

STATE LAND USE DISTRICT BOUNDARY REVIEW

MAUI MOLOKAI LANAI



Michael T. Munekiyo Consulting, Inc.



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.

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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

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CHAPTER I
INTRODUCTION

I. INTRODUCTION

A. 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 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. OSP 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 report for the Islands of Maui, Molokai and Lanai. Separate reports have been prepared for Kauai, Oahu, and Hawaii.

B. 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.

1. 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 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.

2. 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 Commission (LESA) 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 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.

3. **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 been also 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.

4. 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.

5. 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 (LUC) 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 five 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.

C. BACKGROUND OF THE BOUNDARY REVIEW

1. 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.

2. 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 Kealakehe on Hawaii; Wailuku and Wailuku Heights on Maui; and Kapaa and Nukolii 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.

D. STUDY METHODOLOGY

The 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.

1. 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 overlaid 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, 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.

2. 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 protected 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 were 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 to 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.

3. **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 sugar cane 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.

E. 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 those 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 homerule 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 resource 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 (LUC) 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 LUC review petitions by region or subject area, e.g., watersheds.

Types of Recommendations

1. **Reclassifications to the Conservation or Agricultural District**
Priority #1: These are areas that OSP will likely petition for in FY 1992-93 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.

2. Reclassifications to the Urban and Rural Districts

OSP 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, conditions of development, additional information, and the availability of manpower and financial resources.

3. Land Use Commission Petition Stage

OSP will file petitions to reclassify certain areas with the Land Use Commission (LUC). In this case, OSP and the respective County planning department 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 LUC.

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 LUC will conduct a public hearing on the proposed boundary amendment. Six affirmative votes are necessary to approve any boundary amendment.

F. CONSERVATION DISTRICT ISSUES

1. 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 reclassification of land is not enough. It is true that reclassification is only one element of an array of actions needed to protect conservation resources. Reclassification concerns 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 reclassifying lands Urban does not guarantee that these lands will be developed and provide houses and jobs, reclassifying land 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.

2. 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 water birds, 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. OSP 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. On Oahu, there may be areas within proposed stream corridors 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.

3. **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 heavily vegetated, non-native areas. 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.

4. 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 when the assessment of requirements was based strictly on overall supply and demand figures.

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.

5. 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. OSP 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. OSP 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.

G. 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."

Upon further and more detailed analysis, permanent boundaries were recommended by the Commission's consultants, Harland Bartholomew & Associates. 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 (Harland Bartholomew and Associates).

The Commission conducted meetings 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.

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 sugar cane 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 sugar cane, 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.

H. 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 has requested the LUC to change rules for its detailed requirements in terms of the form and content of petitions.

CHAPTER II
COUNTY
ASSESSMENT

II. COUNTY ASSESSMENT

A. POPULATION AND ECONOMIC CONDITIONS

1. Population

Maui County's resident population has displayed steady and strong growth over the past decade, increasing from 70,991 in 1980 to 100,374 in 1990. The rate in resident population growth in the County during this period was 42 percent, which is significantly higher than the Statewide growth rate of 15 percent. The County's de facto population is also exhibiting similar strength, increasing from 115,700 in 1985 to 136,700 in 1990 (DBED, 1990).

In 1990, the Island of Maui accounted for 91,361 or 91 percent of the total current resident population. Molokai and Lanai had populations of 6,049 and 2,119, respectively. Between 1980 and 1990, the resident population of the Island of Maui increased by 45 percent, with Molokai showing an increase of 11 percent and Lanai 15 percent.

The growth in resident and de facto population is expected to outpace the Statewide growth rate over the next several years, as projections for resident and de facto populations for the County in the year 2010 are estimated to reach 145,200 and 216,200, respectively.

2. Economy

Population growth has been driven by a strong local economy. The primary component of Maui County's economic base is the visitor industry. Estimates for 1989 show visitor expenditures in Maui County at \$2.31 billion. This represents a substantial increase over 1980 expenditures of \$0.4 billion. Westbound visitor arrivals to Maui County has remained steady over the past few years, with 1989 arrivals numbering 2,113,100. However, the number of eastbound arrivals has increased, with 1989 figures showing 400,860 visitors. According to Department of Business

and Economic Development and Tourism projections, the average visitor census will increase from 41,800 in 1990 to 73,800 by 2010.

The visitor industry is expected to continue to dominate the local economy as new resort hotels are added to the existing inventory. These include the recently completed Grand Hyatt Wailea (800 rooms) and Kea Lani (400 rooms) on Maui, and the Manele Bay Hotel (250 rooms) on Lanai. The Ritz-Carlton (450 rooms) is also under construction. With the completion of these hotels, the hotel room inventory in the County will increase to 26,830. This represents a 104% increase over the 1984 total of 13,138 (Michael T. Munekiyo Consulting, 1990).

The Persian Gulf crisis in 1991 and an economic downturn on the mainland and in Japan have led to lower visitor arrivals in 1992. As of June 1992, visitor arrivals statewide were down 0.79 percent from 1991 and 7.09 percent down from 1990. As a result, there does not appear to be a market for new hotel rooms at the present time and many development projects statewide have been put on hold.

Agriculture has stabilized as an economic component of the local economy. Production acreage of sugar cane has declined with Wailuku Agribusiness Company, Inc. harvesting its last sugar crop in 1988. Wailuku Agribusiness has, however, diversified its agricultural production base by planting approximately 1,800 acres of macadamia nut and 2,000 acres of pineapple. County-wide diversification in agricultural production is reflected in production volume and market value, as shown in Table 1. The remaining two sugar producers, HC&S and Pioneer Mill, together produced a total of 276,721 tons in 1988.

Sugar cane continues to be Maui County's largest user of Agricultural lands, occupying 42,200 acres in 1988. HC&S and Pioneer Mill, the County's major sugar plantations, produced

Table 1

VOLUME OF CROPS AND VALUE OF SALES OF AGRICULTURE IN MAUI COUNTY - 1989		
Crop	Volume	Value (\$1,000)
Sugar (unprocessed cane)	1,925,000 tons	\$66,400
Pineapple (fresh)	345,000 tons	\$32,863
Vegetables and Melons	41,495,000 lbs.	\$11,615
Fruits (excluding pineapple)	1,020,000 lbs.	\$326
Macadamia Nut	---	---
Taro	---	---
Flowers and Nursery Products	---	\$7,756
Field Crops	---	\$2,989
Source: State of Hawaii, Dept. of Business and Economic Development, 1990.		

229,317 tons and 47,404 tons of sugar, respectively, down roughly two percent (2%) from 1987.

Pineapple production, on the other hand, has been expanding on Maui. Long-time operator, Maui Land and Pineapple Company, entered the fresh-fruit pineapple market recently, air shipping pineapples to the mainland in an effort to combat increased competition from abroad. In 1988, 21,300 acres of County land were in pineapple production, with nearly half of the acreage on Lanai.

With the County's movement toward a more diverse agricultural base, other crops are becoming increasingly noteworthy. Vegetable and melon production, for example, reached record levels in 1988 due in large measure to increased production on

Molokai.

Other major products produced in the County include macadamia nuts, onions, grapes (for wine), and tropical flowers (First Hawaiian Bank, 1989).

Between the years 1980 and 1989, the construction industry on Maui has shown an irregular pattern of growth based on the estimated value of building permits issued. The high point of growth was in 1988 with \$460 million issued in building permits. The lowest year was in 1984 with only \$60 million. During most years building permits have ranged from \$90 million to \$177 million. The year 1989 saw a drop from the previous year's \$460 million to \$238 million. Trends in 1989 indicate that the majority of construction was in the residential area followed by hotel and non-residential areas (DBED, 1990).

Federal expenditures on Maui do not constitute a major part of the Island's economy as it receives about 3% of the total amount expended in the State (\$5.6 billion). Military personnel and their dependents number 54 for the Island (DBED, 1990).

Tourism continues to be the County's primary industry supporting manufacturing and the retail trade. Retail sales have exhibited a steady growth with an 11% increase of 1988 sales over 1987 and an additional 20% growth through the first quarter of 1989.

Maui continues to experience a labor shortage with an unemployment rate of 2.1 percent for the Island in 1989. Molokai and Lanai experienced a 9.5 percent and 9.1 percent unemployment rate respectively for the same period of time.

B. THE COUNTY GENERAL PLAN AND COMMUNITY PLANS

Planning objectives and policies for Maui County are expressed through The General Plan of the County of Maui. The General Plan is a narrative

document which is intended to "...recognize and state the major problems and opportunities concerning the needs and the development of the county and the social, economic and environmental effects of such development to set forth the desired sequence, patterns and characteristics of future development". The General Plan objectives and policies address planning issues such as population; land use and the environment; economic activity; housing and urban design; utility and facility systems; human services; and government.

Given the continuing changes in concerns and priorities of the residents of Maui County, the Charter mandates a periodic update of the General Plan to assure that planning strategies are consistent with current needs. In this regard, the General Plan has been updated to establish relevant objectives and policies which will guide and manage growth in the County through the 1990's.

It is through programs and policies of the County, State and Federal governments that the General Plan is implemented. The principal County mechanism for General Plan implementation is the Community Plan for each of the nine (9) Community Plan regions in the County. See Figure 1. Each Community Plan was formulated to address the broad goals and objectives of the General Plan and to address specific needs, issues and opportunities for each region. The Community Plan incorporates recommendations for growth and development and serves as a guide for socio-economic growth and diversification; environmental and land use planning; urban design; transportation and public facilities development; and human services and governmental support programming.

Land use planning in each Community Plan region is governed by the Community Plan Land Use Map which provides for the spatial allocation and distribution of various land use categories. Typical land use categories established by the Community Plan Land Use Maps are listed, as follows:

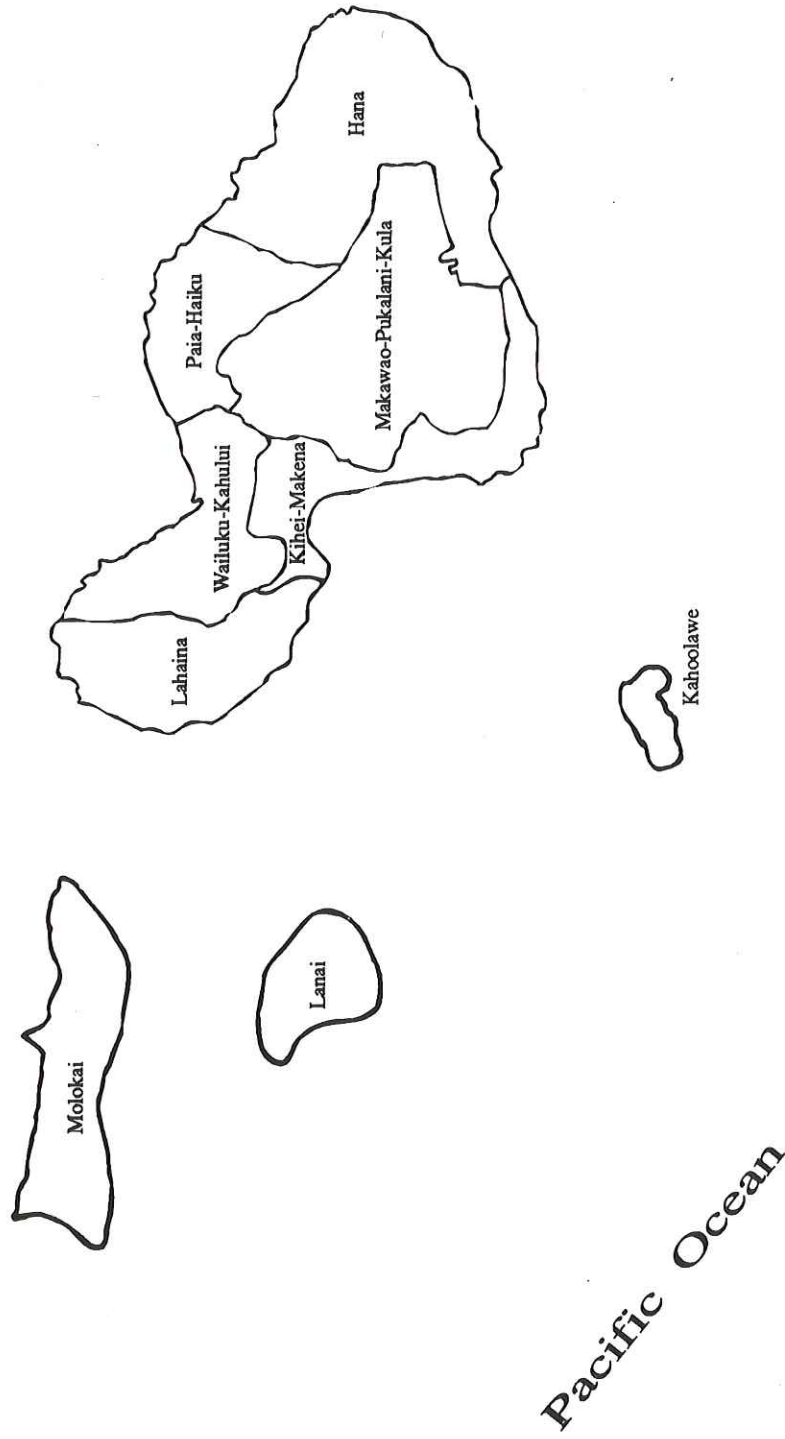


Figure 1



NOT TO SCALE

Maui County Community Plan Regions



Michael T. Munekiyo Consulting, Inc.
Prepared for: State of Hawaii, Office of State Planning

- Agriculture
- Single-Family Residential
- Business/Commercial
- Light Industrial
- Public/Quasi-Public
- Open Space
- Rural
- Multi-Family Residential
- Industrial
- Hotel
- Park
- Project District^a

Like the General Plan, the Community Plan recommendations are subject to change as new needs, issues and opportunities emerge. For this reason, the Community Plans are required to be updated at least every ten (10) years. The County's Community Plan Update process began in April 1992. Land use and development strategies for the following Community Plan regions are summarized below.

C. COMMUNITY PLANS

1. Wailuku-Kahului Community Plan Region

The Wailuku-Kahului Community Plan recommends the establishment of project districts for major residential growth areas adjacent to Wailuku, Kahului and Waiehu. These project districts contain a variety of residential unit types as well as supporting community services. Special consideration is given to the urban areas of Wailuku and Kahului. The State Rural District boundary in Iao Valley is recommended for modification for limited residential use. Modification is also recommended for the State Agricultural District "to allow for contiguous outward expansion of Kahului, Wailuku, Waiehu and Waikapu residential areas". Maintaining the State Conservation District boundaries is also recommended as no changes are anticipated for regional conservation needs.

2. Kihei-Makena Community Plan Region

The Kihei-Makena Community Plan recommends modifications to the State Urban District boundaries for the areas around Maalaea, Kihei, and Makena for residential, commercial, industrial and resort

^a "Project District" is a land use classification intended to provide flexibility in the planning and distribution of specific uses (i.e., allows for a master-planning approach to designate land uses within the area designated "Project District").

expansion. The establishment of project districts between Kulanihakoi and Waipuilani Gulches, the Piilani Project District and the residential expansion area makai of the proposed Piilani Highway extension between Wailea and Makena are also recommended. The Community Plan recommends the establishment of an open space system of parks, utility easements, shoreline areas and drainageways as an open space framework for the built environment. It recommends maintaining the existing State Conservation District boundaries.

3. Lahaina Community Plan Region

The Lahaina Community Plan Land Use Map delineates project districts at Honokohau, Kaanapali and the area between Kaanapali and Lahaina. The Community Plan recommends providing areas for light industrial and service commercial activities at the south edge of Honokowai Gulch and mauka of Honoapiilani Highway and that the needs of the visitor industry be provided for by directing future facilities increases at the planned resorts at Kaanapali and Kapalua. A resident population guideline of 20,000 persons to the year 2003 is recommended. Additionally, the Community Plan seeks to maintain the land acreage required to sustain economically viable agricultural operations and to prevent the urbanization of important sugar cane lands to the greatest extent possible.

4. Makawao-Pukalani-Kula Community Plan Region

The Makawao-Pukalani-Kula Community Plan recommends the revision of the State Agricultural and Rural District boundaries to accommodate residential growth in Pukalani, Makawao and Kula. It further recommends maintaining open space areas along the planned Haleakala Highway Bypass route to allow for a distinct separation between Pukalani and Makawao and the expansion of the Conservation District between the Waihou Spring Reserve Conservation area and the Makawao Forest Reserve and to maintain the remainder of the existing Conservation boundary.

5. Paia-Haiku Community Plan Region

The Paia-Haiku Community Plan recommends limiting expansion of the Urban District to the areas mauka of Paia Town along Baldwin Avenue and makai of the mill. A slight expansion of the Rural District is recommended in Kokomo. Maintenance of the region's State Agricultural District is recommended except for Kuau, Lower Paia and Paia where redesignation to the Urban District may be possible. It is the Community Plan's recommendation to enhance the ocean orientation of the Lower Paia district by establishing open space view corridors and a passive ocean oriented park in Paia Town. The Community Plan recommends maintaining the existing State Conservation District boundaries except at Hookipa, Maliko and Pauwela Point.

6. Hana Community Plan Region

The Hana Community Plan recommends expansions to the Urban District be contained between Hana High and Elementary School and the Hasegawa General Store. It also recommends that the existing Conservation, Agricultural and Rural District boundaries with the exception of several areas adjacent the Agricultural and Rural Districts to be redesignated for residential and light industrial use.

7. Molokai Community Plan Region

The Molokai Community Plan divides the Island into three planning areas designated as East, West and Central Molokai. The Plan recommends maintaining the existing State Agricultural District boundaries except for certain areas to be redesignated to the Urban District. These areas include an approximately eleven (11) acre site south of Maunaloa; about ten (10) acres at Kaluakoi adjacent to the existing Urban District; 75 acres in Kaunakakai town for residential, public facility and park uses; approximately 200 acres makai of Kamehameha V Highway between Kalamaula and Kaluaapuhi Fishpond for heavy industrial use; and about 39 acres east of Kamiloloa next to the existing Urban District. A new Rural

District of about 1,000 acres mauka of the existing Urban District at Kaluakoi is also recommended. It is the Plan's recommendation to establish rural residential uses at Kalae, Kakahaia and West Ohia to Ualapue and urban residential uses at West Ohia and Pukoo. Maintenance of the existing Conservation District boundaries is recommended.

8. **Lanai Community Plan Region**

The Lanai Community Plan recommends maintaining the current State Agricultural District boundaries except for an area adjacent to the Urban District in Lanai City which is designated as a Project District. It also recommends maintaining the current State Rural District boundaries bordering Lanai City except for the area designated as a Project District. And, with the exception of Kaumalapau Harbor, all other Rural District lands are recommended to be designated for Open Space use. In the event that additional lands are required for urban growth, the Community Plan suggests limiting any expansion of the Urban District boundary to areas which are contiguous to the Urban District. The Community Plan recommends maintaining the current State Conservation District boundaries.

D. **ANALYSIS OF COUNTY COMMUNITY PLAN DESIGNATIONS AND EXISTING STATE LAND USE DISTRICTS**

The Five-Year Boundary Review is designed to identify areas which may be considered for reclassification by the State Land Use Commission (LUC). Identification of areas to be recommended for reclassification are being supported through various technical investigations including a technical mapping study (conducted by PBR Hawaii, Inc.) involving the overlay plotting of County development/Community Plans onto the LUC district boundary base maps. This mapping evaluation identifies inconsistencies between County land use planning objectives and the underlying State district boundary classification. While the State land use districts designate broad use categories associated with the Agricultural, Conservation, Rural, and Urban Districts, the Community Plan designations set forth more detailed land use allocations which are

designed to achieve the long-term development objectives of the region. Inconsistencies between County land use planning maps and the LUC district boundary maps then, are used to identify land areas which may warrant evaluation to determine reclassification potential.

In general, mapping inconsistencies were noted if the Community Plan land use designation was not strictly consistent with the underlying State land use district. Table 2 lists those Community Plan land uses which are deemed to be consistent with the underlying State land use district.

Table 2

COMMUNITY PLAN LAND USE DESIGNATIONS CONSISTENT WITH UNDERLYING STATE LAND USE DISTRICT DESIGNATIONS	
State Land Use District	Consistent Community Plan Land Use Designations
Agricultural	Agriculture (AG)
Conservation	Conservation (C), Open Space (OS)
Rural	Rural (R)
Urban	Single-Family Res.(SF); Multi-Family Res. (MF); Business/Commercial (B); Business/Multi-Family (BR); Business/Industrial (BI); Light Industrial (LI); Heavy Industrial (HI); Hotel (H); Public/Quasi-Public (P); Park (PK); Project District (PD); Airport (A or AP); Service Business/Residential (SBR)

From a methodological standpoint, the State land use district boundary maps utilize the U.S.G.S. 1-inch to 2,000-feet scale quadrangle maps, while the Community Plans maps are plotted on the U.S.G.S. maps enlarged to a scale of 1-inch to 1,000-feet. In some instances, therefore, mapping discrepancies may be attributed to differences in map scaling and accuracies.

However, the intent of the overlay assessment is to locate and identify areas which indicate major differences between Community Plan and State land use objectives. For this reason, areas which were evaluated are limited to those sites which measure 15-acres or more in size.

Table 3 summarizes the areas of inconsistency found for the County of Maui. The greatest inconsistency is found with the Community Plan's Open Space designation and the State Agriculture, Rural or Urban Districts (4,681 acres). A large degree of inconsistency also occurs for the Community Plans' Project District lands and State designated Agriculture, Rural and Conservation lands (2,953 acres). Inconsistencies between lands designated Agriculture by the Community Plans, but either Urban, Rural or Conservation by the State (2,242 acres) and inconsistencies between Community Plan Single-Family Residential areas designated as either Agriculture or Rural by the State are also noteworthy.

Parcels (greater than 15 acres) having inconsistent land use designations were reviewed to determine appropriate State land use classifications. Those parcels deemed worthy of reclassification consideration are listed in Table 4.

The list of potential reclassification areas shown in Table 4 will be prioritized to determine recommendations to be advanced to the LUC. These findings and recommendations are discussed in Chapters IV, V and VI of this report.

E. SPATIAL DISTRIBUTION OF STATE LAND USE DISTRICTS

1. Island of Maui

a. Urban District

On the Island of Maui, State Urban designated lands are largely confined to coastal areas, the Central Maui isthmus, and along the slopes of Haleakala. See Figure 2.

Along the west coast of the Island, north from Honokahua Bay to just south of Lahaina, is a band of Urban lands lying

Table 3

SUMMARY OF STATE LAND USE/COUNTY COMMUNITY PLAN INCONSISTENCIES

STATE LAND USE	COUNTY LAND USE DESIGNATIONS																TOTAL
	SF	MF	BR	B	BI	LI	HI	H	R	AG	PD	AP	PK	OS	C	P	
Agriculture	1,522	124				25	144	24	231		2,802	605	717	1,001	612	667	8,474
Conservation										747	51	20				37	855
Rural	86									313	100		104	1,978		19	2,600
Urban									469	1,182				1,702			3,353
Total Acres	1,608	124	0	0	0	25	144	24	700	2,242	2,953	625	821	4,681	612	723	15,282

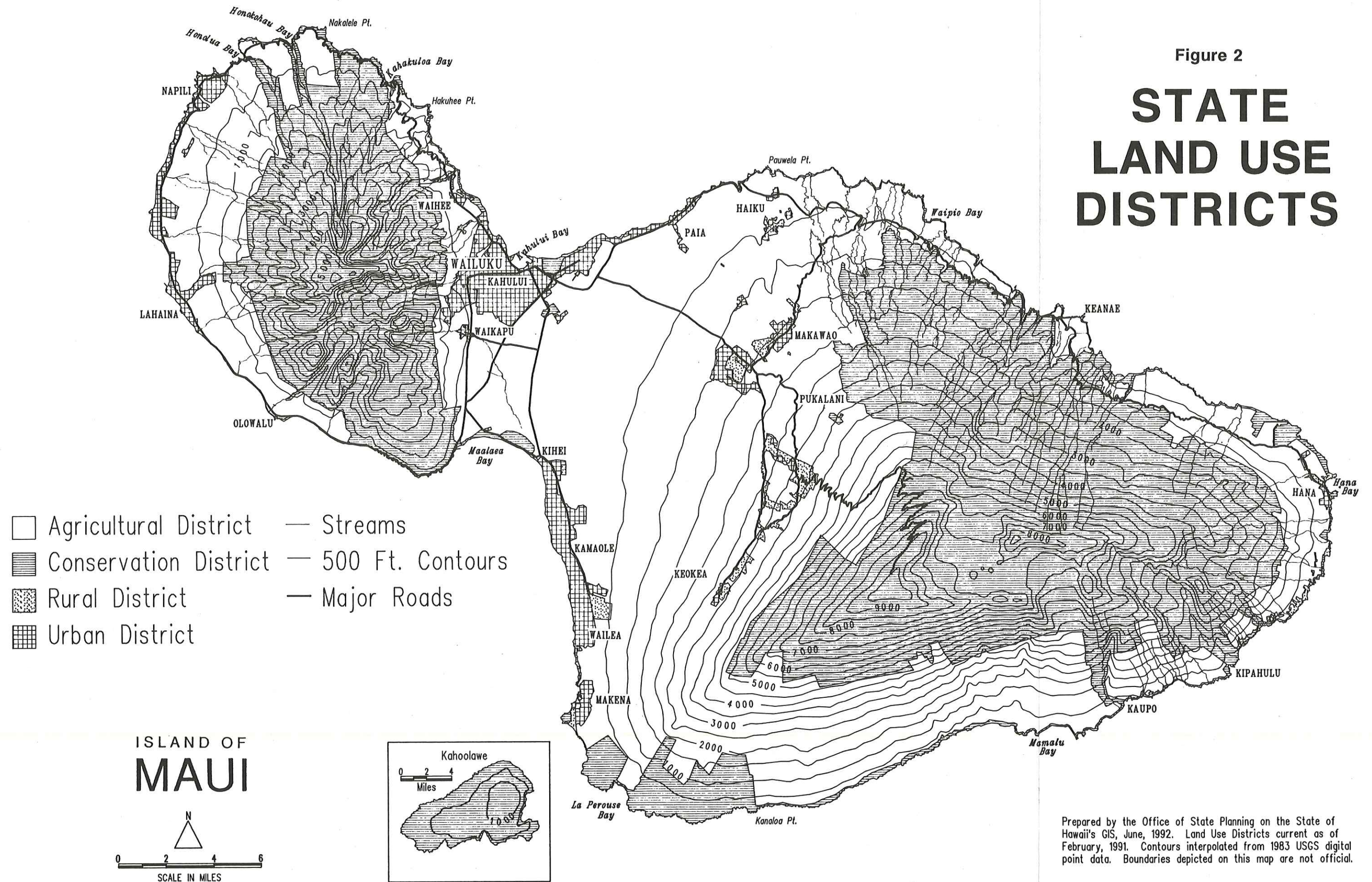
Source: PBR Hawaii, 1990.

Table 4

STATE LAND USE DISTRICT - COMMUNITY PLAN INCONSISTENCIES: SUMMARY OF AREAS WARRANTING RECLASSIFICATION CONSIDERATION					
Island	U.S.G.S. Map Section	LUC Map Designa- tion	Land Area (Acres)	Location	Recommended Reclassification
Lanai	Lanai City	Map L-1	253	Southwest Lanai	Rural to Conservation
Lanai	Maunalei	Map L-2	674	Northeast Lanai	Rural to Conservation; Urban to Conservation
Lanai	Manele Bay	Map L-3	1,057	Southeast Lanai	Rural to Conservation; Urban to Conservation
Maui	Lahaina	Map M-2	142 (portion only)	Lahaina Town	Agricultural to Urban
Maui	Wailuku	Map M-5	128 (portion only)	Paukukalo, Wailuku	Urban to Conservation
Maui	Maalaea	Map M-6	452	Kealia, Maalaea	Agricultural to Conservation
Maui	Paia	Map M-7	67	Puunene and Paia	Agricultural to Urban
Maui	Kilohana	Map M-11	155	Olinda	Agricultural to Conservation
Maui	Hana	Map M-16	21	Hana Bay	Rural to Conservation
Maui	Hana	Map M-16	27	Hana Town	Urban to Agricultural
Molokai	Kaunakakai	Map MO-3	101	Kalamaula	Agricultural to Conservation
Molokai	Kamalo	Map MO-4	332	Pohakuloa	Agricultural to Conservation
Maui	Hana	Map M-16	22	Hana Sanitary Landfill Site	Conservation to Agricultural
Includes lower priority recommendations.					

Figure 2

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.

makai of a vast expanse of Agricultural lands.

A major band of Urban designated lands is also delineated along the southwest coast of Maui. This area, from Maalaea to south of Makena, is designated as Urban, except for isolated zones of Rural and Conservation lands. This area includes the communities of Maalaea, Kihei, Wailea and Makena. Agricultural lands in this area of the Island are located immediately upland of the Urban District on the slopes of Haleakala.

The northern portion of the Central Maui isthmus contains the largest expanse of Urban designated lands on Maui. It includes the communities of Wailuku, Waihee, Waikapu, Kahului, Puunene, and Paia. As elsewhere, these Urban lands are surrounded by Rural, Agricultural, and Conservation designated lands. Conservation lands occupy all of the higher elevations (typically defined by the Forest Reserve line), as well as the coastal band near Waihee. Agricultural lands border the developed areas of Wailuku and Kahului, stretching south across the isthmus.

In East Maui, Urban designated lands occur as pockets within large territories of Agricultural and Conservation lands. For instance, lands around Haiku, Pukalani, Makawao, Kula Sanitorium, and Hana Bay are Urban-zoned.

b. Agricultural District

The Agricultural District on the Island of Maui is concentrated along the western slopes of the West Maui Mountains, on the central isthmus connecting the two mountain ranges, and along the Upcountry and makai slopes of Haleakala. See Figure 2. The primary crops are sugar cane, pineapple and macadamia nuts, with diversified

crops found in the Upcountry areas. Cattle grazing is found in the Upcountry and dryer areas of southeast Maui.

c. Rural District

Scattered pockets of Rural designated lands are found in the rural communities of Haiku, Makawao, Pukalani, and Kula. See Figure 2.

d. Conservation District

The major Conservation areas on the Island encompass the West Maui Forest Reserve in the west, and the Kula Forest Reserve, the Makawao Forest Reserve, the Koolau Forest Reserve, the Kahikinui Forest Reserve, the Hana Forest Reserve, the Kipahulu Forest Reserve, and Haleakala National Park in the east. See Figure 2. Their significance lies in their resources as watershed areas, wilderness and scenic areas and as habitats for Maui's native flora and fauna. Other significant lands in the Conservation District include the coastal lands from Lipoa Point in the northwest toward Waiehu near Kahului; Kanaha Pond Wildlife Refuge in Kahului; Kealia Pond and wetlands east of Maalaea Village; and the majority of the coastline from Cape Kinau in the southeast, toward Hana Airport in the northeast.

