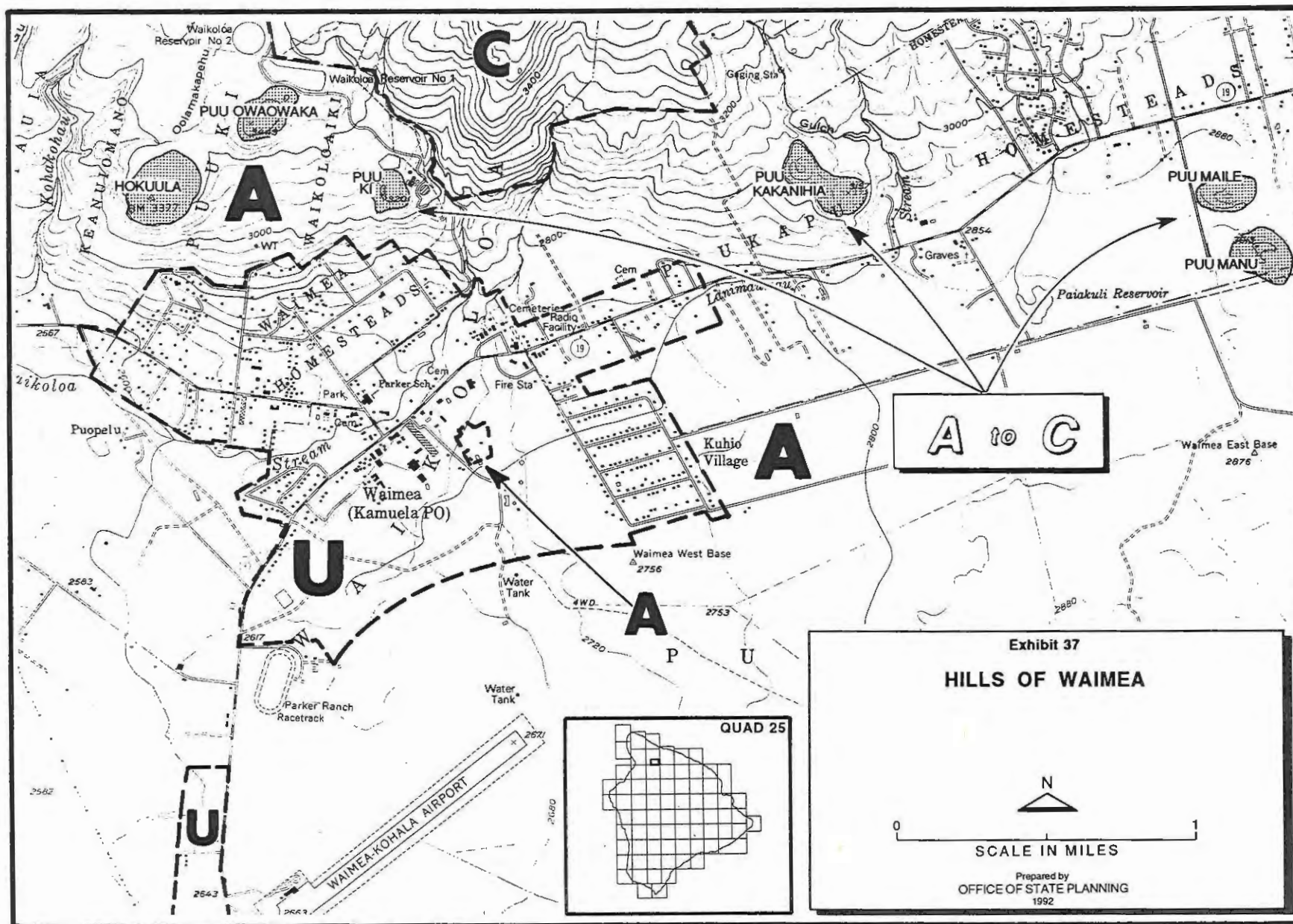
Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

Puus have been identified by the University of Hawaii's Water Resources Research Center as necessary for water recharge areas and watershed protection. Due to the puus' volcanic composition, foliage coverage, composition and shape, there is little surface runoff, therefore, they serve as water recharge areas by channeling the water directly to the underground aquifer. The Hills of Waimea have been further identified as within and part of the North Kohala Watershed.

The area has been identified as having low, medium and high concentrations of plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



38. Puus - South Kohala

There are six puus in the South Kohala district whose resources merit placing them within the Conservation District. They are Puu Honu (4,025 ft.), Puu Iki (4,274 ft.), Puu Lapalapa (4,660 ft.), Puu Makela (3,648 ft.), Puu Loa (4,120 ft.), and Puu Kawaiwai (3,222 ft.). The puus, with the exception of Puu Kawaiwai, are included in the recommendation for the North Kohala Watershed and are located mauka of the Kohala Mountain Road.

The proposed reclassification of the Puus in South Kohala from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic or archaeological sites and sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter. The area includes lands necessary for conserving natural ecosystems of endemic plants, and wildlife.

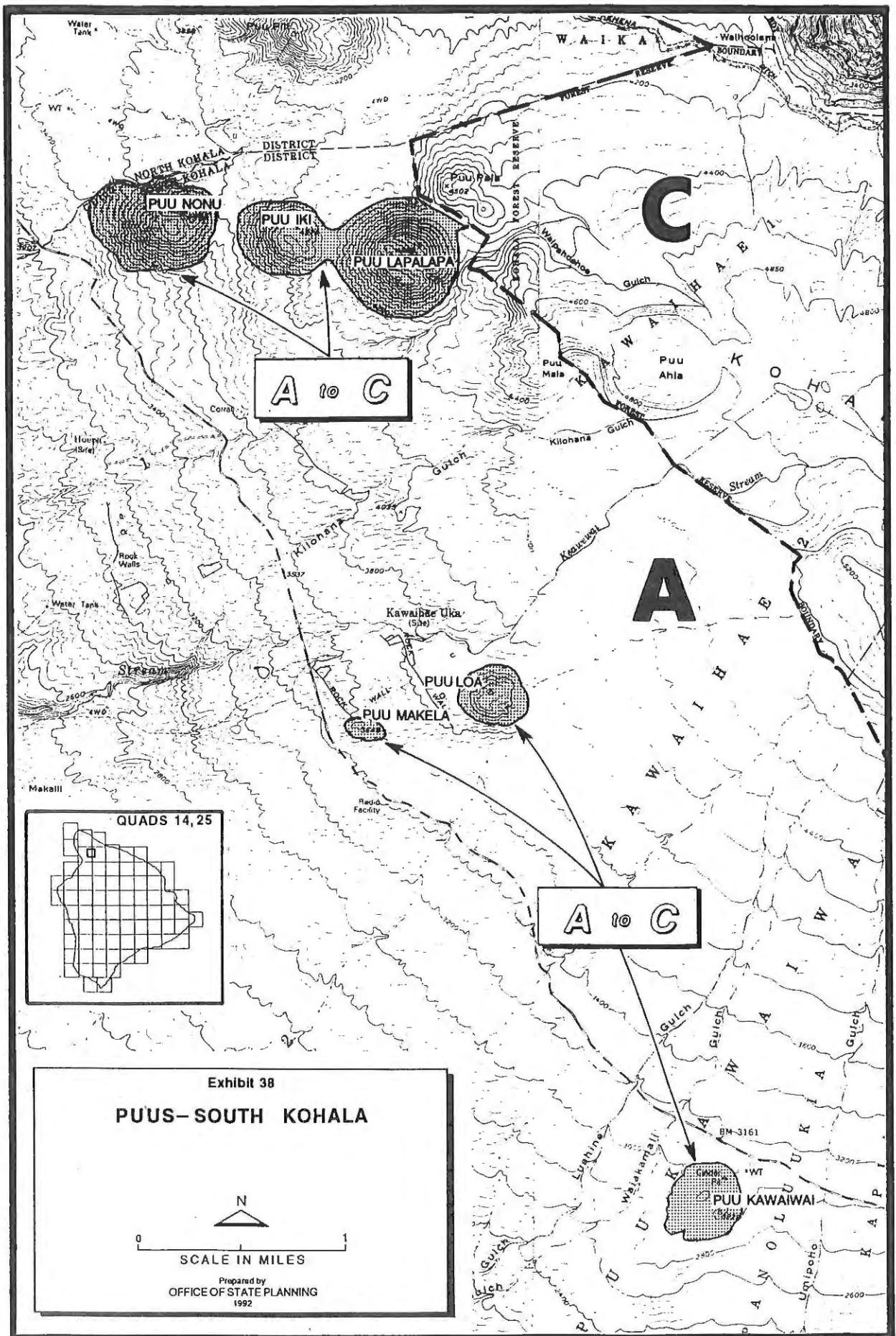
Section 15-15-20(5) The area includes lands necessary for providing and conserving natural ecosystems of endemic plants and wildlife; for forestry . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The area has been identified as having low, medium and high concentrations of plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR. Due to the puus' volcanic composition, foliage coverage and shape, there is little surface runoff, thereby serving as water recharge areas by channeling water directly to the underground aquifer.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



39. Waikoloa Stream/Waiulaula Gulch, 839.28 acres (A to C)

The recommendation includes Waikoloa Stream, also known as Waiulaula Gulch, and tributaries, Mamaewa Gulch, Ouli Gulch, Lanikepu and Waiaka Gulches. Keanuimano Stream and most of the tributaries which flow through gulches from the 3,800-foot and 4,200-foot levels, enter the Urban District of Waimea at approximately the 2,200 foot level and flows into Keanuimano Stream. Waikoloa Stream flows down from approximately the 3,200-foot level through the Urban District of Waimea Town. From approximately the 2,600-foot to the 1,400-foot level, Waikoloa Stream merges with Keanuimano Stream and continues through the Agricultural District as Waikoloa Stream/Waiulaula Gulch to the 200-foot level where it enters the Urban District at Kawaihae and flows into the ocean.

The proposed reclassification of Waikoloa Stream from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting water sources; preserving scenic and historic areas; wilderness reserves; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes.

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving wilderness reserves, and for conserving natural ecosystems of endemic plants, fish and wildlife . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

Waikoloa Stream has been identified as a Special Stream using the Hawaii Stream Assessment criteria, new information from the Division of Aquatic Resources, Department of Land and Natural Resources, and input from stream experts. The stream contains an abundance of native aquatic species.

The proposed reclassification will assist in preventing floods and soil erosion by regulating uses adjacent to the streams.

The proposed recommendation to extend the district boundary from ridge to ridge would protect lands necessary for the protection of water resources and water supplies and lands necessary for preserving wilderness and conserving natural ecosystems of endemic plants, fish and wildlife.

The proposed recommendation would maintain lands necessary for protecting and conserving indigenous and endemic plants, fish and wildlife. The proposed recommendation would impact favorably the State's concern to protect lands necessary for the preservation or maintenance of important natural systems and habitats. The stream has been identified as having abundance of native aquatic species including Lentipes (oopu alamoo).

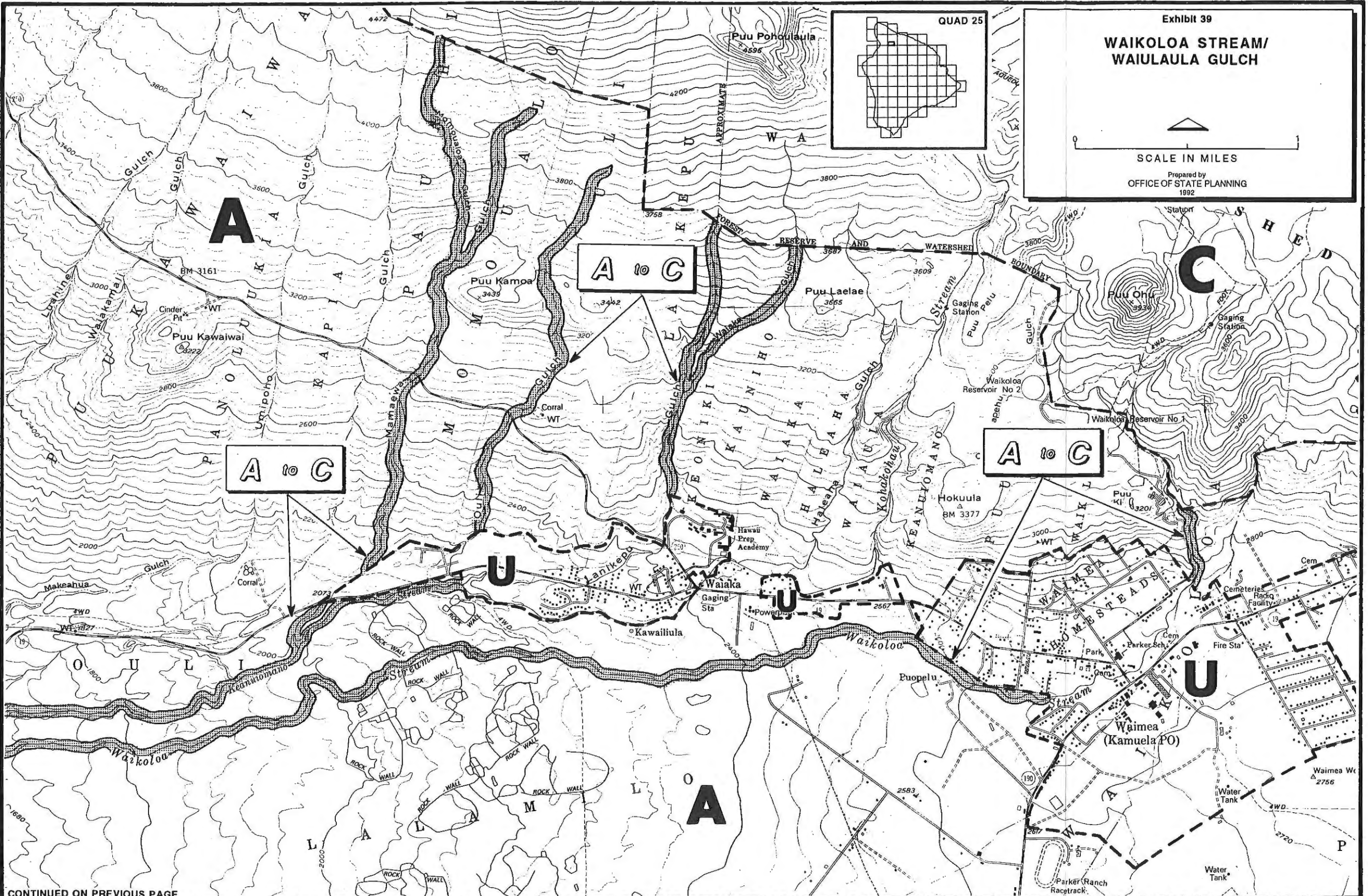
The proposed area for reclassification includes lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use because they contain slopes of greater than 20 percent. Waikoloa Stream has been identified as a Special Stream and should be classified as Conservation because of its aquatic, riparian, wetland, scenic and recreational values. The Conservation District boundary line should include a 100-foot buffer extending from either bank of the stream.

The proposed reclassification addresses the State Recreation Functional Plan which contains an action to maintain wetland and stream systems including all perennial streams in the Kohala Mountains and the windward side of Mauna Kea, and the State Conservation Functional Plan which contains a policy to identify and assess high quality and other streams for preservation.

The proposed area for reclassification includes lands with topography and soils that are not normally adaptable or presently needed for urban, rural or agricultural use. The Waimea-Kamuela area has been identified as a flood problem area (Flood Hazard Information-Report #37). Although no serious floods have occurred in this area after completion of the Soil Conservation Service flood control project in 1968, the measures which were taken cannot provide full protection against flood from increased sheet flows which would occur if new development is allowed to progress uncontrolled. The proposed reclassification will mitigate further problems from floods and soil erosion by regulating uses adjacent to the stream.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources; encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii; exercising an overall conservation ethic in the use of Hawaii's natural resources; promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to utilizing Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of limited resources for future generations.

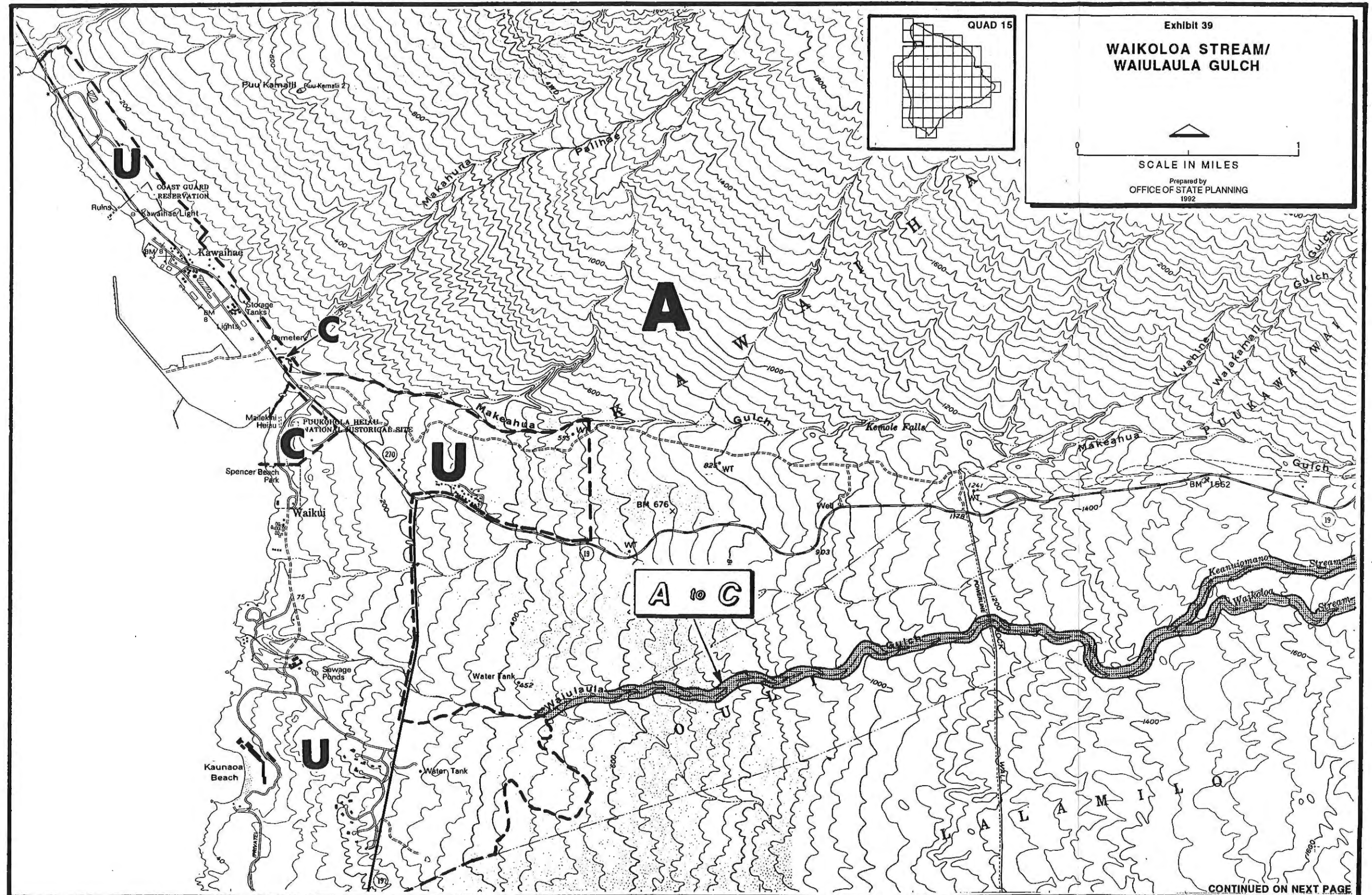


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Exhibit 39
**WAIKOLOA STREAM/
WAIULAU LAUL GULCH**



Prepared by
OFFICE OF STATE PLANNING
1992



NORTH KOHALA

40. Kehena, 3,897.78 acres (A to C)

The site is located on the southwestern side of the North Kohala district, borders on the northwest boundary of the Kohala Forest Reserve and Conservation District, and includes a portion of the Kohala cliffs. The area begins at approximately 2,400 feet to 2,320 feet above sea level, extending approximately 3,900 feet above sea level and ending at the North Kohala/South Kohala district boundaries, including Puu Iki and Puu Pili at its southwestern boundaries. The area is generally bounded on the northwest by Hooleipalaoa Gulch, on the south by the Kohala Forest Reserve and the North Kohala/South Kohala district boundaries, on the east by the Honokane Stream/Gulch, and by the Conservation District on the north. Pololu Stream flows between the two cliffs towards Pololu Valley. This area is also included in the recommendation for the North Kohala watershed.

The proposed reclassification of Kehena from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas, providing wilderness reserves; conserving indigenous or endemic plants, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources.