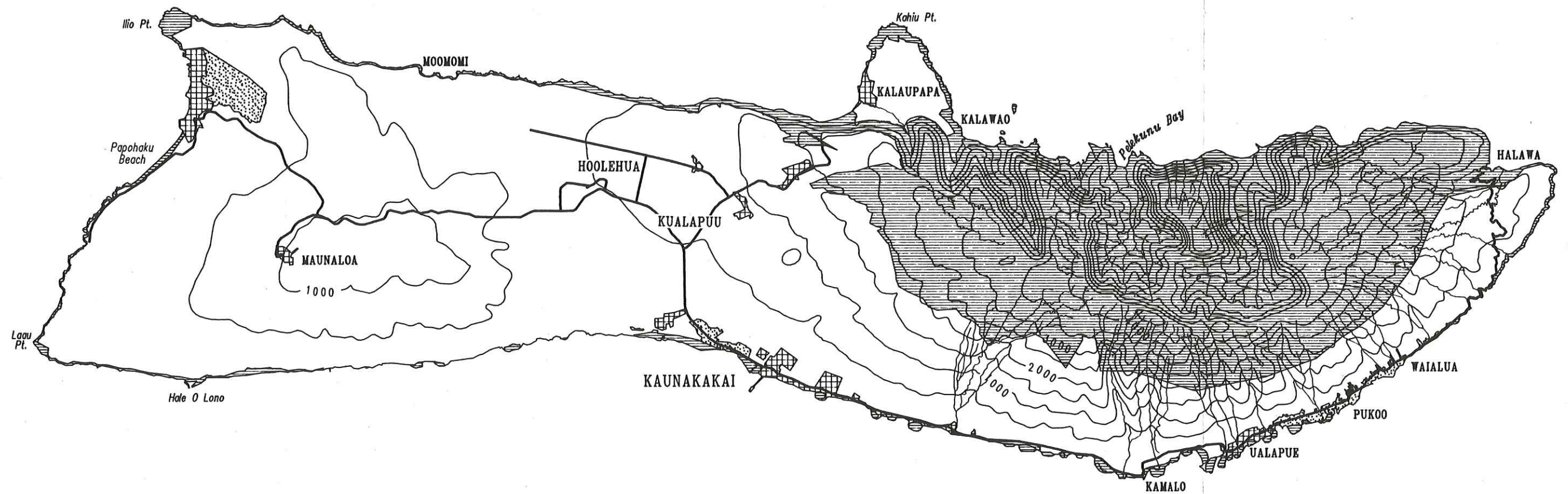
2. Island of Molokai

a. Urban District

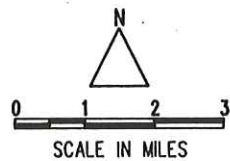
While Urban land acreage on Molokai is significantly smaller, the spatial distribution pattern is similar to that of Maui (i.e., the majority of Urban lands occur along the Island's coast). In the western section of the Island, Kaluakoi on the coast and Maunaloa are classified Urban. Kalaupapa on the north coast and the areas around Kaunakakai and Ualapue on the south coast are virtually the only other Urban classified lands on the Island. See Figure 3.

Figure 3




STATE LAND USE DISTRICTS



ISLAND OF
MOLOKAI



-  Agricultural District
-  Conservation District
-  Rural District
-  Urban District

-  Streams
-  500 Ft. Contours
-  Major Roads

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.

b. Agricultural District

The Agricultural District, by far the largest district, encompasses the remainder of the Island except for small areas of Rural and Urban designated pockets along the coast. See Figure 3. The Agricultural District primarily covers the greater part of the western end of the Island and the narrow band between the Molokai Forest Reserve and the coast. A portion of the Kalaupapa Peninsula is also included in this district.

c. Rural District

The Rural District is concentrated in two areas along the coast: at the Kalanianaʻole Colony west of the town of Kaunakakai; and along the southeast coast between Kaluaaha and Waialua. See Figure 3.

d. Conservation District

The majority of Molokai's Conservation District is located in the northeast portion of the Island within the Molokai Forest Reserve. See Figure 3. Additional lands are found along the coast and include the coastline from Ilio Point in the northwest corner of the Island toward Kalaupapa where it joins with the Molokai Forest Reserve. Extending from the Molokai Forest Reserve at Halawa Bay in the northeast, the Conservation District follows the coastline to Waialua where it meets the Rural District boundary. The Conservation District begins again at Kalaeloa Harbor and continues along the coast except for breaks between Pahiomu and Kanukuawa Fishponds, Kawela to Kaunakakai, and between Ooia Fishpond to just past Kolo Wharf. The numerous fishponds found along the coastline are included in the Conservation District.

3. **Island of Lanai**

a. **Urban District**

Urban District lands are found on the Island's central upland, encompassing Lanai City. Urban lands are also found along the southeast and south coasts, adjoining Rural District lands which band this portion of the Island. See Figure 4.

b. **Agricultural District**

The Agricultural District is primarily composed of two major areas found on the Island's central upland and basin areas and along the northeast slopes between the Conservation District and the coastline. See Figure 4. The major crop is pineapple with some diversified crops being cultivated along the fringes of the pineapple fields.

c. **Rural District**

The Rural District is localized in three areas. They include the northeast coast between Poaiwa and Haua, Waiopee and Halepalaoa Landing and the area around Awahi. Three pockets along the southern coast and around Kaumalapau Harbor, as well as lands in the central area north of Koele, also fall within the Rural District. See Figure 4.

d. **Conservation District**

With the exception of a few isolated pockets of land, the Conservation District represents a contiguous district encompassing the entire northwest portion of Lanai, the majority of its west coast and an irregular band beginning near Kukui Point in the north, extending in a curvilinear fashion southeast toward Manele Bay. Isolated pockets of Conservation lands are also found within the northeast Rural District and interspersed between pockets of Rural District lands along the southern coast. See Figure 4.

STATE LAND USE DISTRICTS

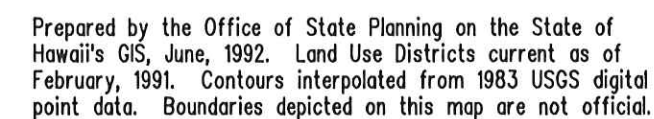


Table 5 lists the acreage of each State Land Use District by Island.

Table 5

ESTIMATED ACREAGE OF LAND USE DISTRICTS - 1990 COUNTY OF MAUI					
Island	Total	Urban	Rural	Agricultural	Conservation
Maui	465,800	18,020	3,747	250,407	193,626
Molokai	165,800	2,509	1,866	111,657	49,768
Lanai	90,500	2,338	2,720	47,239	38,203
Kahoolawe	28,800	---	---	---	28,800
Source: State of Hawaii, Department of Business, Economic Development & Tourism, 1990.					

F. URBAN DISTRICT CHARACTERISTICS

1. Existing Land Uses

a. Residential

Major residential areas on the Island of Maui are primarily located in the Community Plan regions of Wailuku-Kahului, Paia-Haiku, Kihei-Makena and Lahaina. The residential communities found in these planning regions tend to cluster along the Island's central isthmus and coastal areas and represent some of the Island's more densely populated areas. Residential areas are, for the most part, single-family residential neighborhoods with attendant parks, schools and commercial facilities. Smaller residential communities are also found in the Hana and Makawao-Pukalani-Kula Community Plan regions. The Hana residential communities also follow the Island's trend of coastal locations, whereas the residential communities belonging to the Makawao-Pukalani-Kula region are typically located inland along the

slopes of Haleakala.

The residential communities of Molokai, like Maui, are typically found along the Island's coastal areas with a few exceptions near the central and western plateau of the Island. The majority of these residential communities occur along the southeast coastline.

The residential community for the Island of Lanai is located in Lanai City, which is found in the Island's central uplands.

b. Resort

The Island of Maui boasts of two major resort destinations for Island visitors. Along the northwest coast, is the resort area encompassing the Kapalua, Kaanapali, and Lahaina sections of the Lahaina Community Plan region. The second major visitor destination area is found along the southwest shores of the Island, stretching from Kihei in the north to Makena in the south. This area encompasses the master-planned resorts of Wailea and Makena. Another popular destination for Island visitors is Hana located at the eastern-most end of the Island.

Although considered the hub of commercial business on the Island, the Wailuku-Kahului Community Plan region has relatively few visitor accommodations.

Molokai's resort area is concentrated at the Island's west end at Kaluakoi. In addition to the Kaluakoi Resort and other resort condominiums, the Molokai Ranch Wildlife Park is also found here.

New resort accommodations on the Island of Lanai place the Island in transition from an agricultural-based economy to a visitor industry-based economy. For many years the Hotel

Lanai was Lanai's only visitor accommodation. Now the Island is home to two luxury hotels at Manele Bay and Koele (in Lanai City).

c. Commercial and Industrial

The Central Maui region serves as the commercial, industrial and governmental hub for the Island and County of Maui, and includes the following primary activity areas:

- Kahului Harbor, the major commercial port serving the County;
- Kahului Airport, the County's primary airport serving interisland and overseas carriers;
- Maui Memorial Hospital, a 145-bed hospital providing acute, emergency and general care services;
- Wailuku Civic Center, the focal point for County, State and Federal government and non-government professional offices and services;
- Maui Community College, the University of Hawaii's two year community college providing higher education opportunities to County residents;
- Kahului and Wailuku Industrial Areas, privately-developed light industrial areas serving as the centers for light industrial activity on the Island.
- Maui Memorial Recreation Complex, a major athletic and recreation complex consisting of a gymnasium, olympic swimming pool, football and baseball stadiums, tennis courts, and fields for youth athletic activities.

Commercial and industrial areas on Molokai are found around Kaunakakai, the Island's port town.

Outside of Lanai City and the resort areas, Kaumalapau

Harbor comprises the Island's only commercial area.

d. Military

The Department of Defense owns or controls 35,104 acres of land in the County of Maui. By far the largest parcel is the Island of Kahoolawe which encompasses 28,777 acres. Molokai holds the next largest percentage with 6,319 acres and Maui follows with 8 acres. The Island of Lanai has no military installations (DBED, 1990 Data Book). See Figure 5 and Figure 6.

e. State Lands

The State of Hawaii owns a total of 150,070 acres in the County. Of this total, 54,361 acres are under jurisdiction of the Department of Hawaiian Home Lands. See Figure 5 and Figure 6.

2. Urban Land Requirements

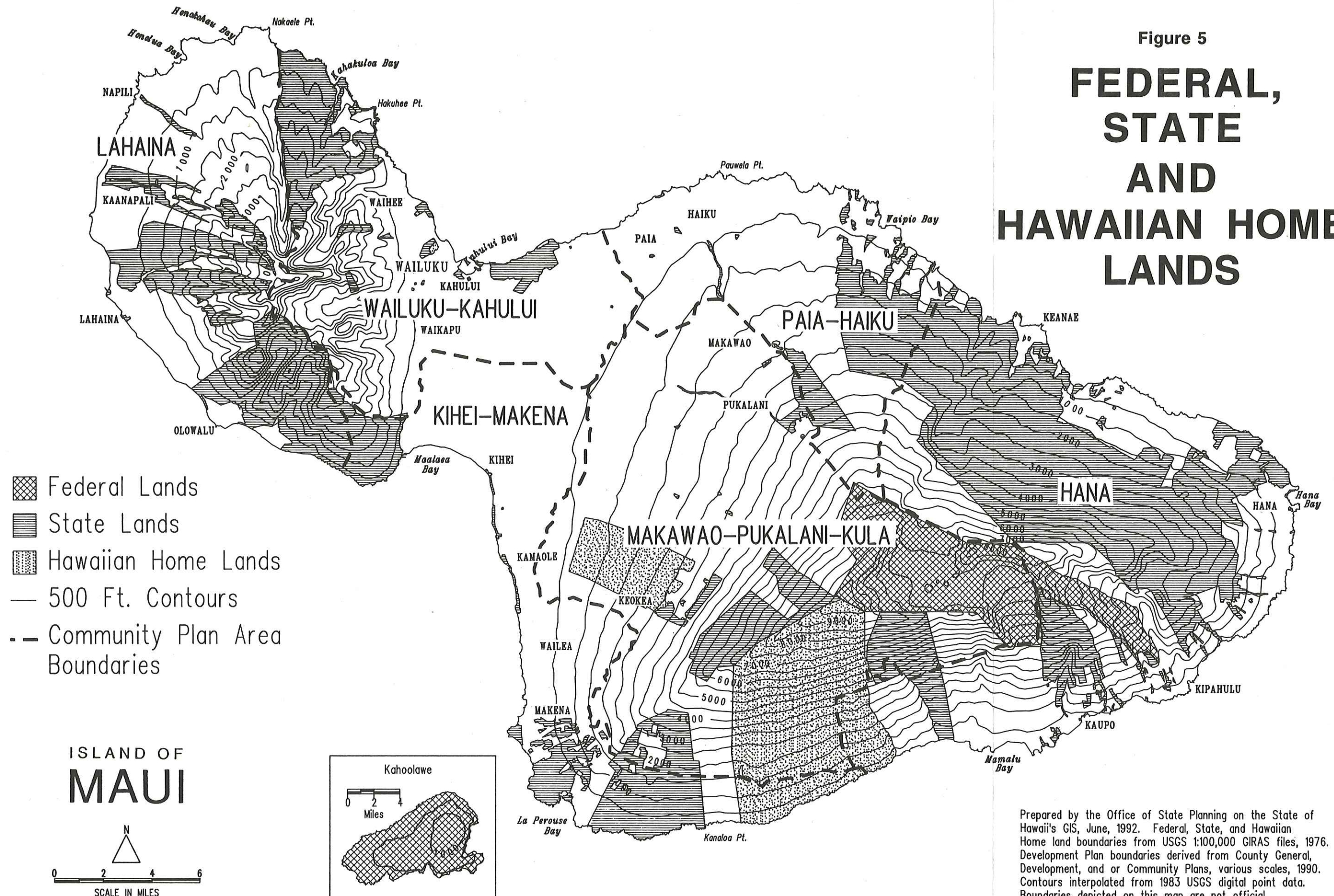
The Urban Lands Requirement Study conducted by Wilson Okamoto & Associates, Inc., for the Five-Year Boundary Review examined existing urban lands in the State to determine whether there is sufficient urban-zoned land to accommodate population and economic growth. Key components in this analysis were 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 LUC records there have been 53,414 acres of land reclassified to the Urban District since 1964 in the State. This represents an increase of 42.3 percent.

In the County of Maui, a total of 4,250 were added to the Urban land inventory between 1976 and 1990. Over two-thirds of these

Figure 5

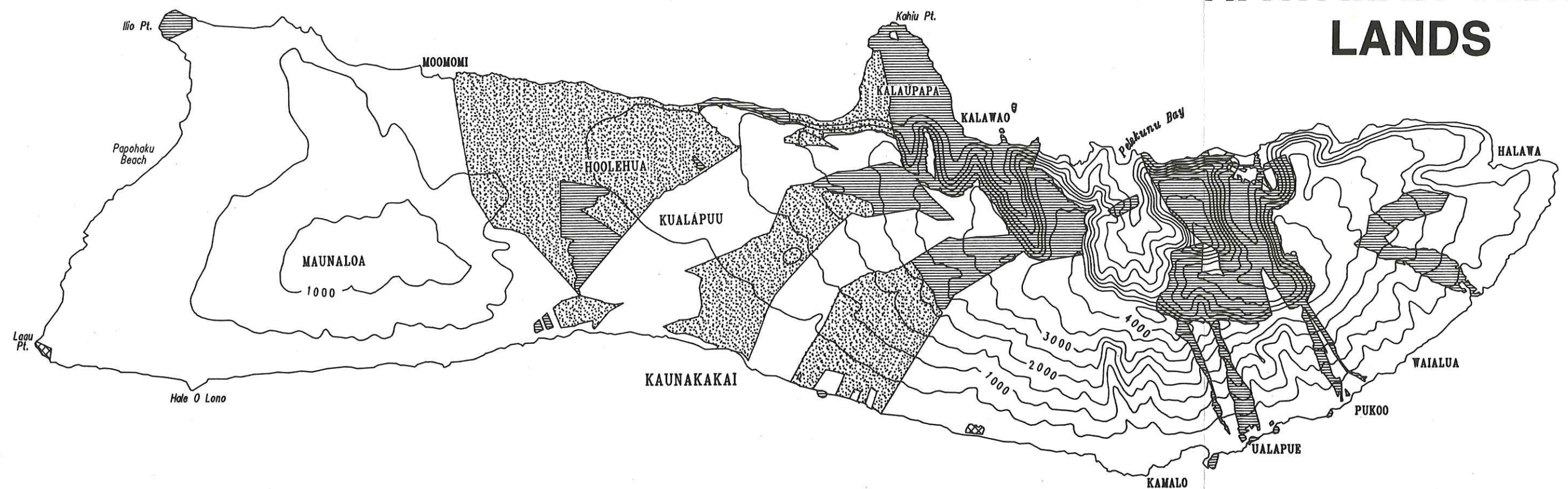
FEDERAL, STATE AND HAWAIIAN HOME LANDS



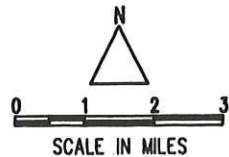
Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Federal, State, and Hawaiian Home land boundaries from USGS 1:100,000 GIRAS files, 1976. Development Plan boundaries derived from County General, Development, and or Community Plans, various scales, 1990. Contours interpolated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

Figure 6

**FEDERAL,
STATE
AND
HAWAIIAN HOME
LANDS**



**ISLAND OF
MOLOKAI**



-  Federal Lands
-  State Lands
-  Hawaiian Home Lands
-  500 Ft. Contours

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.

reclassified lands are located in two planning regions; the Lahaina Community Plan region with 1,500 acres, and the Wailuku-Kahului Community Plan region with 1,436 acres. Kihei, in the Kihei-Makena Community Plan region also experienced relatively high Urban land conversion, with 827 acres. See Table 6.

Vacant developable Urban lands in the County of Maui were identified by the Urban Land Requirements Study. The criteria for developable land is defined as land vacant of any permanent developments, with slopes less than 20 percent, and otherwise free of identifiable environmental constraints, such as wetlands or waterways. Excluded from the definition of developable lands were existing golf courses, parks and roadways and parcels less than five acres.

a. Developable Urban Lands

(1) Island of Maui

A total of 5,824 acres have been identified as vacant Urban lands on the Island of Maui. Of this total, the Study identifies 4,130 acres as being developable. See Table 7. Detailed land use summaries for vacant developable urban lands are contained in Appendix A.

Significant developable parcels in the Wailuku-Kahului Community Plan region include the Maui Lani project and C. Brewer Properties, Inc.'s Wailuku Project District. Other smaller areas of developable Urban lands have been identified mauka of Waiehu Beach, in the Kahului Harbor industrial area, and in Spreckelsville. A total of 1,798 acres of developable lands are found in this planning region.

In the Kihei-Makena Community Planning region, a total of 1,241 acres of developable lands can be

Table 6**URBANIZED LANDS
COUNTY OF MAUI
(BY DISTRICT)**

	1976-80	1981-85	1986-90	TOTAL
WAILUKU-KAHULUI	1	680	755	1,436
KIHEI-MAKENA	51	629	147	827
LAHAINA	106	50	1,344	1,500
HANA	0	0	0	0
MAKAWAO-KULA	95	116	29	240
PAIA-HAIKU	0	8	71	79
MOLOKAI	0	125	0	125
LANAI	0	0	42	42
TOTAL	253	1,608	2,388	4,249

Source: Wilson Okamoto & Associates, Inc. June 1991.

Table 7

VACANT AND DEVELOPABLE URBAN LANDS COUNTY OF MAUI		
Community Plan Region	Vacant Urban Lands	Developable Urban Lands
Wailuku-Kahului	1,945	1,798
Kihei-Makena	2,147	1,241
Lahaina	789	322
Hana	44	44
Makawao-Pukalani-Kula	635	551
Paia-Haiku	264	174
SUBTOTAL ACRES	5,824	4,130
Molokai (Island)	2,573	824
Lanai (Island)	2,581	1,473
TOTAL ACRES	10,978	6,427
Source: Wilson Okamoto & Associates, Inc., June 1991		

found in Maalaea, Kihei, Wailea and Makena. In the Kihei area a number of developable parcels are located in the area between Kihei Road and Piilani Highway. Substantial areas of developable lands are found further south, in the general vicinity north of Wailea and makai of Piilani Highway. North of Maui Meadows is a 119 acre developable parcel identified as Project District 7 by the Kihei-Makena Community Plan.

The Lahaina Community Plan region encompasses developable areas in Napili, Alaeloa, Kahana, Mahinahina, Kaanapali and Lahaina. These areas include parcels near the old Kaanapali Airport, within the Kaanapali Resort, and mauka of Mala Wharf near

the town of Lahaina. Developable lands found in this planning region total 322 acres.

Within the Hana Community Plan region, two locales are identified as having developable lands. These areas, totalling 44 acres, are found in Hana Town and near Koki Beach Park further to the south.

Within the Makawao-Pukalani-Kula Community Plan region, are five areas identified as having developable Urban lands. These areas stretch from Pukalani to Pulehu, Waiakoa and Waiohuli and on to Keokea. The three areas with the greatest percentage of developable lands are Pukalani, Waiohuli and Keokea. The total amount of developable lands found in this region is 551 acres.

Finally, the Paia-Haiku Community Plan region is noted to have small developable areas located in Paia and in the general area stretching from Makawao to Pauwela. A total of 174 acres of developable lands are found in the vicinity of Paia, Pauwela Village, Haiku, Hamakuapoko, Haliimaile and Makawao.

(2) Island of Molokai

A total of 2,573 acres of vacant Urban lands were found on the Island of Molokai. Of this total, 824 acres are considered developable. Sizeable areas of developable lands are found in the general areas of Kaluakoi, Lono Harbor and the village of Kipu. Other locales include Umipaa, Kaunakakai Harbor, Kalokoeli Fishpond, Kamiloloa Heights, Moku, Kawela, Kamalo, Ualapue and Pukoo.

(3) Island of Lanai

Of the 2,581 acres of identified vacant Urban lands found on the Island of Lanai, 1,473 acres are considered developable. Included in these lands are parcels located in the vicinity of Hulopoe and Manele Bays. The remainder is distributed elsewhere on the Island.

b. Demand for Urban Lands

The demand for residential, commercial, industrial, resort, and public area (schools, parks) lands was calculated as part of the Urban Lands Requirements Study. The demand for residential land was based upon the Series M-K projections and using additional methodologies developed by the consultants. Housing demand was estimated based on projected population growth, projected household size, and vacancy rates. Residential projections assumed that existing densities would continue into the future which results in a high estimate of demand for residential land. While the extent and timing of density increases are difficult to forecast, it can 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 reduced. 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 on household size was not available when the study was conducted. The census data shows a higher household size than reflected in the study. If a higher household size is used, the demand for urban land is reduced.

Commercial demand was estimated based on employment or commercial floor area projections. These projections were provided through the land use forecasts prepared in conjunction with the State's long-range transportation studies for the Island of Maui. Employment projections were based on the M-K economic projections.

Industrial demand was similarly based on employment projections, with land area calculated using employees per acre factors. Industrial activities tend to bear a stronger relationship to land rather than to floor area.

Resort demand was projected based on the M-K projections for visitor units in each County. The County of Maui visitor unit projections and distributions were provided through the land use forecasts of the transportation studies.

Assessment of residential area requirements indicate that a total of 58,958 units are needed to support the projected population by the year 2010. A detailed tabular breakdown of residential area requirements are presented in Appendix B. Much of the growth is expected to occur in the Wailuku-Kahului area, followed by Lahaina, Kihei-Makena, and Makawao-Pukalani-Kula. This level of demand translates to an additional 26,853 housing units by the year 2010, requiring lands totalling approximately 3,188 acres.

Assessment of commercial and industrial area requirements indicate the additional need for approximately 414 acres and 779 acres, respectively, by the year 2010 primarily in the Kihei-Makena, Lahaina, and Wailuku-Kahului areas. Assessment of resort area requirements indicate the need for an additional 845 acres of land in resort-designated areas, mainly in Kihei-Makena and Lahaina. Public area needs, which include schools and parks, will require an

additional 234 acres by the year 2010. See Appendix B.

c. **Availability of Urban Lands to Meet Future Demands**

The Urban Land Requirements Study assessment of urban land supply and anticipated need assumes that a reasonable surplus rather than a shortage in the supply is deemed desirable. A reasonable allowance for flexibility is assumed to be 25 percent of the total amount of land estimated to go into use during the planning period. This flexibility factor allows for unanticipated choices of individuals and firms who may acquire land in excess of the estimated need, and allows for land which may be held out of use because of personal preferences of property owners, unfavorable market conditions, or legal constraints which make the land unavailable for immediate development.

On the basis of this assumption, a demand of 2,455 acres of Urban land (County-wide) will be generated by 1995. By the year 2000 a demand of 4,209 acres will be realized. Finally by the year 2010 a demand of 6,814 acres will be generated. See Table 8, Table 9, Table 10 and Table 11.

For County residential-zoned lands, the study reflects a surplus of developable Urban lands through the planning period, except in the Lahaina area, which shows additional residential area needs of 276 acres by the year 2000. See Table 10. These figures do not account for the recently approved urban reclassification for HFDC's project in Lahaina. Molokai and Lanai are projected to have ample acreage of residential land.

By the year 2000, commercial area needs will generate a demand of 408 acres on the Island of Maui. This will result in a deficit of 356 acres. Similarly, there is a shortage of industrial lands, notably in the Kihei area, which has an

Table 8
AVAILABLE URBAN LANDS
1995 - 2010
COUNTY OF MAUI

	1995	2000	2010
WAILUKU-KAHULUI	999	612	1
KIHEI-MAKENA	727	263	(418)
LAHAINA ¹	(115)	(465)	(963)
HANA	4	(15)	(44)
MAKAWAO-KULA	280	223	129
PAIA-HAIKU	91	57	(6)
MAUI 25% FLEXIBILITY FACTOR	(456)	(783)	(1,277)
MAUI SUBTOTAL	1,531	(108)	(2,578)
MOLOKAI 25% FLEXIBILITY FACTOR	(10)	(20)	(34)
MOLOKAI	586	537	466
LANAI 25% FLEXIBILITY FACTOR	(25)	(39)	(51)
LANAI	1,235	1,169	1,105
TOTAL	3,351	1,597	(1,008)
<hr/> Surplus (Deficit) in Acres			

Source: Wilson Okamoto & Associates, Inc. June 1991.

¹ Does not include 500 acres reclassified in 1991 for the HFDC Lahaina project.

Table 9
AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
COUNTY OF MAUI
1995
(IN ACRES)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-		OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/ (DEFICIT)
	ZONED			ZONED			ZONED			ZONED			ZONED						
	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	DEV.					
	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN LAND	URBAN					
														1/					
WAILUKU-KAHULUI	1,285	616	669	23	11	12	188	103	85	0	0	0	1,496	249	1,745	16	746	999	
KIHEI-MAKENA	907	43	864	13	83	(70)	24	130	(106)	114	130	(16)	1,058	68	1,126	13	399	727	
LAHAINA 2	109	204	(95)	16	53	(37)	35	4	31	96	97	(1)	256	2	258	15	373	(115)	
HANA	44	32	12	0	0	0	0	4	(4)	0	4	(4)	44	0	44	0	40	4	
MAKAWAO-KULA	463	180	283	0	1	(1)	0	0	0	0	0	0	463	0	463	2	183	280	
PAIA-HAIKU	166	67	99	0	0	0	6	13	(7)	0	0	0	172	0	172	1	81	91	
MAUI SUBTOTAL	2,974	1,142	1,832	52	148	(96)	253	254	(1)	210	231	(21)	3,489	319	3,808	47	1,822	1,986	
MOLOKAI	247	25	222	0	1	(1)	117	5	112	121	9	112	485	152	637	1	41	596	
LANAI	383	67	316	0	1	(1)	11	9	2	0	23	(23)	394	967	1,361	1	101	1,260	
SUBTOTAL	3,605	1,234	2,371	52	150	(98)	381	268	113	331	263	68	4,368	1,438	5,806	49	1,964	3,842	
25% FLEXIBILITY FACTOR		309			38			67			66					12	491	(491)	
TOTAL	3,605	1,543	2,371	52	188	(98)	381	335	113	331	329	68	4,368	1,438	5,806	61	2,455	3,351	

1/ Includes County-zoned agricultural and rural districts,
but excludes conservation districts.

2/ Does not include 500 acres reclassified in 1991 for the HFDC Lahaina project.

Source: Wilson Okamoto & Associates, Inc. June 1991.

Table 10
AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
COUNTY OF MAUI
2000
(IN ACRES)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-		OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/ (DEFICIT) OF URBAN LANDS
	ZONED	2000	SURPLUS/ (DEFICIT)	ZONED	2000	SURPLUS/ (DEFICIT)	ZONED	2000	SURPLUS/ (DEFICIT)	ZONED	2000	SURPLUS/ (DEFICIT)	ZONED	DEV.					
	DEV.			DEV.			DEV.			DEV.			DEV.						
	URBAN	DEMAND		URBAN	DEMAND		URBAN	DEMAND		URBAN	DEMAND		URBAN LAND	URBAN	URBAN	2000	2000		
																			1/
WAILUKU-KAHULUI	1,285	876	409	23	33	(10)	188	167	21	0	0	0	1,496	249	1,745	57	1,133	612	
KIHEI-MAKENA	907	166	741	13	230	(217)	24	211	(187)	114	237	(123)	1,058	68	1,126	19	863	263	
LAHAINA 2	109	385	(276)	16	141	(125)	35	6	29	96	169	(73)	256	2	258	22	723	(465)	
HANA	44	43	1	0	1	(1)	0	6	(6)	0	8	(8)	44	0	44	1	59	(15)	
MAKAWAO-KULA	463	235	228	0	2	(2)	0	0	0	0	0	0	463	0	463	3	240	223	
PAIA-HAIKU	166	91	75	0	1	(1)	6	22	(16)	0	0	0	172	0	172	1	115	57	
MAUI SUBTOTAL	2,974	1,796	1,178	52	408	(356)	253	412	(159)	210	414	(204)	3,489	319	3,808	103	3,133	675	
MOLOKAI	247	54	193	0	3	(3)	117	8	109	121	13	108	485	152	637	2	80	557	
LANAI	383	104	279	0	3	(3)	11	15	(4)	0	29	(29)	394	967	1,361	3	154	1,207	
SUBTOTAL	3,605	1,954	1,651	52	414	(362)	381	435	(54)	331	456	(125)	4,368	1,438	5,806	108	3,367	2,439	
25% FLEXIBILITY FACTOR		489			104			109			114					27	842	(842)	
TOTAL	3,605	2,443	1,651	52	518	(362)	381	544	(54)	331	570	(125)	4,368	1,438	5,806	135	4,209	1,598	

^{1/} Includes County-zoned agricultural and rural districts,
but excludes conservation districts.

^{2/} Does not include 500 acres reclassified in 1991 for the HFDC Lahaina project.

Source: Wilson Okamoto & Associates, Inc. June 1991.

Table 11

**AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
COUNTY OF MAUI
2010
(IN ACRES)**

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-						
	ZONED			ZONED			ZONED			ZONED			ZONED	OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/	
	DEV.	2010	SURPLUS/	DEV.	2010	SURPLUS/	DEV.	2010	SURPLUS/	DEV.	2010	SURPLUS/	DEV.	DEV.	DEV	2010	2010	(DEFICIT)	
	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN LAND	URBAN	URBAN	DEMAND	DEMAND	OF URBAN	
														1/				LANDS	
WAILUKU-KAHULUI	1,285	1,356	(71)	23	33	(10)	188	275	(87)	0	1	(1)	1,496	249	1,745	79	1,744	1	
KIHEI-MAKENA	907	355	552	13	230	(217)	24	406	(382)	114	495	(381)	1,058	68	1,126	58	1,544	(418)	
LAHAINA 2	109	720	(611)	16	141	(125)	35	12	23	96	274	(178)	256	2	258	74	1,221	(963)	
HANA	44	58	(14)	0	1	(1)	0	11	(11)	0	17	(17)	44	0	44	1	88	(44)	
MAKAWAO-KULA	463	320	143	0	2	(2)	0	0	0	0	0	0	463	0	463	12	334	129	
PAIA-HAIKU	166	132	34	0	1	(1)	6	42	(36)	0	0	0	172	0	172	3	178	(6)	
MAUI SUBTOTAL	2,974	2,941	33	52	408	(356)	253	746	(493)	210	787	(577)	3,489	319	3,808	227	5,109	(1,301)	
MOLOKAI	247	98	149	0	3	(3)	117	14	103	121	19	102	485	152	637	3	137	500	
LANAI	383	139	244	0	3	(3)	11	19	(8)	0	40	(40)	394	967	1,361	4	205	1,156	
SUBTOTAL	3,605	3,178	427	52	414	(362)	381	779	(398)	331	846	(515)	4,368	1,438	5,806	234	5,451	355	
25% FLEXIBILITY FACTOR		795			104			195			212					59	1,363	(1,363)	
TOTAL	3,605	3,973	427	52	518	(362)	381	974	(398)	331	1,058	(515)	4,368	1,438	5,806	293	6,814	(1,007)	

1/ Includes County-zoned agricultural and rural districts,
but excludes conservation districts.

2/ Does not include 500 acres reclassified in 1991 for the HFDC Lahaina project.

Source: Wilson Okamoto & Associates, Inc. June 1991.

estimated need of 211 acres by 2000 and will result in a deficit of 187 acres. County-wide there will be a deficit of 54 acres.

Based on the projected resort demand, there are needs for additional resort-zoned lands on Island of Maui (204 acres by 2000). Molokai shows a continuing surplus of resort lands, while Lanai shows a small deficit of 29 acres over the planning period.

There are substantial amounts of developable Urban lands which are zoned Agricultural by the County, particularly on Lanai (967 acres). Another 317 acres of developable agricultural lands are found on Maui, with 249 acres falling within the Wailuku-Kahului area.

Maui has the greatest demand for available Urban lands to meet its growing population and economy. By the year 1995, the Wailuku-Kahului region will generate the greatest demand (746 acres) for the available lands in its boundaries followed by the Kihei-Makena (399 acres) and Lahaina (373 acres) regions. The Lahaina region, with 258 acres of developable Urban lands, will be facing a projected deficit of 115 acres.

By the year 2000, the Lahaina and Hana Community Plan regions will be experiencing deficits in the availability of Urban lands needed for their growth. The Lahaina region will have a deficit of 465 acres and the Hana region will experience a 15-acre deficit.

By the year 2010, the Kihei-Makena Community Planning region will join the Lahaina and Hana regions in having a deficit of Urban lands. The Wailuku-Kahului region, while having the greatest demand for all the planning years, is

projected to have a surplus of 1 acre. The Pukalani-Makawao-Kula Planning region will have a surplus of 129 acres while Paia-Haiku will have a deficit of 6 acres. Overall the Island will realize a deficit of 1,301 acres by the year 2010.

The Island of Molokai has a total of 637 acres of available Urban lands of which 41 acres will be in demand by the year 1995. Subsequent increases of 80 acres in 2000 and 137 acres in 2010 is estimated. However, a surplus of 500 acres will still remain at the end of this planning period.

The Island of Lanai exhibits the same pattern of demand as Molokai. A surplus of 1,156 acres will remain as available Urban lands by the year 2010. Demand for available lands are comparatively small with 101 acres required in 1995, 154 acres in 2000 and 205 acres by 2010.

Overall, there is a projected surplus of developable Urban lands in the County in each of the planning horizons through the year 2010, although there are significant differences among the Islands. There are substantial surpluses of lands on Molokai and Lanai to meet requirements over the next 20 years. On the Island of Maui, however, there are initial surpluses of 999 acres in 1995 and 612 acres in 2000, but only 1 acre remains in surplus by 2010.

3. Infrastructure^b

a. Overview

Given the rapid rate of growth in the County, capacities of key infrastructure components are being approached and the planning and development of new facilities has emerged as a major community concern. The County of Maui is

^b The portions of this section are taken from the reports Five-Year Boundary Review: Infrastructure Constraints and Opportunities to 2010, Gene Dashiell, A.I.C.P., and Five-Year Boundary Review: Critical Areas Assessment, Michael T. Munekiyo Consulting, Inc.

dedicating considerable effort toward addressing community infrastructural needs as constraints imposed by capacity limitations affect governmental and private sector ability to provide needed affordable housing in a timely fashion.

The Island of Maui is most severely impacted by these infrastructural constraints. For example, the high-growth regions of Wailuku-Kahului, Kihei-Makena, and Lahaina are confronted with traffic and sewerage system facility improvement needs as growth in these regions have outpaced government's ability to develop new system capacities. In addition, water source development projects in these regions have become leading priorities as sustainable yields of existing sources are approached.

Another factor to be considered is the possible exacerbation of traffic conditions under the stress of a civil defense emergency. There are also constraints regarding the adequacy and distribution of electrical power generation systems and backup power generation in the event a disaster occurs.

In response to these regional infrastructure issues, the County Administration and Council have taken aggressive steps to provide appropriate levels of system capacities. For example, regional traffic impact fee ordinances for the Kihei-Makena and Lahaina Community Plan regions have been adopted. These ordinances provide the enabling mechanisms for establishing impact fee schedules and collecting and utilizing such fees to improve regional roadway systems.

Proposals for impact fees are being also advanced by the Council for sewerage systems, which in Kihei-Makena and Wailuku-Kahului are near treatment design capacities. The

County's Department of Public Works is concurrently studying alternatives for providing new treatment facilities to serve the Wailuku-Kahului and Kihei-Makena regions.

Figure 7, Figure 8 and Figure 9 indicate existing facilities and proposed improvements for each Island.

b. Airports^c

(1) Island of Maui

Kahului Airport: Kahului Airport, with two runways, is located on the north coast of Maui near Kahului. The main runway is oriented northeast to southwest and is 7,000 feet in length. The shorter, east-west oriented runway, is 5,000 feet in length. An estimated 4.9 million passengers used the Airport in 1990. Originally designed for interisland service, recent improvements (approximately \$146 million) to the terminal area complex, and roadway access, have significantly increased its capacity and the Airport terminal is now capable of supporting passenger growth beyond the year 2000. The commuter terminal is expected to provide for growth to 2010 and beyond.

In 1995, the projected number of passengers is 6.2 million (1.4 million overseas) which will increase in 2010 to 9.0 million (2.4 million overseas). Cargo volume is also projected to increase significantly.

The airport is located on Urban designated lands. This district extends south from the Airport's northern boundary along the coast. Agricultural lands are found at the eastern and southern limits of the Airport.

^c This section incorporates information received from the State Department of Transportation, Airports Division to the Office of State Planning dated November 25, 1991.

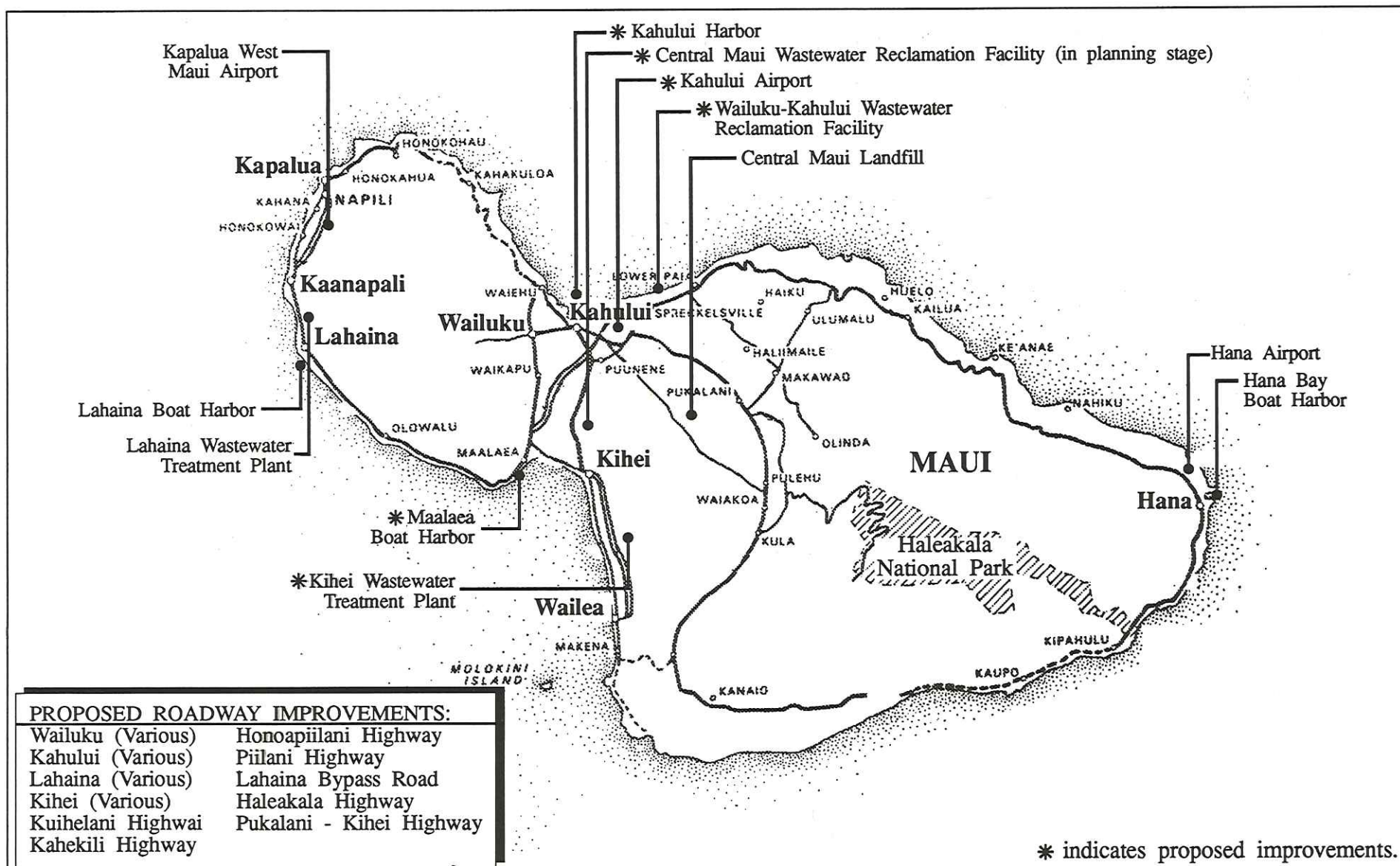


Figure 7

Maui - Existing Facilities and Proposed Improvements

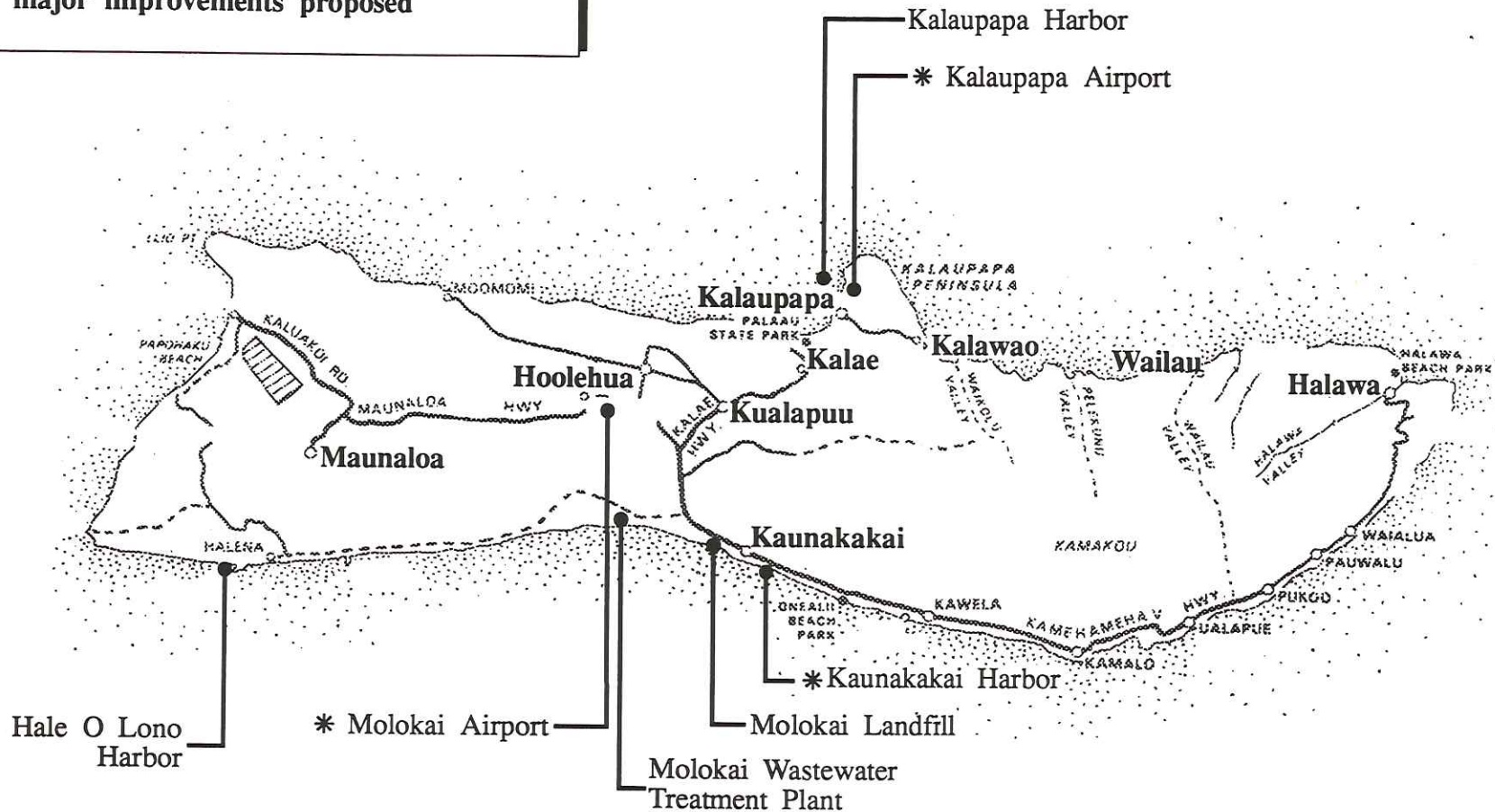


NOT TO SCALE



Michael T. Munekiyo Consulting, Inc.
Prepared for: State of Hawaii, Office of State Planning

PROPOSED ROADWAY IMPROVEMENTS:
No major improvements proposed



* indicates proposed improvements.

Figure 8

**Molokai - Existing Facilities and
Proposed Improvements**



NOT TO SCALE



Michael T. Munekiyo Consulting, Inc.

Prepared for: State of Hawaii, Office of State Planning

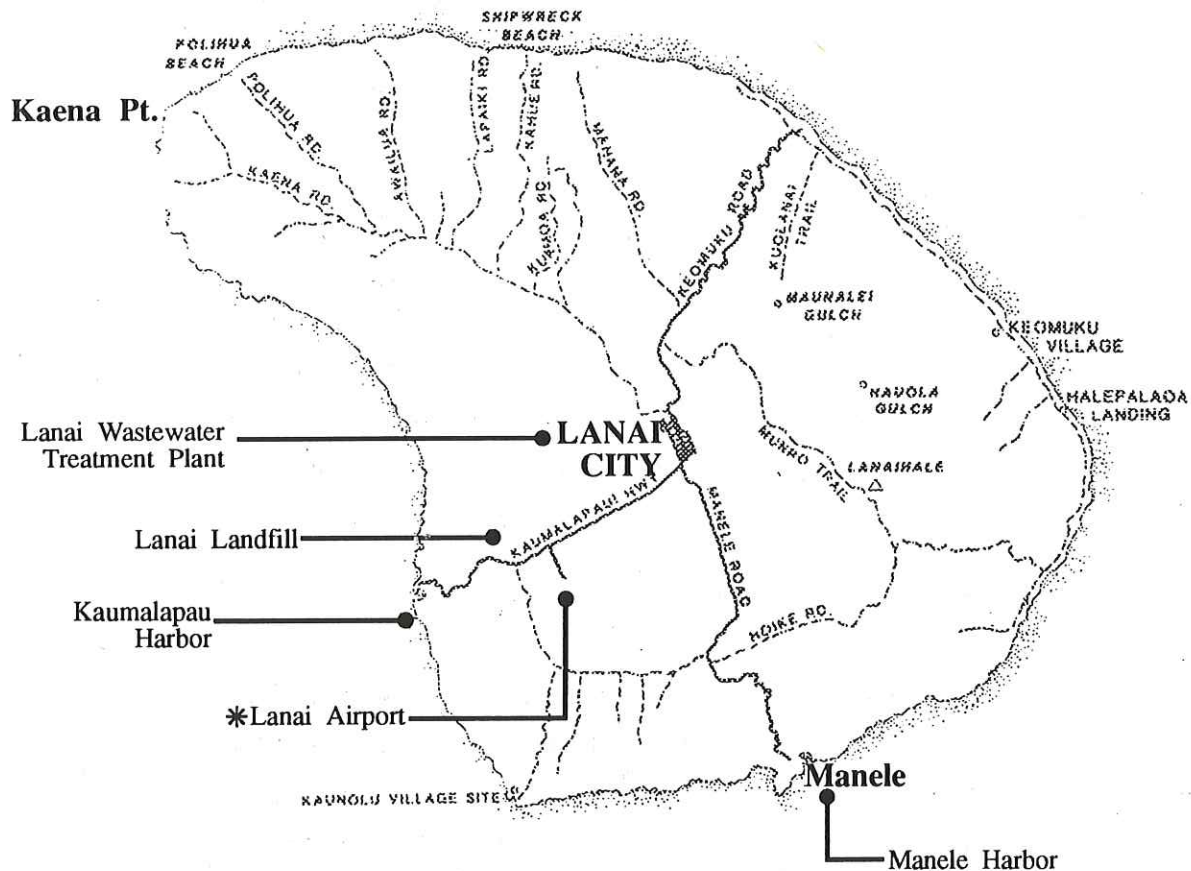


Figure 9 Lanai - Existing Facilities and Proposed Improvements



NOT TO SCALE



Michael T. Munekiyo Consulting, Inc.

Prepared for: State of Hawaii, Office of State Planning

The western boundary is adjacent to the Kanaha Pond Wildlife Refuge and Kanaha Beach Park. These two areas are within the Conservation District. Any improvements or extensions beyond the existing limits of Kahului Airport would require reclassification of the surrounding land with the exception of the northeast end. In response to anticipated increases in passenger traffic, extension of the main runway to 9,600 feet and other general aviation improvements are being proposed.

Kapalua West Maui Airport: The Kapalua West Maui Airport is located on Maui's northwest coast between Honokowai and Kahana. This airport is privately owned by Hawaiian Airlines and has a single runway 3000-feet long by 100-feet wide. Aircraft allowed to land here are restricted to non-jet aircraft. Hours of operation are limited to daylight hours only. The airport handles about 1,400 passengers daily on approximately 30 flights.

The airport and its facilities are located on land designated Urban and is surrounded on all sides by Agriculture zoned lands. Current operating agreements and physical constraints restrict further expansion of this airport. The Airport is bounded on either side of its runway by deep gulches.

Hana Airport: Hana Airport is located on Maui's easternmost coast about three miles northwest of Hana Town. The Airport consists of a single runway 3,600-feet long by 100-feet wide.

Hana Airport is located on lands designated as Agriculture and is surrounded by Conservation District

lands on all sides except for its southwest quadrant. No reclassification of lands is proposed.

(2) **Island of Molokai**

Molokai Airport: Molokai Airport is the primary airport serving the Island of Molokai. A small airfield is located at Kalaupapa to serve this isolated peninsula community. Molokai Airport is located in central Molokai, six miles northwest of Kaunakakai. The Airport services interisland flights only.

The runway system consists of two runways and associated taxiways. The main runway is aligned in a northeast-southwest direction and is 4,500 feet long. The smaller runway is 3,100 feet long and aligned in a north-south direction. The passenger terminal occupies 10,868 square feet of floor space. The total number of passengers served by the Airport increased from 155,482 in 1970 to 338,980 in 1989.

The total number of passengers is expected to increase to 570,000 passengers by 2010. Total volume of air cargo and mail is also expected to increase to the year 2010.

The surrounding terrain presents obstacles for future expansion at the Molokai Airport. For this reason, the Department of Transportation is reevaluating a plan to construct a new airport six miles west-northwest of the existing site. Extension of the main runway is desired if the airport is not moved.

The existing Molokai Airport is within the boundaries of the State Agricultural District. Any proposed

expansion of the existing facility would not encroach into any other districts.

Kalaupapa Airport: This airfield, occupying 55 acres, is located two miles north of the Kalaupapa Settlement. Limited runway and navigation aids, aircraft rescue and firefighting, and passenger terminal facilities exist.

The existing 2,760 foot runway, Runway 5-23, is able to handle commuter, general aviation, and cargo flights but with some weight restrictions. The runway has a narrow 50-foot wide surface. An unpaved apron abuts the passenger terminal facility which occupies about 1,000 square feet. Access is via a single lane road and parking is available for 11 cars. Electrical and telephone service is available and sewage disposal is by means of a cesspool. The total number of passengers passing through the Airport has varied over the years: 3,593 in 1970; 10,002 in 1978; 3,481 in 1981; and 15,252 in 1989.

It is expected that on an annual basis passengers to and from Kalaupapa will increase by 195 percent by 2010, reaching a level of 45,000, while still maintaining the present limit on the number of daily visitors to the settlement.

The present runway is considered inadequate for cargo and air ambulance operations and the cross-wind component is high according to FAA regulations. Therefore, the runway is currently being realigned by 5 degrees with a length of 2,700 feet and a width of 75 feet. Taxiway, blast pad, and night lighting improvements are also being implemented. Total

construction costs for these improvements are estimated at \$7.3 million.

The airfield is located on lands designated Conservation. The realignment of its runway would require the use of additional Conservation District lands.

(3) Island of Lanai

Lanai Airport: Lanai Airport is located 3 miles south of Lanai City, which contains 98 percent of the Island's population. Existing facilities include an interisland terminal and cargo area. The 5,000-foot runway is oriented approximately northeast-southwest and supports interisland commercial aircraft. Historical aviation activity for passengers, cargo, and air mail demonstrates increases in passengers, but reductions in cargo and mail. Passengers increased by 2.8 times from 1970 to 1989 to 105,000 passengers. The facility is not designed to adequately accommodate large inter-island jet aircraft without weight restrictions.

It is estimated that resort destination development could result in 250,000 passengers by 2010. This forecast is based on the expected increase in visitors and resident travel to and from Lanai due to the recent openings of the new Koele Lodge and the Manele Bay Hotel. Only a small number of aircraft are expected to be based at Lanai Airport. Cargo and mail tonnages are also projected to increase.

The existing runway will be lengthened up to 7,000 feet and strengthened to accommodate medium sized interisland air carrier aircraft. To allow this future

expansion, additional land would be required. Apron parking for three air carrier aircraft at a time will be provided for, and a new passenger terminal will be built. Public parking and rental car areas will also be increased. Total proposed capital expenditures are \$52.0 million.

The airport is located entirely on lands which were previously designated Agriculture by the State. A petition reclassifying the airport site and the surrounding lands to the Urban District was recently approved by the LUC.

c. Harbors

(1) Island of Maui

Kahului Harbor. Kahului Harbor, Maui's only deep water port (35-foot draft), is the Island's principal port for commerce and transportation. The Harbor includes a 600-foot wide entrance channel; two breakwaters on either sides of the entrance channel, 2,800 and 2,300 feet in length, respectively; and a harbor basin 2,050 feet wide by 2,400 feet long. There are approximately 3,019 lineal feet of pier and 20 acres of shed and open storage areas. In 1987 there was total cargo throughput of 2.0 million tons. Kahului Harbor is the only major harbor for freight and passengers on the Island of Maui. All ocean freight for the Island are handled at the Kahului Harbor.

Major landside activities surrounding the Harbor include heavy industrial uses, such as the Maui Electric Company's Kahului Power Plant, Kahului Trucking and Storage Company's repair shop and warehouse, PRI's jet fuel facility, and Chevron USA,

Inc.'s and Shell Oil Co.'s fuel storage facilities.

Proposed projects for Kahului Harbor include pier improvements and increases in open storage and work areas. The Harbor, its shoreside facilities and the adjacent lands are on Urban lands. The exception is the Harbor's eastern boundary where it borders the Kanaha Pond Wildlife Refuge which is designated Conservation.

No changes in district boundaries are needed to accommodate harbor needs to the year 2000.

Maalaea Boat Harbor: Maalaea Boat Harbor is one of two State small boat harbors located on the Island of Maui. It is located on the southern coast of Maui along the central isthmus. The Harbor is approximately eight feet deep, has 94 permanently assigned stalls, a 20-foot wide launching ramp and a Coast Guard station. The U.S. Army Corps of Engineers is planning to implement significant navigational improvements at this facility.

Lands surrounding the Harbor are designated Urban, with lands beyond to the north and west, included within the Agricultural and Conservation District's respectively.

Lahaina Boat Harbor: The Lahaina Boat Harbor is located on the northwest coast of Maui. It has 93 permanently assigned berths and a channel depth ranging from eight to ten feet. Although the Harbor has a boat ramp, it is closed except for emergencies.

The Lahaina Boat Harbor is located within the Urban

limits of the town of Lahaina.

Hana Bay Boat Harbor: The Hana Bay Boat Harbor is located on Maui's eastern coast with a pier in the southwest quadrant of the bay and a single boat launching ramp. The ramp is still actively used but the pier is considered unsafe and is no longer in operation.

The area immediately surrounding the pier and boat ramp is designated Urban.

(2) **Island of Molokai**

Kaunakakai Harbor: Kaunakakai Harbor, Molokai's only commercial port, is located on the south coast at Kaunakakai. Kaunakakai Harbor is a medium draft harbor with a depth of 23 feet. Due to the Harbor's relatively shallow draft, only barge operations are provided at this facility.

Because of the limited economic activity on the Island, little need for dramatic expansion of the Harbor has been indicated. The Department of Transportation is considering a variety of improvements to meet possible expansion of economic activity. Specific projects being reviewed are related to shoreside and support facilities, including dedicated areas for direct cargo loading and unloading, sheds, areas for passenger ferry and cruise liner shuttles to the harbor, and improvements to meet recreational boating and small commercial vessel needs. The northeast side of the Harbor is protected by a breakwater which hosts small boat mooring facilities.

The Harbor's shoreside facilities are located in the Urban District encompassing the town of Kaunakakai.

No changes in district boundaries are needed to accommodate harbor needs to the year 2000.

Kalaupapa Harbor: Kalaupapa Harbor is located on the western coast of Kalaupapa Peninsula. The Harbor has a 144-foot long breakwater and a basin 110 feet wide by 305 feet long. The Harbor's draft ranges from eight feet deep to 13 feet at the seaward side.

The Harbor's landside facilities are located on Urban designated lands.

Haleolono Harbor: Haleolono Harbor is located on Molokai's south-west coast approximately 13 miles west of Kaunakakai. A 260-foot wharf is part of the Harbor which is open to public use for small boats.

The Harbor is located within the Conservation District.

(3) **Island of Lanai**

Kaumalapau Harbor: Kaumalapau Harbor is Lanai's only commercial harbor and as such, represents the Island's major commercial link with the rest of the State. The Harbor is located along the southwest coast of the Island and supports the transportation (by barge) of pineapple to Honolulu and commercial supplies from Honolulu. At present, the Harbor has a single access road, a pineapple staging area, a rock wall and small breakwater, and a small boat mooring area. The State of Hawaii is presently negotiating with Castle & Cooke to take over

operations at Kaumalapau Harbor.

The Harbor's present design fails to adequately protect against surging water conditions which on occasion closes the facility. In the interest of safety, the breakwater requires restoration, upgrading and extending to provide the required harbor basin protection.

Shore-side facilities are also recommended for improvement. For example, weather sensitive cargo requires adequate covered areas. A general cargo area near the pier is needed and present activities in this area should be moved elsewhere. Additional improvements would include refrigeration cargo areas, lighting improvements for safety and night operations, and security improvements.

The Harbor is located within a small pocket of Urban land which is bounded on its northern boundary by the Conservation District and along its eastern and southern boundaries by the Rural District. The existing Urban District is sufficient to accommodate harbor needs to the year 2000.

Manele Harbor: Manele Small Boat Harbor is located on Lanai's southern shore and represents the Island's only State recreational boat harbor. The Harbor presently has 24 berths with improvements underway which will provide for additional mooring. The Harbor, which is approximately 6 feet deep, also features a boat launching ramp and a fueling pier.

The Harbor is located in a pocket of Conservation designated lands surrounded by Urban lands.

d. Solid Waste

Solid waste quantities for the County are predicted to follow the Island's pattern of population growth, increasing over the next 20 years. The 1988 volume of 716 tons per day (TPD) is expected to increase to 1,056 TPD over this period (County of Maui).

Because collection is not mandatory, only 13,000 single family homes out of approximately 28,000 elect to pay the monthly fee of three dollars for weekly curbside pickup. The remaining residences haul their refuse to the nearest solid waste facility.

(1) Island of Maui

On the Island of Maui, the Wailuku-Kahului region is home to the 55-acre Central Maui Landfill, located about four miles southeast of the Kahului Airport. With the imminent closure of the Olowalu (in West Maui) and Makani (in Makawao) Landfills, the Central Maui Landfill will be the only disposal site on Maui outside of Hana. A survey conducted in July, 1988 showed that waste at the Central Maui Landfill was arriving at a rate of 640 TPD. This rate exceeded the County's estimate of 252 TPD in 1987 and only 360 TPD in 1995.

With the exception of the Hana planning region, all of Maui sends their solid wastes to the Central Maui Landfill. Wailuku-Kahului accounts for about 54 percent of the total daily average. The Lahaina region accounts for approximately 20 percent which is primarily commercial or County refuse. Olowalu Landfill, located four miles southeast of Lahaina is scheduled for closure in 1991 and no longer accepts commercial refuse. The Kihei-Makena region

accounts for 16 percent of the Island's total refuse, with the remaining six percent generated by the Makawao-Pukalani-Kula and Paia-Haiku regions.

Composting and burning are not utilized as disposal methods at this time. Special types of wastes such as contaminants and medical waste are a disposal problem and enforcement of random dumping and burning of wastes has not been very effective.

To address landfill capacity constraints, the County proposes to divert a maximum amount of wastes away from the landfill. The initial step of this solid waste management program would be to recover materials that can be recycled. To accomplish this, a public education campaign would be carried out and drop boxes provided. Following this step, compostable material would be mixed with sewage sludge, and concrete and rock would be diverted to a crusher for recycling. All wastes that remain would be processed into refuse derived fuel and either sold to industry or burned in new boilers for electricity generation. This program will reduce flow into the landfill and extend the site's useful life.

(2) Island of Molokai

An estimated 22 TPD of solid wastes are generated on Molokai. The present landfill consists of 6.9 acres and will be closed for operations sometime during 1991.

Based on projected population increases only small annual increases in the production of solid wastes will be experienced.

To accommodate solid wastes after the closure of the existing landfill, the County will develop a new solid waste site with a 20-year life span.

(3) Island of Lanai

Approximately 22 TPD of solid waste is generated on Lanai and is presently disposed of in an 8.7 acre site. As this site will close during 1991, the County will develop an alternative site to serve Lanai for the next 20 years. This new site will amply handle solid waste increases which is predicted to be nominal from 1990 to 2010.

e. Roads

In general, the existing traffic operating levels of service (LOS) for the Island of Maui are high to medium during peak hours. This however, does not include the major urban areas such as Wailuku-Kahului, Lahaina and Kihei-Makena which presently experience traffic congestion during peak hours. Other off-peak hour problems are related to road capacity and standards. Proposed improvements projected to the year 2010 are anticipated to meet the projected demand pending availability of sufficient funds.

The roadway system for the Islands of Molokai and Lanai are considered adequate and proposed improvements would permit them to meet projected demands to the year 2010 pending availability of funds.

(1) Island of Maui

Wailuku-Kahului Region: While the Wailuku-Kahului urbanized areas are the population centers of Maui County (combined population 33,148 in 1990), only two major roads link these two communities. This fact typifies the state of the roadway system in

the Wailuku-Kahului region and on Maui as a whole. Roadway capacity improvements have been unable to keep up with new traffic demands generated by residential and visitor growth.

Kaahumanu Avenue is the main arterial connecting Kahului and Wailuku. Kaahumanu Avenue, a continuation of the Hana Highway as it enters the commercial area of Kahului, is a six lane facility between Wharf Street and Kahului Beach Road. It continues west as a four-lane facility, merging with Main Street in downtown Wailuku. Once in Wailuku Town, this same arterial becomes Main Street.

The second link between Kahului and Wailuku is Kahului Beach Road/Lower Main Street. This two lane roadway is often congested, especially between Waiehu Beach Road and Mill Street.

Other arterial components in Kahului include: Puunene Avenue, a two to four lane facility connecting Kaahumanu Avenue and Kuihelani Highway; East Kamehameha Avenue, running adjacent to the Kahului industrial area between Hana Highway and Puunene Avenue; and Kanaloa Avenue, the main access to the War Memorial Stadium and athletic complex.