The proposed reclassification will impact favorably the following area of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

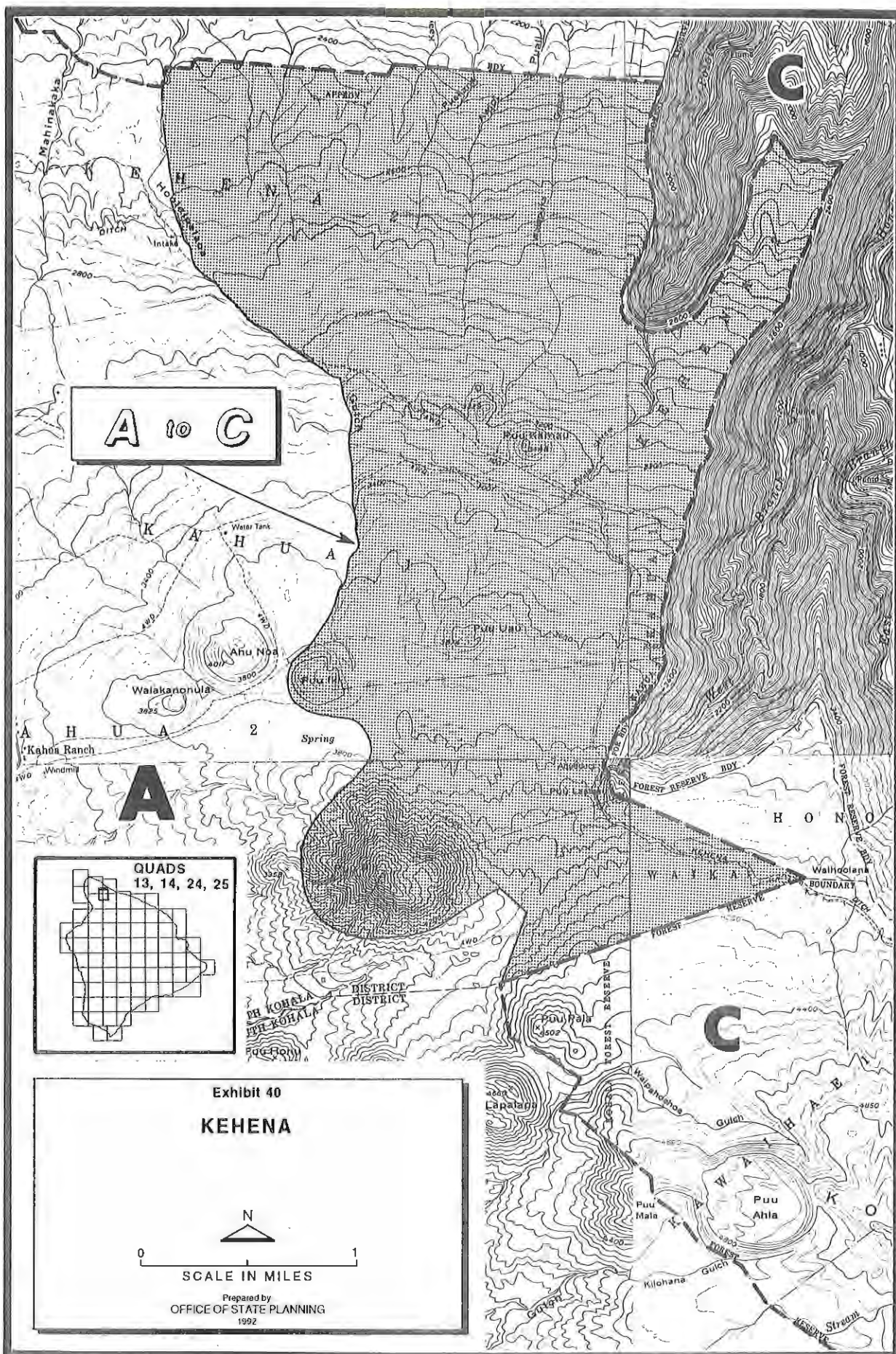
Section 15-15-20(5) The area includes lands necessary for providing and preserving wilderness reserves, and for conserving natural ecosystems of endemic plants and wildlife, and forestry . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

This area has good ohia wet forest. It is located within the area recommended for reclassification to the Conservation District for watershed protection by the Watershed Protection Study, Kohala Mountains, Water Resources Research Center, University of Hawaii.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



41. Makai Extension of Lapakahi State Historical Park, 11 acres (A to C)

The 11-acre site is located immediately south and adjacent to the existing Lapakahi State Historical Park, extending from approximately 40 feet to approximately 160 feet above sea level, bounded on the east by Akoni Pule Highway, on the north by the existing State historical park, and on the west by the ocean.

The proposed reclassification of the parcel within Lapakahi State Park from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting and preserving scenic and historic areas; providing parklands, conserving indigenous or endemic plants, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic and archaeological sites and sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter. The area includes lands necessary for conserving natural ecosystems of endemic plants, fish and wildlife.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, and for conserving natural ecosystems of endemic plants, fish and wildlife . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use, except when those lands constitute areas not contiguous to the conservation district.

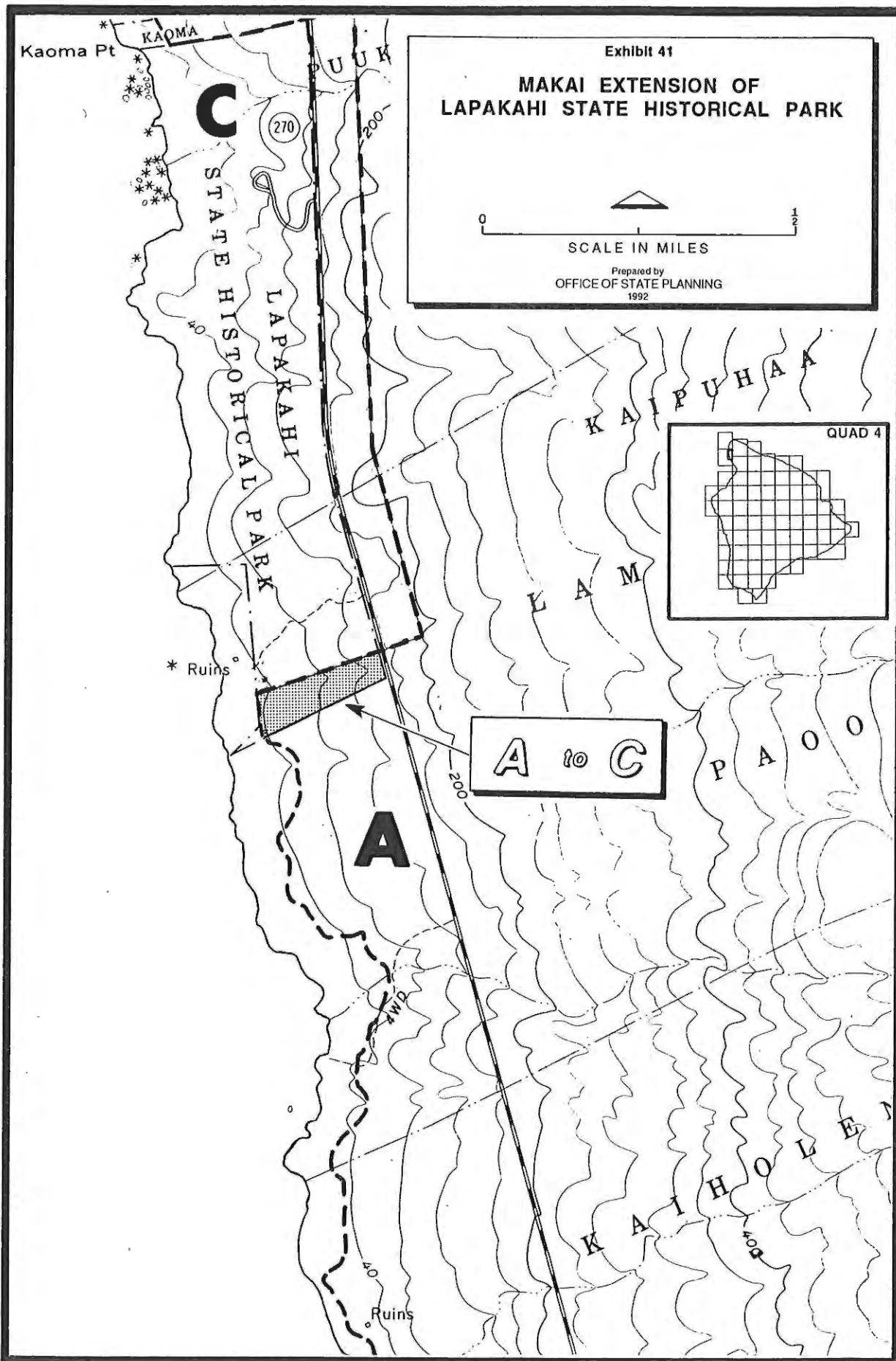
Reclassification would make this area of the park consistent with the adjoining land use designation of conservation for the remainder of the park.

The portion recommended for reclassification to the Conservation District was omitted when the area was first set aside into the Conservation District.

The park focuses on Koaie Fishing Village within the ahupuaa of Lapakahi, located at the northern end of the park. The 265-acre park includes a variety of partially restored sites that once comprised the village. A Marine Life Conservation District was created at the shoreline of this historical park.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking the preservation and conservation of significant natural and historic resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



42. Mauka Extension of Lapakahi State Historical Park, 1,332.4 acres (A to C)

The 1,332.4-acre site is located immediately adjacent to and east of the existing Lapakahi State Historical Park. The area extends within the boundaries of the ahupuaa of Lapakahi from the eastern boundary of the existing State historical park to the Kohala Mountain Road.

The proposed reclassification of the parcel within Lapakahi State Park from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting and preserving scenic and historic areas; providing parklands, conserving indigenous or endemic plants, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic and archaeological sites and sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter. The area includes lands necessary for conserving natural ecosystems of endemic plants, and wildlife.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, and for conserving natural ecosystems of endemic plants, fish and wildlife . . .

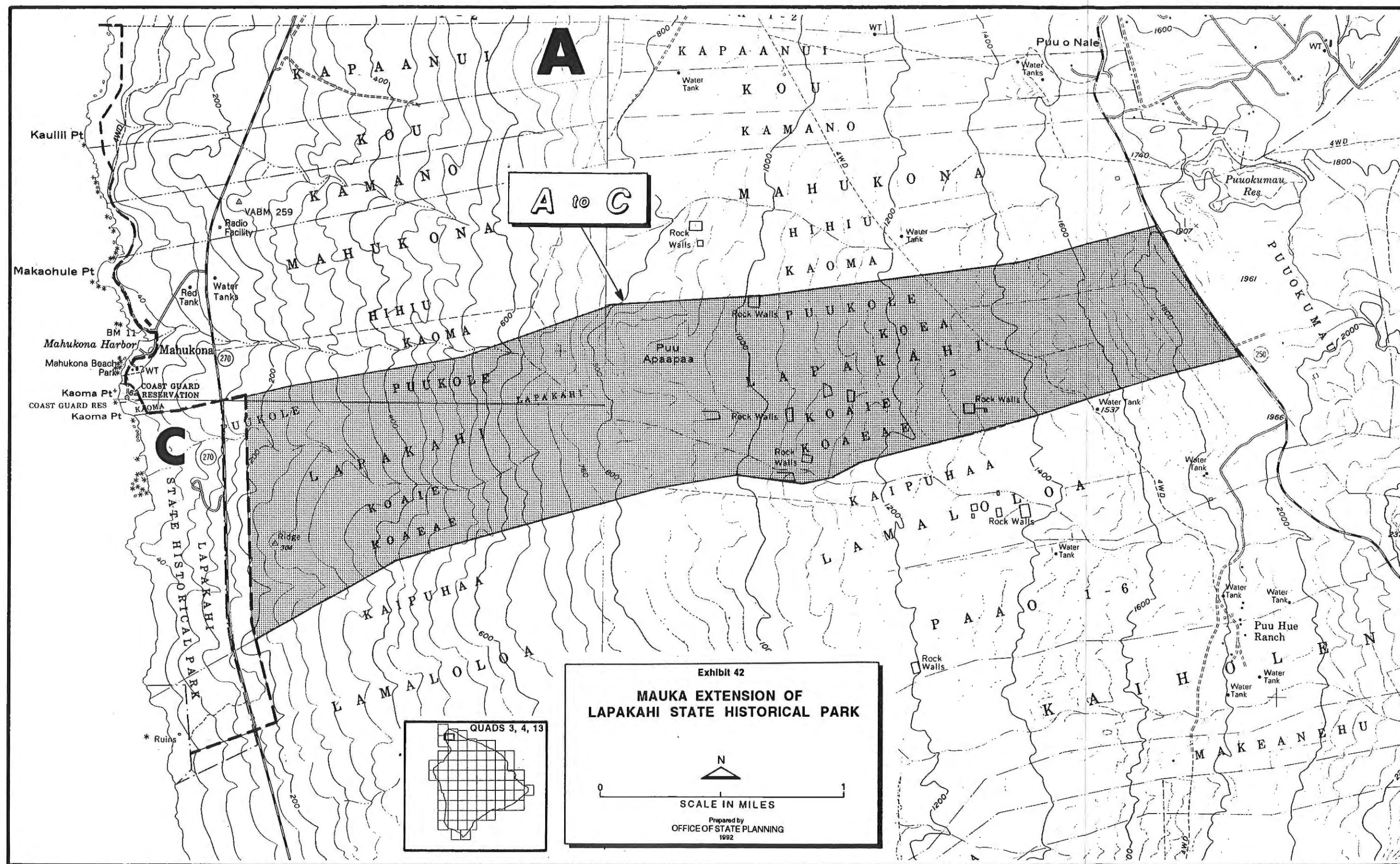
Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use, except when those lands constitute areas not contiguous to the conservation district.

The extension of the existing 265-acre Lapakahi State Historical Park (the narrow habitation zone) to include what has been identified as a part of the Lapakahi Historical complex, will provide and preserve historic, archaeological and cultural sites within a traditional Hawaiian land division, stretching from the ocean to the mountains. The area (1,332.4 acres) stretches from the eastern boundary of the existing park at Akoni Pule Highway to the 1,900 ft. level of the Kohala Mountain Road.

A number of ecological zones comprise the Lapakahi Historical Complex which measures one mile along the shoreline and stretches four miles inland into the Kohala Mountains. The ecological zones include a narrow habitation zone along the shore, a barren zone mauka of the highway, an upland agricultural zone and a dense forest zone. The Lapakahi upland agricultural zone is an excellent example of a leeward, dryland agricultural field system and is representative of the larger Kohala field systems.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking the preservation and conservation of significant natural and historic resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



43. Extension of Conservation District at Akoakoa Point, 322 acres (A to C)

The 322-acre site is located on the northeastern side of the North Kohala district extending from approximately 160 feet above sea level to approximately the 1,400-foot level. The area is bounded on the north and northwest by Neue Bay and Waikaina Gulch, by Waiakalae Gulch on the southwest and Pololu Valley to the southeast.

The proposed reclassification of Akoakoa Point from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting scenic areas; providing parklands and wilderness reserves; conserving indigenous or endemic plants, including those which are threatened or endangered; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance, except as otherwise provided in this Chapter. The area includes lands necessary for conserving natural ecosystems of endemic plants, and wildlife.

Section 15-15-20(5) The area includes lands necessary for providing and preserving parklands, wilderness reserves; and for conserving natural ecosystems of endemic plants, and wildlife; for forestry and other related activities to these uses, except as otherwise provided in this Chapter.

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

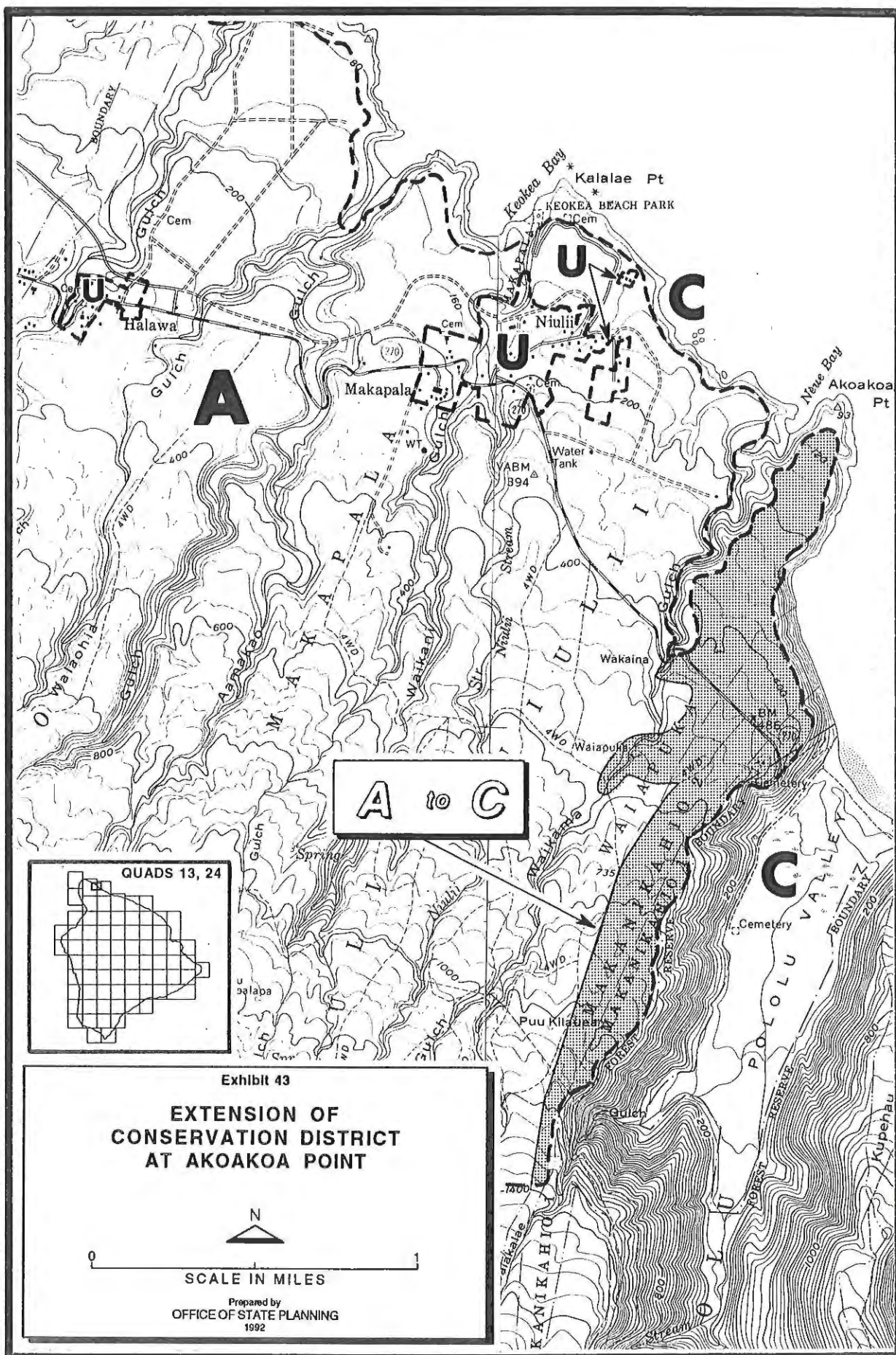
The area has been identified as having medium concentration of plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

The southern portion of Akoakoa Point, from the mouth of Pololu Valley to the existing conservation boundary, is within the proposed addition to the North Kohala watershed.

The cliffs at Akoakoa Point are in Conservation. However, the Conservation District should include the Waiapuka, Mekanikahio 1 and Mekanikahio 2 ahupuaas which are now in the Agricultural District and adjacent to Pololu Valley. The proposed amendment would extend the Conservation District from the forest reserve boundary to Waikama Gulch.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, exercising an overall conservation ethic in the use of Hawaii's natural resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



44. Kohala Cliffs and Valley (Pololu Stream), 720 acres (A to C)

The area is located on the northeastern side of the North Kohala district. The area borders on the northeast boundary of the Kohala Forest Reserve. The cliffs begin at approximately 2,320 feet above sea level, extending southwest to approximately 3,900 feet above sea level. The area is bounded on the southeast by Honokane Nui Stream, Pololu Valley and Stream to the north, Kehena Ditch and the North Kohala/South Kohala district boundary to the south. Pololu Stream flows between the two cliffs towards Pololu Valley.

The proposed reclassification of Kohala Cliffs and Valley from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; providing wilderness reserves; conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; forestry; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources; areas of value for recreational purposes . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and preserving wilderness reserves; and for conserving natural ecosystems of endemic plants, and wildlife; for forestry and other related activities . . .

Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use, except when those lands constitute areas not contiguous to the conservation district.

The area has been identified as part of the North Kohala Watershed and the proposed reclassification to Conservation for Kehena. The area has been identified as having high concentrations of plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

The area is southwest of Pololu Valley and contains lands necessary for the conservation, preservation and enhancement of scenic sites. Puu Laalaau dominates the southern tip of this Y-shaped parcel, and Pololu Stream runs through the middle of the Y. The area provides excellent opportunities for hiking.

The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.