Kahului also has a number of heavily travelled collector streets, including Papa and Wakea Avenues which traverse the heart of the Kahului residential area.

Major roads in Wailuku include Wells Street and High Street, which form one of the principal cross-town

links between Honoapiilani Highway and Kaahumanu Avenue. The Kahekili Highway connects Wailuku Town to the growing Waiehu area.

The region as a whole is experiencing longer commute times and several key problem areas have been recognized as deserving special attention:

- Kaahumanu Avenue and Kahului Beach Road
- Kahului Beach Road and Kanaloa Avenue
- Main Street and Central Avenue
- Main Street and Kinipopo Street

The foregoing intersections characteristically experience long back-ups due to heavy traffic loads.

Other Wailuku intersections operating at capacity are High Street and Wells Street (AM and PM peaks), High Street and Kaohu Street (AM and PM peaks), and Lower Main Street and Mill Street (PM only).

Recognizing these deficiencies, State and County agencies have identified priority transportation improvement projects for the Island of Maui. Listed below are the priority projects in the Wailuku-Kahului region:

- Kahului Beach Road widening from two lanes to four lanes and Kaahumanu Avenue/Kahului Beach Road intersection upgrade.
- Lower Main Street widening from two lanes to four lanes.
- Kuihelani Highway Extension to Kahului Airport.
- Waiale Road widening from two lanes to four

lanes between Lower Main Street and Mahalani Street Extension.

- Lono Avenue Extension to Kuihelani Highway.
- Mahalani Street Extension to Waiale Road.
- Waiale Road Extension to Honoapiilani Highway.
- Puunene Bypass/Mokulele Highway widening from two lanes to four lanes.
- Kuihelani Highway widening from two lanes to four lanes between Puunene Avenue and Maui Lani Parkway.
- Kanaloa Avenue widening from two lanes to four lanes between Lihi Street and Kahului Beach Road.
- Kahekili Highway Extension to Waiale Road.
- Kahekili Highway (North Shore Belt Highway) upgrade from Waiehu to Honokohau.

Improvements associated with the Maui Lani project and the Wailuku and Piihana Project Districts will provide alternatives to existing corridors.

Kihei-Makena Region: The Kihei-Makena planning region is served by two major roadways running parallel to each other in a north-south direction. The State of Hawaii's Piilani Highway serves as the primary arterial roadway, while South Kihei Road is considered the secondary, though more scenic roadway following the shoreline. Several mauka-makai roads connect Piilani Highway and South Kihei Road, including Lipoa Street, Ohukai Street, Keonekai Street, and Welakahao Road.

Honoapiilani Highway runs through the northern section of the region near Maalaea and is linked to the urban areas of Kihei-Makena via North Kihei Road. Mokulele Highway is a heavily travelled roadway connecting Kihei to Puunene and Kahului.

Given the region's growth as employment and residential centers, traffic congestion has become a significant regional issue. The transportation problem in the region, in part can be linked to the under-utilization of Piilani Highway and over-utilization of South Kihei Road. This phenomenon arises because the development areas between the east-west connector roads access onto South Kihei Road as a direct result of their construction prior to the completion of Piilani Highway.

In addition, there are too few of these connector streets to distribute traffic on and off Piilani Highway. For example, Lipoa Street near the commercial establishments of South Kihei Road is heavily travelled because no other links to Piilani Highway exist in the area.

Access to and from Kahului via Mokulele Highway is another transportation deficiency affecting Kihei-Makena. The two-lane Mokulele Highway no longer is sufficient to accommodate flows between these two rapidly growing regions.

To address these deficiencies, State and County agencies have identified several long-term projects in the Kihei-Makena region. These projects include the following:

- Kihei North-South Collector Road from

Mokulele Highway/Piilani Highway to Kilohana Drive.

- Kihei Mauka Makai Road System.
- South Kihei Road widening from two lanes to four lanes between Mokulele Highway and Auhana Road.
- Honoapiilani Highway widening from two lanes to four lanes between Kuihelani Highway and Maalaea Harbor Entrance.
- Piilani Highway widening from two lanes to four lanes between North Kihei Road and Kilohana Drive.
- North Kihei Road Widening from two lanes to four lanes.

Lahaina Region: Honoapiilani Highway is the main roadway serving the West Maui region. This highway provides the only link between West Maui and the rest of the Island (although unimproved sections of highway around the north coast of the Island to Waihee provides limited access).

At a regional scale, Honoapiilani Highway is the main arterial connecting Lahaina, Kaanapali and Kapalua. Lahainaluna Road is one of several roads serving the residences located mauka of Honoapiilani Highway.

In both Lahaina Town and in the area north of Kaanapali, an older road running along the shoreline lies parallel to the newer bypass highway (Honoapiilani Highway). In Lahaina Town, this older road is Front Street. Given the Town's character as a strong visitor center, this two-lane road is frequently congested with vehicles and pedestrians. In the north

Kaanapali area, the newer Honoapiilani Highway bypasses Lower Honoapiilani Road, which handles traffic from the resort and condominium establishments between Kaanapali and Kapalua.

All of the major traffic problems affecting the West Maui region are concentrated in the Lahaina-Kaanapali area. Even with the recent widening of Honoapiilani Highway between Lahainaluna Road and Kaanapali Parkway to four lanes, congestion between these two centers remains acute.

It is the intersections along Honoapiilani Highway that dictate traffic flow, and many of these intersections will be beyond capacity in 1991. The Honoapiilani Highway-Kaniau Street intersection for example, had a two-way average daily traffic volume of 35,700 in 1987. By 2007, the volume will more than double to 72,000.

This volume increase will strain the collector streets linking Honoapiilani Highway and Front Street even more. Shaw Street, Prison Street, Dickenson Street, and Lahainaluna Road are already overburdened, and widening these narrow collectors would be difficult because of negative environmental and economic effects.

To address these deficiencies, State and County agencies have identified several long term projects in the Lahaina region. These projects include the following:

- Lahaina Bypass from Puamana to Honokowai.
- Connector Road System between the Lahaina

Bypass and Honoapiilani Highway.

- Lower Honoapiilani Highway upgrade from Honokowai to Napili.
- Honoapiilani Highway widening from two lanes to four lanes between Lahaina and Maalaea.
- Lahaina Bypass widening from two lanes to four lanes between the North Junction and Dickenson Street Extension.

In addition, a new circulation pattern for Lahaina Town is recommended as various intersection and road upgrades in the area.

Makawao-Pukalani-Kula Region: The primary thoroughfares connecting the Makawao-Pukalani-Kula planning region with the commercial and governmental heart of Maui are the Haleakala and Kula Highways. Haleakala Highway intersects with Hana Highway near the Kahului Airport and continues east and south through Pukalani, Kula, Keokea and Ulupalakua.

Secondary roads serving the region include Haleakala Highway north of its intersection with Kula Highway, Haleakala Crater Road, the Makawao-Kaupakalua Road, Olinda Road and Baldwin Avenue. The mauka section of Haleakala Highway becomes Kekaulike Road after the Highway intersects with Haleakala Crater Road. Several mauka-makai roads connect this road with Kula Highway below, including Kimo Drive, Pulehuiki Road, Kamehameiki Road and Copp Road.

Since Haleakala Highway is the region's primary thoroughfare connecting it to the commercial centers

of Wailuku-Kahului, Kihei-Makena and Lahaina, traffic congestion along this route is of primary concern. The 1987 level of service (LOS) identified for Haleakala Highway with its intersection at Hana Highway ranges from D on Hana Highway's north and south legs to E on its east leg.

Proposed projects to alleviate the existing traffic congestion include the following projects:

- Pukalani Bypass from Kula Junction and Haleakala Widening from two lanes to three lanes between Hana Highway and Pukalani Bypass junction.
- Haleakala widening from three lanes to four lanes between Haliimaile Road and Hana Highway.
- Pukalani-Kihei Highway.

The bypass project is intended to divert the Makawao and Kula traffic around Pukalani and is considered to be one of the top priority items on the project priority listing. A project recently completed is the Haleakala widening between Hana Highway and Haliimaile Road. This project widens the existing 2 lane highway to 3 lanes to provide a truck-climbing lane in the mauka direction. It also improves the operation of the highway and provides the opportunity for implementing an interim contra-flow lane, makai-bound, during the morning peak hours. The construction of a Kihei-Pukalani Highway beginning at the Pukalani Bypass/Haleakala Highway Junction, makai of the Pukalani community and ending at the Kaonoulu Street Extension in Kihei is low on the project priority listing.

Paia-Haiku Region: The Paia-Haiku region is primarily served by Hana Highway which meanders along the region's coastline from Spreckelsville northeast of Kahului Airport to Pauwela before it turns inland. Hana Highway is the primary connector between Hana at the Island's eastern end and Kahului at the central isthmus. Following the Island's entire northeast coast, it is the primary connector for the Hana and Paia-Haiku regions. Secondary roads serving the Paia-Haiku region is Baldwin Avenue and Kaupakalua Road. These two roads connect the coastal areas of the region with the upper elevations near Makawao. Other smaller roadways provide the same makai-mauka connection between Hana Highway and Kaupakalua Road.

Although several recommendations to improve traffic flow in this region have been listed in the region's Community Plan, there are currently no proposed projects identified by the State.

Hana Region: The Hana region's primary connector is the Hana Highway which begins in Kahului and winds its way along the northeast coast of Maui ending just above Kakio in Hana. An alternative route to Hana is provided by the existing Piilani Highway (beyond Ulupalakua). However this road is a combination of A.C. pavement, gravel and unpaved sections and narrows to a single lane in various places and therefore is not considered a viable alternative for commuter traffic.

A project to extend the existing Piilani Highway from Wailea to Hana has been proposed. Project improvements include upgrading the existing unpaved

roadway, constructing drainage facilities and replacing structurally deficient bridges. This would provide an alternative route to Kaupo, Kipahulu and ultimately Hana. At present this project is of low priority.

(2) Island of Molokai

The Island of Molokai has a relatively extensive road network. Major roadways include Mauna Loa Highway, Kalae Highway, Farrington Road and Kamehameha V Highway. The Kalaupapa Peninsula is isolated from this roadway system and has its own interior system centered in the Kalaupapa community.

Population projections for the Island predict an increase of only 3,000 persons by the year 2010. For this reason, no large increases in the existing traffic pattern is expected. Proposed projects to the road system include improvements and widening along the southern and eastern portion of the Island, but are considered as relatively minor projects. There are no large scale projects proposed for the Island.

(3) Island of Lanai

The Island of Lanai has a fairly centralized road network which primarily services Lanai City near the Island's heart. From this central point, several roads extend out toward the coastline of the Island providing access to these otherwise remote areas. Kaunalapau Highway connects Lanai City with Kaunalapau Harbor, the Island's only commercial port. Manele Road provides access to Manele Harbor which is the Island's newest resort area. Keomuku Road stretches from Lanai City to the Island's northeast coast and services the coastline

from Kaiolohia Bay to Keomuku. Awalua Highway extends partway toward the northwest point of the Island. These facilities are composed of two lane asphalt surfaced roads which provide adequate capacity.

Traffic volumes between the years 1990 and 2010 are expected to increase slightly and as such the existing network is expected to accommodate the expected demand. There are no new projects proposed for the Island.

f. Water

(1) Island of Maui

There are five municipal water systems operated by the County for the Island of Maui and two private systems located in Kaanapali and Kapalua. See Figure 10. Municipal systems are found in Lahaina, Hana, Kula, Makawao and Central Maui. There is some overlapping of water service areas and Community Plan regions especially in the Central Maui service area. Potable water is extracted from both ground and surface sources. Table 12 summarizes the existing and projected demands and available and projected capacities by service areas.

**STATE LAND USE DISTRICT
BOUNDARY REVIEW**

MAUI

KAHOOLAWE



MUNICIPAL WATER SERVICE AREA

**Figure 10
MUNICIPAL WATER SERVICE AREA
Island of Maui**

Prepared by State of Hawaii, Office of State Planning

Table 12

POTABLE WATER SUMMARY FOR MAUI WATER SERVICE AREAS				
Volume in MGD (Million Gal/Day) by Water Service Area^a	Existing Average Use (1987)	Existing Capacity (1990)	Demand in 2010	Capacity in 2010
Municipal Systems				
Central Maui	15.1	22.0	30.5	32.0
Lahaina	5.7	6.2	10.8	10.20
Hana	0.3	0.7	0.4	0.8
Kula	3.0	3.0	6.0	8.0
Makawao	2.0	2.0	6.0	8.0
Private Systems				
Kaanapali	2.5	5.8	6.7	10.7
Kapalua	0.6	0.6	2.2	3.0
^a There are some differences between the planning areas and the water service areas.				

Central Maui: The Central Maui Service area includes the Wailuku-Kahului, Kihei-Makena and a portion of the Paia-Haiku planning regions. The system consists of a series of source wells and a delivery system of transmission and distribution lines.

A portion of the Central Maui System was developed by the Central Maui Water Transmission and Source Development Joint Venture (CMWTSDJV), a cooperative funding program between the County and major landowners in the Wailuku-Kahului and Kihei-Makena regions.

The CMWTSDJV's system includes the Waihee Wells and transmission system stretching from Waihee to Makena. In serving both the Wailuku-Kahului region and the Kihei-Makena region, this system is considered one of the County's key infrastructure components.

There are five sources of water in the Central Maui System, as summarized in Table 13.

Department of Water Supply statistics show that in fiscal year 1987, an average of 7.66 MGD was withdrawn from water sources in the Wailuku-Kahului region. It is estimated that in the current year 7.8 MGD will be withdrawn, and by the year 2000 the figure will reach 10.2 MGD. The DWS has identified additional sources to meet the growing demands of the Wailuku-Kahului and Kihei-Makena regions. These potential sources include the Waihee, Kahakuloa, and Haiku Aquifer Systems.

In 1987, demand in the Kihei-Makena region totalled

Table 13

CENTRAL MAUI WATER SOURCES	
SOURCE	AMOUNT WITHDRAWN IN 1987 (mg)
Iao Tunnel	487.37
Kepaniwai Well	2.32
Mokuhau Wells	2,116.94
Waiehu Wells	116.59
Waihee Wells (CMWTSDJV)	2,791.8
Source: County of Maui, Departments of Planning and Water Supply, 1990.	

7.1 MGD. It is estimated that demand is currently 8.6 MGD, and that by the year 2000 14.4 MGD will be needed (County of Maui, 1990). Moreover, projected water demand for the year 2010 for the Central Maui Water System, combining both the Wailuku-Kahului and Kihei-Makena regions, is 30 MGD.

The unit consumption rate for single family homes in the Kihei District is substantially higher than typical at 841 gpd/unit. Rates within the district reach even higher levels. The Wailea and Maui Meadows developments, for example, have rates of 1,455 gpd/unit and 1,229 gpd/unit, respectively. This compares to 407 gpd/unit in Wailuku and 519 gpd/unit in Kahului. The higher consumption rates in the Kihei District for single family residences likely result from landscape irrigation and larger lot sizes (M&E Pacific, Inc., 1992). These figures suggest that water conservation measures can be especially effective in the Kihei area.

Lahaina: The West Maui region is served by a County water system and the private Kaanapali and Kapalua water systems.

Three surface water systems and eight wells service the municipal system. System consumption in 1987 was 5.7 million gallons per day and is expected to increase to 10.8 MGD by 2010.

To meet this increased demand, the Department of Water Supply proposes to develop 4 MGD of additional capacity to the year 2007. Five new wells will be developed to meet this demand. In addition, the possibility of acquiring 1.0 MGD from Maui Pineapple Company's Honokohau Ditch is being explored. In the longer range, wells between the Honolua and Honokohau Streams may provide as much as 5 MGD. And, if water quality and transmission line standards are met, the Pioneer Mill Company's system may be incorporated into the municipal system, adding 0.2 MGD capacity.

The Kaanapali Water System, operated by the Kaanapali Water Corp. (KWC), serves the Kaanapali Resort. This system reported average domestic water usage at 2.52 MGD in 1987. The estimated usage is projected at 2.8 MGD and 6.74 MGD for the period 2000 through 2010.

Like other water systems facing increased demand, KWC has identified alternatives to meet its future needs, including additional groundwater developments, desalinization, surface water treatment, development of a high level dike system, or water transport from other aquifers.

The Kapalua Water System is a smaller operation serving the Kapalua Resort. The water in this system is treated after being withdrawn from the Honokohau Ditch System. In 1987, domestic usage was 0.61 MGD, and by 2010, water usage in the Resort is expected to increase to about 2.2 MGD. In order to meet the higher demand, current plans call for the development of one well mauka of the Resort, followed by the subsequent construction of two additional wells. The Resort's two existing golf courses and a future third course will continue to use untreated water from Honokohau Ditch.

Hana: The municipal water system for the Hana service area consists of four small systems. In 1987, the system's capacity was 0.66 MGD compared to the demand for the same year of 0.28 MGD. The potential yield for the Hana service area greatly exceeds the area's present requirements. By the year 2000, the population is expected to increase to 2,300 with an expected rise in demand to 0.43 MGD by the year 2010. Based on this data, a single well capable of producing 0.5 MGD of water would be sufficient to meet the future demands of the Hana Town.

Other wells in the area have a sufficient installed capacity to meet the expected demand. By the year 2010, the estimated capacity of the Hana water system will be 0.8 MGD. Potential yield is estimated to be 16 MGD pending available funding for development.

Kula: The Kula water system is based on two surface collection systems and a treatment plant. An

additional water source during the dry season is water pumped from the Makawao water system. During the fiscal year of 1987, the average daily use was 3 MGD. Of this total, 0.25 MGD was supplemented by the Makawao system during the dry season.

The availability of water in this area is sensitive to drought conditions because of the system's reliance on surface water collection and treatment. Due to this reliance on surface water and the periodic dry periods, the County enacted a rule (1977 Kula Rule) limiting the issuance of water meters.

Projected water demand to the year 2010 is expected to increase to 8.0 MGD with the Kula Rule in place. To meet water needs during drought conditions, planning has been initiated to develop approximately 100 million gallons of storage capacity between 1989 and 2010. This proposed project will include a 100 MG reservoir, treatment plant and a large transmission line. This project, pending availability of funds, will provide sufficient water to meet the estimated 2010 demands.

Makawao: In addition to its own service area, the Makawao Water System also serves portions of the Kula service area. This system depends upon surface water for its water source and during 1987 supplied about 2.0 MGD to the area. The East Maui Irrigation (EMI) ditch, which provides water to this service area, possesses a capacity of up to 16 MGD. Although this system relies on surface water collection, its location in an area of relatively high rainfall makes it less sensitive to drought conditions.

By the year 2010 the demand for water within the Makawao service area is expected to rise to 6.0 MGD. Based on these increases, the existing water system will have to increase its capacity by 4.6 percent per year to meet the expected water demand.

By 2006, the Kamole Treatment Plant will reach its operating capacity of 8.0 MGD. Expansion of the plant to 12.0 MGD may be realized at a later date. To accommodate storage and peak dry period demands, the plant has been oversized by 50 percent. Expansion of the Kamole Plant to 12.0 MGD capacity would provide an adequate supply of water to meet projected demands.

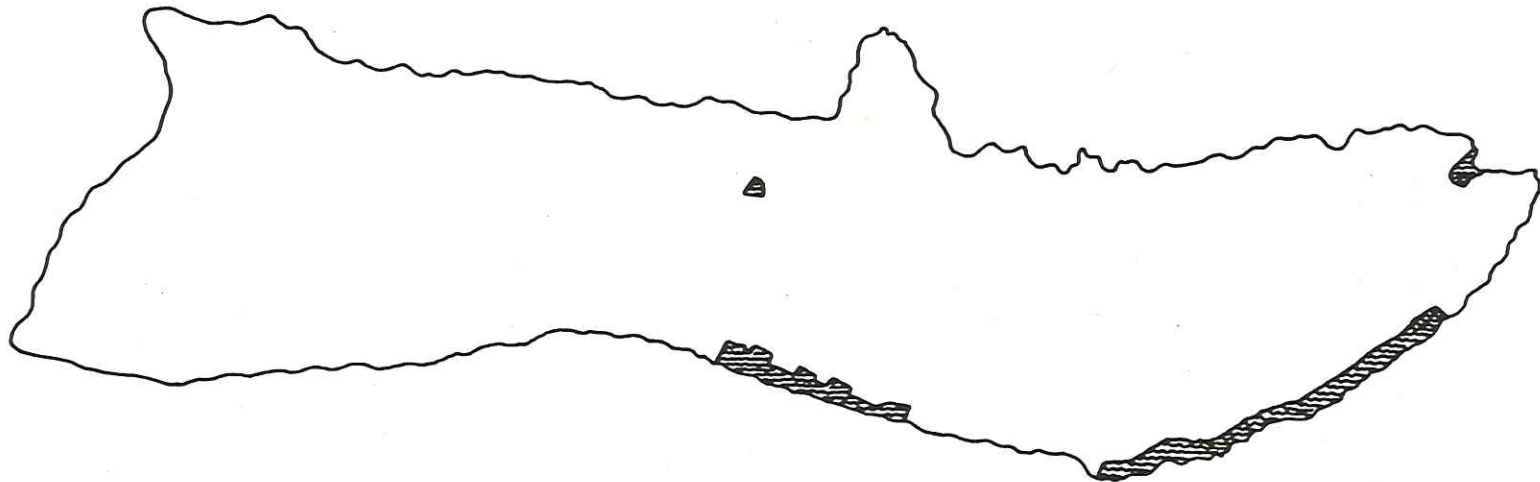
(2) Island of Molokai

Molokai's water system consists of the Kaunakakai Water System, which is the Island's major system, and three additional smaller systems which serve several rural communities. See Figure 11. In 1990, the demand for potable water on the Kaunakakai system was 0.7 MGD. Capacity of the system is scheduled to reach 1.6 MGD by 1991.

Projected demand for the Island is expected to reach 1.84 MGD by the year 2010. Private agricultural water system withdrawals are expected to remain unchanged until 2010.

Present population and water demand indicate only marginal increases which can be met by the existing water systems. However, should major development projects be proposed for the Island, development of new water resources must accompany them.

MOLOKAI



STATE LAND USE DISTRICT BOUNDARY REVIEW

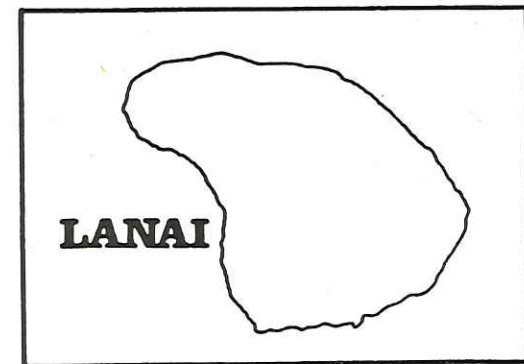


Figure 11
MUNICIPAL WATER SERVICE AREA
Islands of Molokai and Lanai



MUNICIPAL WATER SERVICE AREA

Prepared by State of Hawaii, Office of State Planning

(3) Island of Lanai

Lanai's water source consists of the Maunalei Water System which encompasses a single aquifer. The system is privately owned by Castle and Cooke. See Figure 11. In 1989, the estimated population of the Island was 2,400. Estimated water demand for the year 1990 was 0.39 MGD.

g. Wastewater Facilities

(1) Island of Maui

Wastewater collection, treatment and disposal on Maui is divided into two municipal service areas: Central Maui and Lahaina. Resort areas outside these two areas generally have their own sewage disposal system and in general, injection well technology is utilized. See Figure 7. However, injection wells are prone to clogging and generally have low capacities.

Wailuku-Kahului Region: The Wailuku-Kahului region is served by the County's wastewater collection, transmission, and treatment systems. While most of the urbanized region is served by the County system, a few outlying areas such as Waikapu and Waihee remain beyond the tributary area of the municipal collection system.

Regional wastewater treatment is provided at the Wailuku-Kahului Wastewater Reclamation Facility located in Kahului, east of and adjacent to the Kahului Harbor industrial area. The plant now processes an average flow of 5.3 million gallons per day, with a design capacity of 6.0 MGD. With major new projects proposed for the Wailuku-Kahului region (i.e., Maui

Lani, Wailuku and Piihaha Project Districts, and new light industrial development) capacity at the existing plant will be exceeded within a short time frame. To help address this shortfall, the County is currently upgrading the existing treatment facility to provide an additional 1.9 MGD of capacity. However, since treatment demand generated by projected growth will exceed the additional capacity provided through the upgrade improvements, new wastewater treatment capacity will need to be developed in this region.

As a long-term solution to meeting regional wastewater treatment needs therefore, the County is investigating the feasibility of constructing a new Central Maui Wastewater Reclamation Facility (CMWRF) which would provide sufficient capacity to meet the long-term needs of Wailuku-Kahului and Kihei-Makena. If the CMWRF is determined feasible, new transmission systems from each region will need to be constructed to extend to the new plant site, which would likely be in the Puunene area.

Kihei-Makena Region: Most of the Kihei-Makena region is served by the County's wastewater collection and treatment system. As presently configured, the collection system conveys wastewater flows to South Kihei Road where a system of gravity and force mains are used to transport flows to the Kihei Wastewater Reclamation Facility.

The Kihei Wastewater Reclamation Facility, located mauka of Piilani Highway next to the Silversword Golf Course, has a design capacity of 6.0 MGD. Proposed improvements would increase design capacity to 8.0 MGD by mid-1995.

As discussed in the previous section, the County is studying the feasibility of a new CMWRF. Conceptually, the CMWRF would be designed to meet the long-term wastewater treatment needs of both the Wailuku-Kahului and Kihei-Makena regions.

Lahaina Region: The urbanized areas of Lahaina, stretching from Lahaina Town to Kapalua, is served by the County's wastewater collection and transmission systems and the Lahaina Wastewater Reclamation Facility (LWRF). Located along Honoapiilani Highway, approximately one mile north of the Kaanapali Beach Resort, the LWRF has an existing design capacity of 6.7 MGD. The existing average flow through the plant is approximately 5.2 MGD. With projects such as the Housing Finance and Development Corporation's Lahaina Master Plan project, new demands will be placed upon the facility. With this in mind, the County is proposing the expansion of the LWRF to accommodate flows of up to 9.0 MGD. The proposed expansion is estimated to be completed in October 1994.

Makawao-Pukalani-Kula Region: This primarily residential region has no County wastewater facility and is largely sewered by cesspools. It is estimated that the gross residential wastewater generation of the area will reach 1.8 MGD by 2010. For new development, wastewater disposal would be required to be handled by means other than cesspools in Critical Wastewater Disposal Areas.

A Makawao/Pukalani Facility Plan is proposed for the region and will identify the required capacity for a wastewater treatment plant to service the area.

Paia-Haiku Region: This region is part of the Wailuku-Kahului service area. Currently, only Paia and Kuau are served by the County's wastewater collection and transmission system.

Hana Region: This region consists primarily of single-family residences and has no wastewater treatment plant to handle the area's wastewater. Disposal at the present time is by cesspools. It is estimated that the gross residential wastewater generation for this region would be 0.2 MGD by the year 2010.

There are no proposed projects for the development of a wastewater treatment plant at the present time. However an update of the Hana Wastewater Facilities Plan, which is under consideration, would identify the required capacity of any proposed plant.

(2) Island of Molokai

Molokai is served by a County wastewater collection and transmission system which services the Kaunakakai area. See Figure 8. The existing capacity of the WWTP is 0.30 MGD with the present demand at 0.23 MGD. It is projected that an additional 3,000 persons will be added to the present population between the years 1987 and 2010.

Proposed expenditures for design and construction under the Molokai Sewage Master Plan is estimated to cost \$5.75 million. The extension of the existing collection system to the east end of the Island is estimated at \$4.7 million. Based on these improvements, the proposed system should accommodate the expected increases in sewage

demand and at the same time provide a means of connecting some of the cesspool systems and private systems along the southern coast.

(3) Island of Lanai

Lanai's sewage system has an existing capacity of approximately 0.5 MGD. See Figure 9. Present demand is 0.19 MGD. The new resort at Manele Bay operates its own wastewater system which has a current capacity of 70,000 GPD. Should the need arise, this system is capable of being expanded to handle 140,000 GPD.

Based on projected growth for the Island, the existing system is considered adequate and there are no new wastewater system projects proposed.

h. Parks and Recreation

(1) Island of Maui

Wailuku-Kahului Region: The Wailuku-Kahului region includes numerous recreational opportunities for the region's residents. In addition to swimming-related activities, much of the region's coastal area is used for recreational fishing. There are also numerous inland park facilities which meet neighborhood and community-wide recreational needs. Major facilities include the Kepaniwai Park, Wailuku Community Center, the Kahului Community Center, and the War Memorial Complex which includes a gymnasium, swimming pool, football and baseball stadiums, tennis courts and numerous fields for youth athletic events.

The need to provide additional opportunities for diving, beach picnicking, hunting and walking facilities

has been identified for the region (DLNR, 1985).

Kihei-Makena Region: In addition to its many fine beaches, the Kihei-Makena region is home to such recreational resources as the Kihei Boat Ramp, Maalaea Boat Harbor, Keawakapu Artificial Reef, and Makena State Park. However, projections still indicate a high need for action on diving, surfing, boating, sunbathing, and beach picnicking activities. Further, there are high needs for inland recreation (hiking, hunting, camping, picnicking), swimming pools, and walking areas (DLNR, 1985).

Lahaina Region: The West Maui region is served by several beach parks, neighborhood parks, and regional recreational facilities encompassed within the Lahaina Civic Center complex. Although this region has many beach areas, needs point to more diving and boating opportunities and, to a lesser degree, more action on swimming, sunbathing, surfing, and canoe paddling activities. From a facilities standpoint, more pools and walking areas are needed (DLNR, 1985).

Makawao-Pukalani-Kula Region: This Upcountry region has various inland recreational opportunities including Polipoli Springs State Recreation Area and Haleakala National Park. However, the State Recreation Functional Plan identifies the added need for more recreational facilities which include the further development of Polipoli Springs State Recreation Area.

Paia-Haiku Region: This region has several shoreline recreational facilities including Baldwin

Beach Park, Hookipa Beach Park and Lower Paia Park.

Hana Region: The Hana region has numerous recreational opportunities which include shoreline fishing, boating activities and swimming. Community recreational facilities include the Hana County Park and Hana Beach Park along the shores of Hana Bay. The Waianapanapa State Park, north of Hana Town, offers camping facilities and related recreational opportunities. There are also a number of small beaches scattered along the shoreline.

The State Recreation Functional Plan (1991) recognizes the need for additional shoreline resources and recommends the acquisition of Honomanu Bay as a beach park.

(2) Island of Molokai

Although Molokai has numerous beaches and bays with various recreational opportunities, many of these areas are not readily accessible to the public. Recreational facilities include Kiowea Park, Halawa Beach Park, Murphy Beach Park, Kakahai'a Beach Park, Oneali'i Beach Park, and Palaau State Park. Recognizing the need for further recreational facilities, the State Recreation Functional Plan proposes the inclusion of Honomuni Beach, Halawa Valley, Moanui Bay, Moomomi Sand Dune Area and Maunahui-Makakupaia Trail as recreational facilities.

(3) Island of Lanai

Like Molokai, Lanai's shoreline resources are not always readily accessible. Recreational facilities include Manele Bay with its small boat harbor and

Hulopo'e Beach Park. Inland resources include various hiking trails but these are not part of any recreational facility system. To increase the number of recreational facilities on the Island, the State Recreation Functional Plan proposes the development of Keomuku Hawaiian Trail and Kaiolohia-Kahui Coastal Trail. The Plan also proposes the acquisition of Shipwreck Beach for park purposes.

i. Schools

Student enrollment in the County is projected to have an overall increase from the year 1990 to the year 1996. See Table 14. The Island of Maui is expected to have the greatest overall increase with the projected student enrollment increasing from 16,903 students to 21,020 by the

Table 14

1990-1996 ACTUAL AND PROJECTED ENROLLMENT MAUI DISTRICT							
Island	1990	1991	1992	1993	1994	1995	1996
Maui	16,903	17,869	18,145	18,845	19,586	20,300	21,020
Molokai	1,667	1,722	1,757	1,819	1,840	1,864	1,892
Lanai	501	517	536	554	567	578	593
TOTAL	17,788	18,386	19,048	19,750	20,501	21,222	21,946

year 1996. To help accommodate this growth, a number of new schools are being planned. In the Lahaina District, two new elementary schools are being projected. The Kihei area will require an additional elementary school. The Wailuku-Kahului area is anticipated to have an additional

intermediate school and two new elementary schools. A new high school is being planned in the Makawao-Pukalani-Kula region. See Figure 12.

Molokai shows the only decrease in student enrollment dropping from 384 in 1990 to 333 in 1996. However, a new intermediate school facility is being planned to separate the existing high school and intermediate school population. See Figure 13.

Lanai is expected to see an increase in its student enrollment because of the addition of two major resort facilities on the Island. The 1990 student population of 501 is expected to increase to 593 by the year 1996. However, the existing facility in Lanai City is expected to accommodate the increase. See Figure 14.

The Department of Education is concerned about residential developments which will have a severe enrollment impact on the public schools in their school service boundary areas. Many of the schools on Maui are already operating beyond capacity and cannot accommodate large student enrollment increases without additional facilities. New schools are being projected on Maui to service the growing communities and to prevent overcrowding and unmanageable conditions at some schools.

4. Urban Land Issues

Urban land use issues for the County of Maui include concerns over additional urban growth and the adequacy of infrastructure to service that growth. Related issues include impacts on the quality of life; conflicts between the use of land for agriculture and urban development; the need for affordable housing; the proliferation of proposed golf course developments; and the impacts of proposed developments on scenic, open space and coastal resources.

**LAHAINA COMMUNITY
PLAN REGION**

Kamehameha III School
Lahaina Intermediate School
Lahainaluna High School
Princess Nahienaena
Elementary School
*Two New Lahaina
Elementary Schools

WAILUKU-KAHULUI COMMUNITY PLAN REGION

Baldwin High School
Iao School
Kahului School
Waihee School
Lihikai School
Maui High School
Wailuku Elementary School
Maui Community College
Maui Waena Intermediate School
* New Maui Lani Elementary School
* New Intermediate School
* New Wailuku Elementary School II

**PAIA-HAIKU COMMUNITY
PLAN REGION**

Haiku School
Keanae School
Makawao School
Paia School

**HANA COMMUNITY
PLAN REGION**

Hana High &
Elementary School

**KIHEI-MAKENA
COMMUNITY PLAN REGION**

Kihei School
Lokelani Intermediate School
*New Kihei Elementary School II

**MAKAWAO-PUKALANI-KULA
COMMUNITY PLAN REGION**

Kula Elementary School
Pukalani Elementary School
Haleakala School
Kalama Intermediate School
Makawao School
* New High School

* indicates proposed school.

Figure 12

**Maui - Existing and Proposed
Public School Facilities**



NOT TO SCALE



Michael T. Munekiyo Consulting, Inc.

Prepared for: State of Hawaii, Office of State Planning

Figure 14

Lanai - Existing Public School Facilities



NOT TO SCALE



Michael T. Munekiyo Consulting, Inc.

Prepared for: State of Hawaii, Office of State Planning

Current shortfall in infrastructure capacities have highlighted the need to allow infrastructure components to come to par with existing and projected demands created by the relatively rapid growth experienced by the County. There is widespread recognition that infrastructure capacities should be a primary consideration in land use decision-making. The current inadequacies of various infrastructure elements within the County, therefore, indicate a need to cautiously approach the reclassification of additional Urban lands, despite recommendations set forth in each regional Community Plan.

At the same time, however, there is a need to provide additional Urban areas to help meet market demand for affordable housing. Identification of potential Urban areas for reclassification, therefore, should be at a scale which balances housing needs with infrastructure availability.

With more than 250,000 acres of Agricultural-classified lands, there is also recognition that the character of the Island and its regional communities is strongly influenced by agricultural-related activities. In addition to agriculture's vital role in the local economy, productive agricultural lands establish the Island's unique and valued open space character. Therefore, amendments to State Land Use boundaries must be sensitive to the significant role agricultural lands play in defining Maui's physical and economic attributes.

5. Analysis of Urban Lands

Urban land issues are principally focused in the Community Plan regions of Wailuku-Kahului, Kihei-Makena and Lahaina. Leading issues in these critical growth areas relate to infrastructure capacities and affordable housing availability. The Wailuku-Kahului Community Plan region, for example, is in a "catch-up" mode to bring new sewage treatment capacity on-line to meet new housing

developments proposed at Maui Lani and the Wailuku and Piihaha Project Districts. Similar constraints are found in the water source availability and roadway system capacities. These limitations in infrastructure systems place added pressure on meeting demands for affordable housing in the region. Costs to develop new infrastructure systems must either be absorbed by residential housing developers through direct construction of improvements or via impact fees and assessments.

The current inventory of available developable Urban lands in the Wailuku-Kahului region, however, should promote the development of new housing projects, at least through the year 2000. By the year 2010, a deficit in available developable Urban lands is expected. The manner in which this projected deficit is addressed will, in large part, be dependent upon directions established during the Community Plan update for the region.

The updating of the Community Plans by the County of Maui began in April 1992. The Kihei-Makena, Lahaina, Paia-Haiku and Hana Community Plans are being reviewed in the first phase of review. The second phase of review, anticipated to begin in April 1993, includes the Wailuku-Kahului, Makawao-Pukalani-Kula, Molokai and Lanai Community Plans. All Community Plans must undergo review by Citizen Advisory Committees, Planning Commission and County Council.

Similar conditions prevail in the Kihei-Makena Community Plan region in terms of infrastructure and affordable housing needs. With regard to Urban land availability, an adequate supply of residential lands is projected to the year 2010. However, deficits in commercial and industrial lands are projected as early as 1995. Overall, there is a surplus of developable urban lands in the region.

Infrastructure and affordable housing needs must also be addressed in the Lahaina Community Plan region.

Key considerations which affect recommendations for Urban lands on Maui County include: 1) The need for urban lands to provide for urban growth for the next ten years; 2) The Community Plan update process; and 3) Infrastructure constraints.

First, overall there is only a modest need for additional urban lands on the Island of Maui for the next ten years. Lanai and Molokai have a surplus of urban lands.

Second, the Community Plan update process is currently in progress. Accordingly, it does not appear appropriate to reclassify areas based on the existing Community Plan directions for growth which may change under the upcoming review.

Third, infrastructure is a critical concern on Maui and reclassifications of large acreage to Urban may only exacerbate the problem. Therefore, only modest expansions to the Urban District are proposed. Urban reclassification is being recommended for mill expansion at Paia and Puunene and for proposed residential use adjacent to the Urban District near the Doris Todd Memorial School in Paia. Reclassification of these areas is consistent with the Community Plans for these areas and the type and scale of the proposed uses are not anticipated to adversely impact infrastructure systems or agricultural resources.

Urban reclassification is also being recommended for runway and facilities expansion at Kahului Airport. Ohukai subdivision is an existing residential subdivision in the Agricultural District which is recommended for reclassification to Urban for housekeeping purposes.

In the Kihei-Makena region, an 18.63 acre area at the Wailea Resort is being recommended for urbanization for expansion purposes. The area is designated for urban use in the Kihei-Makena Community Plan and a portion of the site is already in golf

course use.

Urban reclassification of a site for affordable housing at either Wainee or Puukolii is also recommended. The Wainee site is designated on the Lahaina Community Plan but development at that site has been delayed due to flooding and drainage problems. If Wainee cannot be developed in a timely manner, the Puukolii site is recommended as an alternate site.

There are no recommendations for Urban reclassifications for Molokai or Lanai. Portions of Ualapue, a rural community now in the Urban District, are recommended for reclassification to Rural. Reclassification is consistent with the Molokai Community Plan designation.

G. AGRICULTURAL DISTRICT

The following discussion on Maui's agricultural resources summarizes the Agricultural Resources Study by Deloitte and Touche (1991).

1. Existing Land Uses

a. Island of Maui

The major agricultural areas on the Island of Maui are located on the northwest coast, the central isthmus, along the slopes of Haleakala, and along the east and southeast coastlines of the Island.

The two major agricultural crops on the Island of Maui are sugar and pineapple with 42,464 acres in sugar cane and approximately 10,000 acres in pineapple. Other crops on Maui include macadamia nuts, vegetables, fruits (other than pineapples), taro and flower and nursery products. Aquaculture is still a relatively small part of Maui's agricultural profile with only 13 acres for the entire County in production.

The major sugar plantations are Hawaiian Commercial and

Sugar Company (HC&S) and the Pioneer Mill Company. HC&S has 32,502 acres of land under cultivation in the Wailuku-Kahului, Kihei-Makena, Makawao-Pukalani-Kula, Paia-Haiku and Hana districts and is the State's largest sugar plantation. Pioneer Mill is among the State's three smallest plantations and cultivates 6,962 acres of land in the Lahaina district.

Of the approximately 10,000 acres of land under pineapple cultivation, 7,450 cultivated acres belong to Maui Land and Pineapple (MLP). These lands are located in the Lahaina and Paia-Haiku areas. The other major pineapple grower is Wailuku Agribusiness Company which has 2,200 acres under cultivation in the Wailuku-Kahului district.

According to the Department of Agriculture, there are approximately 3,500 acres in diversified agriculture excluding beef and cattle, macadamia nuts and aquaculture. Beef and cattle operations, flowers, macadamia nuts and nursery products are other major agricultural industries on Maui.

Wailuku-Kahului: The major crops for the Wailuku-Kahului region are sugar and pineapple. Macadamia nut cultivation is a recent but important agricultural operation in this region. Other agricultural industries include beef and cattle and nursery products.

Kihei-Makena: The major agricultural industry for the Kihei region is sugar. Other industries found in the region include beef and cattle.

Lahaina: In the Lahaina region, the major crops are sugar and pineapple, under cultivation by Pioneer Mill and MLP, respectively.

Makawao-Pukalani-Kula: The Makawao-Pukalani-Kula region contains a large diversity of agricultural industries. These include beef and cattle, nursery products, orchids and sugar. Pineapple is also cultivated here.

Paia-Haiku: The Paia-Haiku region includes sugar and pineapple as the major crops. Other agricultural industries including beef and cattle, macadamia nuts and nursery products.

Hana: Hana's primary agricultural industry is beef and cattle. At one time, sugar was the dominant crop but is now replaced by cattle operations.

b. Island of Molokai

A large part of the Island of Molokai is under agricultural use except for the east central to north sector of the Island. The pineapple industry was once the primary agricultural resource for the Island of Molokai. However, with the withdrawal of pineapple operations from the Island, emphasis has been placed on developing a solid diversified agricultural base. Corn and wheat, and small truck farming operations are now part of the Island's agricultural profile. Livestock operations include cattle, hogs and pigs.

c. Island of Lanai

On the Island of Lanai, agriculture is concentrated in the central, relatively flat region. Nicknamed the "Pineapple Isle", Lanai's major agricultural industry is pineapple. While recognized as the world's largest single pineapple plantation (operated by the Dole Company), pineapple operations on the Island will ultimately be phased out.

2. Agricultural Land Requirements

a. Island of Maui

Lands rated A and B by the Land Study Bureau are located on Maui's northwest coast along the slopes of the West Maui mountains, along the north central coast around Kahului and Wailuku and stretching across the central isthmus toward Maalaea in the south, and extending from the Kahului-Wailuku area toward Maliko Bay in the northeast. See Figure 15.

However, A and B rated lands represent only a portion of the lands in agricultural use on Maui. There are successful agricultural operations on lands designated C and D by the Land Study Bureau. For example, the lands north of Kahului, east of Maliko Bay and extending inland toward Kula fall in these categories. Lands in Makena which are rated E are used successfully for cattle operations.

The Land Evaluation and Site Assessment Commission (LESAC) developed a separate rating system in 1986 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 agricultural quality of a site or area based upon its non-physical characteristics or attributes.

The LESAC determined agricultural acreage requirements for Maui County based upon commodity production goals. See Table 15. These production goals themselves were based upon current levels of production, projected population growth, and economic feasibility. As shown in the table, the County's acreage requirements are expected to hold steady through 1995.

Figure 15

"A"&"B" AGRICULTURAL LANDS

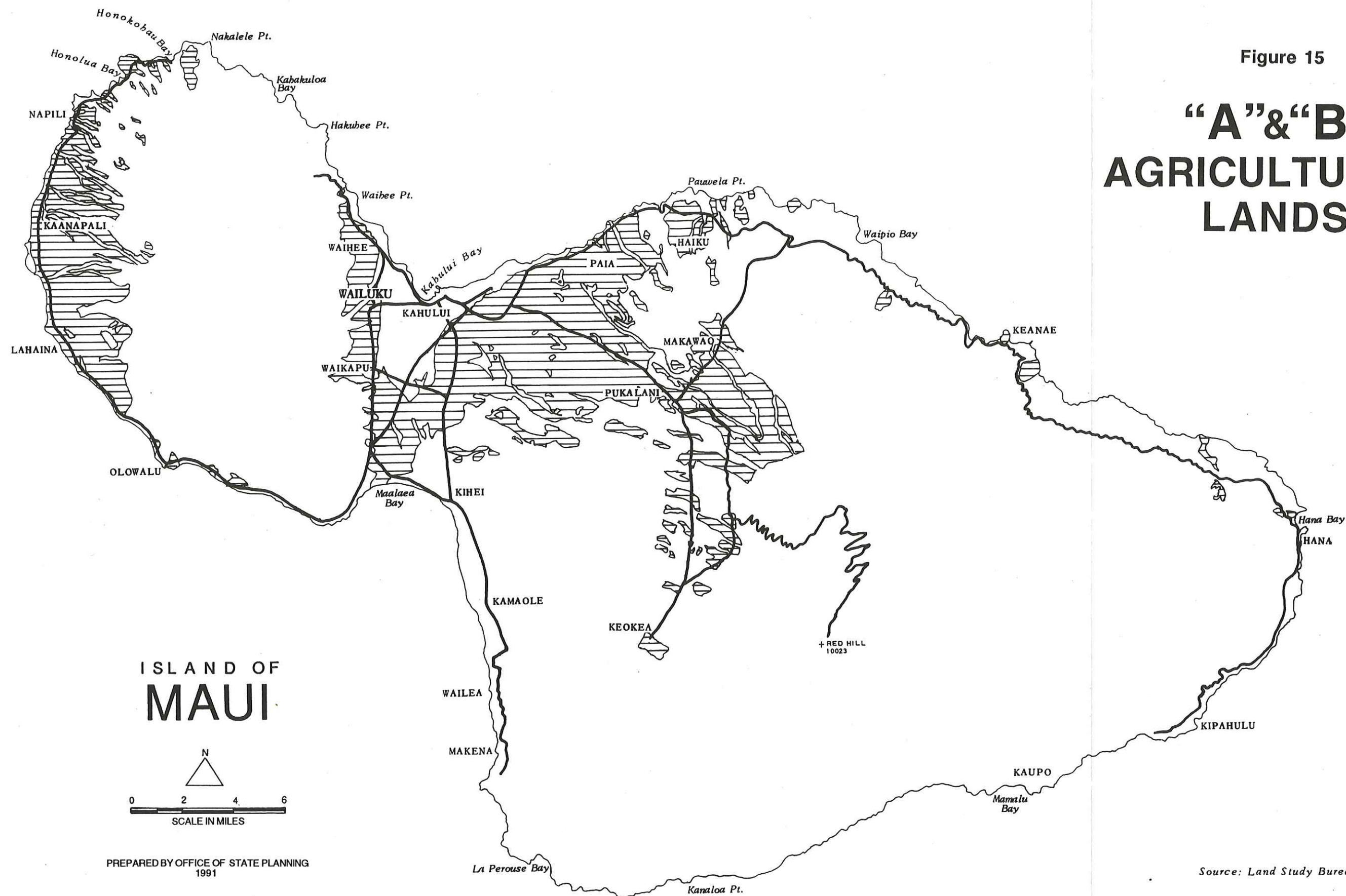


Table 15

AGRICULTURAL PRODUCTION ACREAGE REQUIREMENTS BY ISLAND FOR 1983 (ACTUAL), 1990 AND 1995			
Island	1983	1990	1995
Maui	168,600	132,500	133,000
Molokai	33,000	26,700	27,300
Lanai	13,500	12,700	12,700
TOTAL	212,100	171,900	173,000

b. Island of Molokai

On the Island of Molokai, lands rated A and B by the Land Study Bureau are relatively scarce. See Figure 16. Lands once under pineapple cultivation, are for the most part rated C and D and are found in the central west end to north west coast of the Island.

c. Island of Lanai

The Island of Lanai is similar to Molokai in that there is a scarcity of A rated lands. See Figure 17. Therefore, lands under cultivation are those rated C and D by the Land Study Bureau.

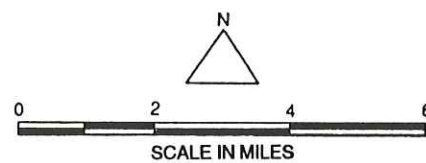
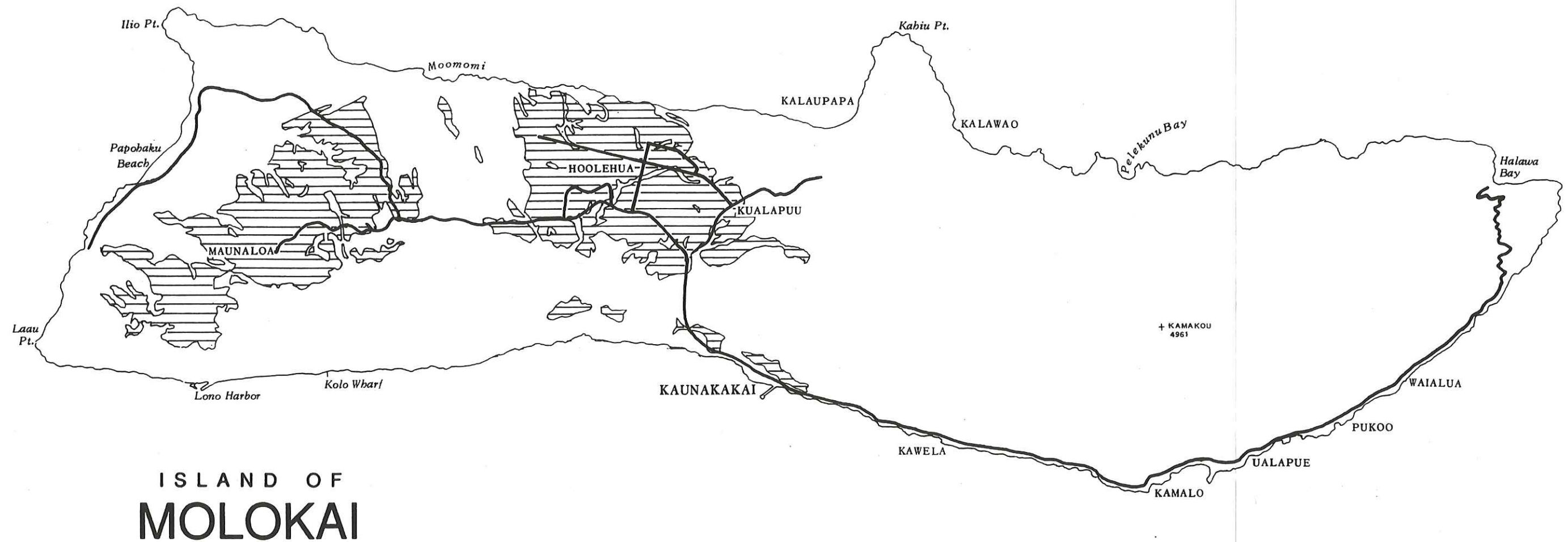
3. Agricultural Land Use Issues

The Agricultural Resources Study prepared by Deloitte and Touche analyzed issues and trends in the State's major agricultural industries. Land availability is the major land issue impacting the future success of Maui's agricultural community. Critical resource issues include the cost and availability of capital, the cost and availability of labor, and the cost of materials, supplies, and insurance. Pest control is also of major concern to local growers.

The extent of labor scarcity on Maui is reflected in MLP's and Wailuku Agribusiness' decision to import laborers from overseas.

Figure 16

“A” & “B” AGRICULTURAL LANDS

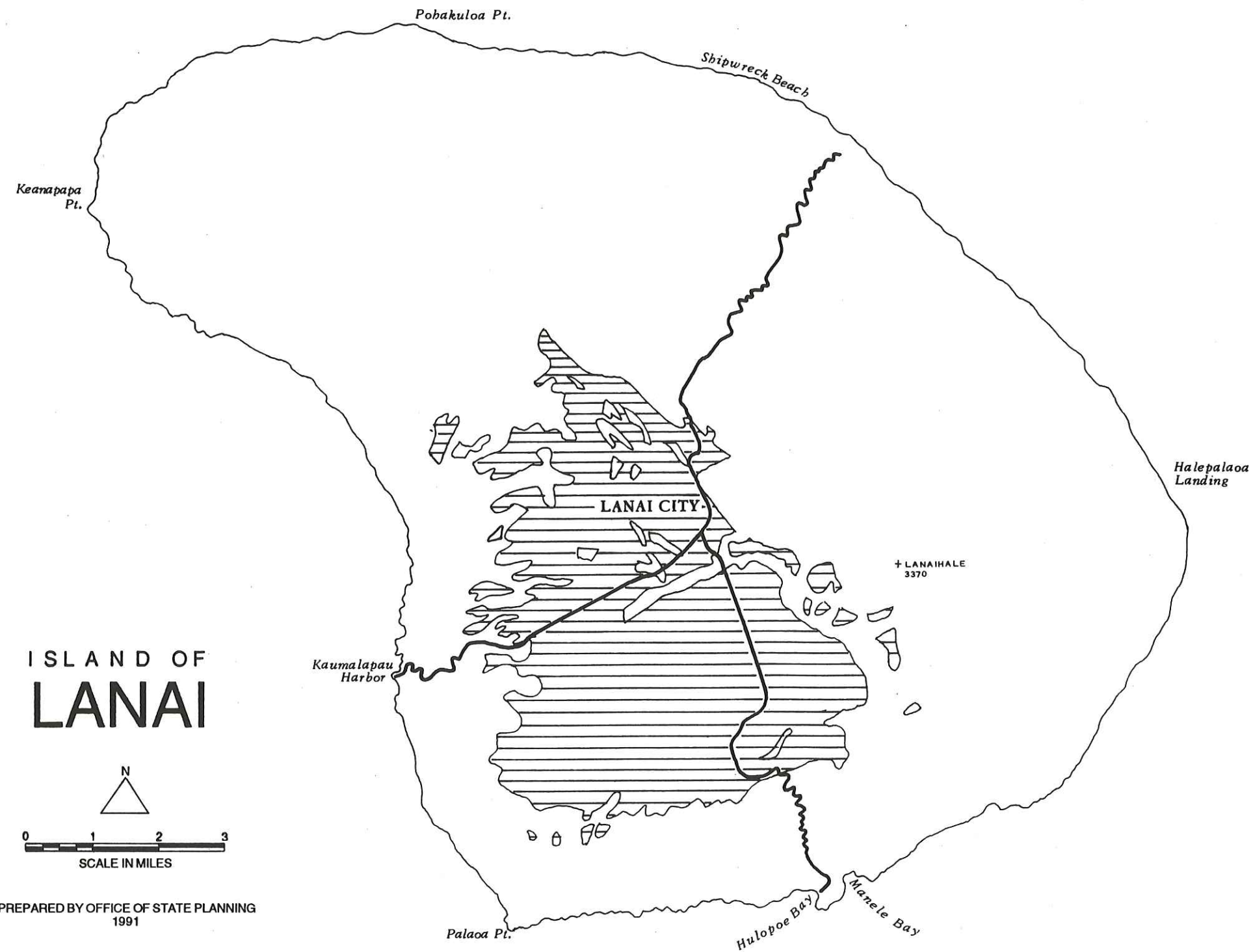


PREPARED BY OFFICE OF STATE PLANNING
1991

Source: Land Study Bureau

Figure 17

“A”&“B” AGRICULTURAL LANDS



Source: Land Study Bureau

MLP has brought in college-student workers during the summer, while Wailuku Agribusiness has employed Hispanics for the full year.

In addition to the foregoing general issues, concerns have also been identified for HC&S, the Island's primary sugar operation. For example, access to water from the East Maui Irrigation system is a major issue for the plantation. A portion of the irrigation water is provided through four State leases, which historically have been for 20 years. All of the long-term leases have expired, and HC&S has been unable to secure new long-term leases from the State. The sugar plantation is also concerned about the implementation of minimum stream flow standards which could result in less water available for irrigation.

Like other sugar operations, HC&S is receiving increasing complaints from residents about smoke from cane burning. HC&S has partially addressed this issue with the installation of automatic weather stations to help determine burning times which will have the least impact on the residents who live downwind of the sugar cane fields.

Although HC&S is the State's most profitable sugar operation, they are continually looking for additional improvements in their operations or other profitable opportunities. HC&S will continue to invest in new equipment as it has over the past 10 years (annual capital expenditures over the last 10 years averaged approximately \$12.0 million). They plan to increase planting and ratoon less, as the first crop generally has higher yields than ratoon crops. This will also help control the cornstalk borer, a moth whose larvae kill young cane shoots. HC&S is also exploring producing pulp from cane trash.

HC&S currently has 34,126 fee acres under cultivation and 25,386 idle acres. An additional 1,376 acres leased from the State of

Hawaii are also under cultivation. The lease will expire in 2003.

Operational and economic factors essential for HC&S to remain an economically viable operation include:

- Assured water supplies
- Reasonable Federal and State environmental requirements
- Port scheduling that allows access to sugar for shipping
- Community and governmental support
- Housing for employees
- Improved cane varieties and continued agricultural research
- Continuing productivity increases
- Availability of capital

While HC&S does not indicate any plans to diversify into different types of agricultural crops, it does intend to retain most of its land for sugar production.

Pioneer Mill, (the Island's other sugar producer) on the other hand has explored the possibility of growing other crops such as macadamia nuts, coffee, and tea. Like other plantations, Pioneer Mill is subject to urbanization pressures. The plantation, which is one of the smallest sugar operations in the State with 6,962 acres, is located in West Maui. Acres cultivated have declined by 13 percent since 1985. It is expected that in the coming decades, Pioneer Mill lands will gradually be developed into residential housing. The State of Hawaii, Housing Finance and Development Agency's housing project, for example, is expected to cut Pioneer Mill's sugar lands to between 5,000 and 6,500 acres within the next few years.

4. Analysis of Agricultural Lands

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

According to constitutional and statutory mandates, the State must seek to preserve important agricultural lands. The sugar, pineapple and diversified agricultural industries provide revenues, jobs, an alternate energy source and valuable open space benefits. In light of increasing urbanization pressures, the continued and future protection of these lands will be especially important. However, the State's concern for the preservation of agricultural lands must be considered in a broader regional context which includes the need to provide for more affordable housing, minimizing governmental cost while providing necessary public services, and preservation of open spaces.

The anticipated reduction of sugar cane lands (to the year 2000) on the Island of Maui is estimated to be 1.4 percent of the total agricultural acreage. From a regional standpoint, Lanai will undergo the greatest change in agricultural land use, with Castle and Cooke's planned phase-out of pineapple cultivation. This would involve about 7,000 acres of land currently under pineapple cultivation. While Castle & Cooke has not made its plans for these lands public, it is known that they are looking into alternative crops, such as vegetables, fruits, forage crops (alfalfa, oats and barley). At this time, none of these crops, or even a combination of these crops, can utilize all the acreage currently in pineapple.

No major additions to the Agricultural District are recommended because of sufficient lands are available to meet agricultural production goals. However, 22 acres at Waihee are recommended for reclassification from the Urban to Agricultural District where Waihee Oceanfront, Inc. originally planned to locate a roadway, clubhouse, fencing and guest cottages. Based on master plan revisions, these facilities have either been relocated or eliminated, thus removing the basis for Urban designation.

The reclassification of lands at Paia, Puunene and in the vicinity of Doris Todd Memorial School from Agricultural to Urban is not

anticipated to adversely impact agricultural resources as small acreages are involved. The urbanization of lands at either Wainee (100 acres) or Puukolii (100 acres) for affordable housing may reduce acreage available to Pioneer Mill. However, the company expects to be able to continue sugar operations even with this reduction in acreage.

The size of the Agricultural District will be reduced by reclassification of lands into the Conservation District. Many of these lands are not currently being used for agricultural purposes and, therefore, there will be no adverse impacts on agricultural resources. In other cases, lands are being used for grazing which can continue as a "grandfathered use."

H. CONSERVATION DISTRICT

1. Watersheds

The Hawaii Water Code and the State Water Resources Protection Plan call for increased protection of watersheds. The State Water Resources Protection Plan finds that "adequate management" and control of watersheds is a prerequisite for two major concerns -- retaining sufficient acreage of watersheds to insure infiltration into groundwater aquifers to meet needs, and to protect the quality of raw water. It is vital that a minimum area of conservation lands be set aside for watersheds for infiltration (Yuen and Associates, 1990).

Three areas on Maui have been identified as watershed areas by the University of Hawaii Water Resources Research Center. These areas are presently in the Agricultural District and are located in East Maui on the northern slopes of Haleakala. The first area has an area of approximately 1,271 acres and is being recommended for reclassification to the Conservation District because of its high average annual rainfall (120 inches). The remaining two areas, however, experience lesser amounts of rainfall. A 2,303-acre zone identified by the UHWRRC, for

example, has an average rainfall total of 75 inches. A third area of approximately 7,900 acres is located to the southeast of Waihou Spring Forest Reserve. Rainfall amounts in this large area vary, diminishing in the southerly direction to 45 inches annually.

Because OSP did not have sufficient time to assess the latter two areas, only the 1,271-acre watershed area is being recommended during this Boundary Review.

On Molokai and Lanai, all watersheds are within the existing Conservation boundaries.

2. Forest Reserves

The Island of Maui has a total of 73,227 acres in the State Forest Reserve System distributed among eight forest reserves. See Figure 18. The largest is the Koolau Forest Reserve which includes 31,387 acres. This is followed by West Maui (14,544 acres), Hana (13,207 acres), Kula (4,965 acres), Kahikinui (4,466 acres), Kipahulu (2,372 acres), Makawao (2,093 acres) and Waihou Spring (190 acres). These forest reserves enhance and protect watersheds, provide habitats for rare and endangered species, protect native forests, increase recreational opportunities, and allow for forestry activities.

The Molokai Forest Reserve is the only reserve on that Island and is 16,030 acres in size. See Figure 19.