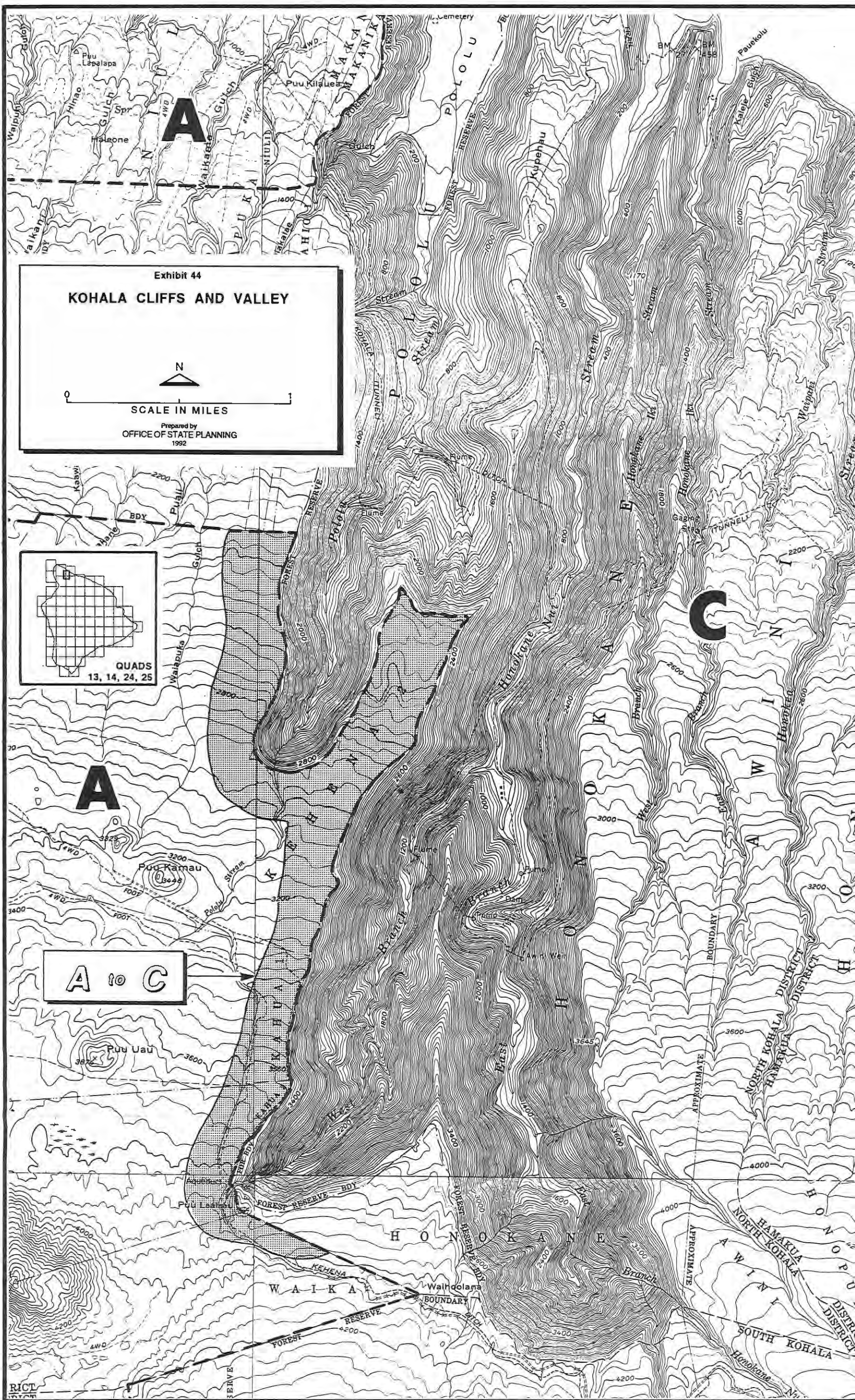
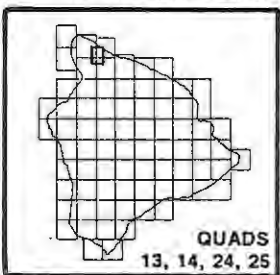


Exhibit 44
KOHALA CLIFFS AND VALLEY

N

0 1
SCALE IN MILES

Prepared by
OFFICE OF STATE PLANNING
1992



A to C

45. Puus - North Kohala

There are 13 puus in the North Kohala district whose resources merit placing them in the Conservation District. They are Puu Kehoni, Puu Ula, Puu Mamo, Puu Hue, Puu Kehena, Puu Lahikiola, Puu Lepo, Puu Aiea, Waiakanonula, Ahunoa, Puu Iki, Puu Uau, and Puu Pili.

The proposed reclassification of the Puus in North Kohala from the Agricultural District to the Conservation District meets the criteria for Conservation Districts contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic areas; conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural resources . . .

The proposed reclassification will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Administrative Rules:

Section 15-15-20(4) The area includes lands necessary for the conservation, preservation, and enhancement of scenic sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(5) The area includes lands necessary for providing and conserving natural ecosystems of endemic plants and wildlife; for forestry . . .

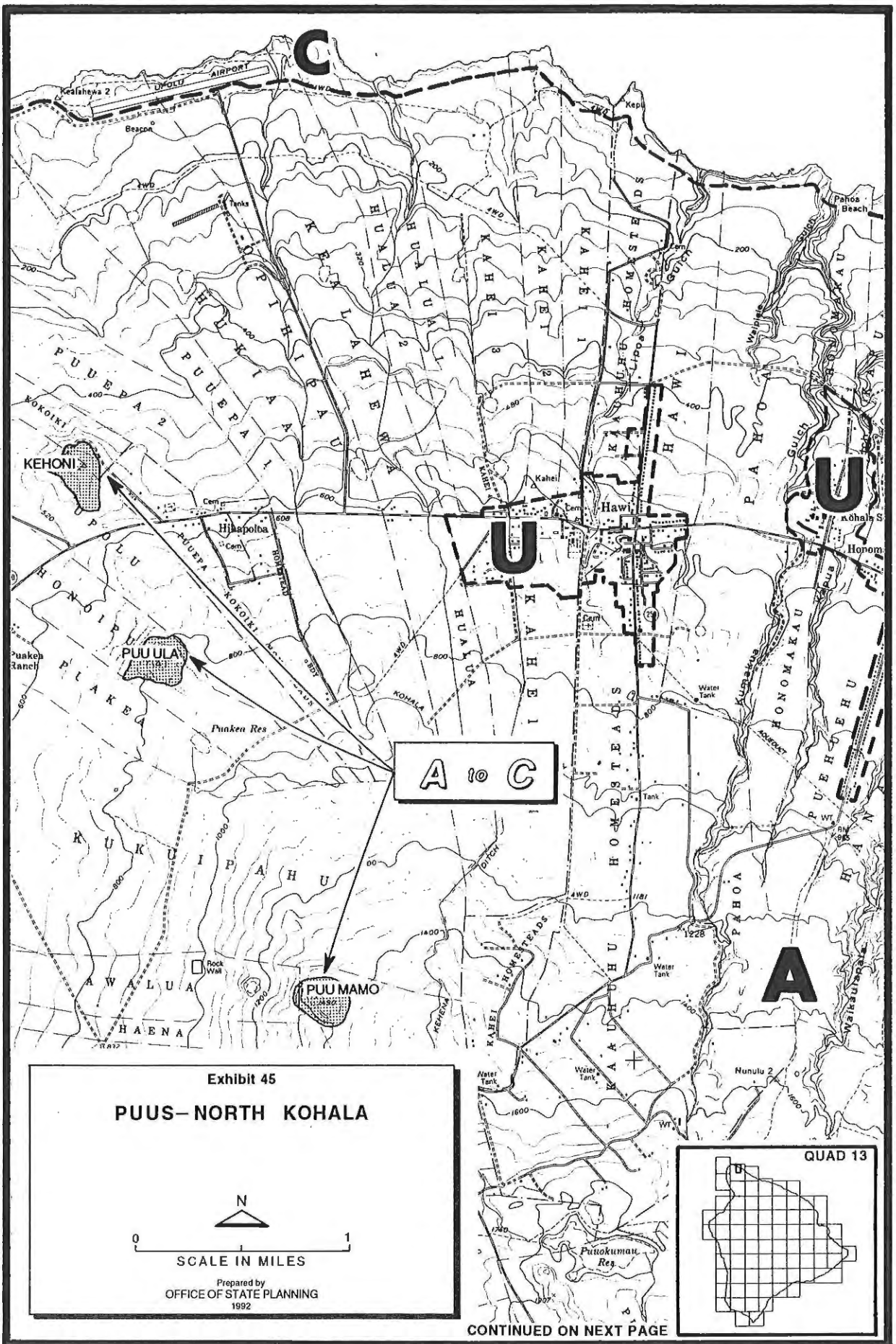
Section 15-15-20(7) The area includes lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use . . .

The area has been identified as having low, medium and high concentrations of plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR. Due to the puus' volcanic composition, foliage coverage and shape, there is little surface runoff and they act as water recharge areas by channeling water directly to the underground aquifer.

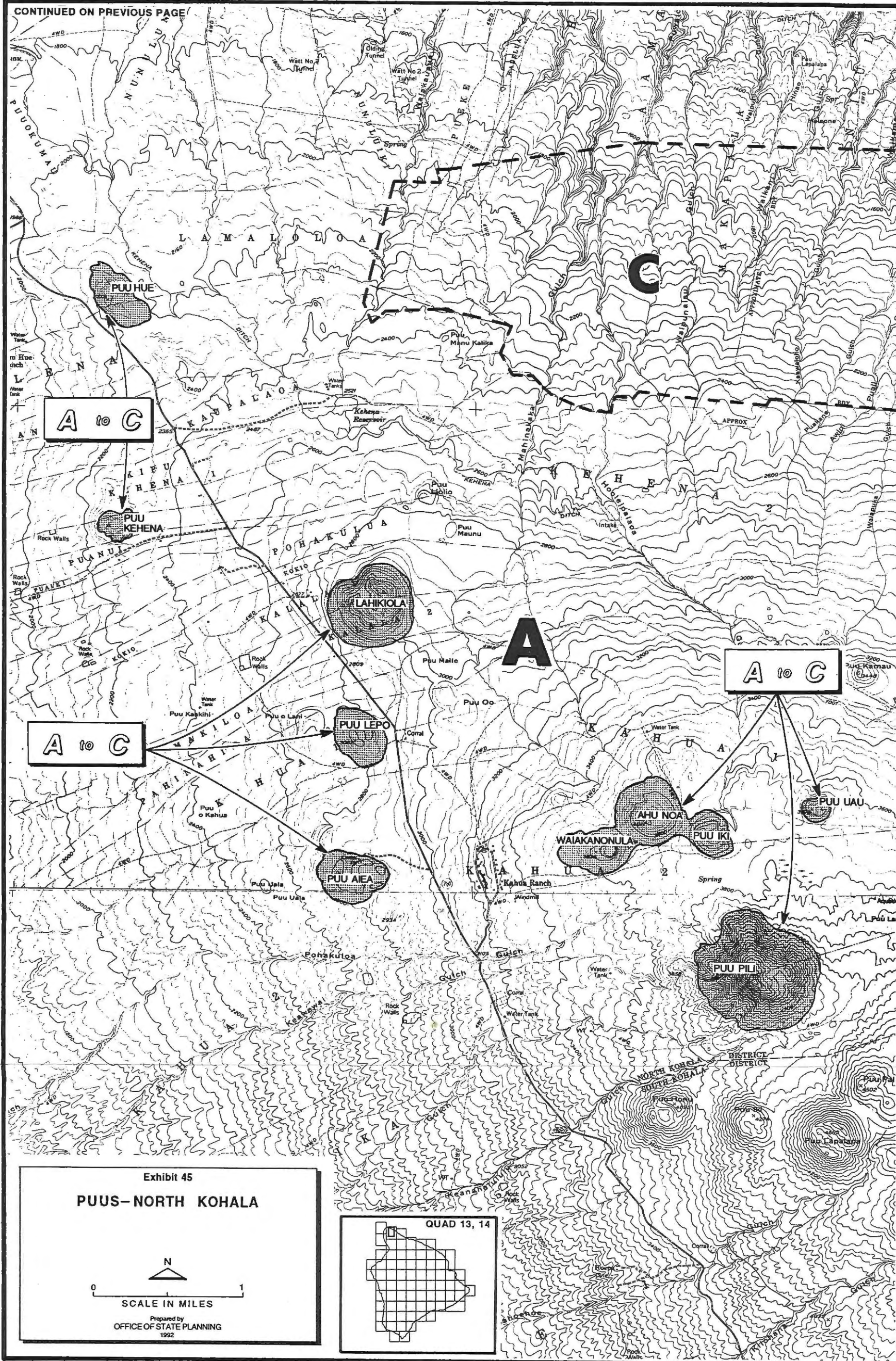
The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of

Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

The proposed reclassification conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources. Utilizing Hawaii's limited land resources wisely; providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline and other limited resources for future generations.



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**AREAS OF
CRITICAL CONCERN**

46. Kona Watershed and Natural Resource Area (113,112 acres)

Water is a pressing concern because of growth in the North Kona district. The high rainfall and fog drip zone on the slopes of Hualalai and Mauna Loa are the ultimate generators of water supply in Kona. If altered so that its positive hydrological features are debased, the developable water supply will contract. There are no alternate water supplies feasibly available to urbanized Kona.

The chloride content at the Kahaluu Well, the existing Kona basal water table source, has risen to dangerously high levels according to the State Water Resources Protection Plan.

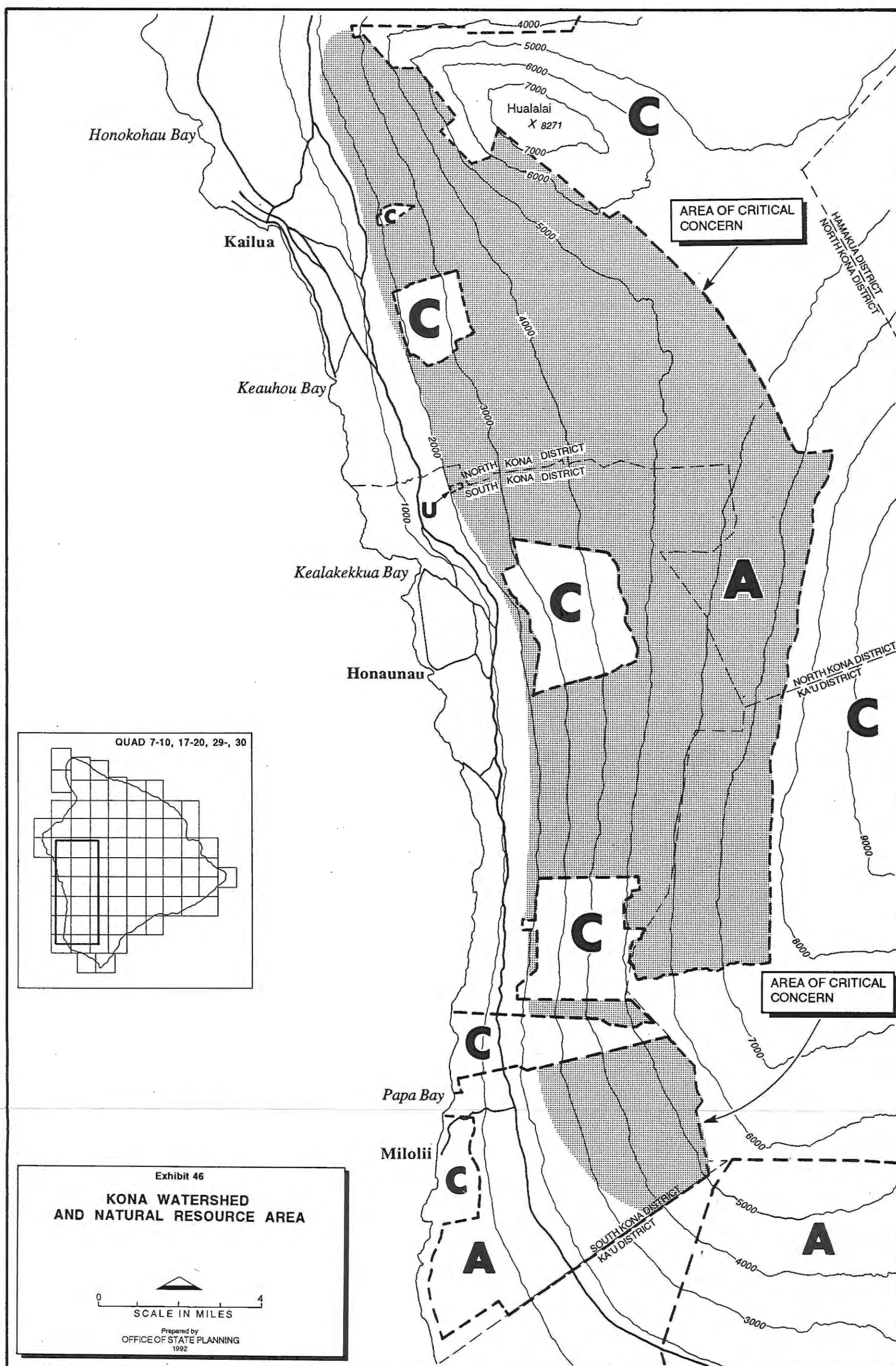
The Kona Watershed is in the Agricultural District rather than the Conservation District and is primarily in ranch use. The draft Watershed Protection Study, Conservation Zone Adjustment, conducted by the Water Resources Research Center, University of Hawaii, for the Five-Year Boundary Review, recommends expanding the Conservation District to protect the high rainfall and fog drip zone on the slopes of Hualalai and Mauna Loa.

Portions of the area including Hualalai and Central Kona-Kealia contain essential habitat for Hawaii's endangered forest birds, the Hawaiian creeper, Hawaiian akepa, akiapolaau and Hawaiian crow or alala. These areas are identified in the Hawaiian Forest Bird Recovery Plan, USFWS, and the Alala Recovery Plan, USFWS.

The proposed area contains large acreages of native forest including koa, ohia, mamane and remnant sandalwood (Hawaiian Forest Bird Survey, USFWS, 1976-1983). The quality of these forests range from relatively intact to highly grazed. The range and extent of this forest area, encompassing a band between approximately 3,000-ft. elevation to 7,000-ft. elevation and including portions of eight U.S.G.S. quadrangles, make it an important ecological resource for the State of Hawaii.

The proposed area also serves to mitigate flood hazards to communities located on the west slopes of Hualalai and Mauna Loa. The area surrounding and including these communities is characterized by under-developed or poorly defined drainage ways, all subject to potential flooding. Residents are subject to increasing hazards from floodwater damages as land is put to higher utilization (North Kona Flood Plain Management Study and South Kona Area Flood Hazard Analyses, Soil Conservation Service, U.S. Department of Agriculture, 1983 and 1978, respectively).

The West Hawaii Regional Plan, Office of State Planning, November 1989, supports the land use reclassification of the mauka lands of Hualalai to the Conservation District and calls for ensuring that its subzone designation is consistent with its protection as a watershed.



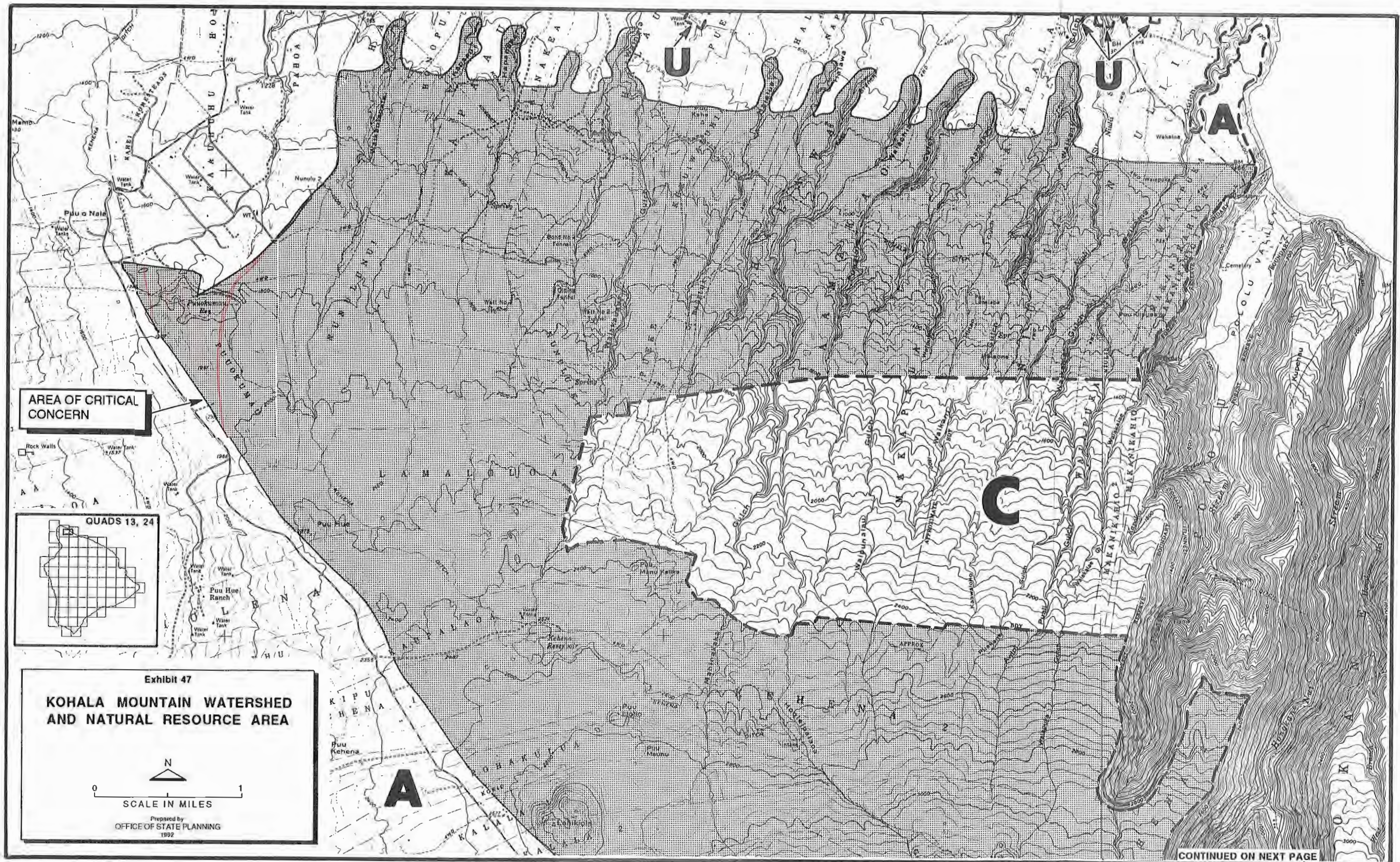
47. Kohala Mountain Watershed and Natural Resource Area (22,500 acres)

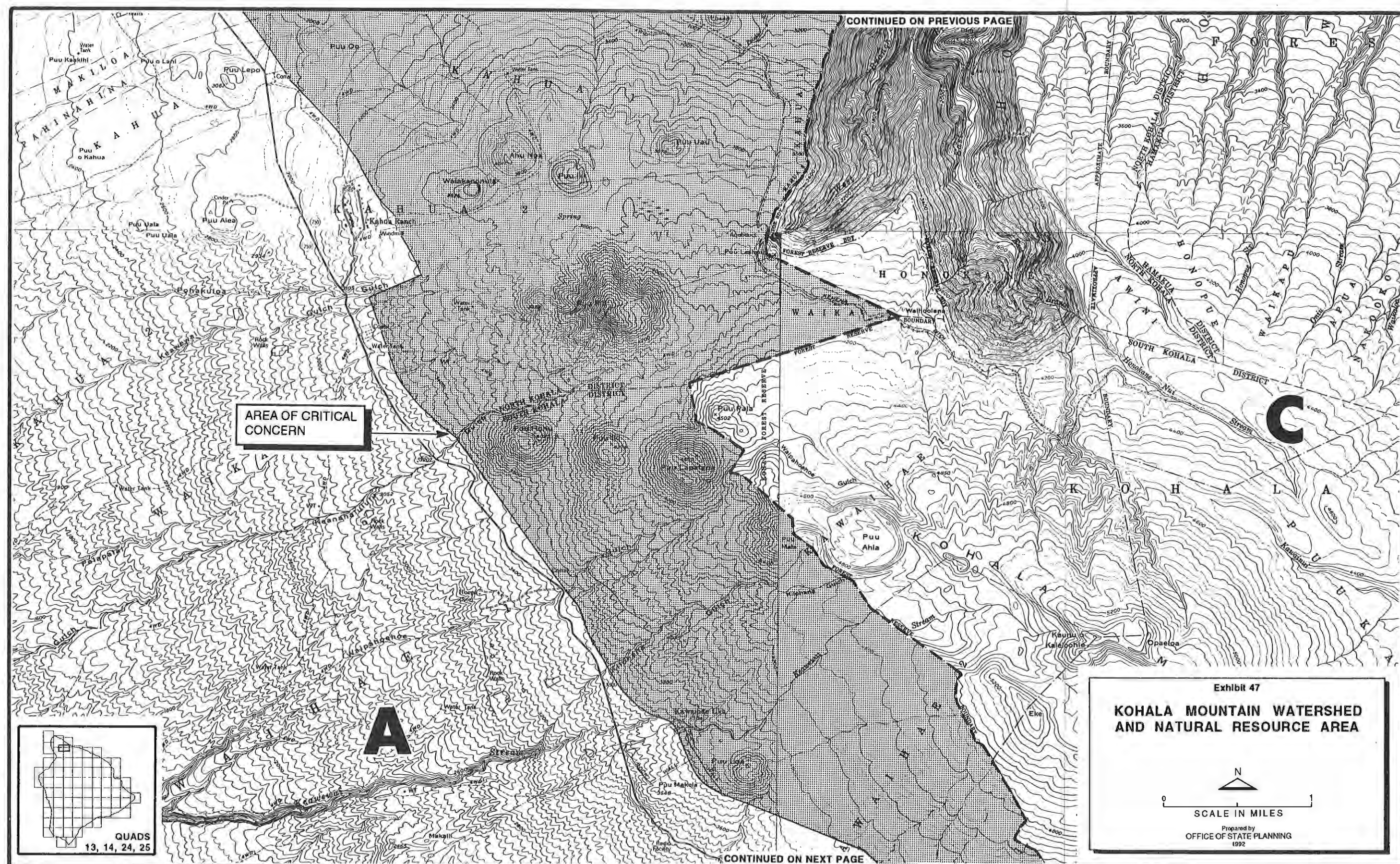
The existing Conservation Zone in the Kohala mountain range extending from Pololu to Waipio Valley yields approximately 40 mgd of groundwater to an array of ditches and tunnels. In addition, water is diverted from streams on the leeward slope above Waimea for municipal and irrigation uses. Substantial groundwater resources have also been identified by exploratory drilling northwest of Pololu on the windward side, and to some extent in the dry leeward sector.

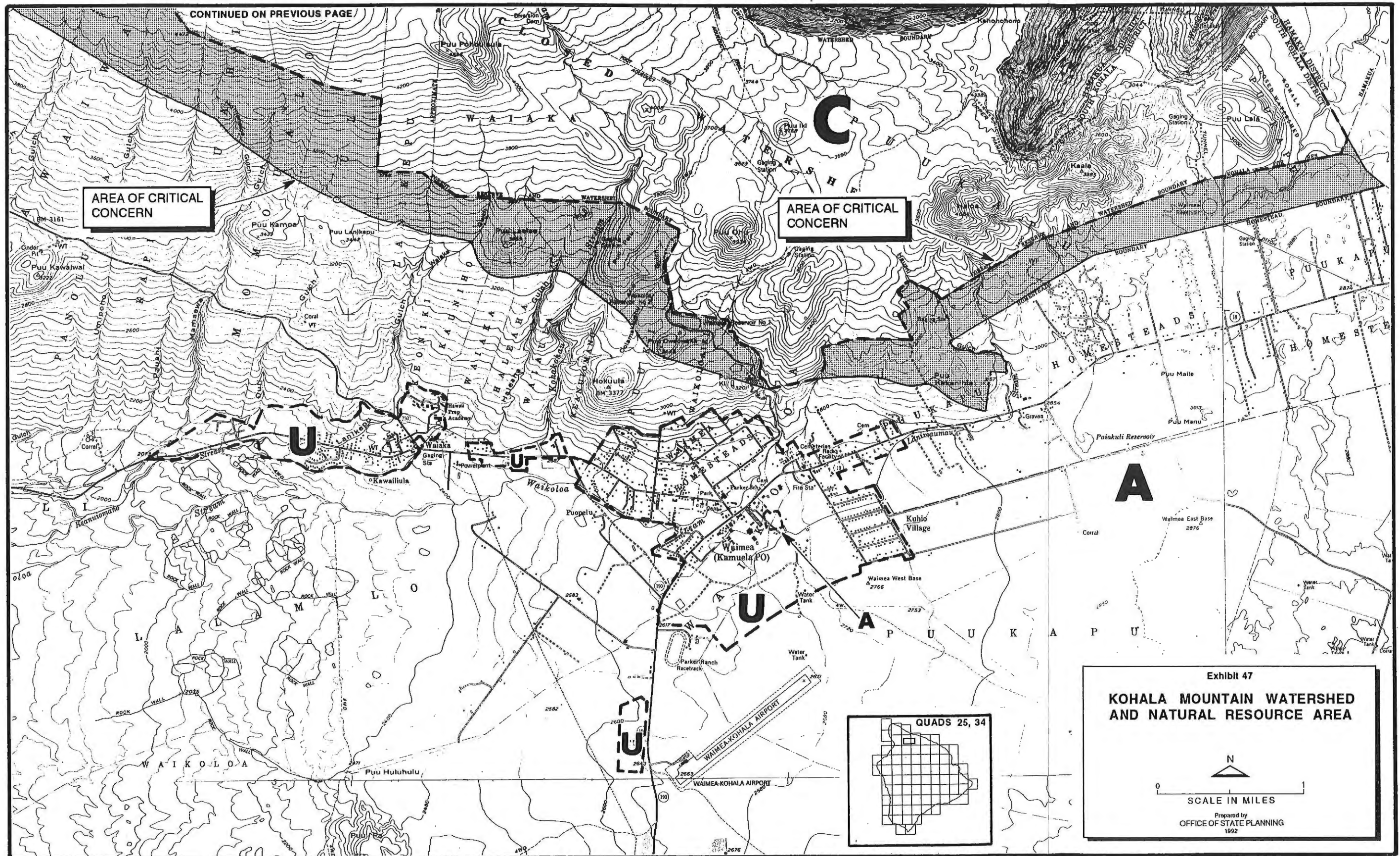
These groundwater resources are expected to become principal sources of domestic supply for developments in the South Kohala district as well as in the regions where they occur. The existing Conservation Zone tributary to these water resources is quite small. The draft Watershed Protection Study conducted by the University of Hawaii Water Resources Research Center for the Five-Year Boundary Review, recommends expanding the Conservation District in the North Kohala mountains to generally enclosed areas having greater than about 60 to 75 inches (north side) average rainfall, but also to expand into somewhat lower rainfall zones where volcanic vents and cinder cones can reasonably be incorporated.

The area has been identified as having high concentrations of plant taxa listed or under review for endangered or threatened status, according to the Threatened and Endangered Plant Fire Map, DLNR.

Portions of the larger area contain intact wet ohia forest, and areas in the back of Pololu and Honokane Valleys provide scenic vistas. These areas are identified as recommendations separate from the larger Kohala Mountain Area of Critical Concern.







Discussion of Areas of Critical Concern: Kona and Kohala Mountain Watersheds and Natural Resource Areas

Conditions in West Hawaii have changed considerably from the 1960's when district boundary lines were first drawn and from the late 1960's and early 1970's when boundaries were last reviewed. Since then, water has become a critical issue. Billions of dollars have been invested in the makai areas and thousands of additional visitor and residential units are planned which will require water to sustain their growth. The Kona and Kohala Mountain watersheds are vital recharge areas and need careful protection.

These areas also contain valuable natural resources including native forests and forest bird habitat.

Relationship to State and County Plans

Protection of these areas conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, seeking effective protection of Hawaii's unique and fragile environmental resources, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, exercising an overall conservation ethic in the use of Hawaii's natural resources, and promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

It also conforms to the Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, restricting development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area, identifying critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats; areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; scenic resources; and utilizing Hawaii's limited land resources wisely.

The State Water Resources Protection Plan calls for increased protection of watersheds and specifically identifies the Kona highlands as an area for high priority consideration.

The County of Hawaii General Plan states that the County shall encourage appropriate State agencies to review and designate forest and watershed areas into the Conservation District during State land use boundary comprehensive reviews.

Threats to the Resources

Some feel that these lands should remain in the Agricultural District maintaining that existing ranching activities are not detrimental to the watershed. However, it can no longer be assumed that historical agricultural uses which may or may not be incompatible with watershed protection will continue.

Cattle ranching, especially smaller operations, has encountered difficult financial times. The wave of investment that has recently swept the islands has even reached mauka Kona.

Two former ranches, Hokukano Ranch and Kealakekua Ranch, have development proposals. A golf course has been proposed at Hokukano Ranch. Three golf courses, a lodge and 550 units were proposed at Kealakekua Ranch. Kealakekua Development Company has since cut back their proposal to one golf course and approximately 500 units. A 1,800-acre subdivision, Kaloko Mauka, cuts through native forest and bird habitat on the slopes of Hualalai. Acres of native forest have been cleared.

Historically, logging has also taken place on these lands. Former sandalwood forests have been logged and only remnant sandalwood populations remain. Koa was also extensively logged in the past. Fragmented koa patches, degraded koa woodlands and deforested pasture lands are the result of historical koa logging practices. Selective koa harvesting continues as an ongoing activity on some properties.

Issues and Conflicts

Reclassification of these lands into the Conservation District can serve to protect important resources since uses in the Conservation District are closely regulated.

However, there is a need to recognize existing ranching operations and potential impacts to these uses. Existing uses such as ranching and forestry will be grandfathered in under existing statutes and allowed to continue as non-conforming uses. However, any change in the type of use or expansion of an existing use would require a permit and this may be burdensome to existing ranching operations.

At the minimum, the status quo should be maintained in the area, that is, no golf courses or additional residential development. In addition, forest protection and enhancement should be promoted and rare and endangered species protected.

Alternatives are the establishment of a special subzone which would allow only uses compatible with watershed purposes, but would allow the landowner greater flexibility than the usual Conservation District subzone designation. Negotiation of easements, participation in the Natural Area Reserve Partnership Program or Forest Stewardship Program or other agreed-upon methods for protection are other ways to achieve protection of the resource as an alternative to Conservation designation.

Another option could be County or landowner-initiated and would involve a change in County zoning for the area to exclude golf courses and additional residential development.

The taxation issue is another problem which needs to be addressed. In some cases, paradoxically, taxes may increase if lands are placed into the Conservation District. This is because lands dedicated to grazing use have the lowest tax rate. Unfortunately, this also provides an incentive for landowners to convert forest land into pasture since this will lower their tax rate.

When reclassification of lands to the Conservation District is proposed, the Counties often raise the issue of homerule. Their concern is that reclassification to Conservation takes these lands out of County control/regulation. However, in order for more intensive use to occur, a State land use district boundary change and, subsequently, appropriate County approvals would be needed.

In the case of the Kona and North Kohala Watershed areas, homerule may become a major issue because of the acreages involved. However, the uses that the Counties would ordinarily regulate in this area would be the development of golf courses, residential subdivisions, resort-type uses, or commercial, industrial uses. If a special subzone were established excluding new uses of this type and requiring a district boundary amendment for such uses, no County authority would be lost. Once the land was reclassified out of Conservation, the applicant would have to get County zoning and other approvals for these uses.

The Kona and North Kohala Watersheds should be protected. Reclassification to the Conservation District is one option. The other alternatives outlined are other methods.

A Watershed Roundtable was convened by the Department of Land and Natural Resources and the Hawaii County Council in 1991. The purpose of the roundtable was to bring parties on different sides of this issue together to see if some common ground could be found to work out a solution to this dilemma. Two roundtable meetings have been held. Landowners, ranchers, environmental organizations, community members, State, County and Federal agencies participated in the roundtable discussions.

At the second meeting, it became clear that no progress was being made on the issue. There was no consensus among the parties involved. The Office of State Planning indicated that while it was willing to continue to participate in Roundtable discussions, the boundary review was operating under a deadline. Although the Office would like to pursue options, it needs to have assurances that existing uses would be locked in place until some solution is reached or until the next boundary review is completed in order to avoid further urbanization or development. OSP proposed to negotiate easements or agreements with the ranchers. These agreements between the State and the ranchers would provide that existing uses could continue but that the ranchers would not engage in new or more intensive uses of the land, for example, for subdivisions or golf courses. It was proposed that these easements or agreements run until the next Five-Year

Boundary Review or until a mutually agreeable solution to the resource problem was reached, whichever was shorter. The ranchers were asked at the roundtable if they could in principle endorse the concept as proposed. The ranchers responded that their interests were too diverse and that they could not speak with one voice on this issue.

The OSP then indicated that it would begin discussions with each rancher or landowner individually and that if agreements on easements or other methods of protection could not be reached, petitions for reclassification to the Conservation District would be initiated.

In the meantime, House Concurrent Resolution 292-92 requests the Department of Land and Natural Resources and the County of Hawaii to continue the facilitated roundtable discussions already started. The Legislature expanded the scope of the discussions to include issues of natural resources management, rather than focusing exclusively on watershed management. The Legislature also asked that the Kohala Watershed area also be discussed.

The Department of Land and Natural Resources has asked the Alternative Dispute Resolution Center of the Judiciary to conduct these facilitated workshops.

While the Five-Year Boundary Review in the past may have been primarily the preparation of a report, changing times and more public involvement in the planning process bring a new dimension to the boundary review, incorporating problem-solving by the parties involved. Roundtable discussions have been successful in other dispute situations and may show the way to meet multiple objectives in the West Hawaii watershed.

Alternatives for Protection of the Resources

The following presents some advantages and disadvantages associated with various alternatives for protection of these resources.

Alternative 1. Reclassification to the State Conservation District (Protective or Resource Subzone)

Advantages

- Would provide high protection for the watershed and natural resources for the area.
- Existing uses would be grandfathered in (this is provided under existing statutes). However, new or more intensive uses of the land would require review through a Conservation District Use Application (CDUA). Golf courses and residential subdivisions would not be allowed.
- The Resource Subzone allows forestry uses but any activities more intensive than those which are currently practiced (for example, clear-cutting) would require a CDUA. In other words, resource extraction uses are permitted but some review is required.
- Uses are more limited in the Protective Subzone.

Disadvantages

- Leaves the parcel open for future reclassification back to more intensive use.
- Landowners object to potential restrictions and claim that it would affect owner's financial borrowing power.
- The ranchers' perception is that they would have to obtain CDUA's for minor operational activities and this would hamper their business.
- Ranchers maintain that their activities are beneficial to the area-- grazing reduces potential fire hazards and controls banana poka and that ranching activities would be difficult to conduct in the Conservation District.
- The County has homerule concerns.

Alternative 2. Special Subzone in the Conservation District

Under this alternative, lands would be reclassified to the Conservation District but BLNR would place the lands in a Special Subzone. Conservation District rules allow for the creation of Special Subzones in which uses can be tailored to meet the characteristics of the property.

This Special Subzone could allow cattle ranching and forestry under certain conditions, e.g., selective harvesting of trees, no clear-cutting, replanting, rotation of cattle to allow regeneration of koa trees, etc. It would allow the normal activities associated with these operations without requiring separate CDUA's.

Advantages

- Allows for continuation of existing uses without the burdens of the CDUA process.
- Golf courses and residential subdivisions would not be allowed.
- Would provide for protection of the watershed and natural resources of the area.
- If lands are used as collateral, their value would be more likely to be based on their current use rather than speculative value.

Disadvantages

- Landowners maintain that if the land is placed in the Conservation District, it will affect their borrowing power.
- The County has homerule concerns.
- Parcel could be reclassified back to another district at some future date.

Alternative 3. Conservation or Agricultural Perpetual Easement

Under this alternative, the landowners would voluntarily agree to restrictions on the use of their property. The easement is recorded with the deed on the property.

Advantages

- Allows tailoring of permitted uses and restrictions (custom fit).
- Provides latitude for defining allowable and restricted uses.
- It is perpetual, unlike Conservation District classification which can be changed.
- Under certain conditions, there may be tax benefits for the landowner.
- If easement is held jointly by the State and the County, then the home rule issue may not be a problem.

Disadvantages

- The process for monitoring and enforcing easements is not clear.

Alternative 4. Participation in Natural Area Partnership or Forest Stewardship Programs

Advantages

- Provides for active management of the lands.
- Landowner retains control of the property and receives cost-sharing benefits (i.e., landowner may receive either matching funds or twice the funds spent depending on the program).
- Requires preparation of a management plan by the landowner and acceptance by BLNR. Plan must be available for public review.

Disadvantages

- Only specific high quality lands can qualify for the Natural Area Partnership Program (NAP) which provides 2 to 1 funding.
- More latitude exists for lands to qualify for the Forest Stewardship Program (FSP).
- FSP entails at least a ten-year commitment. NAP calls for perpetual commitment.
- Penalties for withdrawal from the program are minimal.
- Agreements depend upon the level of State funding available.

Alternative 5. Change in County Zoning

Under this alternative, County zoning for the area would be changed to protect the watershed and natural resources of the area.

Advantages

- Would restrict uses and preserve values of the area.
- Would address County home rule concerns.
- If lands are used as collateral, their value would be more likely to be based on their current use rather than speculative value.

Disadvantages

- Landowners may contend that this would have an impact on their financing ability.
- Could be rezoned at some future date.
- Would need to assure that State interests are protected.

Other Alternatives

Other alternatives which merit further discussion include:

1. Farmland and Open Space Mitigation Programs. Under the California Land Conservation Act of 1965, landowners receive preferential tax assessments based on the use value of the land when they enter into contracts limiting the use of land to agricultural and open space purposes for a specified term of years. (The Williamson Act, 25 Years of Land Conservation, The Resources Agency, State of California, 1990.)
2. Transfer of Development Rights (TDR). Alaska and county and local governments in six other states have initiated TDR's as a form of farmland protection. With TDR's, private developers can buy the development rights from land in a "preservation region" and apply them to land in a "development region." Thus, owners can preserve agricultural lands or natural resources lands by selling their development rights, and developers can develop in designated regions more densely than the zoning would otherwise permit. (Draft, "Agricultural Land Protection in the U.S. and Hawaii, Issues and Methods," John C. Martin, College of Tropical Agriculture and Human Resources, University of Hawaii, 1988.) (W. Lockeretz, ed., Sustaining Agriculture Near Cities, Ankeny, IA, Soil and Water Conservation Society.)

3. Acquisition of Property, Purchase Lease-back and Purchase of Development Rights. Acquisition of property also known as land banking or land trust provides government with direct control over the lands but has not been widely used because of the very high cost to taxpayers.

A variation on this theme is purchase leaseback of lands where land is bought by the government and the agricultural rights leased back for farming. It also entails high cost to taxpayers and requires the consent of affected landowners.

Purchase of development rights involves government paying the landowners the difference between the farm use value of the land and market value. This prevents urban development and the farmer retains all other property rights. This alternative also involves costs to the taxpayer (see J.C. Martin).

Summary

These areas are important for the public health, safety and welfare. Mechanisms need to be found to protect these resources. The selection of appropriate mechanisms will involve hard decisions and some trade-offs between competing interests. However, the struggle and effort which will be involved will be in the best long-term interest of the State and its residents.