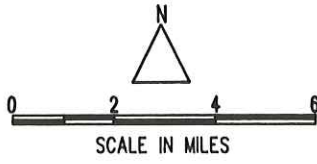
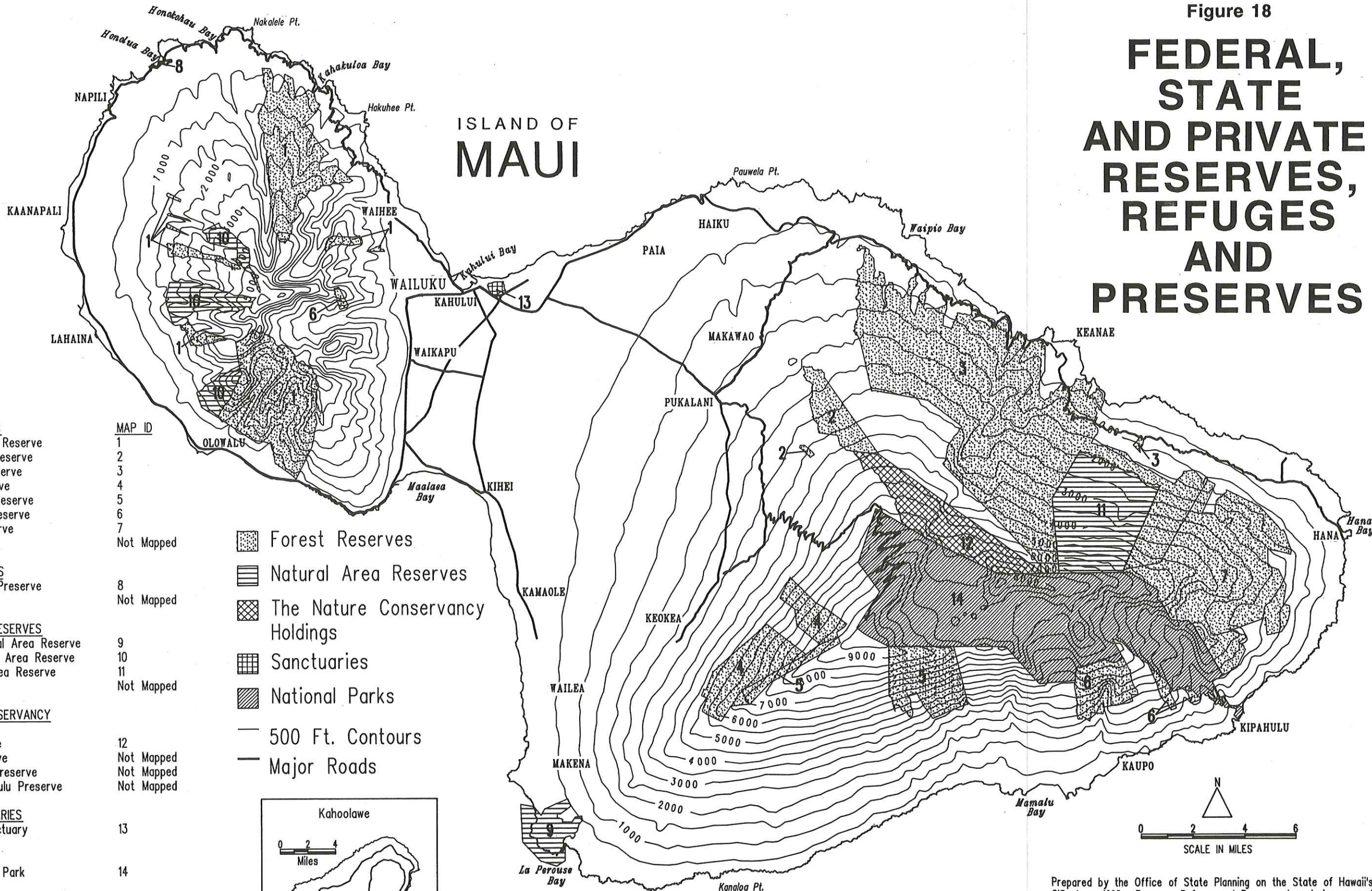
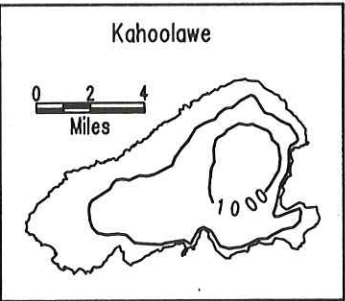
The forest reserves on Maui and Molokai are within the Conservation District and should remain in that district.

Figure 18

FEDERAL, STATE AND PRIVATE RESERVES, REFUGES AND PRESERVES

- | | MAP ID |
|---|------------|
| FOREST RESERVES | |
| West Maui Forest Reserve | 1 |
| Makawao Forest Reserve | 2 |
| Koolau Forest Reserve | 3 |
| Kula Forest Reserve | 4 |
| Kahikinui Forest Reserve | 5 |
| Kipahulu Forest Reserve | 6 |
| Hana Forest Reserve | 7 |
| Waihou Spring | Not Mapped |
| MARINE PRESERVES | |
| Honolua-Mokuleia Preserve | 8 |
| Molokini Shoal | Not Mapped |
| NATURAL AREA RESERVES | |
| Ahihi-Kinohao Natural Area Reserve | 9 |
| West Maui Natural Area Reserve | 10 |
| Hanalei Natural Area Reserve | 11 |
| Kanaloa | Not Mapped |
| THE NATURE CONSERVANCY PRESERVES | |
| Waikamoi Preserve | 12 |
| Kapunakea Preserve | Not Mapped |
| Maui Lava Tube Preserve | Not Mapped |
| Portions of Kipahulu Preserve | Not Mapped |
| WILDLIFE SANCTUARIES | |
| Kanaha Pond Sanctuary | 13 |
| NATIONAL PARKS | |
| Haleakala National Park | 14 |
| OTHER | |
| Maui Land and Pineapple Company's Puu Kukui Watershed Management Area | Not Mapped |

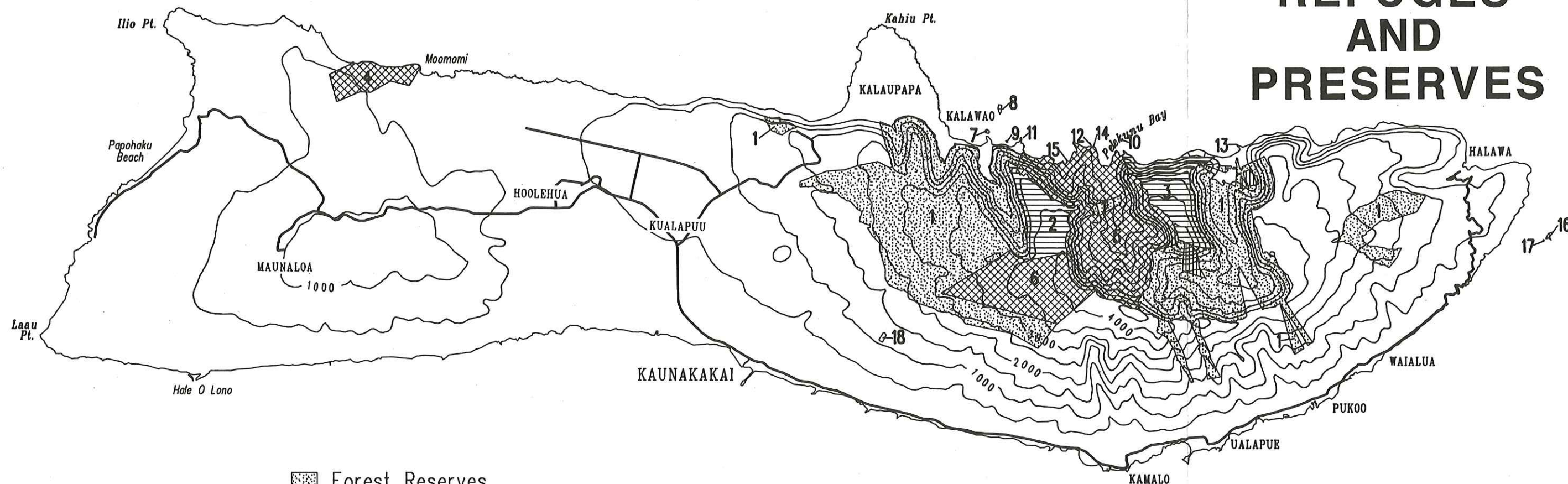
-  Forest Reserves
-  Natural Area Reserves
-  The Nature Conservancy Holdings
-  Sanctuaries
-  National Parks
-  500 Ft. Contours
-  Major Roads



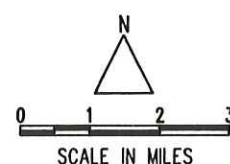
Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Reserve, Refuge, and Preserve boundaries current as of May, 1991. Contours interpolated from 1983 USGS digital point data. Managed area boundaries on this map are a compilation of a variety of primary and secondary data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

Figure 19

FEDERAL, STATE AND PRIVATE RESERVES, REFUGES AND PRESERVES



ISLAND OF MOLOKAI



- Forest Reserves
- Natural Area Reserves
- The Nature Conservancy Holdings
- Sanctuaries
- National Parks
- 500 Ft. Contours
- Major Roads

FOREST RESERVES	
Molokai Foreset Reserve	MAP-ID 1
NATURAL AREA RESERVES	
Puu Alii Natural Area Reserve	2
Olokui Natural Area Reserve	3
THE NATURE CONSERVANCY PRESERVES	
Moomomi Dunes Preserve	4
Pelekunu Preserve	5
Kamakou Preserve	6
NATIONAL PARKS	
Kalaupapa National Historical Park	Not Mapped

WILDLIFE SANCTUARIES	
Okala State Seabird Sanctuary	MAP-ID 7
Mokapu State Seabird Sanctuary	8
Huelo State Seabird Sanctuary	9
Mokohola State Seabird Sanctuary	10
State Seabird Sanctuary	11
Mokumanu State Seabird Sanctuary	12
Kukuipalaoa State Seabird Sanctuary	13
State Seabird Sanctuary	14
Pauonuakea State Seabird Sanctuary	15
Mokuhooniki State Seabird Sanctuary	16
Kanaha Rock State Seabird Sanctuary	17
Kamiloloa Plant Sanctuary	18

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.

3. Public and Private Protected Natural Areas

Many of Hawaii's preeminent 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, Nature Conservancy Preserves, and U.S. Fish and Wildlife Refuges. See Figure 18, Figure 19 and Figure 20.

a. Natural Area Reserves

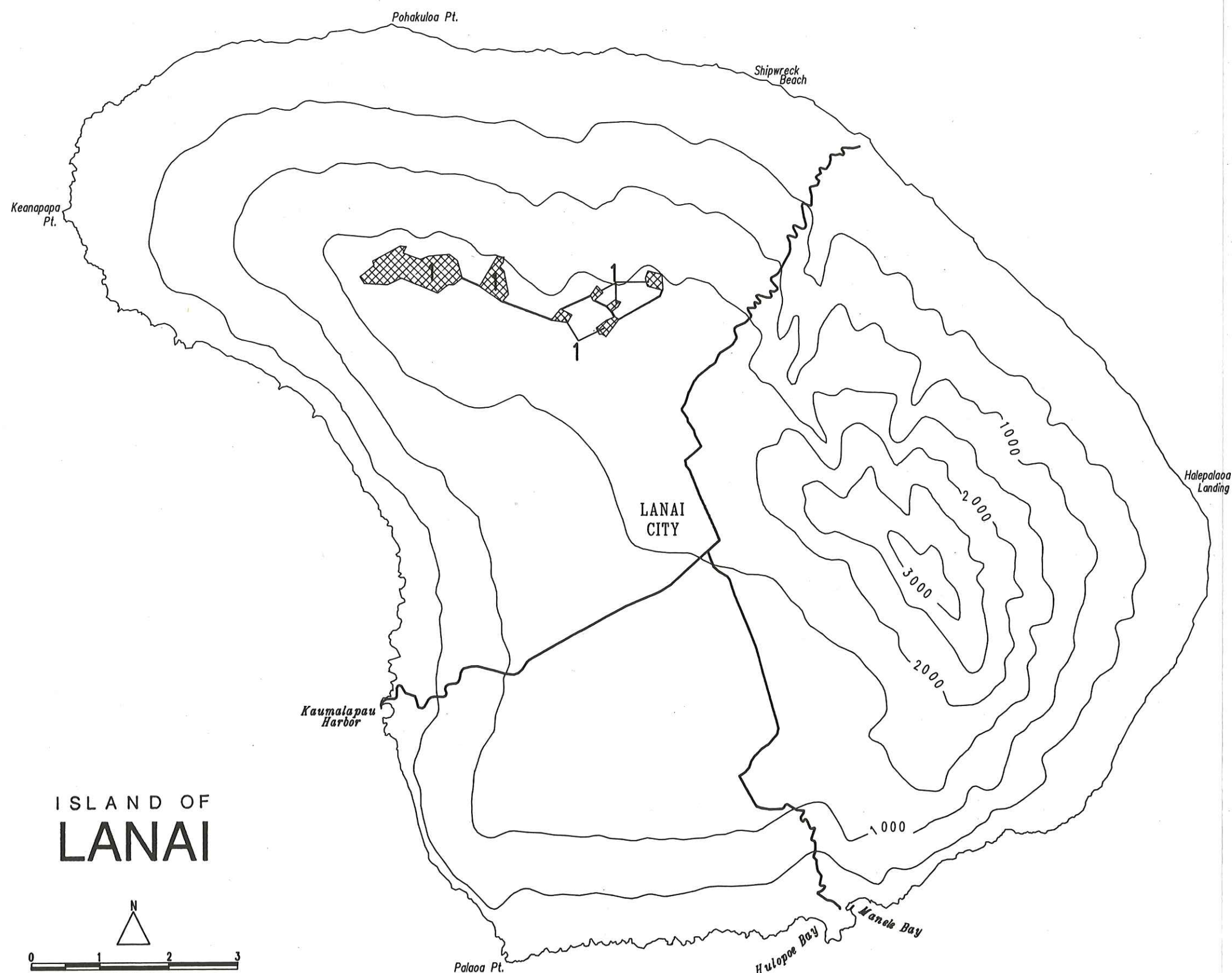
In 1970 the State of Hawaii established the Natural Area Reserves System (NARS) to help protect its unique natural resources. Teams, funded by the legislature, surveyed the reserves and developed management plans to protect the areas' irreplaceable resources from animals and other disturbances. There are 19 NARs on five Islands totalling 109,186 acres. On Maui, there are presently four NARs: Ahihi-Kinau; West Maui; Hanawi; and Kanaio.

The 2,045-acre Ahihi-Kinau NAR is located on the southern coast of Maui just beyond Makena. Ahihi-Kinau is set on the last historic lava flow on Maui and contains five natural communities. These include anchialine pools with a large variety of rare Hawaiian shrimps, and a unique coastal lava tube providing habitat for native Hawaiian cave animals. Pollution, human activities and weeds are potential threats to this NAR. Portions of the NAR extend beyond the boundaries of the existing Conservation District into the Agricultural District. Reclassification of those portions in the Agricultural District to the Conservation District is recommended.

The West Maui NAR is located in the West Maui Mountains (within the Conservation District) and is 6,702 acres in size. This NAR is comprised of four different parcels and includes bogs, montane lakes, forest bird habitat, and rare and endangered plants. The area is a vital watershed area

Figure 20

FEDERAL, STATE AND PRIVATE RESERVES, REFUGES AND PRESERVES



- Forest Reserves
- Natural Area Reserves
- The Nature Conservancy Holdings
- Sanctuaries
- National Parks
- 500 Ft. Contours
- Major Roads

THE NATURE CONSERVANCY PRESERVES	MAP-ID
Kanepuu Preserve	1
MARINE PRESERVES	
Manele-Hulopoe MLC	Not Mapped

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.

containing the headwaters of West Maui's perennial streams.

The Hanawi NAR, also located within the Conservation District on the north slope of Haleakala, is Maui's largest at 7,500 acres. The area stretches from the 2,000 foot contour to above the 7,500 foot contour encompassing an ohia forest and the critical habitat for five of Maui's endangered forest bird species.

The Kanaio NAR is located on the south slope of Haleakala and includes several rare plants. Weeds and feral goats are the primary threats to this area.

Besides the existing NARs, several other sites have been identified as candidates for NAR status. These sites are:

- **Upper Waihoi Valley:** Unique montane bogs and near-pristine forests are set on cinder substrates. Feral pigs are contributing to the rapid degradation of this windward East Maui site.
- **Wai'anapanapa Caves:** This site contains a rare type of lava tube anchialine pool with native shrimp and other unusual invertebrates and a Hala Coastal Mesic Forest. Although the Caves are currently within a State Park and are candidates for NARS status, human disturbance remains a potential threat because of easy access.
- **Upper Hana Forest Reserve:** Wet ohia forest communities and bogs contain rare plants and are an essential habitat for Maui forest birds. Weeds and feral pigs are the primary threats.
- **Hanawi Extension:** Below the 1,200-foot contour, Hanawi Stream provides habitat for many characteristic native stream plants and animals. Future water diversion and well development threaten this environment.

- **Hanaula (West Maui NAR addition):** In addition to communities associated with the drier sections of the West Maui NAR, this site contains rare plants confined to the Hanaula area above Waikapu. Weeds, fire, and feral pigs are major threats.

All of these candidate sites are already within the Conservation District.

Molokai's two NARs were established in 1985. Olokui NAR (1,620 acres) is an isolated mountain between Pelekunu and Wailau Valleys on the northern edge of eastern Molokai. Because of steep cliffs on all sides, the site has been free from feral herbivores. Olokui is refuge for many rare native birds and plants and is perhaps the best example of a pristine cloudforest ecosystem in the State. Puu Alii NAR in north central Molokai contains lowland and montane wet ohia forests and is a rare forest bird habitat. Puu Alii encompasses 1,330 acres. Both Olokui and Puu Alii are in the Conservation District.

b. Marine Life Conservation Districts

Maui County has three Marine Life Conservation Districts (MLCDs). Honolua-Mokuleia Bay MLCD was established in 1978 and is 45 acres in size. Molokini Shoal MLCD was established in 1977 and includes 200 acres of underwater area at Molokini Island. This small island is located three miles off the south coast of Maui and is a popular snorkeling site. Manele-Hulopoe MLCD is located on the Island of Lanai. All three MLCDs are in the Conservation District. In addition, Kahului and Kaunakakai Harbors are designated Fisheries Management Areas.

c. National Parks

The County's most well known national park is Haleakala National Park on Maui. Haleakala National Park is

comprised of 27,350 acres of Federal land and is within the Conservation District. In 1989, the Park attracted 1,396,521 visitors (DBED, 1990).

The other national park in Maui County is Kalaupapa National Historical Park on Molokai. This park was created in 1986 to provide protection to the leprosy settlement. Portions of Kalaupapa National Historical Park are in the Urban and Agricultural Districts. In recognition of its archaeological and biological resources, the entire park area except the airport and town areas is proposed for inclusion into the Conservation District.

d. Nature Conservancy Preserves

The Nature Conservancy of Hawaii manages several preserves on Maui. Kapunakea Preserve in the mountains above Kaanapali protects at least 25 different types of rare Hawaiian plants, animals and natural communities. The 5,230-acre Waikamoi Preserve is the habitat for 12 Hawaiian bird species, seven of which are endangered. The preserve also protects some of the State's best forests. The Maui Lava Tubes Preserve protects a lava tube ecosystem whose fragility precludes a description of its location. In addition, the Nature Conservancy of Hawaii purchased privately owned portions of Kipahulu Valley and transferred most of these to the Federal Government to extend Haleakala National Park to the sea. The Nature Conservancy also is working with Maui Land and Pineapple Company on the Puu Kukui Preserve in West Maui. All of the preserves except for portions of Waikamoi are in the Conservation District. Portions of Waikamoi are proposed for inclusion into the Conservation District.

On Molokai, the Nature Conservancy of Hawaii oversees the Pelekunu Preserve, the Kamakou Preserve, and the

Moomomi Preserve. These three preserves total 9,453 acres and are within the Conservation District or proposed for inclusion in the Conservation District (Moomomi Preserve). On Lanai, the 462-acre Kanepuu Preserve is the best remaining example of native dryland forest in Hawaii. This preserve is in the Conservation District.

e. U.S. Fish and Wildlife Refuges

The County's only Fish and Wildlife Refuge is Kakahaia Fish and Wildlife Refuge on Molokai. Portions of Kakahaia are in the Agricultural District and are recommended for reclassification to Conservation.

4. 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 suited to their special environments.

The State of Hawaii has approximately 80 endangered species. Among these are great species such as the whales, and diminutive species such as the forest birds referred to as honey creepers. 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. As of May 1991, 25 percent of all plants and birds on the endangered species list in the United States are found in Hawaii. Within the next two years, an additional 100 Hawaiian plants are expected to be added to the endangered species list by the U.S. Fish and Wildlife Service.

The Nature Conservancy's Hawaii Heritage Program (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 not be regarded as final statements about the resources present, nor 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.

The vegetation information shown in the maps comes from the U.S. Fish and Wildlife Service's (USFWS) "Hawaiian Forest Bird Survey" (1976-1983). An important by-product of the survey was the creation of vegetation maps for the montane areas of all of the islands except Oahu. Lower elevations (generally below 2,500 feet elevation) were not mapped because native forest birds are rarely found there. Although incomplete, these USFWS vegetation maps comprise the most comprehensive and recent vegetation information 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 types were derived from the USFWS vegetation information for the 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.

Bird habitat ranges have been digitized from maps in the USFWS Hawaii Forest Bird Recovery Plans. The "bird habitat ranges" shown on the maps in this report represent a combination of individual ranges.

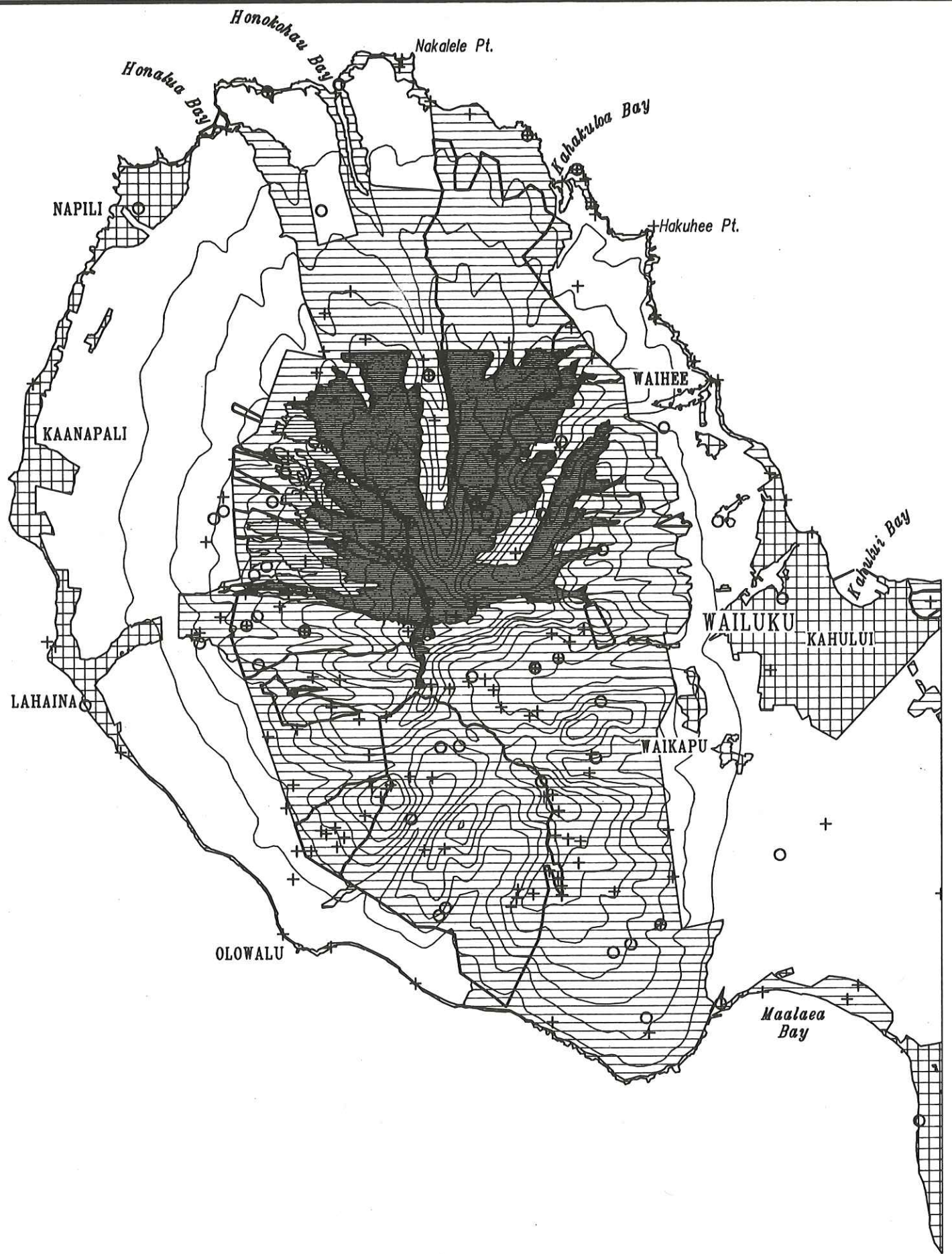
For these maps, a "managed area" was defined as an area that is being managed to protect its biological resources under legal mandates and authority or through management plans and activities. The maps include as managed areas: National Wildlife Refuges (NWS), National Parks (NP), and National Historic 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 U.S. Geological Survey 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, on each island.

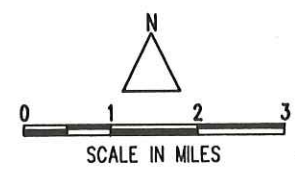
The Nature Conservancy assisted OSP in a series of workshops attended by biologists and others with field or local knowledge of significant biological resources in order to identify the locations of rare and endangered plants and animals. The findings of these workshops are presented in the Proceedings of the Native Ecosystems and Rare Species Workshops, (1991). The attached maps show the locations of rare species. See Figure 21, Figure 22, Figure 23, Figure 24, Figure 25, and Figure 26. Information

Figure 21

NATIVE ECOSYSTEMS AND RARE SPECIES



ISLAND OF
MAUI



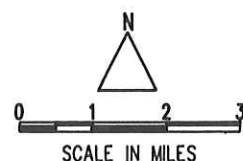
Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official. Species data provided for informational purposes only. See accompanying report.

- | | | | | |
|---|---|-------------------|---|---|
| A | C | | R | U |
| | | Native Vegetation | | |
| | | Native/Exotic Mix | | |
| | | Exotic Vegetation | | |
| | | Bare | | |
| | | Out of Study Area | | |
| 500 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 22

NATIVE ECOSYSTEMS AND RARE SPECIES

ISLAND OF MAUI



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.

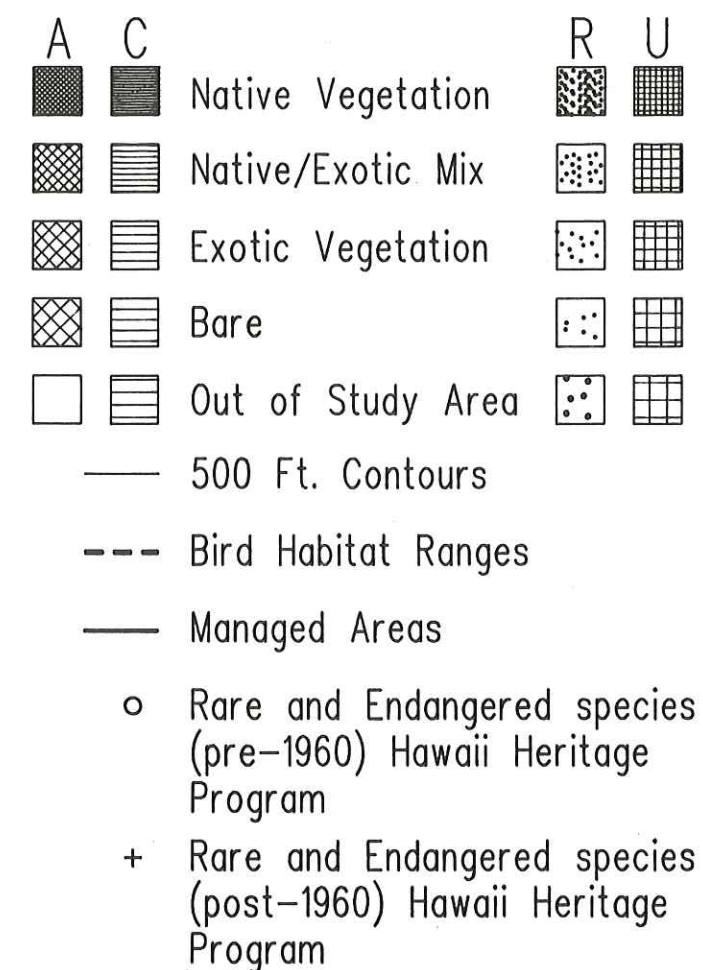
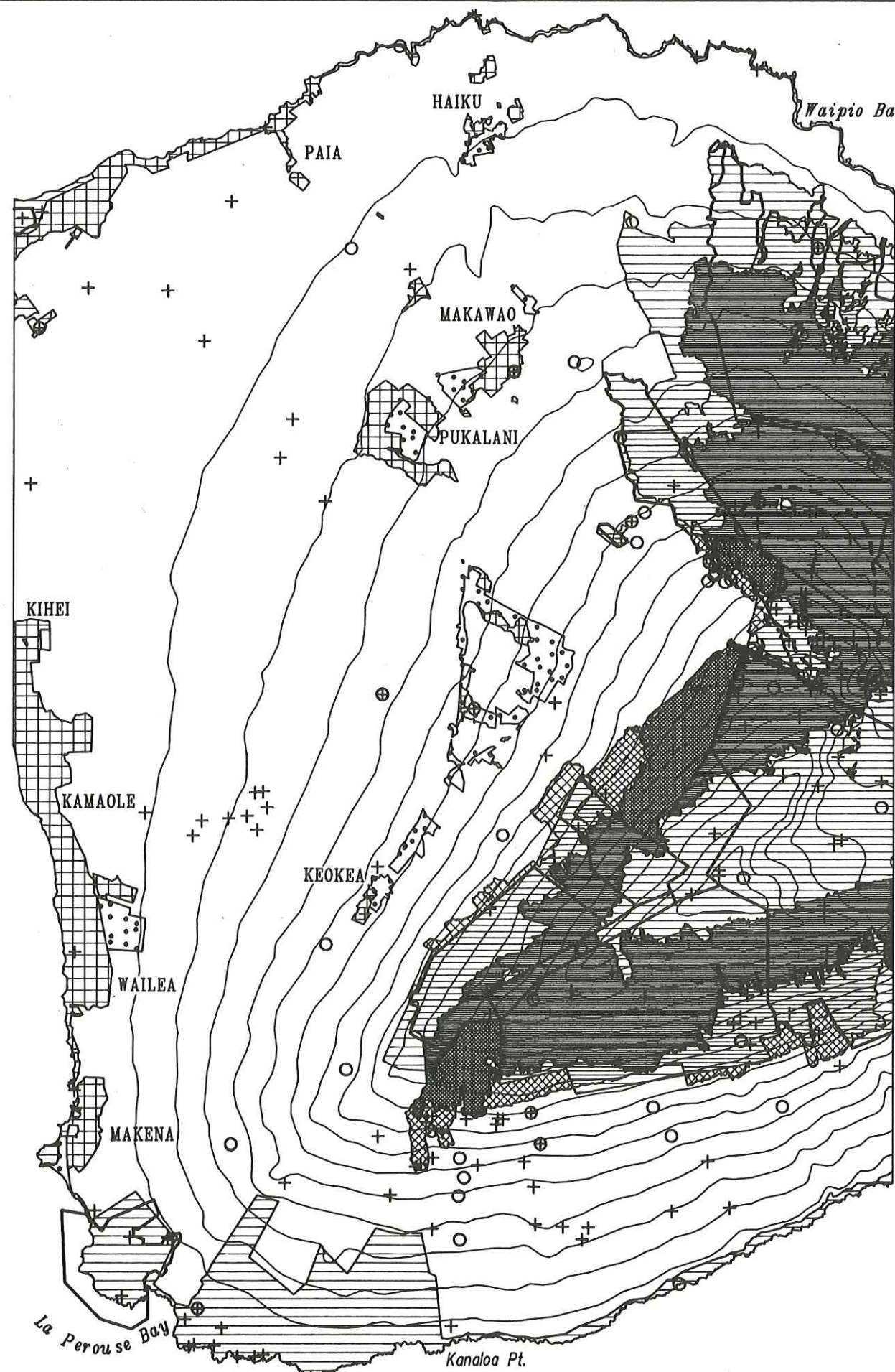
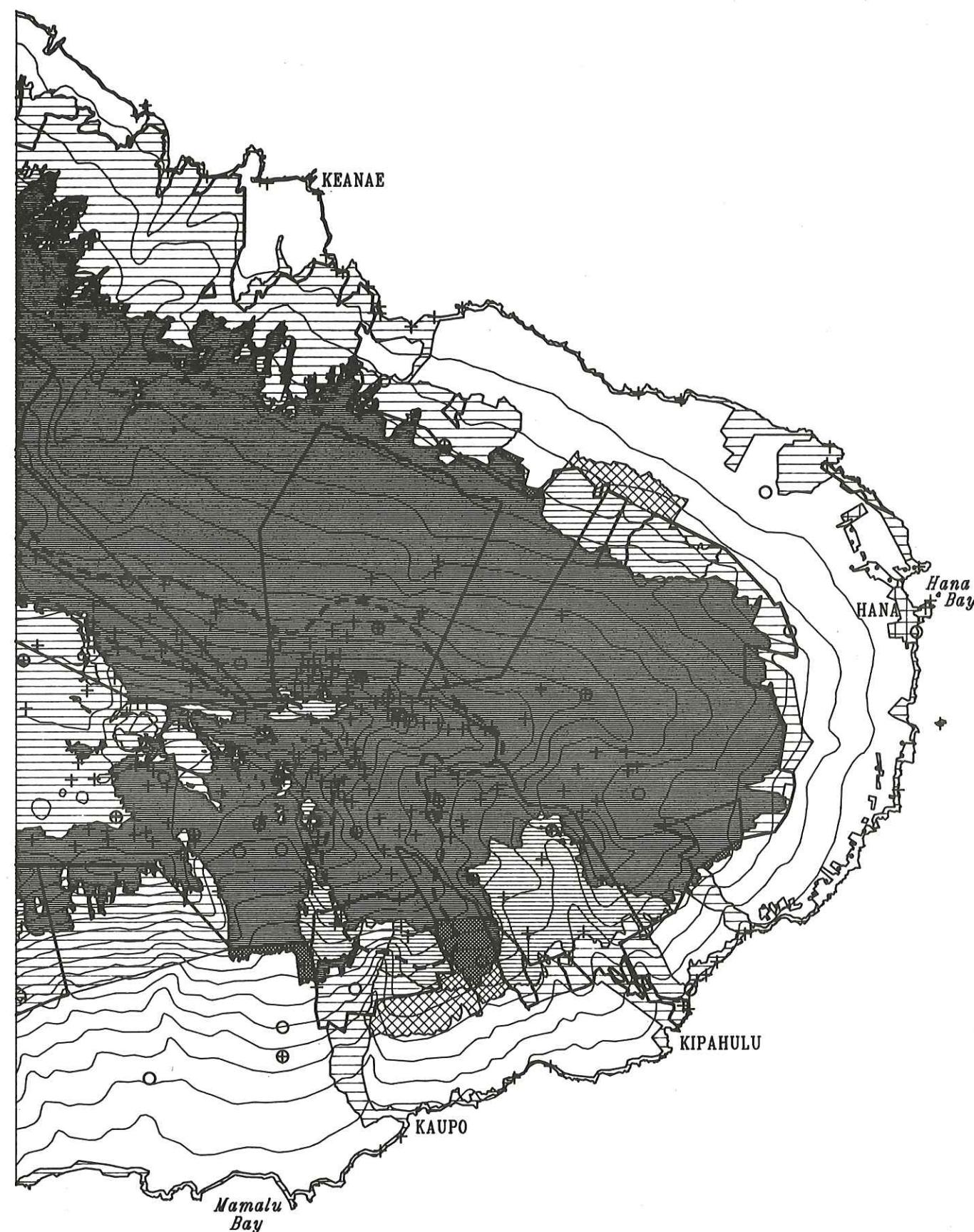
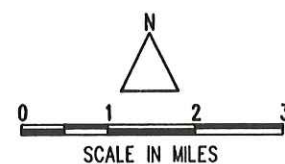