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APPENDIX A

**POPULATION
PROJECTIONS**

TABLE 1
POPULATION PROJECTIONS
1987 - 2010
COUNTY OF HAWAII

	1987 1/	PERCENT	1990 2/	PERCENT	1995 2/	PERCENT	2000 2/	PERCENT	2005 2/	PERCENT	2010 1/	PERCENT
PUNA	19,003	16.6%	21,157	17.0%	25,038	17.6%	29,131	18.2%	33,903	18.8%	39,865	19.3%
SOUTH HILO	45,303	39.6%	47,322	38.0%	50,187	35.2%	52,064	32.5%	53,695	29.7%	55,520	26.9%
NORTH HILO	1,495	1.3%	1,535	1.2%	1,576	1.1%	1,572	1.0%	1,544	0.9%	1,500	0.7%
HAMAKUA	5,303	4.6%	5,664	4.5%	6,256	4.4%	6,792	4.2%	7,374	4.1%	8,085	3.9%
NORTH KOHALA	3,602	3.2%	4,082	3.3%	4,966	3.5%	5,924	3.7%	7,054	3.9%	8,470	4.1%
SOUTH KOHALA	7,097	6.2%	8,486	6.8%	11,133	7.8%	14,140	8.8%	17,750	9.8%	22,300	10.8%
NORTH KONA	20,503	17.9%	23,585	18.9%	29,325	20.6%	35,657	22.2%	43,176	23.9%	52,620	25.5%
SOUTH KONA	7,293	6.4%	7,754	6.2%	8,493	6.0%	9,139	5.7%	9,826	5.4%	10,660	5.2%
KAU	4,700	4.1%	5,014	4.0%	5,524	3.9%	5,982	3.7%	6,477	3.6%	7,080	3.4%
TOTAL	114,300	100.0%	124,600	100.0%	142,500	100.0%	160,400	100.0%	180,800	100.0%	206,100	100.0%

1/ County of Hawaii Planning Department for Hawaii County Highway Planning Study.

2/ M-K projections using distributions derived from 2010 projections.

APPENDIX B

**SUMMARIES OF
FUTURE AREA
REQUIREMENTS
BY LAND USE**

TABLE 1
AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
COUNTY OF HAWAII
1995
(IN ACRES)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-	OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/
	ZONED			ZONED			ZONED			ZONED			ZONED	DEV.	DEV.	1995	1995	(DEFICIT)
	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	DEV.	DEV.	DEMAND	DEMAND	OF URBAN
	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN LANDS	URBAN	URBAN			LANDS
														1/				
PUNA	1,704	426	1,278	16	12	4	463	20	443	0	0	0	2,183	1,840	4,023	15	473	3,550
SOUTH HILO	1,912	1,087	825	492	18	474	383	28	355	55	8	47	2,842	526	3,368	13	1,154	2,214
NORTH HILO	47	0	47	2	0	2	0	0	0	0	0	0	49	12	61	0	0	61
HAMAKUA	157	190	(33)	7	4	3	0	7	(7)	0	0	0	164	67	231	1	202	29
NORTH KOHALA	220	163	57	10	3	7	0	2	(2)	0	0	0	230	49	279	2	170	109
SOUTH KOHALA	3,402	340	3,062	187	48	139	123	11	112	200	0	200	3,912	940	4,852	12	411	4,441
NORTH KONA	2,163	230	1,933	219	53	166	1,372	26	1,346	309	106	203	4,063	1,296	5,359	18	433	4,926
SOUTH KONA	128	198	(70)	23	4	19	0	11	(11)	0	0	0	151	142	293	1	214	79
KAU	380	114	266	21	3	18	0	5	(5)	42	0	42	443	162	605	1	123	482
SUBTOTAL	10,113	2,748	7,365	977	145	832	2,341	110	2,231	606	114	492	14,037	5,034	19,071	63	3,180	15,891
25% FLEXIBILITY FACTOR		687			36			28			29					16	795	(795)
TOTAL	10,113	3,435	7,365	977	181	832	2,341	138	2,231	606	143	492	14,037	5,034	19,071	79	3,975	15,096

1/ Includes County-zoned agricultural, rural and unplanned districts, but excludes open zones.

TABLE 2
AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
COUNTY OF HAWAII
2010
(IN ACRES)

	RESIDENTIAL ZONED			COMMERCIAL ZONED			INDUSTRIAL ZONED			RESORT ZONED			COUNTY- ZONED	OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/ (DEFICIT)
	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	DEV.	DEV.	2010	2010	OF URBAN
	URBAN	DEMAND		URBAN	DEMAND		URBAN	DEMAND		URBAN	DEMAND		URBAN LANDS	URBAN	URBAN	DEMAND	DEMAND	LANDS
														1/				
PUNA	1,704	1,330	374	16	37	(21)	463	80	383	0	0	0	2,183	1,840	4,023	83	1,530	2,493
SOUTH HILO	1,912	2,023	(111)	492	91	401	383	117	266	55	0	55	2,842	526	3,368	55	2,286	1,082
NORTH HILO	47	0	47	2	0	2	0	1	(1)	0	0	0	49	12	61	0	1	60
HAMAKUA	157	421	(264)	7	14	(7)	0	25	(25)	0	0	0	164	67	231	12	472	(241)
NORTH KOHALA	220	549	(329)	10	9	1	0	8	(8)	0	0	0	230	49	279	16	582	(303)
SOUTH KOHALA	3,402	1,484	1,918	187	116	71	123	53	70	200	514	(314)	3,912	940	4,852	74	2,241	2,611
NORTH KONA	2,163	1,298	865	219	190	29	1,372	140	1,232	309	454	(145)	4,063	1,296	5,359	118	2,200	3,159
SOUTH KONA	128	327	(199)	23	19	4	0	38	(38)	0	0	0	151	142	293	13	397	(104)
KAU	380	325	55	21	12	9	0	18	(18)	42	6	36	443	162	605	4	365	240
SUBTOTAL	10,113	7,757	2,356	977	488	489	2,341	480	1,861	606	974	(368)	14,037	5,034	19,071	375	10,074	8,997
25% FLEXIBILITY FACTOR	1,939				122			120			244					84	2,519	(2,519)
TOTAL	10,113	9,696	2,356	977	610	489	2,341	600	1,861	606	1,218	(368)	14,037	5,034	19,071	469	12,593	6,479

1/ Includes County-zoned agricultural, rural and unplanned districts, but excludes open zones.

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 3
RESIDENTIAL UNIT DEMAND
1990 - 2010
COUNTY OF HAWAII

	1987 POP. 1/	HOUSING UNITS 1/	1990 POP.	HOUSE- HOLDS 2.73 PPH 2/	TOTAL DEMAND 3/	1995 POP. 1/	HOUSE- HOLDS 2.73 PPH 2/	TOTAL DEMAND 3/	2000 POP.	HOUSE- HOLDS 2.68 PPH	TOTAL DEMAND	2005 POP.	HOUSE- HOLDS 2.64 PPH	TOTAL DEMAND	2010 POP.	HOUSE- HOLDS 2.61 PPH	TOTAL DEMAND
PUNA	19,003	6,472	21,157	7,595	7,975	25,038	8,988	9,437	29,131	10,652	11,185	33,903	12,585	13,215	39,865	14,968	15,717
SOUTH HILO	45,303	15,463	47,322	16,987	17,837	50,187	18,016	18,917	52,064	19,038	19,990	53,695	19,932	20,929	55,520	20,847	21,889
NORTH HILO	1,495	636	1,535	551	579	1,576	566	594	1,572	575	604	1,544	573	602	1,500	563	591
HAMAKUA	5,303	1,676	5,664	2,033	2,135	6,256	2,246	2,358	6,792	2,484	2,608	7,374	2,737	2,874	8,085	3,036	3,188
NORTH KOHALA	3,602	1,253	4,082	1,465	1,539	4,966	1,783	1,872	5,924	2,166	2,274	7,054	2,618	2,749	8,470	3,180	3,339
SOUTH KOHALA	7,097	2,830	8,486	3,046	3,199	11,133	3,997	4,196	14,140	5,170	5,429	17,750	6,589	6,919	22,300	8,373	8,792
NORTH KONA	20,503	8,969	23,585	8,466	8,890	29,325	10,527	11,053	35,657	13,039	13,691	43,176	16,027	16,829	52,620	19,758	20,746
SOUTH KONA	7,293	1,673	7,754	2,783	2,923	8,493	3,049	3,201	9,139	3,342	3,509	9,826	3,648	3,830	10,660	4,003	4,203
KAU	4,700	1,699	5,014	1,800	1,890	5,524	1,983	2,082	5,982	2,187	2,297	6,477	2,404	2,525	7,080	2,658	2,791
TOTAL	114,299	40,671	124,599	44,728	46,964	142,499	51,154	53,711	160,399	58,654	61,586	180,800	67,115	70,471	206,100	77,386	81,256

1/ County of Hawaii Planning Department for Hawaii County Highway Planning Study.

2/ 98% of population in households; declining persons per household factors.

3/ Includes units to satisfy 5% desired vacancy rate.

4/ The projections of housing need in this report reflect the high end of a range of projections. These projections are based on DBED Series M-K population projections and assume declining household sizes ranging from 2.86 persons per household in 1990 to 2.66 persons per household in 2010. These household sizes are much lower than those reported by the 1990 census and decrease at a faster rate than extrapolations made using census data. Additionally, estimations of land required to accommodate housing need are based on single family densities ranging from 3.5 to 5.5 dwelling units per acre.

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 4
RESIDENTIAL AREA REQUIREMENTS
2010
COUNTY OF HAWAII

	1987 UNITS 1/	2010 DEMAND (UNITS) 2/	ADDITIONAL UNITS NEEDED	PERCENT SINGLE FAMILY 3/	SF- DENSITY UNITS/AC 4/	MF- DENSITY UNITS/AC 4/	SF- ACRES NEEDED 5/	MF- ACRES NEEDED 5/	TOTAL ACRES NEEDED
PUNA	6,472	15,717	9,245	98.4%	6.9	13.5	1,319	11	1,330
SOUTH HILO	15,463	21,889	6,426	81.3%	2.7	13.5	1,934	89	2,023
NORTH HILO	636	591	(45)	93.9%	2.4	13.5	0	0	0
HAMAKUA	1,676	3,188	1,512	96.5%	3.5	13.5	417	4	421
NORTH KOHALA	1,253	3,339	2,086	76.1%	3.1	13.5	512	37	549
SOUTH KOHALA	2,830	8,792	5,962	73.3%	3.2	13.5	1,366	118	1,484
NORTH KONA	8,969	20,746	11,777	62.9%	7.6	13.5	975	324	1,298
SOUTH KONA	1,673	4,203	2,530	96.1%	7.6	13.5	320	7	327
KAU	1,699	2,791	1,092	93.8%	3.2	13.5	320	5	325
TOTALS	40,671	81,256	40,585				7,163	595	7,757

1/ County of Hawaii Planning Department for Hawaii County Highway Planning Study.

2/ See Residential Demand table.

3/ County of Hawaii Planning Department projections for highway study.

4/ Derived from Hawaii County General Plan, 1990, area profiles.

Islandwide multi-family densities used in absence of district data.

5/ Increase in units divided by density factor.

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 5

**RESIDENTIAL AREA REQUIREMENTS
1995 - 2010 SUMMARY
COUNTY OF HAWAII**

	1987 UNITS	1995 DEMAND	ACRES NEEDED	2000 DEMAND	ACRES NEEDED	2005 DEMAND	ACRES NEEDED	2010 DEMAND	ACRES NEEDED
PUNA	6,472	9,437	426	11,185	678	13,215	970	15,717	1,330
SOUTH HILO	15,463	18,917	1,087	19,990	1,425	20,929	1,721	21,889	2,023
NORTH HILO	636	594	0	604	0	602	0	591	0
HAMAKUA	1,676	2,358	190	2,608	259	2,874	333	3,188	421
NORTH KOHALA	1,253	1,872	163	2,274	269	2,749	394	3,339	549
SOUTH KOHALA	2,830	4,196	340	5,429	647	6,919	1,018	8,792	1,484
NORTH KONA	8,969	11,053	230	13,691	521	16,829	866	20,746	1,298
SOUTH KONA	1,673	3,201	198	3,509	237	3,830	279	4,203	327
KAU	1,699	2,082	114	2,297	178	2,525	246	2,791	325
TOTAL	40,671	53,710	2,748	61,587	4,214	70,472	5,827	81,256	7,757

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 6
COMMERCIAL AREA REQUIREMENTS
1995 - 2010
COUNTY OF HAWAII

	1987	1995			2000			2005			2010		
	EMPLOYMT	EMPLOYMT	SQ FT	ACRES	EMPLOYMT	SQ FT	ACRES	EMPLOYMT	SQ FT	ACRES	EMPLOYMT	SQ FT	ACRES
	1/	2/	3/	4/	1/	5/	5/	INCREASE	INCREASE	NEEDED	INCREASE	INCREASE	5/
PUNA	1,490	711	177,692	12	1,155	288,750	20	1,665	416,250	29	2,174	543,500	37
SOUTH HILO	12,622	1,583	395,692	18	2,572	643,000	30	5,250	1,312,500	60	7,928	1,982,000	91
NORTH HILO	163	(17)	(4,308)	0	(28)	(7,000)	0	(7)	(1,750)	0	15	3,750	0
HAMAKUA	810	247	61,846	4	402	100,500	7	610	152,500	11	818	204,500	14
NORTH KOHALA	473	155	38,769	3	252	63,000	4	387	96,750	7	521	130,250	9
SOUTH KOHALA	3,355	4,199	1,049,692	48	6,823	1,705,750	78	8,457	2,114,250	97	10,091	2,522,750	116
NORTH KONA	7,498	4,592	1,148,000	53	7,462	1,865,500	86	10,718	2,679,500	123	13,973	3,493,250	160
SOUTH KONA	1,623	233	58,308	4	379	94,750	7	734	183,500	13	1,088	272,000	19
KAU	1,045	172	43,077	3	280	70,000	5	499	124,750	9	718	179,500	12
TOTAL	29,079	11,875	2,968,768	145	19,297	4,824,250	236	28,313	7,078,250	348	37,326	9,331,500	459
<p>1/ County of Hawaii Planning Department, employment projections by planning area.</p> <p>2/ Interpolated from year 2000 projections.</p> <p>3/ Commercial square feet increase based on 250 square feet per employee.</p> <p>4/ Based on floor area ratios of 0.5 for S. Hilo, S. Kohala and N. Kona and 0.3 for other areas.</p> <p>5/ Cumulative employment, square footage increases and acreage needs.</p>													

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 7
INDUSTRIAL AREA REQUIREMENTS
1995 - 2010
COUNTY OF HAWAII

	1990 INDUSTRIAL EMPLOYMENT 1/	1995 INDUSTRIAL EMPLOYMENT	ACRES NEEDED 2/	2000 INDUSTRIAL EMPLOYMENT 3/	ACRES NEEDED	2005 INDUSTRIAL EMPLOYMENT	ACRES NEEDED	2010 INDUSTRIAL EMPLOYMENT 3/	ACRES NEEDED
PUNA	2,524	2,725	20	2,926	40	3,126	60	3,326	80
SOUTH HILO	3,528	3,809	28	4,090	56	4,392	86	4,694	117
NORTH HILO	28	30	0	32	0	33	1	34	1
HAMAKUA	847	914	7	982	14	1,040	19	1,097	25
NORTH KOHALA	213	230	2	247	3	273	6	298	8
SOUTH KOHALA	1,355	1,463	11	1,571	22	1,729	37	1,887	53
NORTH KONA	3,317	3,582	26	3,846	53	4,282	96	4,718	140
SOUTH KONA	1,369	1,478	11	1,587	22	1,667	30	1,746	38
KAU	620	670	5	719	10	760	14	800	18
TOTAL	13,800	14,900	110	16,000	220	17,300	350	18,600	480
<p>1/ 1990, 1995, and 2005 employment estimated from County of Hawaii projections. 2/ 10 employees per acre assumed. 3/ County of Hawaii Planning Department projections for Highway Planning Study.</p>									

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 8
RESORT AREA REQUIREMENTS
1995 - 2010
COUNTY OF HAWAII

	1987 VISITOR UNITS 1/	DENSITY UNITS/ACRE 2/	1995 VISITOR UNITS 3/	ACRES NEEDED 4/	2000 VISITOR UNITS	ACRES NEEDED	2005 VISITOR UNITS	ACRES NEEDED	2010 VISITOR UNITS	ACRES NEEDED
PUNA	0	0	0	0	0	0	0	0	0	0
SOUTH HILO	1,304	27	1,531	8	1,304	0	1,295	0	1,287	0
NORTH HILO	0	0	0	0	0	0	0	0	0	0
HAMAKUA	6	0	6	0	6	0	6	0	6	0
NORTH KOHALA	10	0	10	0	10	0	10	0	10	0
SOUTH KOHALA	1,511	16	4,330	0	6,661	322	8,174	416	9,732	514
NORTH KONA	4,529	25	7,175	106	8,271	150	11,647	285	15,876	454
SOUTH KONA	64	21	64	0	64	0	64	0	64	0
KAU	84	7	84	0	84	0	103	3	124	6
TOTAL	7,508		13,200	114	16,400	472	21,300	704	27,100	973

1/ County of Hawaii Planning Department.
2/ Based on existing densities calculated for each area from 1989 Visitor Plant Inventory.
3/ Based on M-K visitor unit projections for County, distributed per County Planning Department projections for highway planning study.
4/ Additional units divided by density factor for area; cumulative totals from 1995.

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

TABLE 9
PUBLIC AREA NEEDS
SCHOOL SPACE REQUIREMENTS
1995 - 2010
COUNTY OF HAWAII

	1990 HOUSE- HOLDS	1995 HOUSEHOLD INCREASE	STUDENT INCREASE		2000 ACRES NEEDED	HOUSEHOLD INCREASE	STUDENT INCREASE		2005 ACRES NEEDED	HOUSEHOLD INCREASE	STUDENT INCREASE		2010 ACRES NEEDED	HOUSEHOLD INCREASE	STUDENT INCREASE		ACRES NEEDED
			K-8 1/ HS 1/		2/ 3/		K-8 HS		3/ K-8 HS		K-8 HS				K-8 HS		
PUNA	7,595	1,393	641	306	7	3,057	1,406	673	7	4,990	2,295	1,098	39	7,373	3,392	1,622	46
SOUTH HILO	16,987	1,029	473	226	7	2,051	943	451	7	2,945	1,355	648	7	3,860	1,776	849	39
NORTH HILO	551	15	7	3	0	24	11	5	0	22	10	5	0	12	6	3	0
HAMAKUA	2,033	213	98	47	0	451	207	99	0	704	324	155	0	1,003	461	221	7
NORTH KOHALA	1,465	318	146	70	0	701	322	154	0	1,153	530	254	7	1,715	789	377	7
SOUTH KOHALA	3,046	951	437	209	7	2,124	977	467	7	3,543	1,630	779	39	5,327	2,450	1,172	46
NORTH KONA	8,466	2,061	948	453	7	4,573	2,104	1,006	39	7,561	3,478	1,663	53	11,292	5,194	2,484	60
SOUTH KONA	2,783	266	122	59	0	559	257	123	0	865	398	190	0	1,220	561	268	7
KAU	1,800	183	84	40	0	387	178	85	0	604	278	133	0	858	395	189	0
TOTAL	44,726	6,429	2,957	1,414	28	13,927	6,406	3,064	60	22,387	10,298	4,925	145	32,660	15,024	7,185	212

1/ Kindergarten to eighth grade, and high school. Based on County ratios of student enrollment to total households, 1980 Census.

2/ Based on Dept. of Education standards for new schools, 7 acres for elementary schools, and 25 acres for high schools.

3/ Cumulative household increase, projected enrollment, and acreage totals through 2010.

TABLE 10
PUBLIC AREA NEEDS
PARKS SPACE REQUIREMENTS
1995 - 2010
COUNTY OF HAWAII

	1990 POPULATION 1/	1995 POPULATION INCREASE 1/	ACRES NEEDED 2/	2000 POPULATION INCREASE	ACRES NEEDED	2005 POPULATION INCREASE	ACRES NEEDED	2010 POPULATION INCREASE	ACRES NEEDED
PUNA	19,003	3,881	8	7,974	16	12,746	25	18,708	37
SOUTH HILO	45,303	2,865	6	4,742	9	6,373	13	8,198	16
NORTH HILO	1,495	41	0	37	0	9	0	0	0
HAMAKUA	5,303	592	1	1,128	2	1,710	3	2,421	5
NORTH KOHALA	3,602	884	2	1,842	4	2,970	6	4,388	9
SOUTH KOHALA	7,097	2,647	5	5,654	11	9,264	18	13,814	28
NORTH KONA	20,503	5,740	11	12,072	24	19,591	39	29,035	58
SOUTH KONA	7,293	739	1	1,385	3	2,072	4	2,906	6
KAU	4,700	510	1	968	2	1,463	3	2,066	4
TOTAL	114,299	17,899	35	35,802	71	56,198	111	81,536	163
1/ See Population Projections Table									
2/ Based on 2 acres per 1,000 population.									

Source: Urban Land Requirements Study, Wilson Okamoto and Associates, 1991

APPENDIX C

**PRELIMINARY TMK LISTING
FOR
RECLASSIFICATION
RECOMMENDATIONS**

site name	tmk	portion
Akoakoa Point	5-2-001-001	Y
Akoakoa Point	5-2-001-002	N
Akoakoa Point	5-2-001-006	Y
Akoakoa Point	5-2-001-012	Y
Akoakoa Point	5-2-002-001	Y
Akoakoa Point	5-2-002-006	Y
Akoakoa Point	5-2-002-008	Y
Akoakoa Point	5-2-005-001	Y
Akoakoa Point	5-2-005-002	N
Akoakoa Point	5-2-005-003	N
Akoakoa Point	5-2-005-004	N
Akoakoa Point	5-2-005-004	N
Area Above Hilo FR-Waikoloa Ponds	2-6-018-001	N
Area Above Hilo FR-Waikoloa Ponds	2-6-018-003	N
Hakalau-Huumula	2-9-005-003	N
Hakalau-Huumula	2-9-005-005	N
Hakalau-Huumula	3-3-001-007	N
Hakalau-Huumula	3-3-001-008	N
Hapuna Beach Rec. Area	6-2-002-001	Y
Hapuna Beach Rec. Area	6-6-002-035	Y
Hapuna Beach Rec. Area	6-6-002-041	Y
Hawaii Volcanoes National Park	9-9-001-006	N
Hills of Waimea	6-4-001-034	Y
Hills of Waimea	6-4-001-037	Y
Hills of Waimea	6-4-004-020	Y
Hills of Waimea	6-4-018-055	Y
Hills of Waimea	6-4-018-093	Y
Hills of Waimea	6-4-018-094	Y
Hills of Waimea	6-4-018-095	Y
Hills of Waimea	6-5-001-003	Y
Hills of Waimea	6-5-001-020	Y
Hills of Waimea	6-5-001-020	Y
Hills of Waimea	6-5-001-047	Y
Honomalino	8-9-001-002	N
Honuaula Tract 2	7-4-001-003	N
Honuaula Tract 3	7-4-001-002	Y
Honuaula Tract 3 Ext.	7-5-013-022	N
Kaalaiki-Ninole	9-7-001-014	N
Kaalaiki-Ninole	9-7-001-015	N
Kaalaiki-Ninole	9-7-001-016	N
Kaalaiki-Ninole	9-7-001-017	N
Kaalaiki-Ninole	9-7-001-020	N
Kailua to Keahole Urban Area	7-3-003-005	N
Kailua to Keahole Urban Area	7-3-003-006	N
Kailua to Keahole Urban Area	7-3-003-007	N
Kailua to Keahole Urban Area	7-3-003-008	N
Kailua to Keahole Urban Area	7-3-003-009	N
Kailua to Keahole Urban Area	7-3-003-010	N
Kailua to Keahole Urban Area	7-3-003-011	N
Kailua to Keahole Urban Area	7-3-003-012	N
Kailua to Keahole Urban Area	7-3-003-013	N
Kailua to Keahole Urban Area	7-3-003-017	N
Kailua to Keahole Urban Area	7-3-003-018	N
Kailua to Keahole Urban Area	7-3-003-020	N
Kailua to Keahole Urban Area	7-3-003-032	N
Kailua to Keahole Urban Area	7-3-003-033	N
Kailua to Keahole Urban Area	7-3-003-034	N
Kailua to Keahole Urban Area	7-3-003-035	N
Kailua to Keahole Urban Area	7-3-003-036	N
Kailua to Keahole Urban Area	7-3-003-037	N
Kailua to Keahole Urban Area	7-3-003-038	N
Kailua to Keahole Urban Area	7-3-003-039	N
Kailua to Keahole Urban Area	7-3-003-040	N
Kailua to Keahole Urban Area	7-3-003-041	N

[illegible]

[illegible]

sitename	tmk	portion
Kailua to Keahole Urban Area	7-3-007-057	N
Kailua to Keahole Urban Area	7-3-007-058	N
Kailua to Keahole Urban Area	7-3-007-059	N
Kailua to Keahole Urban Area	7-3-007-060	N
Kailua to Keahole Urban Area	7-3-007-061	N
Kailua to Keahole Urban Area	7-3-007-062	N
Kailua to Keahole Urban Area	7-3-009-004	N
Kailua to Keahole Urban Area	7-3-009-005	N
Kailua to Keahole Urban Area	7-3-009-007	N
Kailua to Keahole Urban Area	7-3-009-008	N
Kailua to Keahole Urban Area	7-3-009-013	N
Kailua to Keahole Urban Area	7-3-009-017	N
Kailua to Keahole Urban Area	7-3-009-018	N
Kailua to Keahole Urban Area	7-3-009-019	Y
Kailua to Keahole Urban Area	7-3-009-020	N
Kailua to Keahole Urban Area	7-3-009-023	N
Kailua to Keahole Urban Area	7-3-009-025	Y
Kailua to Keahole Urban Area	7-3-009-026	N
Kailua to Keahole Urban Area	7-3-010-002	N
Kailua to Keahole Urban Area	7-3-010-003	N
Kailua to Keahole Urban Area	7-3-010-029	N
Kailua to Keahole Urban Area	7-3-010-031	Y
Kailua to Keahole Urban Area	7-3-010-033	N
Kailua to Keahole Urban Area	7-3-010-035	N
Kailua to Keahole Urban Area	7-4-008-002	Y
Kailua to Keahole Urban Area	7-4-008-005	N
Kailua to Keahole Urban Area	7-4-008-011	N
Kailua to Keahole Urban Area	7-4-008-012	Y
Kailua to Keahole Urban Area	7-4-008-013	N
Kailua to Keahole Urban Area	7-4-008-026	Y
Kailua to Keahole Urban Area	7-4-008-029	N
Kailua to Keahole Urban Area	7-4-008-030	N
Kailua to Keahole Urban Area	7-4-008-033	Y
Kailua to Keahole Urban Area	7-4-008-047	N
Kailua to Keahole Urban Area	7-4-008-048	N
Kailua to Keahole Urban Area	7-4-008-049	N
Kaloko and Honokohau Fishponds	7-3-009-002	Y
Kaloko and Honokohau Fishponds	7-3-009-021	N
Kaloko and Honokohau Fishponds	7-4-008-010	Y
Kaloko and Honokohau Fishponds	7-4-008-025	Y
Kanakaleonui-Keanakolu Tract	3-7-001-010	Y
Kaohe	4-3-010-002	Y
Kaohe	4-3-010-008	Y
Kaohe	4-4-014-002	Y
Kaohe	4-4-014-003	N
Kaohe	4-4-014-004	N
Kaohe	4-4-015-003	Y
Kaohe-Kukuipae	8-7-001-008	N
Kaohe-Kukuipae	8-7-001-012	N
Kaupulehu	7-2-002-001	Y
Kaupulehu	7-2-002-011	N
Kaupulehu	7-2-003-003	Y
Keaau	1-6-003-003	N
Keaau	1-6-003-007	Y
Keaau	1-6-003-008	Y
Keaau	1-6-003-011	N
Keaau	1-6-003-012	N
Keaau	1-6-003-013	N
Keaau	1-6-003-014	N
Keaau	1-6-003-015	N
Keaau	1-6-003-068	N
Keaau	1-6-003-076	N
Keaau	1-6-003-084	N
Kehena	5-8-002-001	Y
Kehena	5-9-002-001	Y

sitename	tmk	portion
Kehena	5-9-002-002	Y
Kehena	5-9-002-004	Y
Keolonahihi Keakealaniwahine Comp.	7-7-004-011	N
Keolonahihi Keakealaniwahine Comp.	7-7-004-012	N
Keolonahihi Keakealaniwahine Comp.	7-7-004-017	N
Keolonahihi Keakealaniwahine Comp.	7-7-004-043	N
Keolonahihi Keakealaniwahine Comp.	7-7-004-051	N
Keolonahihi Keakealaniwahine Comp.	7-7-004-052	N
Kilauea Keauhou	9-9-001-004	Y
Kohala Cliffs and Valleys	5-8-002-001	Y
Kohala Cliffs and Valleys	5-9-002-001	Y
Kona Watershed	7-2-002-001	Y
Kona Watershed	7-2-007-001	Y
Kona Watershed	7-2-007-006	Y
Kona Watershed	7-3-001-002	N
Kona Watershed	7-4-001-001	N
Kona Watershed	7-4-001-002	N
Kona Watershed	7-4-001-003	N
Kona Watershed	7-4-001-004	N
Kona Watershed	7-4-001-005	N
Kona Watershed	7-4-001-006	N
Kona Watershed	7-4-001-007	N
Kona Watershed	7-4-002-006	N
Kona Watershed	7-4-002-007	N
Kona Watershed	7-4-002-008	N
Kona Watershed	7-4-002-009	N
Kona Watershed	7-4-002-012	N
Kona Watershed	7-4-002-013	N
Kona Watershed	7-4-003-001	Y
Kona Watershed	7-4-003-002	Y
Kona Watershed	7-4-005-001	N
Kona Watershed	7-4-005-002	N
Kona Watershed	7-4-005-003	N
Kona Watershed	7-4-005-004	N
Kona Watershed	7-5-001-001	Y
Kona Watershed	7-5-001-005	N
Kona Watershed	7-5-001-006	N
Kona Watershed	7-5-001-007	Y
Kona Watershed	7-5-001-008	N
Kona Watershed	7-5-001-010	N
Kona Watershed	7-5-001-011	N
Kona Watershed	7-5-001-015	Y
Kona Watershed	7-5-001-018	Y
Kona Watershed	7-5-001-020	N
Kona Watershed	7-5-001-021	N
Kona Watershed	7-5-001-022	N
Kona Watershed	7-5-001-023	N
Kona Watershed	7-5-001-026	Y
Kona Watershed	7-5-001-027	Y
Kona Watershed	7-5-001-029	Y
Kona Watershed	7-5-001-030	Y
Kona Watershed	7-5-001-044	Y
Kona Watershed	7-5-001-053	Y
Kona Watershed	7-5-001-066	N
Kona Watershed	7-5-001-067	N
Kona Watershed	7-5-001-068	N
Kona Watershed	7-5-001-069	N
Kona Watershed	7-5-001-072	N
Kona Watershed	7-5-001-073	N
Kona Watershed	7-5-013-004	Y
Kona Watershed	7-5-013-005	Y
Kona Watershed	7-5-013-014	N
Kona Watershed	7-5-013-020	Y
Kona Watershed	7-5-013-022	Y
Kona Watershed	7-5-014-001	N

sitename	tmk	portion
Kona Watershed	7-5-014-003	N
Kona Watershed	7-5-014-017	N
Kona Watershed	7-5-014-022	N
Kona Watershed	7-5-014-023	N
Kona Watershed	7-6-001-001	N
Kona Watershed	7-6-001-002	N
Kona Watershed	7-6-002-002	Y
Kona Watershed	7-6-002-024	Y
Kona Watershed	7-6-002-028	Y
Kona Watershed	7-6-002-029	Y
Kona Watershed	7-6-002-030	N
Kona Watershed	7-6-002-031	N
Kona Watershed	7-6-002-032	N
Kona Watershed	7-7-001-001	Y
Kona Watershed	7-7-001-002	Y
Kona Watershed	7-7-001-004	Y
Kona Watershed	7-8-001-001	Y
Kona Watershed	7-8-001-002	Y
Kona Watershed	7-8-001-003	Y
Kona Watershed	7-8-001-004	N
Kona Watershed	7-8-001-007	Y
Kona Watershed	7-8-001-009	N
Kona Watershed	7-8-002-001	N
Kona Watershed	7-8-002-002	Y
Kona Watershed	7-8-002-006	Y
Kona Watershed	7-8-002-007	Y
Kona Watershed	7-8-002-009	N
Kona Watershed	7-8-002-010	Y
Kona Watershed	7-8-003-001	N
Kona Watershed	7-8-003-002	N
Kona Watershed	7-8-003-003	N
Kona Watershed	7-8-003-004	N
Kona Watershed	7-8-003-005	N
Kona Watershed	7-8-003-006	N
Kona Watershed	7-8-003-007	N
Kona Watershed	7-8-003-008	N
Kona Watershed	7-8-003-009	N
Kona Watershed	7-8-003-010	N
Kona Watershed	7-8-003-011	N
Kona Watershed	7-8-003-012	N
Kona Watershed	7-8-003-013	N
Kona Watershed	7-8-003-014	N
Kona Watershed	7-8-003-015	N
Kona Watershed	7-8-003-016	N
Kona Watershed	7-8-003-017	N
Kona Watershed	7-8-003-018	N
Kona Watershed	7-8-003-019	N
Kona Watershed	7-8-003-020	N
Kona Watershed	7-8-003-021	N
Kona Watershed	7-8-003-022	N
Kona Watershed	7-8-003-023	N
Kona Watershed	7-8-003-024	N
Kona Watershed	7-8-003-025	N
Kona Watershed	7-8-003-026	N
Kona Watershed	7-9-001-001	N
Kona Watershed	7-9-002-001	N
Kona Watershed	7-9-002-002	N
Kona Watershed	7-9-002-003	N
Kona Watershed	7-9-002-004	N
Kona Watershed	7-9-002-005	N
Kona Watershed	7-9-002-006	Y
Kona Watershed	7-9-002-007	N
Kona Watershed	7-9-002-008	N
Kona Watershed	7-9-002-009	N
Kona Watershed	7-9-002-010	N

sitename	tmk	portion
Kona Watershed	7-9-002-011	N
Kona Watershed	7-9-002-012	N
Kona Watershed	7-9-002-013	N
Kona Watershed	7-9-002-014	N
Kona Watershed	7-9-002-015	N
Kona Watershed	7-9-002-016	N
Kona Watershed	7-9-002-017	N
Kona Watershed	7-9-002-018	N
Kona Watershed	7-9-002-019	N
Kona Watershed	7-9-002-020	N
Kona Watershed	7-9-002-021	N
Kona Watershed	8-1-001-002	Y
Kona Watershed	8-1-001-003	Y
Kona Watershed	8-1-005-001	Y
Kona Watershed	8-1-005-002	Y
Kona Watershed	8-1-005-006	Y
Kona Watershed	8-1-005-009	Y
Kona Watershed	8-1-005-024	Y
Kona Watershed	8-1-008-013	N
Kona Watershed	8-1-008-014	N
Kona Watershed	8-1-008-015	N
Kona Watershed	8-2-001-008	N
Kona Watershed	8-2-001-019	N
Kona Watershed	8-2-001-041	N
Kona Watershed	8-2-010-004	Y
Kona Watershed	8-2-010-011	Y
Kona Watershed	8-2-012-001	N
Kona Watershed	8-2-012-012	N
Kona Watershed	8-2-012-013	N
Kona Watershed	8-3-001-002	N
Kona Watershed	8-3-002-001	N
Kona Watershed	8-3-002-009	Y
Kona Watershed	8-3-002-010	Y
Kona Watershed	8-3-002-011	Y
Kona Watershed	8-3-002-012	Y
Kona Watershed	8-3-002-013	Y
Kona Watershed	8-3-002-014	Y
Kona Watershed	8-3-002-015	Y
Kona Watershed	8-3-002-016	Y
Kona Watershed	8-3-014-001	N
Kona Watershed	8-3-014-002	N
Kona Watershed	8-3-014-003	N
Kona Watershed	8-3-014-004	N
Kona Watershed	8-3-014-005	N
Kona Watershed	8-3-014-006	N
Kona Watershed	8-3-014-007	N
Kona Watershed	8-3-014-008	Y
Kona Watershed	8-3-014-009	N
Kona Watershed	8-3-014-010	N
Kona Watershed	8-3-014-011	N
Kona Watershed	8-3-014-012	N
Kona Watershed	8-3-014-013	N
Kona Watershed	8-3-014-014	N
Kona Watershed	8-3-014-015	N
Kona Watershed	8-3-014-016	N
Kona Watershed	8-3-014-017	N
Kona Watershed	8-3-014-018	N
Kona Watershed	8-3-014-019	N
Kona Watershed	8-3-014-020	N
Kona Watershed	8-3-015-017	N
Kona Watershed	8-3-015-018	N
Kona Watershed	8-3-015-019	N
Kona Watershed	8-3-015-020	N
Kona Watershed	8-3-015-021	N
Kona Watershed	8-3-015-022	N

sitename	tmk	portion
Kona Watershed	8-3-015-023	N
Kona Watershed	8-3-015-024	N
Kona Watershed	8-3-015-025	N
Kona Watershed	8-3-015-026	N
Kona Watershed	8-3-015-027	N
Kona Watershed	8-3-015-028	N
Kona Watershed	8-3-015-029	N
Kona Watershed	8-3-015-030	N
Kona Watershed	8-3-015-031	N
Kona Watershed	8-3-015-032	N
Kona Watershed	8-3-015-033	N
Kona Watershed	8-3-015-034	N
Kona Watershed	8-3-015-035	N
Kona Watershed	8-3-015-036	N
Kona Watershed	8-3-015-037	N
Kona Watershed	8-3-015-038	N
Kona Watershed	8-3-015-039	N
Kona Watershed	8-3-015-041	N
Kona Watershed	8-3-015-042	N
Kona Watershed	8-3-015-043	N
Kona Watershed	8-4-001-002	N
Kona Watershed	8-4-002-012	Y
Kona Watershed	8-4-002-020	N
Kona Watershed	8-4-002-021	N
Kona Watershed	8-4-002-022	N
Kona Watershed	8-4-003-002	Y
Kona Watershed	8-4-003-003	Y
Kona Watershed	8-4-003-004	Y
Kona Watershed	8-4-003-005	N
Kona Watershed	8-4-003-006	Y
Kona Watershed	8-4-003-007	Y
Kona Watershed	8-4-003-008	Y
Kona Watershed	8-4-003-009	Y
Kona Watershed	8-4-003-010	Y
Kona Watershed	8-4-003-011	Y
Kona Watershed	8-4-003-012	N
Kona Watershed	8-4-003-013	N
Kona Watershed	8-4-003-014	N
Kona Watershed	8-4-003-025	N
Kona Watershed	8-5-001-001	N
Kona Watershed	8-5-001-002	Y
Kona Watershed	8-5-002-001	Y
Kona Watershed	8-6-001-001	Y
Kona Watershed	8-6-001-003	N
Kona Watershed	8-6-002-001	N
Kona Watershed	8-6-002-003	N
Kona Watershed	8-6-002-004	N
Kona Watershed	8-6-002-005	N
Kona Watershed	8-6-002-006	N
Kona Watershed	8-6-002-007	N
Kona Watershed	8-6-002-008	N
Kona Watershed	8-6-002-009	N
Kona Watershed	8-6-002-010	Y
Kona Watershed	8-6-002-011	Y
Kona Watershed	8-6-002-015	Y
Kona Watershed	8-6-003-001	N
Kona Watershed	8-6-003-002	N
Kona Watershed	8-6-003-003	N
Kona Watershed	8-6-003-004	Y
Kona Watershed	8-6-003-007	Y
Kona Watershed	8-6-003-009	Y
Kona Watershed	8-6-003-010	Y
Kona Watershed	8-6-003-011	Y
Kona Watershed	8-6-004-001	N
Kona Watershed	8-6-004-002	N

sitename	tmk	portion
Kona Watershed	8-6-004-005	Y
Kona Watershed	8-6-004-009	N
Kona Watershed	8-6-004-010	N
Kona Watershed	8-6-004-018	N
Kona Watershed	8-6-004-019	N
Kona Watershed	8-6-006-007	Y
Kona Watershed	8-6-006-018	N
Kona Watershed	8-6-006-020	N
Kona Watershed	8-6-006-023	N
Kona Watershed	8-6-006-024	N
Kona Watershed	8-7-001-004	N
Kona Watershed	8-7-001-005	N
Kona Watershed	8-7-001-007	N
Kona Watershed	8-7-001-008	N
Kona Watershed	8-7-001-009	N
Kona Watershed	8-7-001-010	N
Kona Watershed	8-7-001-011	N
Kona Watershed	8-7-001-012	N
Kona Watershed	8-7-001-013	N
Kona Watershed	8-7-001-014	N
Kona Watershed	8-7-002-002	Y
Kona Watershed	8-7-002-005	Y
Kona Watershed	8-7-002-006	Y
Kona Watershed	8-7-002-007	Y
Kona Watershed	8-7-002-011	Y
Kona Watershed	8-7-002-012	N
Kona Watershed	8-7-002-013	N
Kona Watershed	8-7-002-014	Y
Kona Watershed	8-7-002-016	Y
Kona Watershed	8-7-002-023	N
Kona Watershed	8-7-002-024	Y
Kona Watershed	8-7-002-026	Y
Kona Watershed	8-7-002-027	N
Kona Watershed	8-7-002-028	N
Kona Watershed	8-7-002-031	Y
Kona Watershed	8-7-002-033	Y
Kona Watershed	8-7-004-001	Y
Kona Watershed	8-7-004-002	Y
Kona Watershed	8-7-004-008	Y
Kona Watershed	8-7-004-009	N
Kona Watershed	8-7-004-010	N
Kona Watershed	8-7-004-011	Y
Kona Watershed	8-7-004-012	N
Kona Watershed	8-7-004-013	Y
Kona Watershed	8-7-004-014	Y
Kona Watershed	8-7-006-001	Y
Kona Watershed	8-7-006-002	Y
Kona Watershed	8-7-008-003	Y
Kona Watershed	8-7-008-008	Y
Kona Watershed	8-7-008-012	Y
Kona Watershed	8-7-008-016	Y
Kona Watershed	8-7-008-020	N
Kona Watershed	8-7-008-029	Y
Kona Watershed	8-7-008-033	Y
Kona Watershed	8-7-008-034	Y
Kona Watershed	8-7-008-035	Y
Kona Watershed	8-7-010-001	N
Kona Watershed	8-7-012-001	Y
Kona Watershed	8-7-012-004	N
Kona Watershed	8-7-012-005	N
Kona Watershed	8-7-012-007	N
Kona Watershed	8-8-001-001	N
Kona Watershed	8-8-001-003	N
Kona Watershed	8-8-001-004	N
Kona Watershed	8-8-001-008	N