Figure 23

NATIVE ECOSYSTEMS AND RARE SPECIES



ISLAND OF
MAUI

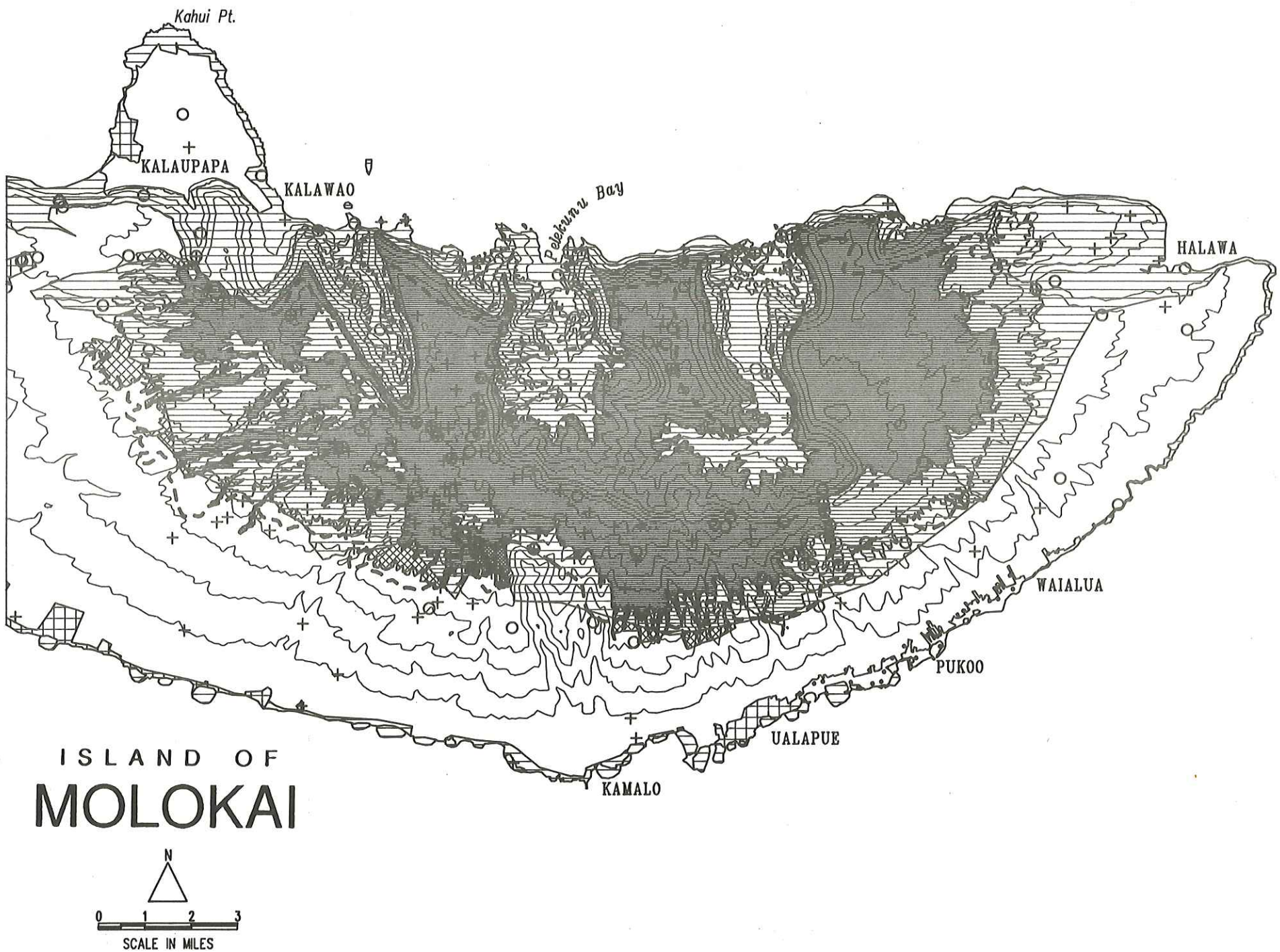


Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official. Species data provided for informational purposes only. See accompanying report.

- | | | | | |
|---|---|-------------------|---|---|
| A | C | | R | U |
| | | Native Vegetation | | |
| | | Native/Exotic Mix | | |
| | | Exotic Vegetation | | |
| | | Bare | | |
| | | Out of Study Area | | |
| — 500 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 24

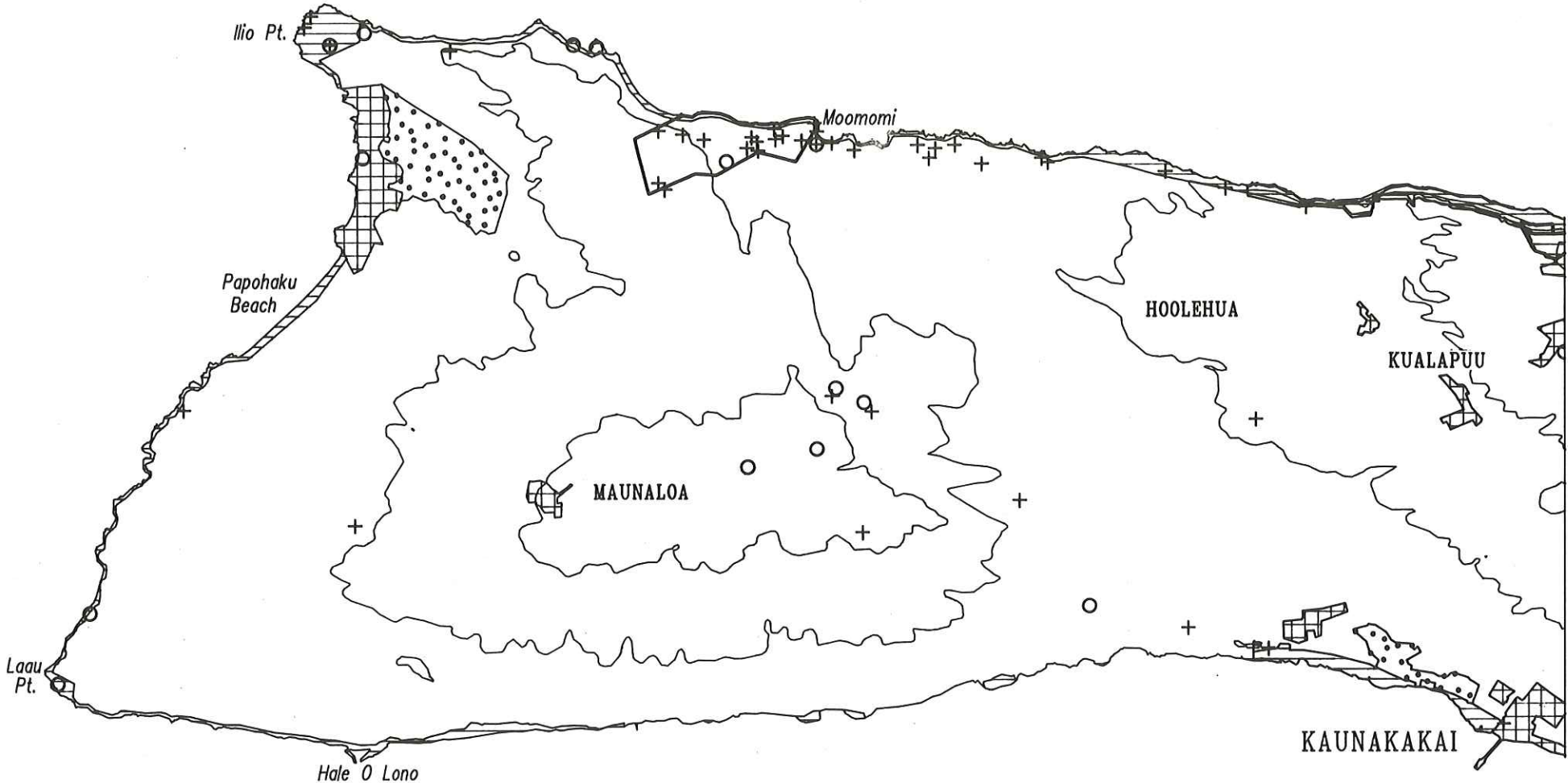
NATIVE ECOSYSTEMS AND RARE SPECIES



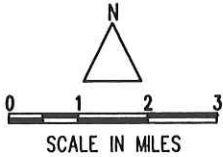
- | | | | | |
|---|---|---------------------|---|---|
| A | C | | R | U |
| | | Native Vegetation | | |
| | | Native/Exotic Mix | | |
| | | Exotic Vegetation | | |
| | | Bare | | |
| | | Out of Study Area | | |
| | | 500 Ft. Contours | | |
| | | Bird Habitat Ranges | | |
| | | Managed Areas | | |
| | | ○ | Rare and Endangered species (pre-1960) Hawaii Heritage Program | |
| | | + | Rare and Endangered species (post-1960) Hawaii Heritage Program | |

Figure 25

NATIVE ECOSYSTEMS AND RARE SPECIES



ISLAND OF MOLOKAI

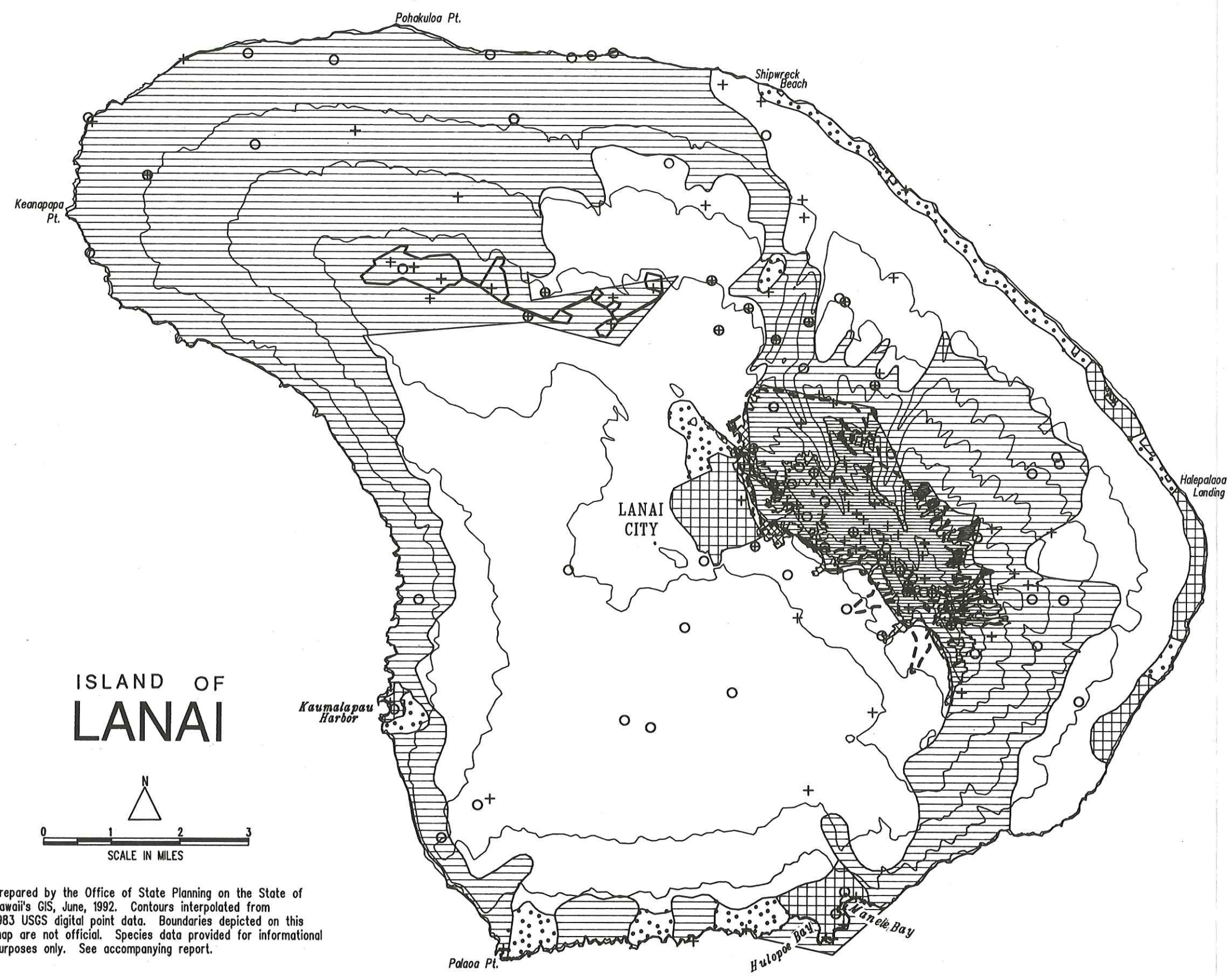


Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official. Species data provided for informational purposes only. See accompanying report.

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|----------|----------|---------------------|---|----------|
| A | C | | R | U |
| | | Native Vegetation | | |
| | | Native/Exotic Mix | | |
| | | Exotic Vegetation | | |
| | | Bare | | |
| | | Out of Study Area | | |
| | | 500 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 26

NATIVE ECOSYSTEMS AND RARE SPECIES



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|---|---|---------------------|---|---|
| A | C | | R | U |
| | | Native Vegetation | | |
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regarding the location of rare and endangered species has been provided by The Nature Conservancy's Hawaii Heritage Program. The data points on the workshop maps distinguish between older, often historical information (pre-1960), and more recent observations (1960-1990).

In the Proceedings, twenty-one sites believed to contain significant biological resources were identified outside of the current Conservation District on the Island of Maui. See Table 16. 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. See Figures 21, 22 and 23.

Kekaalaau, Hanakao, Luakoi, and Puu Hona are all adjacent to existing managed areas in the Conservation District on the slopes of West Maui. They contain rare plants and native natural communities, with endangered plants in the Luakoi area.

Waihee Dunes on the east shore of West Maui is the last remaining unconsolidated sand dune on Maui, and contains the endangered dwarf naupaka. The Federally designated wetland at Waihee provides habitat for endangered waterbirds and migrant bird species. Makamakaole Stream north of Waihee is one of only a few undiverted streams left on Maui and contains many aquatic species, including the rare goby, 'o'opu alamo'o.

On the north shore of East Maui, Pilale Bay is an unusually clean bay with native aquatic species. Monk seals have also been sighted in the area. Anchialine pools at Nanualele, north of Hana Bay, may contain native species, but a survey of the pools is needed. Puaaluu and Hahalawe Streams on the south slopes of Haleakala contain native vegetation and aquatic species, including a rare native damselfly.

Kaapahu is an area surrounded by Conservation District lands and

adjacent to Kipahulu FR. It contains one of the best examples of koa and 'ohi'a forest outside of Kipahulu Valley and may provide habitat for endangered native birds. The forests of Kaupo Gap to the west provide habitat for two endangered animal species, Hawaiian hoary bats and nene. Both sites would provide buffer zones for Kipahulu FR.

The area from upper Pahihi Gulch to Kanaio in the southwest portion of East Maui has been divided into four different sites: Upper Pahihi to Kamole; Lower Kamole Gulch; Manawainui Gulch Region; and Auwahi-Kanaio. Some sections have been studied more than others, but it is believed that the entire area contains native vegetation with rare plants scattered throughout. Auwahi-Kanaio also provides habitat for native spiders, and it is the only East Maui location for a rare land snail endemic to Maui.

Kaunauhane Cave and Puu Mahoe west of Kanaio, encompass recent lava flows that contain endemic cave species, including seven species at Puu Mahoe known only from that cave system.

The native forests at Puu Makua, directly above Lualailua Hills, include a rare mamane forest and provide habitat for native birds. Puu O Kali, above Kihei, contains the best remaining examples of lowland dry vegetation on Maui and seven rare plant species. The native forests of Makawao provide habitat for endangered birds, endemic spiders, and at least six rare plants. Puu Piiholo, east of Makawao, contains unusually high densities of endangered Hawaiian hoary bats, although there is no native vegetation in the area.

OSP has assessed each of the sites and its assessment is shown in Table 16.

Table 16

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED TO CONTAIN BIOLOGICAL RESOURCES - ISLAND OF MAUI		
Site	Assessment	Recommendation
Kekaalaau	Mauka portion is native forest. Surrounded by Conservation District on three sides ^a .	Reclassify to Conservation
Hanakaoo	Biological resources are scattered and do not establish a basis for reclassification ^b . There may be other reasons for reclassifying this area to Conservation, e.g., steep slopes.	No change
Luakoi/Lihau	The Luakoi area already within the Conservation District. Contains biologically significant resources. Biological resources are scattered in the area falling within the Agricultural District ^b .	No change
Puu Hona	Biological resources are scattered. The area has been grazed ^b .	No change
Waihee Dunes	The dunes are to be protected under LUC's conditions for reclassification.	Reclassify to Conservation
Makamakaole Stream	Possesses outstanding aquatic values according to HSA ^c .	Reclassify to Conservation
Pilale Bay & Inland Areas	Biological significance uncertain.	Reclassify inland areas to Conservation for watershed value
Nanualele Pools	At least two of the anchialine pools are intact and contain biota typical of other anchialine pools.	No change
Puaaluu and Hahalawe Streams	Possesses outstanding aquatic resources, HSA.	Reclassify to Conservation
Kaapahu	High quality koa and ohia forest ^a .	Reclassify to Conservation
Kaupo Gap	Only a small portion of the eastern corner of this parcel contains koa. The area is largely grassland ^a .	No change
Puu O Kali	Contains concentrations of rare native plants ^a .	Reclassify to Conservation
Upper Pahihi to Kamole	Area may contain native vegetation and scattered rare plants but further survey needed.	No change
Lower Kamole Gulch	Area may contain native vegetation and scattered rare plants but further survey needed.	No change
Manawainui Gulch Region	Area may contain native vegetation and scattered rare plants but further survey needed.	No change
Auwahi-Kanaio	Area may contain native vegetation and scattered rare plants but further survey needed.	No change
Kaunauhane Cave	Biological resources include cave species. Further study required.	No change
Puu Mahoe	Biological resources include cave species. Further study required.	No change
Puu Makua	Contains small pockets of native plants in crater and fissure.	No change
Waikamoi	Area is within the TNC Preserve.	Reclassify to Conservation
Puu Piiholo	Known for unusual bat concentrations. Further study required.	No change

^a Wes Wong, DLNR, et al., November 1991, July 1992.
^b Telephone conversation with Bob Hobdy, DOFAW, DLNR, September 1991.
^c HSA - Hawaii Stream Assessment.

On Molokai, fifteen sites believed to contain significant biological resources were identified outside of the current Conservation District. See Table 17, Figure 24 and Figure 25.

A large portion of the northwest coast of Molokai, from Kawakiunui Beach around the northwest point through Moomomi was identified as biologically outstanding. This area contains a rare native dune ecosystem, rare native plants, habitat for endangered monk seals, and the only known nesting site on Molokai for threatened green sea turtles.

The entire Kalaupapa peninsula was identified because of its biological resources, and because it is currently a National Historical Park.

On the south shore, Waialua Stream was considered one of the best streams on Molokai for native stream species. Three wetland areas, also on the south shore, Paialoa, Kakahaia, and Umipaa, provide endangered waterbird habitat.

Only one inland site was identified on the west end of Molokai. Maunaloa Summit contains populations of native plants, including the endangered *Gardenia brighamii*.

The gulches in the Meyer Lake area on the north slopes of east Molokai contain native vegetation and provide critical habitat for rare native land snails. Three areas on the south slope running from Kahuaawi in the west to Kamalo in the east contain native forests and shrublands with scattered populations of rare native plants throughout.

USFWS vegetation maps identified additional areas of native forest that extend below the existing Conservation District boundary in the Puaahala area. Further field work is needed to confirm the types and distribution of plants that remain in this area. Keopukaloa

contains a small but significant stand of lama trees.

OSP has assessed each of these sites and its assessment is shown in Table 17.

On Lanai, four sites believed to contain significant biological resources were identified outside of the current Conservation District. See Table 18 and Figure 26.

It was noted at the first Lanai workshop that district boundaries on the island seemed arbitrarily drawn. For example, a large section of Agricultural District land in eastern Lanai, from Poaiwa gulch in the north to the existing Conservation District boundary in the southeast, is covered with native 'a'ali'i shrubland and pili grassland. It also contains the largest stand of Hawaiian cotton or ma'o in the state. The area around Lae Hi Beach contains native coastal vegetation.

There are rare plants and native strand on the peninsula between Manele Bay and Hulopoe Bay on the southeast coast. Kanepuu, on the western slopes of the island, is a Nature Conservancy preserve containing two endangered plants, other rare plants, and the last remnants of a native dryland forest that once covered much of Lanai.

Table 17

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED TO CONTAIN BIOLOGICAL RESOURCES - ISLAND OF MOLOKAI		
Site	Assessment	Recommendation
Ilio to Moomomi	Moomomi Preserve possesses a high density of native vegetation along the coast. This area can be divided into three sections, Ilio Pt. to Moomomi, Moomomi Preserve, and Moomomi Dunes which extends east of the Preserve to Anahaki Gulch. The Preserve and Moomomi Dunes contain sand dune ecosystems and a high density of rare plants. Ilio Pt. to Moomomi is reported to contain rare coastal plants.	Reclassify the Preserve and Moomomi Dunes to Conservation
Portions of Kalaupapa	National Historical Park. Recommended by NPS ^a .	Reclassify portions to Conservation
Waialua Stream	Contains 'o'opu alamo'o.	Reclassify to Conservation
Paialoa Wetland	Recognized in State Conservation Lands Functional Plan, Hawaiian Water-birds Recovery Plan, and Regional Wetlands Concept Plan.	Reclassify to Conservation
Kakahāia Wetlands	National Wildlife Refuge.	Reclassify to Conservation
Umipaa Wetland	Contains a heavy concentration of Hawaiian waterbirds. ^b	Reclassify to Conservation
Maunaloa Summit	A small area contains rare and endangered plants. DLNR has proposed a plant sanctuary for the site ^c .	No change
Palaau/Meyer Lake	Area is primarily grazed land. Land snails are likely to be located in the gulch areas already in the Conservation District. ^d	No change
Kaunakakai Gulch System	Known to contain rare plants. Although this area is subject to forest fires, certain native plants regenerate quickly after fires and are found in this area. Therefore, these areas continue to have value for the protection of rare species ^c .	Reclassify to Conservation
Kamiloloa-Makapupaia	Contains native but mostly degraded shrubland. Further survey work needed. ^d	Reclassify to Conservation
Kawela-Kamalo	Contains native forest and shrubland. ^c	Reclassify portions to Conservation
Puaahala to Kaluaaha	Most of the site identified does not contain forest resources ^d .	No change
Keopukaloa	Significant stand of lama trees.	Merits reclassification but is of lower priority because of parcel's small size.
Kawakiunui Beach	Biological significance is unclear. Further study needed.	No change
^a Communication with National Park Service. ^b Ron Walker, DLNR, November 1991. ^c Michael Buck, DOFAW, DLNR, September 5, 1991. ^d Meeting with Wes Wong, Bob Hobdy & Fern Duvall, November 13, 1991.		

Table 18

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED TO CONTAIN BIOLOGICAL RESOURCES - ISLAND OF LANAI		
Site	Assessment	Recommendation
Northeast Slopes	Contains native shrubland and grassland and rare plants. Further survey work is recommended for this areas. The area is recommended for reclassification to Conservation based on other reasons, including unsuitability for agricultural use, steep slopes and open space value.	Reclassify to Conservation
Lae Hi Beach	Further survey work needed.	No change
Manele/Hulopoe Peninsula	This area has been recently reclassified to Urban.	No change
Kanepuu	Upon subsequent confirmation of the easement boundaries, it was found that the entire preserve is in the Conservation District.	No change

The sites identified in the Proceedings of the Native Ecosystems and Rare Species Workshops were assessed and examined by the Office of State Planning. In general, they fell into two categories: 1) those that had been studied and/or surveyed or were known to contain significant biological resources; and 2) those that were suspected to contain significant biological resources but needed further work to verify these resources. Those which fell into the former category and met other criteria established for the Conservation District as discussed in this chapter, (e.g., special streams, selected wetlands etc.), were recommended for inclusion into the Conservation District.

5. 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 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 possible, it is the intention of the Legislature to preserve Hawaii's unique native flora and fauna by reclassifying native forests 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.

Areas with predominantly native vegetation, areas where native and exotic species are co-dominant and areas with predominantly exotic vegetation are shown on Figures 21 through 26. 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 Figures 21 through 26.

a. Island of Maui

The Native Ecosystems and Rare Species Workshops identified a number of native forests on Maui which are presently outside of the Conservation District. These include Kaapahu which contains high quality wet montane forest with hapuu understory; portions of Waikamoi Preserve; and Kekaalau, on the West Maui Mountains. Also identified is the Upper Pahihi to Kamole area located below the Kahikinui Forest Reserve. This site is not well surveyed but is believed to contain patches of native forest mixed with alien vegetation and may be a habitat for forest birds. This area, however, is not being recommended for reclassification to the Conservation District at this time but is recommended for further survey work.

b. Island of Molokai

Molokai contains two (2) native forest areas located outside of the Conservation District. The Kamiloloa-Makakupaia and the Waiakuilani Gulch areas on the south slopes of east Molokai contain native forests and shrubland. These sites are presently in the Agricultural District and are recommended for reclassification to the Conservation District.

Waianui Gulch-Puu Olelo were also considered. However, it was subsequently found that Waianui Gulch, which contains native forests and shrubland, already is within the Conservation District. Puu Olelo is utilized as pasture land and is appropriately classified within the Agricultural District.

c. Island of Lanai

The Kanepuu area on the western slopes of Lanai contains the remnants of a native dryland forest which once covered much of the Island. Since the site is already in the Conservation District and is in a Nature Conservancy

preserve, reclassification is not warranted.

6. **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 the Interior's Endangered or Threatened Species List as of 1980.

a. **Island of Maui**

On Maui, an endangered forest bird habitat range has been identified and drawn on the previous East and Central Maui maps. Bird habitat ranges identify the space required for the continued existence and growth of bird species. On Maui, the range occupies a large portion of the upper elevations of East Maui and is within the Conservation District.

b. **Island of Molokai**

Molokai contains an endangered forest bird habitat range in the interior of the western half of the Island. The majority of the range is in the Conservation District, with portions on the south side in the Agricultural District.

c. **Island of Lanai**

On Lanai, an endangered forest bird habitat range is located east of Lanai City and is approximately eight square miles in size. The range primarily falls into the Conservation District, though sections along the south side are in the Agricultural District.

7. **Wetlands**

The value of wetlands was little known until recent years. It was recognized that these areas provided habitat for wildlife but this was often considered secondary to the potential for agricultural and urban uses that could be accomplished through land filling. It is now acknowledged that wetlands not only provide habitat for

endangered waterbirds and migratory sea birds, they help to control flooding by acting as retention basins; filter nutrients and sediments and thereby reduce the pollutants that enter a waterway; enhance aquifer recharge; provide recreational opportunities such as nature study, hiking, photography; and provide scenic and open space relief.

Wetlands are, by name and definition, wet, but the moisture can be supplied by freshwater, groundwater, brackish/estuarine or ocean water. Wetland-types include land-based wetlands with generally deep soils, to marine wetlands that are coral reefs and seagrass beds.

Wetlands and the values they provide are threatened by reclamation for agriculture and urban uses, the loss of water through stream diversion, channelization and groundwater withdrawal as well as sedimentation through excessive upland erosion.

To protect these important ecosystems, it is recommended that they be included in the Conservation District along with a buffer zone. A number of studies have found that buffers are effective in reducing the amount of pollution entering a waterway (Klein 1990). In addition, the U.S. Department of Agriculture's Soil Conservation Service, Conservation Reserve Program encourages the establishment of specially designed vegetative filter strips around water resources such as wetlands through regulatory and other incentives to landowners (EPA, 1988). Importantly, Conservation designation will provide for regulation of uses around the wetland (e.g., residences) to assure that uses immediately adjacent to the wetland do not adversely impact it.

The following wetlands are identified as important or sensitive in the State Conservation Lands Functional Plan, Hawaiian Waterbirds Recovery Plan, The Hawaiian Wetlands National

Wildlife Refuge Complex Master Plan, and The Regional Wetlands Concept Plan (Emergency Wetlands Resource Act). See Figure 27 and Figure 28.