sitename	tmk	portion
Kona Watershed	8-8-001-010	N
Kona Watershed	8-8-001-012	N
Kona Watershed	8-8-001-016	N
Kona Watershed	8-8-001-020	N
Kona Watershed	8-8-001-021	N
Kona Watershed	8-8-001-022	N
Kona Watershed	8-8-001-029	N
Kona Watershed	8-8-001-030	N
Kona Watershed	8-8-001-031	N
Kona Watershed	8-9-001-001	N
Kona Watershed	8-9-001-002	Y
Kona Watershed	8-9-001-003	Y
Kona Watershed	8-9-001-022	N
Kona Watershed	8-9-001-023	Y
Kona Watershed	8-9-001-024	Y
Kona Watershed	8-9-006-004	N
Kona Watershed	8-9-006-017	Y
Kona Watershed	8-9-006-029	N
Kona Watershed	8-9-006-030	N
Kona Watershed	8-9-006-031	Y
Kona Watershed	8-9-006-032	Y
Kona Watershed	8-9-006-033	Y
Kona Watershed	9-2-001-003	Y
Kona Watershed	9-2-001-005	Y
Lalakea Stream	4-8-003-006	Y
Lalakea Stream	4-8-003-010	Y
Lapakahi-Makai	5-7-001-022	Y
Lapakahi-Mauka	5-7-001-009	N
Lapakahi-Mauka	5-7-001-010	Y
Lapakahi-Mauka	5-7-001-012	N
Lapakahi-Mauka	5-7-001-013	N
Lapakahi-Mauka	5-7-001-014	N
Lapakahi-Mauka	5-7-001-015	N
Laupahoehoe to Maulua Bay	3-4-002-004	Y
Laupahoehoe to Maulua Bay	3-4-004-009	Y
Laupahoehoe to Maulua Bay	3-4-004-011	Y
Laupahoehoe to Maulua Bay	3-4-004-012	Y
Laupahoehoe to Maulua Bay	3-4-004-020	N
Laupahoehoe to Maulua Bay	3-4-004-025	Y
Laupahoehoe to Maulua Bay	3-5-001-001	Y
Laupahoehoe to Maulua Bay	3-5-001-002	Y
Laupahoehoe to Maulua Bay	3-5-001-013	N
Laupahoehoe to Maulua Bay	3-5-001-014	N
Laupahoehoe to Maulua Bay	3-5-001-017	Y
Laupahoehoe to Maulua Bay	3-5-001-018	Y
Laupahoehoe to Maulua Bay	3-5-001-020	Y
Laupahoehoe to Maulua Bay	3-5-001-031	N
Laupahoehoe to Maulua Bay	3-5-001-041	N
Laupahoehoe to Maulua Bay	3-5-001-068	N
Laupahoehoe to Maulua Bay	3-5-002-003	Y
Laupahoehoe to Maulua Bay	3-5-002-006	N
Laupahoehoe to Maulua Bay	3-5-002-021	N
Laupahoehoe to Maulua Bay	3-5-002-027	Y
Laupahoehoe to Maulua Bay	3-5-003-008	N
Laupahoehoe to Maulua Bay	3-5-003-018	Y
Laupahoehoe to Maulua Bay	3-5-003-020	Y
Laupahoehoe to Maulua Bay	3-5-003-022	Y
Laupahoehoe to Maulua Bay	3-5-003-027	Y
Laupahoehoe to Maulua Bay	3-5-004-014	Y
Laupahoehoe to Maulua Bay	3-5-004-035	N
Laupahoehoe to Maulua Bay	3-5-004-037	N
Laupahoehoe to Maulua Bay	3-5-004-049	N
Laupahoehoe to Maulua Bay	3-5-004-050	N
Laupahoehoe to Maulua Bay	3-5-005-005	N
Laupahoehoe to Maulua Bay	3-5-005-010	N

sitename	tmk	portion
Laupahoehoe to Maulua Bay	3-5-005-011	Y
Laupahoehoe to Maulua Bay	3-6-003-001	N
Laupahoehoe to Maulua Bay	3-6-003-012	N
Laupahoehoe to Maulua Bay	3-6-005-043	N
Laupahoehoe to Maulua Bay	3-6-006-005	n
Laupahoehoe to Maulua Bay	3-6-006-007	N
Laupahoehoe to Maulua Bay	3-6-006-018	N
Laupahoehoe to Maulua Bay	3-6-006-022	Y
Laupahoehoe to Maulua Bay	3-6-006-023	Y
Laupahoehoe to Maulua Bay	3-6-006-031	N
Laupahoehoe to Maulua Bay	3-6-006-040	N
Laupahoehoe to Maulua Bay	3-6-006-043	N
Laupahoehoe to Maulua Bay	3-6-006-077	Y
Lehuawehi Point to Alia Point	2-8-002-001	Y
Lehuawehi Point to Alia Point	2-8-002-002	Y
Lehuawehi Point to Alia Point	2-8-002-004	Y
Lehuawehi Point to Alia Point	2-8-002-005	Y
Lehuawehi Point to Alia Point	2-8-002-006	Y
Lehuawehi Point to Alia Point	2-8-002-007	Y
Lehuawehi Point to Alia Point	2-8-002-008	Y
Lehuawehi Point to Alia Point	2-8-002-018	Y
Lehuawehi Point to Alia Point	2-8-002-019	Y
Lehuawehi Point to Alia Point	2-8-002-020	Y
Lehuawehi Point to Alia Point	2-8-002-021	Y
Lehuawehi Point to Alia Point	2-8-002-022	Y
Lehuawehi Point to Alia Point	2-8-002-023	Y
Lehuawehi Point to Alia Point	2-8-002-024	Y
Lehuawehi Point to Alia Point	2-8-002-025	Y
Lehuawehi Point to Alia Point	2-8-002-026	Y
Lehuawehi Point to Alia Point	2-8-004-001	Y
Lehuawehi Point to Alia Point	2-8-009-001	Y
Lehuawehi Point to Alia Point	2-8-009-003	Y
Lehuawehi Point to Alia Point	2-8-009-009	Y
Lehuawehi Point to Alia Point	2-8-009-010	Y
Lehuawehi Point to Alia Point	2-8-010-009	Y
Lehuawehi Point to Alia Point	2-8-011-001	Y
Lehuawehi Point to Alia Point	2-8-011-002	Y
Lehuawehi Point to Alia Point	2-8-011-003	Y
Lehuawehi Point to Alia Point	2-8-011-005	Y
Lehuawehi Point to Alia Point	2-8-011-009	Y
Lehuawehi Point to Alia Point	2-8-011-011	Y
Lehuawehi Point to Alia Point	2-8-011-013	Y
Lehuawehi Point to Alia Point	2-8-011-014	Y
Lehuawehi Point to Alia Point	2-8-011-020	Y
Lehuawehi Point to Alia Point	2-8-012-001	Y
Lehuawehi Point to Alia Point	2-8-012-002	Y
Lehuawehi Point to Alia Point	2-8-012-003	Y
Lehuawehi Point to Alia Point	2-8-012-004	Y
Lehuawehi Point to Alia Point	2-8-012-008	Y
Lehuawehi Point to Alia Point	2-8-012-015	Y
Lehuawehi Point to Alia Point	2-8-012-016	N
Lehuawehi Point to Alia Point	2-8-012-020	Y
Lehuawehi Point to Alia Point	2-8-013-003	Y
Lehuawehi Point to Alia Point	2-8-013-004	Y
Lehuawehi Point to Alia Point	2-8-013-035	Y
Lehuawehi Point to Alia Point	2-8-013-044	N
Lehuawehi Point to Alia Point	2-8-015-002	Y
Lehuawehi Point to Alia Point	2-8-015-003	Y
Lehuawehi Point to Alia Point	2-8-015-004	N
Lehuawehi Point to Alia Point	2-8-015-005	Y
Lehuawehi Point to Alia Point	2-8-015-013	Y
Lehuawehi Point to Alia Point	2-8-017-009	Y
Lehuawehi Point to Alia Point	2-8-017-011	Y
Lehuawehi Point to Alia Point	2-8-017-012	N
Lehuawehi Point to Alia Point	2-8-017-020	N

sitename	tmk	portion
Lehuawehi Point to Alia Point	2-8-017-023	N
Lehuawehi Point to Alia Point	2-8-017-043	Y
Lehuawehi Point to Alia Point	2-8-017-044	Y
Lehuawehi Point to Alia Point	2-8-017-045	Y
Lehuawehi Point to Alia Point	2-8-017-049	Y
Makaula-Ooma	7-3-001-002	N
Maulua Bay to Haiku Point	3-2-003-007	Y
Maulua Bay to Haiku Point	3-2-003-009	Y
Maulua Bay to Haiku Point	3-2-003-010	Y
Maulua Bay to Haiku Point	3-2-003-011	Y
Maulua Bay to Haiku Point	3-2-003-012	Y
Maulua Bay to Haiku Point	3-2-003-013	Y
Maulua Bay to Haiku Point	3-2-003-014	Y
Maulua Bay to Haiku Point	3-2-003-015	Y
Maulua Bay to Haiku Point	3-2-003-022	Y
Maulua Bay to Haiku Point	3-2-003-025	Y
Maulua Bay to Haiku Point	3-2-003-026	Y
Maulua Bay to Haiku Point	3-2-004-014	Y
Maulua Bay to Haiku Point	3-2-004-015	Y
Maulua Bay to Haiku Point	3-2-004-016	Y
Maulua Bay to Haiku Point	3-2-004-018	Y
Maulua Bay to Haiku Point	3-2-004-019	Y
Maulua Bay to Haiku Point	3-2-004-020	Y
Maulua Bay to Haiku Point	3-2-004-021	Y
Maulua Bay to Haiku Point	3-2-004-023	Y
Maulua Bay to Haiku Point	3-2-004-029	Y
Maulua Bay to Haiku Point	3-2-004-030	Y
Maulua Bay to Haiku Point	3-4-001-002	Y
Maulua Bay to Haiku Point	3-4-001-003	Y
Maulua Bay to Haiku Point	3-4-001-009	Y
Maulua Bay to Haiku Point	3-4-001-016	Y
Maulua Bay to Haiku Point	3-4-001-017	Y
Maulua Bay to Haiku Point	3-4-001-019	Y
Maulua Bay to Haiku Point	3-4-001-020	Y
Maulua Bay to Haiku Point	3-4-001-021	Y
Maulua Bay to Haiku Point	3-4-001-023	Y
Maulua Bay to Haiku Point	3-4-003-025	Y
Maulua Bay to Haiku Point	3-4-003-063	Y
Moaula	9-6-006-009	N
Moaula	9-6-006-010	N
Moaula	9-6-006-015	N
Moaula	9-6-006-018	N
Nahaku Point to Hakalau Bay	2-9-004-056	Y
Nahaku Point to Hakalau Bay	3-1-001-001	Y
Nahaku Point to Hakalau Bay	3-1-001-015	Y
Nahaku Point to Hakalau Bay	3-1-001-022	Y
Nahaku Point to Hakalau Bay	3-1-001-023	Y
Nahaku Point to Hakalau Bay	3-1-001-024	Y
Nahaku Point to Hakalau Bay	3-1-001-025	Y
Nahaku Point to Hakalau Bay	3-1-001-026	Y
Nahaku Point to Hakalau Bay	3-1-001-027	Y
Nahaku Point to Hakalau Bay	3-1-001-028	Y
Nahaku Point to Hakalau Bay	3-1-001-030	Y
Nahaku Point to Hakalau Bay	3-1-001-034	Y
Nahaku Point to Hakalau Bay	3-1-001-038	Y
Nahaku Point to Hakalau Bay	3-1-003-002	Y
Nahaku Point to Hakalau Bay	3-1-003-003	Y
Nahaku Point to Hakalau Bay	3-1-003-006	Y
Nahaku Point to Hakalau Bay	3-1-003-007	Y
Nahaku Point to Hakalau Bay	3-1-003-008	Y
Nahaku Point to Hakalau Bay	3-1-003-009	Y
Nahaku Point to Hakalau Bay	3-1-003-017	Y
Nahaku Point to Hakalau Bay	3-1-003-019	Y
Nahaku Point to Hakalau Bay	3-1-003-020	Y
Nahaku Point to Hakalau Bay	3-1-003-023	Y

sitename	tmk	portion
Nahaku Point to Hakalau Bay	3-1-003-024	Y
Nahaku Point to Hakalau Bay	3-1-004-003	Y
Nahaku Point to Hakalau Bay	3-1-004-004	Y
Nahaku Point to Hakalau Bay	3-1-004-011	Y
Nahaku Point to Hakalau Bay	3-1-004-013	Y
Nahaku Point to Hakalau Bay	3-1-004-014	Y
Nahaku Point to Hakalau Bay	3-1-004-015	Y
Nahaku Point to Hakalau Bay	3-1-004-017	Y
Nahaku Point to Hakalau Bay	3-1-004-020	Y
Nahaku Point to Hakalau Bay	3-1-004-021	Y
Nahaku Point to Hakalau Bay	3-1-004-022	Y
Nahaku Point to Hakalau Bay	3-1-004-025	N
North Kohala Watershed	5-2-002-001	Y
North Kohala Watershed	5-2-002-003	N
North Kohala Watershed	5-2-002-007	N
North Kohala Watershed	5-2-005-001	Y
North Kohala Watershed	5-2-005-006	N
North Kohala Watershed	5-2-005-008	N
North Kohala Watershed	5-2-006-003	Y
North Kohala Watershed	5-3-001-001	Y
North Kohala Watershed	5-3-001-004	Y
North Kohala Watershed	5-3-001-006	Y
North Kohala Watershed	5-3-001-008	N
North Kohala Watershed	5-3-001-011	N
North Kohala Watershed	5-3-001-012	Y
North Kohala Watershed	5-3-002-001	Y
North Kohala Watershed	5-4-001-001	N
North Kohala Watershed	5-4-001-003	N
North Kohala Watershed	5-4-001-004	Y
North Kohala Watershed	5-4-001-008	N
North Kohala Watershed	5-4-001-010	N
North Kohala Watershed	5-4-001-011	Y
North Kohala Watershed	5-4-001-018	N
North Kohala Watershed	5-4-001-019	N
North Kohala Watershed	5-7-001-001	Y
North Kohala Watershed	5-8-002-001	Y
North Kohala Watershed	5-8-002-002	N
North Kohala Watershed	5-8-002-003	N
North Kohala Watershed	5-8-002-005	N
North Kohala Watershed	5-8-002-006	N
North Kohala Watershed	5-8-002-008	Y
North Kohala Watershed	5-8-002-010	N
North Kohala Watershed	5-8-003-002	Y
North Kohala Watershed	5-8-003-003	Y
North Kohala Watershed	5-8-003-004	Y
North Kohala Watershed	5-8-003-005	Y
North Kohala Watershed	5-8-003-006	N
North Kohala Watershed	5-8-003-007	Y
North Kohala Watershed	5-8-003-009	Y
North Kohala Watershed	5-8-003-011	Y
North Kohala Watershed	5-8-003-012	N
North Kohala Watershed	5-8-003-014	Y
North Kohala Watershed	5-8-003-017	N
North Kohala Watershed	5-8-003-018	N
North Kohala Watershed	5-8-003-019	N
North Kohala Watershed	5-9-002-001	Y
North Kohala Watershed	5-9-002-002	Y
North Kohala Watershed	5-9-002-004	Y
North Kohala Watershed	5-9-002-005	N
North Kohala Watershed	5-9-002-006	N
North Kohala Watershed	6-1-001-004	Y
North Kohala Watershed	6-2-001-003	Y
North Kohala Watershed	6-2-001-007	Y
North Kohala Watershed	6-2-001-008	Y
North Kohala Watershed	6-2-001-025	Y

sitename	tmk	portion
North Kohala Watershed	6-4-001-034	Y
North Kohala Watershed	6-4-001-050	Y
North Kohala Watershed	6-4-001-051	N
North Kohala Watershed	6-4-001-052	N
North Kohala Watershed	6-4-001-053	N
North Kohala Watershed	6-4-001-054	N
North Kohala Watershed	6-4-001-055	N
North Kohala Watershed	6-4-001-056	N
North Kohala Watershed	6-4-001-073	N
North Kohala Watershed	6-4-002-125	N
North Kohala Watershed	6-4-002-143	N
North Kohala Watershed	6-5-001-003	Y
North Kohala Watershed	6-5-001-020	Y
North Kohala Watershed	6-5-001-047	N
Olaa West	1-9-001-006	N
Oleomoana	8-7-012-005	N
Onomea Bay to Maumau Point	2-7-002-002	Y
Onomea Bay to Maumau Point	2-7-002-003	Y
Onomea Bay to Maumau Point	2-7-002-003	N
Onomea Bay to Maumau Point	2-7-003-001	Y
Onomea Bay to Maumau Point	2-7-003-023	Y
Onomea Bay to Maumau Point	2-7-003-025	Y
Onomea Bay to Maumau Point	2-7-004-037	Y
Onomea Bay to Maumau Point	2-7-004-095	N
Onomea Bay to Maumau Point	2-7-004-096	Y
Onomea Bay to Maumau Point	2-7-004-132	N
Onomea Bay to Maumau Point	2-7-005-001	Y
Onomea Bay to Maumau Point	2-7-005-002	Y
Onomea Bay to Maumau Point	2-7-005-012	Y
Onomea Bay to Maumau Point	2-7-005-013	Y
Onomea Bay to Maumau Point	2-7-005-014	Y
Onomea Bay to Maumau Point	2-7-005-015	Y
Onomea Bay to Maumau Point	2-7-005-016	Y
Onomea Bay to Maumau Point	2-7-005-017	Y
Onomea Bay to Maumau Point	2-7-005-018	Y
Onomea Bay to Maumau Point	2-7-005-029	Y
Onomea Bay to Maumau Point	2-7-005-035	Y
Onomea Bay to Maumau Point	2-7-005-037	Y
Onomea Bay to Maumau Point	2-7-005-045	Y
Onomea Bay to Maumau Point	2-7-005-052	Y
Onomea Bay to Maumau Point	2-7-005-053	Y
Onomea Bay to Maumau Point	2-7-005-055	Y
Onomea Bay to Maumau Point	2-7-005-056	Y
Onomea Bay to Maumau Point	2-7-005-057	Y
Onomea Bay to Maumau Point	2-7-005-058	Y
Onomea Bay to Maumau Point	2-7-005-059	Y
Onomea Bay to Maumau Point	2-7-005-060	Y
Onomea Bay to Maumau Point	2-7-005-061	Y
Onomea Bay to Maumau Point	2-7-005-063	Y
Onomea Bay to Maumau Point	2-7-005-065	Y
Onomea Bay to Maumau Point	2-7-005-066	Y
Onomea Bay to Maumau Point	2-7-005-074	Y
Onomea Bay to Maumau Point	2-7-005-075	N
Onomea Bay to Maumau Point	2-7-007-001	Y
Onomea Bay to Maumau Point	2-7-009-012	Y
Onomea Bay to Maumau Point	2-7-009-013	Y
Onomea Bay to Maumau Point	2-7-009-014	Y
Onomea Bay to Maumau Point	2-7-009-015	Y
Onomea Bay to Maumau Point	2-7-009-016	Y
Onomea Bay to Maumau Point	2-7-009-017	Y
Onomea Bay to Maumau Point	2-7-009-019	Y
Onomea Bay to Maumau Point	2-7-009-020	Y
Onomea Bay to Maumau Point	2-7-009-028	Y
Onomea Bay to Maumau Point	2-7-009-029	Y
Onomea Bay to Maumau Point	2-7-037-002	Y

sitename	tmk	portion
Onomea Bay to Maumau Point	2-7-037-003	Y
Onomea Bay to Maumau Point	2-7-037-004	Y
Onomea Bay to Maumau Point	2-7-037-005	Y
Onomea Bay to Maumau Point	2-7-037-006	Y
Onomea Bay to Maumau Point	2-7-037-010	Y
Onomea Bay to Maumau Point	2-7-037-011	Y
Onomea Bay to Maumau Point	2-7-037-012	Y
Onomea Bay to Maumau Point	2-7-037-013	Y
Onomea Bay to Maumau Point	2-7-037-014	Y
Onomea Bay to Maumau Point	2-7-037-015	Y
Onomea Bay to Maumau Point	2-7-037-016	Y
Onomea Bay to Maumau Point	2-7-037-017	Y
Onomea Bay to Maumau Point	2-7-037-018	N
Onomea Bay to Maumau Point	2-7-037-019	Y
Onomea Bay to Maumau Point	2-7-037-020	Y
Onomea Bay to Maumau Point	2-7-037-021	Y
Onomea Bay to Maumau Point	2-7-037-024	N
Onomea Bay to Maumau Point	2-7-037-026	Y
Onomea Bay to Maumau Point	2-7-037-027	Y
Onomea Bay to Maumau Point	2-7-037-029	Y
Onomea Bay to Maumau Point	2-7-037-030	Y
Onomea Bay to Maumau Point	2-7-037-034	N
Onomea Bay to Maumau Point	2-7-037-036	Y
Onomea Bay to Maumau Point	2-7-037-037	Y
Onomea Bay to Maumau Point	2-7-037-038	Y
Onomea Bay to Maumau Point	2-7-037-039	Y
Onomea Bay to Maumau Point	2-7-037-040	Y
Onomea Bay to Maumau Point	2-7-037-041	Y
Puus North Kohala	5-5-005-001	Y
Puus North Kohala	5-6-001-001	Y
Puus North Kohala	5-6-001-020	Y
Puus North Kohala	5-6-001-021	Y
Puus North Kohala	5-6-001-055	N
Puus North Kohala	5-6-001-069	Y
Puus North Kohala	5-6-001-070	Y
Puus North Kohala	5-7-001-001	Y
Puus North Kohala	5-8-001-004	Y
Puus North Kohala	5-8-002-001	Y
Puus North Kohala	5-8-002-008	Y
Puus South Kohala	5-9-001-001	Y
Puus South Kohala	5-9-001-013	Y
Puus South Kohala	5-9-002-001	Y
Puus South Kohala	5-9-002-002	Y
Puus South Kohala	5-9-002-004	Y
Puus South Kohala	6-1-001-005	Y
Puuwaawaa	7-1-001-001	Y
Puuwaawaa	7-1-001-003	N
Puuwaawaa	7-1-001-005	N
Puuwaawaa	7-1-002-001	Y
State Owned Lands - K to K	7-3-009-005	N
State Owned Lands - K to K	7-3-009-008	N
State Owned Lands - K to K	7-3-010-002	Y
State Owned Lands - K to K	7-3-010-033	Y
Upper Paauhau	4-4-015-002	N
Upper Paauhau	4-4-015-003	Y
Upper Paauhau	4-4-015-004	Y
Waikoloa Stream	6-2-001-005	Y
Waikoloa Stream	6-2-001-007	Y
Waikoloa Stream	6-2-001-008	Y
Waikoloa Stream	6-2-001-009	Y
Waikoloa Stream	6-2-001-011	Y
Waikoloa Stream	6-2-007-001	Y
Waikoloa Stream	6-2-007-002	Y
Waikoloa Stream	6-2-007-003	Y
Waikoloa Stream	6-2-007-004	Y

sitename	tmk	portion
Waikoloa Stream	6-2-007-005	Y
Waikoloa Stream	6-2-007-006	Y
Waikoloa Stream	6-2-007-007	Y
Waikoloa Stream	6-2-007-008	Y
Waikoloa Stream	6-2-007-009	Y
Waikoloa Stream	6-2-007-010	Y
Waikoloa Stream	6-2-009-002	Y
Waikoloa Stream	6-2-009-004	Y
Waikoloa Stream	6-2-009-008	Y
Waikoloa Stream	6-2-009-010	Y
Waikoloa Stream	6-2-009-012	Y
Waikoloa Stream	6-2-009-016	Y
Waikoloa Stream	6-2-009-018	Y
Waikoloa Stream	6-2-009-020	Y
Waikoloa Stream	6-2-009-022	Y
Waikoloa Stream	6-2-011-014	Y
Waikoloa Stream	6-2-011-015	Y
Waikoloa Stream	6-2-011-017	Y
Waikoloa Stream	6-2-011-018	Y
Waikoloa Stream	6-2-011-019	Y
Waikoloa Stream	6-2-011-020	Y
Waikoloa Stream	6-2-011-021	Y
Waikoloa Stream	6-2-011-022	Y
Waikoloa Stream	6-2-011-023	Y
Waikoloa Stream	6-2-011-026	Y
Waikoloa Stream	6-2-011-027	Y
Waikoloa Stream	6-2-011-028	Y
Waikoloa Stream	6-5-001-010	Y
Waikoloa Stream	6-6-001-002	Y
Wailea Bay	6-6-002-002	N
Wailuku Streams	2-6-009-005	Y
Waipio Valley Rim	4-8-003-006	Y
Waipio Valley Rim	4-8-003-010	Y
Waipio Valley Rim	4-8-004-003	Y
Waipio Valley Rim	4-8-004-006	Y
Waipio Valley Rim	4-8-004-012	N
Waipio Valley Rim	4-8-004-013	N
Waipio Valley Rim	4-8-004-014	N
Waipio Valley Rim	4-8-004-015	N
Waipio Valley Rim	4-8-004-016	N
Waipio Valley Rim	4-8-004-017	Y
Waipio Valley Rim	4-8-004-030	Y
Waipio Valley Rim	4-8-006-001	Y
Waipio Valley Rim	4-8-006-007	N
Waipio Valley Rim	4-8-006-008	Y
Waipio Valley Rim	4-8-006-009	Y
Waipio Valley Rim	4-8-006-011	Y
Waipio Valley Rim	4-8-006-041	Y
Waipio Valley Rim	4-8-007-015	Y
Waipio Valley Rim	4-8-007-021	Y
Waipio Valley Rim	4-8-007-022	Y
Waipio Valley Rim	4-8-007-030	Y
Waipunalei	3-6-006-047	Y
Waipunalei	3-6-006-047	Y
Waipunalei	3-6-006-070	Y
Waipunalei	3-6-006-072	Y
Waipunalei	3-6-006-079	N
Waipunalei	3-7-001-003	N

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<u>Name</u>	<u>Affiliation</u>
Lyman Abbott	National Park Service and U.S. Fish and Wildlife
Glenn Abe	Land Management Division, Department of Land and Natural Resources
Mike Adams	Resident, County of Maui
Paul Aki	Environmental Management Division, Department of Health
Toshio Ansai	County Planning Commission, County of Maui
Aric Arakaki	Molokai Ranch
Thomas Arizumi	Environmental Management Division, Department of Health
Kaipo Asing	Kauai County Council
Leo Asuncion	Land Use Commission staff
Stephanie Aveiro	Department of Human Concerns, County of Maui
Ron Bachman	Division of Forestry and Wildlife, (Hawaii), Department of Land and Natural Resources
Vince Bagoyo, Jr.	Maui County Council
Gary Barbano	National Park Service
Arthur Bauckham	Department of Health
Hobie Beck	Waikoko Valley Taro Farmer
Carl Berg	Department of Health
Steven Bergfeld	Division of Forestry and Wildlife, Department of Land and Natural Resources
Roy Blackshear	W.H. Shipman, Ltd.
Hartwell Blake	Planning Commission, County of Kauai
Marie Bruegmann	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Michael Buck	Division of Forestry and Wildlife, Department of Land and Natural Resources
Andrew Bushnell	Planning Commission, County of Kauai
Teresa Cabrera	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Julie Ann Cachola	Office of State Planning
David Callies	William S. Richardson School of Law, University of Hawaii
Bill Cameron	Environmental Center, University of Hawaii
Wayne Carvalho	Dillingham Partners
Luisa Castro	The Nature Conservancy of Hawaii
Meredith Ching	Alexander & Baldwin, Inc.
Brian Choy	Office of Environmental Quality Control
Joseph Chu	Department of Hawaiian Home Lands
Lester Chuck	Department of Education

Gail Chun	Hawaii Heritage Program, The Nature Conservancy of Hawaii
John Coatts	U.S. Soil Conservation Service
Heather Cole	PIA Sports Properties
Joseph Conant	Housing Finance Development Corporation
Roy Cooper	W.H. Shipman Properties
John Corbin	Aquaculture Development Program, Department of Land and Natural Resources
Ross Cordy	Historic Preservation Division, Department of Land and Natural Resources
Carolyn A. Corn, Ph.D.	Division of Forestry and Wildlife, Department of Land and Natural Resources
Maxine Correa	Kauai County Council
David Craddick	Department of Water Supply, County of Maui
Ralph Daehler	Division of Forestry and Wildlife, (Kauai), Department of Land and Natural Resources
Dan Davidson	Land Use Research Foundation
Linda Delaney	Office of Hawaiian Affairs
Bill Devick	Aquatic Resources Division, Department of Land and Natural Resources
Joannie Dobbs	Hawaii Heritage Program, The Nature Conservancy of Hawaii
David Dodds	Resident, County of Maui
Gary Doi	Agriculture Coordinating Committee
Takashi Domingo	Hawaii County Council
Leinaala Drummond	Maui County Council
Fern Duvall	Department of Land and Natural Resources
Tom Dye	Historic Preservation Division, Department of Land and Natural Resources
Rick Eichor	Department of Attorney General
Marge Elliott	Insight International
Henry Eng	Campbell Estate
Thomas English	W.H. Shipman, Ltd.
Mary Alice Evans	Office of State Planning
Roger Evans	Office of Conservation & Environmental Affairs, Department of Land and Natural Resources
Keoni Fairbanks	Planning Department, County of Maui
John Ford	U.S. Fish and Wildlife Service
Frank Howarth	Bishop Museum
Kathleen Fruth	U.S. Fish and Wildlife Service
Bill Fuhrman	Hana Community Advisory Committee, Maui
Howard Fujimoto	Office of State Planning
Tatsuo Fujimoto	Office of State Planning
Roy Fujioka	Department of Finance, County of Kauai
Alvin Fukunaga	Director of Public Works, County of Maui
Jesse Fukushima	Kauai County Council
Jim Funaki	Takushi, Funaki, Wong and Stone
James Gannon	Farmers Lokahi Hawaii
Sam Gon	Hawaii Heritage Program, The Nature Conservancy of Hawaii
James M. Greenwell	Palani Ranch/Lanihau Partners
James S. Greenwell	Palani Ranch/Lanihau Partners

Annie Griffin	Historic Preservation Division, Department of Land and Natural Resources
Warren Haight	Molokai Ranch
Dona Hanaike	Department of Land and Natural Resources
Skippy Hao	Aquatic Resources Division, (Maui), Department of Land and Natural Resources
Rodney Haraguchi	Kauai Taro Growers Association
John Harder	Environmental Management Division, Department of Health
Kim Harris	The Nature Conservancy of Hawaii
Roger Harris	PIA Sports Properties
John T. Harrison, Ph.D.	Environmental Center, University of Hawaii
John Harry	Department of Finance, County of Kauai
Christopher Hart	Chris Hart & Partners
Jerry Haruno	Environmental Management Division, Department of Health
Norman K. Hayashi	Planning Department, County of Hawaii
Kazu Hayashida	Board of Water Supply, City and County of Honolulu
Don Heacock	Aquatic Resources Division, (Kauai), Department of Land and Natural Resources
Edward Henry	Office of Conservation and Environmental Affairs, Department of Land and Natural Resources
Don Hibbard	State Historic Preservation Division Department of Land and Natural Resources
Nani Hill	Planning Commission, County of Kauai
Miles Hironaka	Planning Department, County of Kauai
Ray Ho	Kauai resident
Bob Hobdy	Division of Forestry and Wildlife, Department of Land and Natural Resources
Goro Hokama	Maui County Council
Alan Holt	The Nature Conservancy of Hawaii
Luciana Honigman	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Eric Honma	Kauai Liaison, Office of the Governor
Howard Horiuchi	Division of Forestry and Wildlife, (Hawaii), Department of Land and Natural Resources
Tosh Hosoda	The Gentry Companies
Charley Ice	Department of Hawaiian Home Lands
Glenn Ifuku	Department of Business, Economic Development and Tourism
Jim Jacobi	Hawaii Research Center, Volcano
Jack Jeffrey	Hakalau National Wildlife Refuge
James Juvik	Geography Department, University of Hawaii at Hilo
Kelvin Kai	Kamehameha Schools/B.P. Bishop Estate, Kauai
Charmaine Kamaka	Department of Parks and Recreation, County of Hawaii
Greg Kamm	Grove Farm Company, Inc.
Roy Kamm	Hawaii Heritage Program, The Nature Conservancy of Hawaii
LaFrance Kapaka-Arboleda	Hawaiian Farmers of Hanalei

Galen Kawakami	Division of Forestry and Wildlife, (Kauai), Department of Land and Natural Resources
Moses Keale	Office of Hawaiian Affairs
George Kekuna	Civil Defense Agency, City and County of Honolulu
Sidney Keliipuleole	The Kamehameha Schools/B.P. Bishop Estate
Steve Kellogg	R.M. Towill Corporation
Jack Keppler	Department of Land and Natural Resources
Mike Kido	Kauai Community College, University of Hawaii
Howard Kihune	Maui County Council
Harry Kim	Civil Defense Agency, County of Hawaii
Connie Kiriu	Planning Department, County of Hawaii
Yukio Kitagawa	Department of Agriculture
Paul Kiyabu	Department of Education
Christine Kobayashi	Resident, County of Kauai
Joseph N. Kobayashi	Resident, County of Kauai
Russell Kokubun	Hawaii County Council (former member)
Ron Kouchi	Kauai County Council
Darrel Kuamoo	Aquatic Resources Division, (Hawaii), Department of Land and Natural Resources
Ben Kudo	Dwyer, Imanaka, Schraff and Kudo
Jeffrey Lacy	Planning Department, County of Kauai
Libert Landgraf	Hana Ranch
Denis Lau	Environmental Management Division, Department of Health
Joel Lau	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Stephen Lau	Land Management Division, Department of Land and Natural Resources
Stephen Lau, Ph.D.	Water Resources Research Center, University of Hawaii
Michael Lauretta	Planning Department, County of Kauai
Alice Lee	Maui County Council
Benjamin B. Lee	Department of General Planning, City and County of Honolulu
Lynn Lee	Office of Hawaiian Affairs
Michael T. Lee	U.S. Army Corps of Engineers
Jerry Leinecke	Hawaiian and Pacific Islands National Wildlife Refuge Complex, U.S. Fish and Wildlife Service
Greg Leong	Department of Business, Economic Development and Tourism
John C. Lewin	Department of Health
Robert Lindsay	The Kamehameha Schools/B.P. Bishop Estate
Bill Liu	U.S. Department of Navy
Peter L'Orange	Hawaii Leeward Planning Conference
Rae Loui	Department of Land and Natural Resources
Kem Lowry, Ph.D.	Department of Urban and Regional Planning, University of Hawaii
Phillip M. Luce	Planning Commission, County of Hawaii
Debra Luning	Housing Finance and Development Corporation
Lorene Maki	Office of State Planning
Brian Mamclay	Planning Department, County of Kauai
Cynthia Marnie	The Outdoor Circle

Fred Matsumoto	Department of Economic Development, County of Maui
George Matsumoto	Water and Land Management Division, Department of Land and Natural Resources
Scott Matsuura	Alexander & Baldwin, Inc.
Dwight Matsuwaki	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Maurice Matsuzaki	Conservation and Resources Enforcement Division, Department of Land and Natural Resources
Bruce C. McClure	Department of Public Works, County of Hawaii
Nancy McMahon	State Historic Preservation Division, Department of Land and Natural Resources
Ricardo Medina	Maui County Council
Jeff Melrose	The Kamehameha Schools/B.P. Bishop Estate
Yola Meyer Forbes	R.W. Meyer Limited
Karin Meyer	The Nature Conservancy of Hawaii
Jackie Miller	Environmental Center, University of Hawaii
Susan Miller	Natural Resources Defense Council
John Min	Chris Hart and Partners
Brian Miskae	Planning Department, County of Maui
Abe Mitsuda	Office of State Planning
Wally Miyahira	Castle & Cooke, Inc.
Steve Montgomery	Bishop Museum
Barry Morgan	The Nature Conservancy of Hawaii
John Morgan	Kualoa Ranch, Oahu
Mina Morita	Planning Commission, County of Kauai
Martha Mowry	Hanalei Garden Farms
William Mowry	Hanalei Garden Farms
Maurice Munechika	Kauai County Council
Duk Hee Murabayashi	DHM, inc.
Ed Murabayashi	Water Resources Research Center University of Hawaii
Ralston Nagata	State Parks and Outdoor Recreation Division, Department of Land and Natural Resources
Peter Nakamura	Princeville Corporation
Rodney Nakano	Planning Department, County of Hawaii
Audrey Newman	The Nature Conservancy of Hawaii
Melvin Nishihara	Civil Defense Division, Department of Defense
Wayne Nishiki	Maui County Council
Bob Nishimoto, Ph.D.	Aquatic Resources Division, (Hawaii), Department of Land and Natural Resources
Brian Nishimoto	AMFAC/JMB, Hawaii, Inc. (as of 1991)
Brian Nishimura	Office of Housing and Community Development, County of Hawaii
Keith Nitta	Planning Department, County of Kauai
Wes Nohara	Maui Land and Pine
John Obata	National Tropical Botanical Garden
Ann Ogata-Deal	Department of Attorney General
Edwin Okubo	Housing Division, County of Maui
Steve Oliver	Department of Public Works, County of Kauai
Randall Osakoda	Resident, County of Kauai
Gregory Pai, Ph.D.	Office of State Planning
Jim Parrish	Environmental Center, University of Hawaii

William W. Paty	Department of Land and Natural Resources
Steve Perlman	National Tropical Botanical Garden
Lyman Perry	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Edwin Petteys	Division of Forestry and Wildlife, (Kauai), Department of Land and Natural Resources
Richard Poirier	Office of State Planning
Dan Polhemus	Bishop Museum
David Pratt	Grove Farm Company, Inc.
Thane Pratt	Hawaii Research Center, Volcano
Roy Price	Civil Defense Division, Department of Defense
Bill Puleloa	Aquatic Resources Division, (Molokai) Department of Land and Natural Resources
Diane Ragone	National Tropical Botanical Garden
Monte Richards	Kahua Ranch
Barbara Robeson	Planning Commission, County of Kauai
Warren S. Robinson	Gay and Robinson, Inc., Kauai
Henry Sakuda	Aquatic Resources Division, Department of Land and Natural Resources
Cynthia Salley	McCandless Ranch
Bert Saruwatari	Land Use Commission staff
Robert Sasaki	Alexander & Baldwin, Inc.
Hal Schofield	Department of Attorney General
Paul Schwind, Ph.D.	Planning and Development Office, Department of Agriculture
William H. Sewake	Department of Water Supply, County of Hawaii
Mark Sheffel	Division of Forestry and Wildlife, Department of Land and Natural Resources
Peter Simmons	McCandless Ranch
Alan Smith	Grove Farm Company, Inc.
Clifford Smith, Ph.D.	University of Hawaii, Botany
Robert Smith	U.S. Fish and Wildlife Service
Jean Nishida Souza	Office of State Planning
Wayne Souza	State Parks Division, Department of Land and Natural Resources
Ken Sprague	Board of Water Supply, City and County of Honolulu
Hana Springer	Hawaii Resident
William Stormont	Division of Forestry and Wildlife, (Hawaii), Department of Land and Natural Resources
C. Michael Street	Department of Public Works, City and County of Honolulu
Alfred Suga	Department of Education
James Sugai	Farmers Lokahi Hawaii
Manabu Tagomori	Water and Land Management Division, Department of Land and Natural Resources
Janice Takahashi	Housing Finance and Development Corporation
Clyde Takekuma	Department of Public Works, County of Kauai
Clyde Takemura	Department of Health
Kelvin Taketa	The Nature Conservancy of Hawaii
Wayne Takeuchi	Division of Forestry and Wildlife, Department of Land and Natural Resources
Fred Talon	Land Use Commission

Bill Tam	Department of Attorney General
Joe Tanaka	Maui County Council (until November 1992)
Craig Tasaka	Office of State Planning
James Tehada	Kauai County Council
Tom Telfer	Division of Forestry and Wildlife, (Kauai), Department of Land and Natural Resources
Cliff Temps	Kealahou Development Corporation
Mary Rose Teves	Environmental Planning Office, Department of Health
Douglas Tom	Office of State Planning
Patricia Tottori Liu	Gentry Hawaii, Ltd.
Gary Toyama	Environmental Management Division, Department of Health
Ron Tsuzuki	Highways Division, Department of Transportation
Dennis Tulang	Environmental Management Division, Department of Health
Edward Uchida	Statewide Transportation Planning Office, Department of Transportation
Esther Ueda	Land Use Commission
Ann Usagawa	Planning Department, County of Hawaii
Randal Valencio	Kauai County Council
Kaye Varela	Ophihale Community Association
Richard Voss	U.S. Fish and Wildlife Service
Charles Wakida	Division of Forestry and Wildlife, (Hawaii), Department of Land and Natural Resources
Ron Walker	Division of Forestry and Wildlife, Department of Land and Natural Resources
Richard Wass	Hakalau National Wildlife Refuge
Kimo Wendt	Resident, County of Maui
Mark White	The Nature Conservancy
Carol Wilcox	Planning Department, County of Kauai
Margaret Wilson	Office of Environmental Quality Control
Roderick Wilson	AMFAC/JMB, Hawaii, Inc.
Toni Withington	Citizens for the Protection of the North Kohala Coastline
Norma Wong	Office of State Planning
Wes Wong	Division of Forestry and Wildlife, (Maui), Department of Land and Natural Resources
Ken Wood	National Tropical Botanical Garden
Earl Yamamoto	Planning and Development Office, Department of Agriculture
James Yamamoto	Office of State Planning
Karen Yamamoto	Office of State Planning
Andrew Yanoviak	Save Mount Olomana Association
Journ Yee	Finance Realty
Randall M.L. Yee	Planning Commission, City and County of Honolulu
Mason Young	Land Management Division, Department of Land and Natural Resources
Andy Yuen	U.S. Fish and Wildlife Service
Moani Zablan	McCandless Ranch
Dan Zevin	Hawaii Heritage Program, The Nature Conservancy of Hawaii
Marjorie Ziegler	Sierra Club Legal Defense Fund

State Land Use District Boundary Review

Project Team

Mary Lou Kobayashi, Project Manager
Judith Henry
Charles Carole
Scott Derrickson
Robyn Loudermilk
Sanford Beppu
Sallie Edmunds
Darrell Zane

Graphics Support

Stewart Wastell
Adele Carpenter
David Morikami

Geographic Information System Support

Craig Tasaka, Project Manager
Joan Esposito
Susan Bevacqua
Jon Hodge
Jon Chun

Clerical Assistance

Karen Tasaka
Mineyo Nii
Fay Nishimoto
Karen Oshiro

LIST OF ABBREVIATIONS

CDUA	Conservation District Use Application
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOE	Department of Education
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DOT	Department of Transportation
FR	Forest Reserves
GMA	Game Management Areas
HAVONP	Hawaii Volcanoes National Park
HHP	Hawaii Heritage Program
HOST	Hawaii Ocean Science Technology
HRS	Hawaii Revised Statutes
K-K	Keahole to Kailua
LESA	Land Evaluation and Site Assessment
LESAC	Land Evaluation and Site Assessment Commission
LUC	Land Use Commission
LUPAG	Land Use Pattern Allocation Guide Maps
mgd	Million gallons per day
MLCD	Marine Life Conservation Districts
NARS	Natural Area Reserves System
NELH	Natural Energy Laboratory of Hawaii
NHP	National Historic Park
NHS	National Historic Sites
NP	National Parks
NWR	National Wildlife Refuge
OSP	Office of State Planning
SLH	Session Laws of Hawaii
UCPC	United Cane Planters' Cooperative
UH	University of Hawaii
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WWTP	Wastewater Treatment Plant