Maui:

- Kanaha Pond
- Kealia Pond
- Olli
- Various Reservoirs

Molokai:

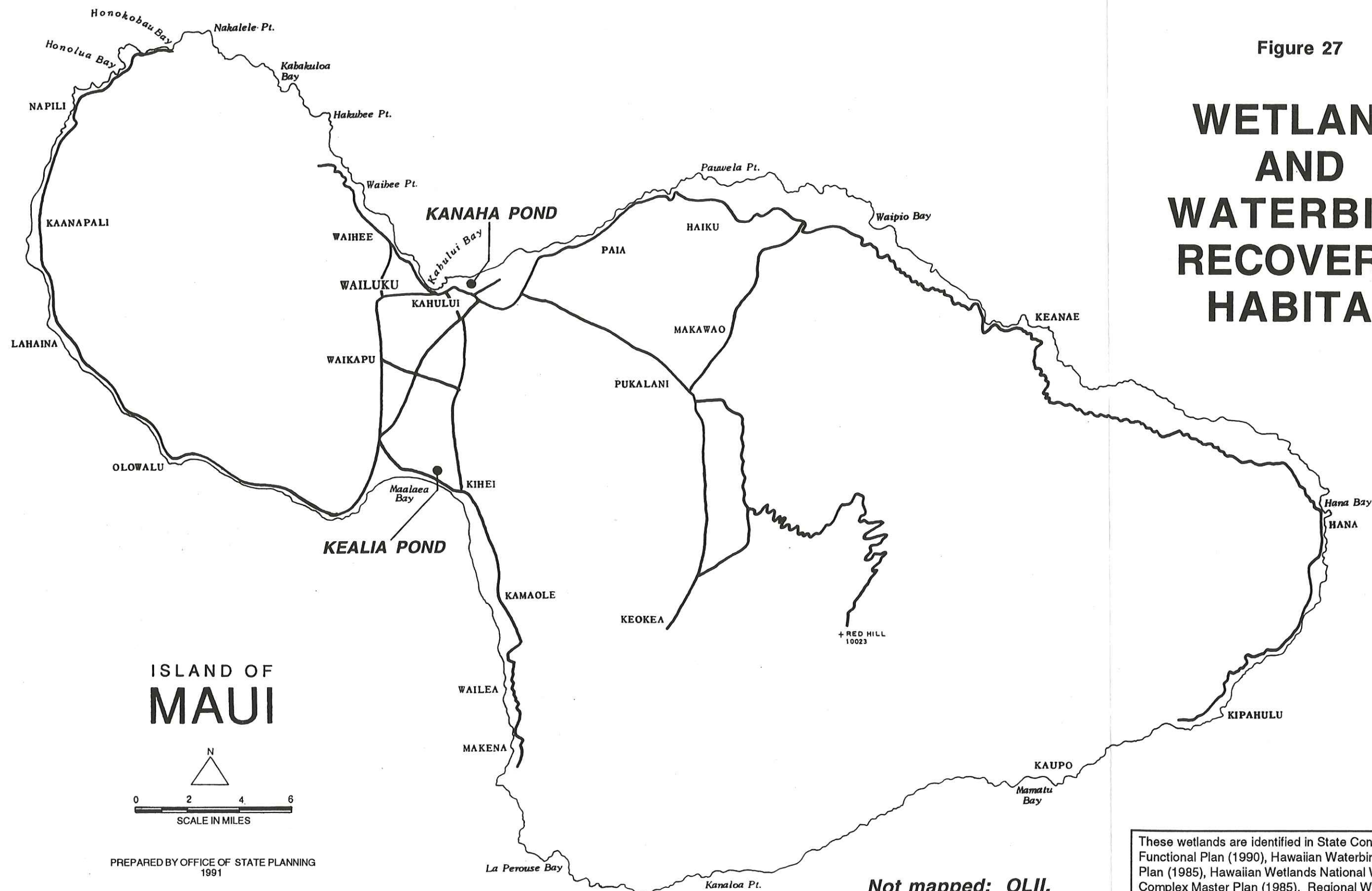
- Kakahaia National Wildlife Refuge (Includes Fishpond)
- Kamahuehue
- Kaunakakai Sewage Treatment Pond
- Kualapuu Reservoir
- Ooia-Kaluaapuhi (Umipaa)
- Orca Sea Farms
- Paialoa Pond and Wetlands

Table 19 is an assessment of the various wetlands found within the County.

The two major wetlands on Maui are Kanaha Pond and Kealia Pond. Kanaha Pond near the Kahului Airport is a wildlife sanctuary managed by the Department of Land and Natural Resources and is within the Conservation District. The Hawaiian stilt, coot, gallinule and the black crowned night-heron can be found at Kanaha Pond. Kealia Pond near Maalaea Bay is a habitat area for the endangered Hawaiian stilt and Hawaiian coot. The mud flat areas, created by intermittent flooding and siltation, are good feeding and nesting habitats for these birds. In addition to its ecosystem value, Kealia Pond is a vital component of the area's natural drainage system, serving as a collection basin for local storm runoff from Waikapu Stream. Portions of Kealia Wetland are in the Agricultural District and are recommended for inclusion into the Conservation District.

Figure 27

WETLAND AND WATERBIRD RECOVERY HABITAT

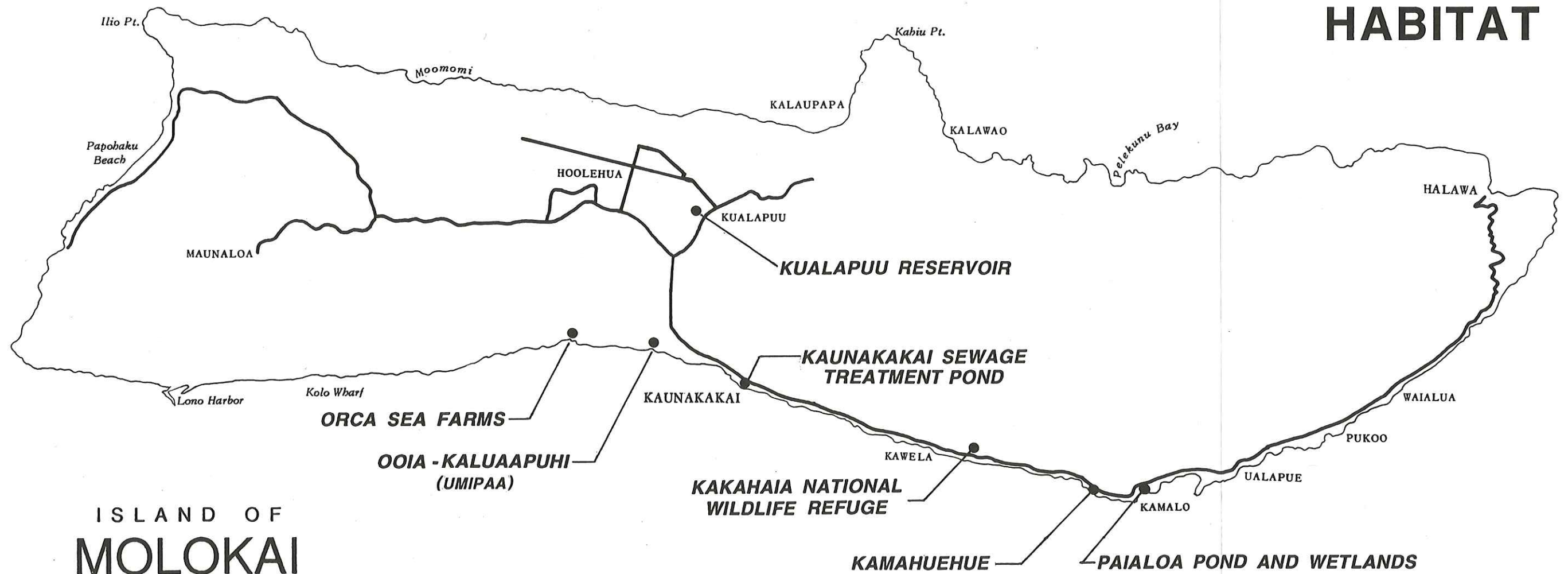


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1991

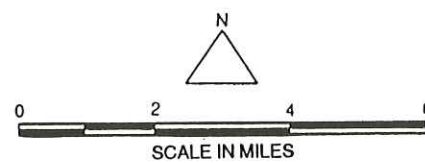
These wetlands are identified in State Conservation Lands Functional Plan (1990), Hawaiian Waterbirds Recovery Plan (1985), Hawaiian Wetlands National Wildlife Refuge Complex Master Plan (1985), Regional Wetlands Concept Plan: Emergency Wetlands Resource Act (1990), and/or State Recreational Functional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

Figure 28

WETLANDS AND WATERBIRD RECOVERY HABITAT



ISLAND OF
MOLOKAI



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1991

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.

Table 19

ASSESSMENT OF WETLANDS					
Site	Existing SLU District	Use	Development Pressure	Contains Special Streams, in Floodplain or County Open Space District	Recommendation
MAUI					
Kanaha	Conservation	---	---	---	No change
Kealia	Agricultural/ Conservation	Not in use	Yes	Open Space	Reclassify buffer area to Conservation
Keanae	Agricultural	Taro	No	No	No change
Olii (site unknown)					
Various reservoirs (sites unknown)					
Paukukalo	Agricultural	No	Yes	Open Space Coastal Hazard Zone	Reclassify to Conservation
Waihee	Agricultural	No	Yes	No	Reclassify to Conservation
Olai Pond	Agricultural	No	Unknown	No	Less than 15 acres. No change
Paniaka Pond	Agricultural	No	Unknown	No	Less than 15 acres. No change
MOLOKAI					
Kakahaia	Agricultural	USFWS Refuge	No	No	Reclassify to Conservation
Kamahuehue	Conservation	---	---	---	No change
Kaunakakai STP	Agricultural	No	No	No	No change
Kualapuu	Agricultural	Yes	No	No	No change
Ooia-Kaluaapuhi	Conservation	---	---	---	---
Orca Sea Farms	Agricultural	Aquaculture	No	No	No change
Paialoa Wetlands (Pond in Conservation)	Agricultural	No	Yes	No	Reclassify to Conservation
Umipaa	Agricultural	No	Yes	No	Reclassify to Conservation

Wetlands already in the Conservation District (i.e. Kanaha Pond, Kamahuehue, Ooia-Kaluaapuhi, and portions of Kealia Pond and Kakahaia) should remain in that district. Kakahaia National Wildlife Reserve, Paialoa Pond and Wetlands and portions of Kealia Wetland are recommended for reclassification to the Conservation District. Wetlands which are in compatible agricultural use, e.g., taro which keeps waterways open, are not subject to development pressures, do not contain special streams and are not located in a flood plain or County Open Space district, may remain in the Agricultural District (i.e. Keanae, identified in Wetlands and Wetland Vegetation of Hawaii, Elliot and Hall, 1977; Orca Sea Farms; and Kualapuu Reservoir). Should land uses change in the future, however, these wetlands should be reclassified to Conservation.

In addition, Paukukalo Wetlands, Waihee Wetlands, Olai Pond, Paniaka Pond and Umipaa Wetlands were identified as important for protection in discussions with the State Department of Land and Natural Resources and the County of Maui. Olai Pond and Paniaka Pond are less than 15 acres in size. The County, rather than the Land Use Commission, has the authority to reclassify these areas into the Conservation District.

There are other wetlands in Maui County which were not assessed given the budgetary limitations of the Boundary Review. However, some of these wetlands may be important Conservation resources and any land use change which may impact them should be carefully evaluated.

8. Beaches and Coastal Areas

In 1985, Maui County had approximately 49 acres of beach acreage and six miles of beach frontage. Overall, there is a projected high need for fishing, diving, swimming, beach picnicking, and sunbathing resources. In addition, the Kihei-Makena area and Molokai are projected to have a high need for action for beach

camping (DLNR, 1985).

a. Island of Maui

For swimming areas in particular, the Department of Land and Natural Resources rated principal swimming areas in Hawaii according to their site characteristics and the distance users would likely be willing to travel to reach the site. Swimming areas on Maui rated as having high statewide significance or high islandwide significance are Baldwin Park, Paia Bay, Oneloa Beach, Small Beach, Maluaka Beach, Poolenalena Beach, Palaua Beach, Polo Beach, Wailea Beach, Ulua Beach, Mokapu Beach, Keawakapu Beach, Kamaole Beaches I, II, and III, Wahikuli Beach, Kaanapali Beach, Napili Bay, Kapalua Bay, Honokahua Bay, and Mokuleia Bay.

Three areas along the Waihee coast are being recommended for reclassification to the Conservation District: first, the portion of the Waihee Stream not developed for the proposed golf course is being recommended because of the area's archaeological resources; second, the Conservation District on the sand dunes is recommended to be expanded downwards to the edge of the proposed golf course as added insurance against disturbance; and third, the portion of land within 200 feet of the shoreline and presently in the Agricultural District is recommended for reclassification to allow for a continuous 200-foot setback along the makai border of the proposed golf course.

b. Island of Molokai

Molokai beaches with high statewide and islandwide significance include Kanalukaha Beach, Kapukuwahine Beach, Kahalepohaku Beach, Kaupoa Beach, Kawaaloo Bay, Awahua Beach, Iliopii Beach, Pelekunu Bay, Wailau

Beach, Kamaalaea Inlet, Kawili Inlet, Fagans Beach, and Honomuni Beach.

c. **Island of Lanai**

Beaches on Lanai with high statewide and islandwide significance are Polihua Beach and Shipwreck Beach (wilderness coastlines), and Hulopoe Bay (DLNR, 1987). Those portions of Shipwreck Beach within the Rural and Agricultural Districts are recommended for reclassification to Conservation.

9. **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.

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. See Table 20.

The optimum solution identified is the protection of entire watersheds from activities that lead to increased sediment loads, pollution, and other harmful changes in flowing stream 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.

Table 20

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.

However, ridge to ridge Conservation District protection is not always possible due to existing land use activities. In these cases, we have recommended a 100-foot Conservation District corridor on both sides of streams as measured from the bank. 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 (Klein, 1990). The U.S. Department of Agriculture's Soil Conservation Service Conservation Reserve Program encourages the establishment of specially designed vegetative filter strips along water courses through cash and regulatory incentives to landowners. 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. In addition, Conservation designation would provide for the regulation of uses next to the stream (e.g., grading, construction of residences and other structures) to help assure stream protection.

This report recommends that Conservation District corridors be established along Special Streams. Special Streams were identified using the Hawaii Stream Assessment and input from stream experts and were defined as having outstanding aquatic values or riparian values that are also associated with waterbird recovery habitat. (See Tables 21 and 22. See also Figure 29, Figure 30, Figure 31, and Figure 32.) 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.

It is noted that only perennial streams have been considered for special stream designation. However, there are undoubtedly other streams worthy of consideration. For example, although lowland

Table 21
Special Streams: Maui

Legend	
Special Stream Criteria	1. Outstanding Aquatic according to the Hawaii Stream Assessment 2. Outstanding Riparian including waterbird recovery habitat according to the Hawaii Stream Assessment 3. High Quality Estuary according to OSP/Coastal Zone Management 4. Outstanding Aquatic based on 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
Land Use Districts	In order from mountain to ocean

Stream Name	Special Stream Criteria	Values	Land Use Districts	Land Uses	Recommendation
Honolua	*		Conservation		
Honokohau	1	Abundance of native aquatic species.	Conservation Agriculture	Rural type uses, bananas	Recommend a 100 foot stream protection corridor.
Kahakuloa	1	Presence of all four native species that are indicators of a good aquatic environment.	Conservation Agriculture Rural	Rural type uses	Recommend stream protection but because the total area is less than 15 acres, reclassification needs to be approved by the county.
Makamakaole	1	Abundance of native aquatic species.	Conservation Agriculture	No agricultural uses	Recommend that the conservation district be expanded to include the entire stream valley from ridge to ridge avoiding the house on east side and Maluhia Boy Scout Camp on west side.
Waihee	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Rural		Recommend the conservation district be expanded from ridge to ridge in the agricultural district.
Waikapu	2	Recovery habitat, T&E birds, rare plants, and 30 % native forest	Conservation Agriculture Urban Agriculture Conservation	Sugar	Recommend a 100 foot stream protection corridor.
Honomanu	*		Conservation		
Piinaau	1,2	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o) and 3 other native species. 60 % native forest, 3 T&E birds.	Conservation Agriculture Conservation	Taro, small agricultural	Recommend a 100 foot stream protection corridor.

Wailuanui	1	Abundance of native aquatic species; and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture	Taro nearby.	Recommend a 100 foot stream protection corridor.
W. Wailuaiki	*		Conservation		
E. Wailuaiki	*		Conservation		
Waiohue Gl.	*		Conservation		
Hanawi	*		Conservation		
Makapipi	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	Houses and small agricultural	Recommend a 100 foot stream protection corridor.
Kawakoe	1	Presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	House near stream at road	Recommend a 100 foot stream protection corridor.
Kapia	1	Abundance of native aquatic species and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Rural Agriculture Conservation	Houses	Recommend a 100 foot stream protection corridor through the agricultural district.
Wailua	*		Conservation		
Honolewa	*		Conservation		
Waieli	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	One house, no major agricultural use.	Recommend that the conservation district be expanded to include the entire stream valley from ridge to ridge.
Kakiweka	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	One house, no major agricultural use	Recommend that the conservation district be expanded to include the entire stream valley from ridge to ridge.
Hahalawe	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	Steep forestland. Between this and the next stream is pastureland.	Recommend that the conservation district be expanded to include the entire stream valley from ridge to ridge.
Puaaluu	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o) and 3 other native species.	Conservation Agriculture Conservation	Steep forestland	Recommend that the conservation district be expanded to include the entire stream valley from ridge to ridge.
Oheo Gl.	*		Conservation		
Kukuiula	1	Abundance of native aquatic species, and presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	fences and grass	Recommend a 100 foot stream protection corridor.
Alelele	1	Abundance of native aquatic species.	Conservation Agriculture	Steep forestland	We recommend that the conservation district be expanded to include the entire stream valley from ridge to ridge.
Manawainui	*		Conservation		

Table 22
Special Streams: Molokai

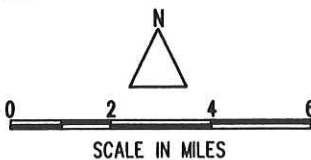
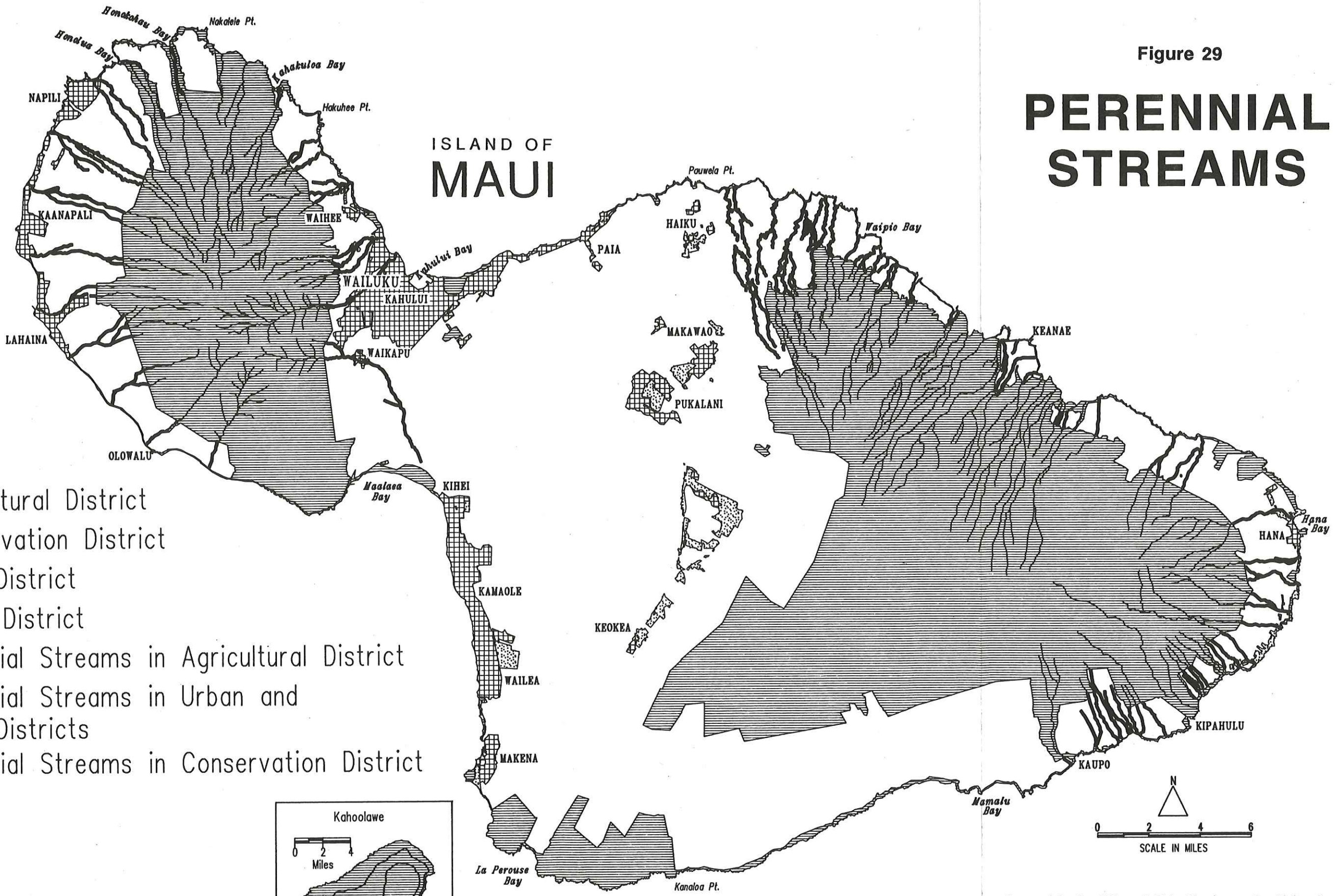
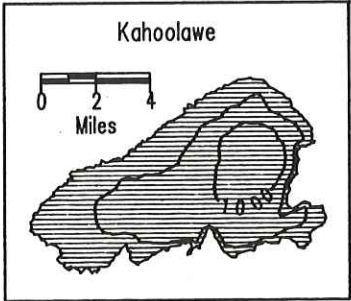
Legend	
Special Stream Criteria	1. Outstanding Aquatic according to the Hawaii Stream Assessment 2. Outstanding Riparian including waterbird recovery habitat according to the Hawaii Stream Assessment 3. High Quality Estuary according to OSP/Coastal Zone Management 4. Outstanding Aquatic based on Hawaii 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
Land Use Districts	In order from mountain to ocean

Stream Name	Special Stream Criteria	Values	Land Use Districts	Land Uses	Recommendation
Waialeia	*		Conservation		
Waikolu	*		Conservation		
Wainene	*		Conservation		
Anapuhi	*		Conservation		
Waiohookalo	*		Conservation		
Kailili	*		Conservation		
Pelekunu	*		Conservation		
Haloku	*		Conservation		
Oloupena	*		Conservation		
Puukaoku	*		Conservation		
Wailau	*		Conservation		
Waiahookalo	*		Conservation		
Kahiwa	*		Conservation		
Kawainui	*		Conservation		
Pipiwai	*		Conservation		
Halawa	*		Conservation		
Papio	4	Presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Conservation	Cattle grazing, farming	A 100 foot conservation district corridor should be delineated on each side of the stream.
Honouliwai	4	Presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture	Residential uses at mouth	A ridge-to-ridge conservation district corridor narrowing to 100 foot corridors on each side of the stream should be delineated.
Waialua	4	Presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Rural	Residential uses at mouth, taro	A ridge-to-ridge conservation district corridor should be delineated in the agricultural district, narrowing to 100 foot at the confluence of the tributaries.
Honomuni	4	Presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture Rural	Residential uses at mouth, historic taro	A ridge-to-ridge conservation district corridor should be delineated in the agricultural district.
Kawela	4	Diversity of native aquatic species, presence of Lentipes ('o'opu alamo'o).	Conservation Agriculture	Residential uses at mouth, historic taro	A ridge-to-ridge conservation district corridor should be delineated in the agricultural district, narrowing to 100 foot at the confluence of the tributaries.

Figure 29

PERENNIAL STREAMS

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



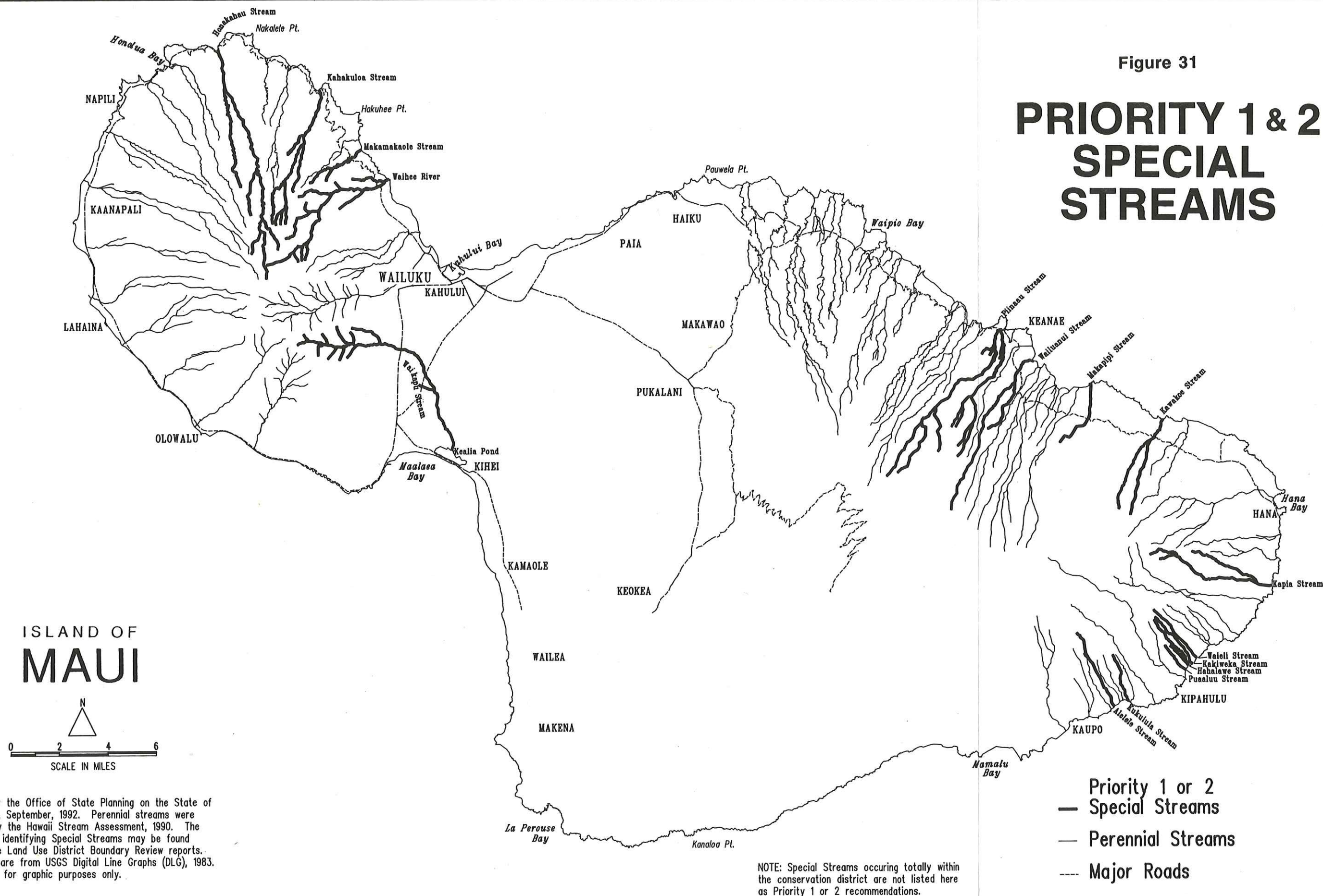
Prepared by the Office of State Planning on the State of Hawaii's GIS, June, 1992. Land Use Districts current as of February, 1991. Contours interpolated from 1983 USGS digital point data. Boundaries depicted on this map are not official.

PERENNIAL STREAMS



Figure 31

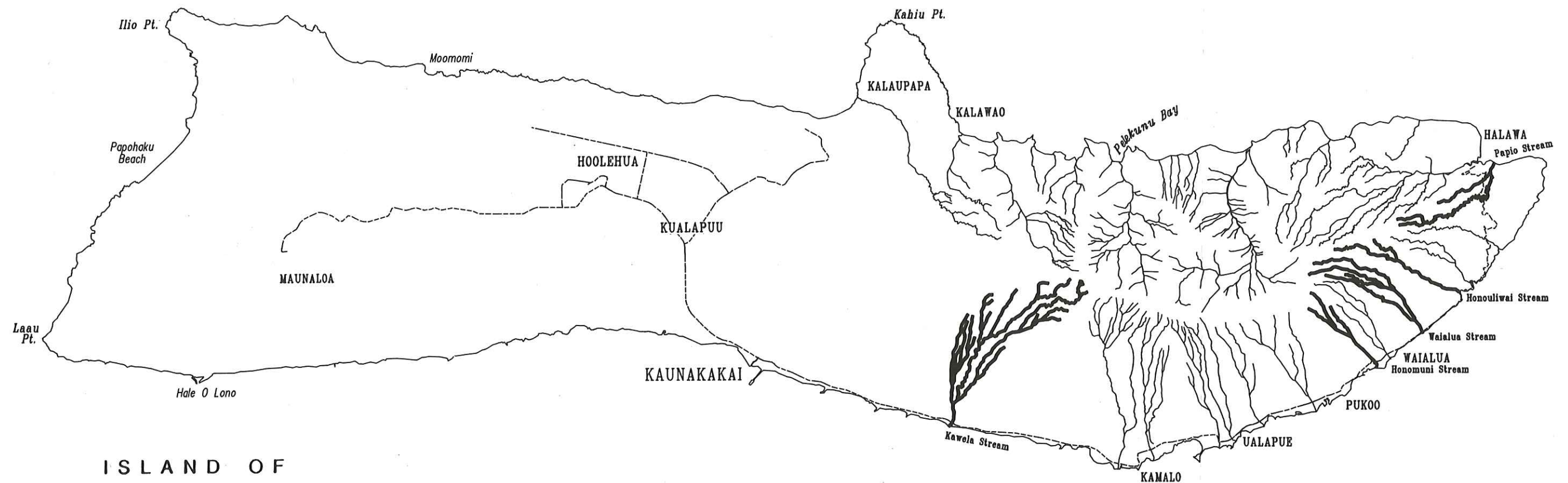
PRIORITY 1 & 2 SPECIAL STREAMS



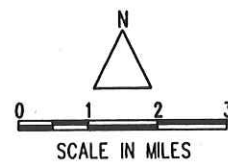
Prepared by the Office of State Planning on the State of Hawaii's GIS, September, 1992. Perennial streams were identified by the Hawaii Stream Assessment, 1990. The criteria for identifying Special Streams may be found in the State Land Use District Boundary Review reports. Base maps are from USGS Digital Line Graphs (DLG), 1983. To be used for graphic purposes only.

Figure 32

PRIORITY 1 & 2 SPECIAL STREAMS



ISLAND OF MOLOKAI



Prepared by the Office of State Planning on the State of Hawaii's GIS, September, 1992. Perennial streams were identified by the Hawaii Stream Assessment, 1990. The criteria for identifying Special Streams may be found in the State Land Use District Boundary Review reports. Base maps are from USGS Digital Line Graphs (DLG), 1983. To be used for graphic purposes only.

- Priority 1 or 2 Special Streams
- Perennial Streams
- Major Roads

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

portions of some streams may be dry during parts of the year, aquatic biologists are finding *Lentipes concolor* in the upper reaches which means that recruitment appears to be occurring even though the stream may be seasonally dry.

"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" (Devick, et al., 1991). 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.

10. Significant Scenic Resources

Scenic resources are vital for maintaining Hawaii's natural beauty and for enriching our quality of life. Because of their appeal to visitors, these resources are also vital to the continued health of the visitor industry. Significant scenic resources should be included in the Conservation District.

Significant scenic resources on Maui include Iao Valley, Haleakala Crater, Seven Sacred Pools, La Perouse Bay, the Keanae Peninsula, Waianapanapa Caves, Southeast Rift Cone and Crater, Iao Cliff and Valley and the Hana forest along Haleakala's northeast slope. Molokai's scenic resources include Mapulehu Mango Grove, Kapuaiwa Coconut Grove, Moomomi Sand Dunes, Pelekunu Cliff and Valley, Palaau Cliffs, and Halawa Cliff and Valley. Shipwreck Beach, Garden of the Gods, the Palikaholo sea cliffs and offshore islets, and the sea cliffs and islets off the western coastline are considered significant scenic resources on Lanai.

11. State Parks

The Department of Land and Natural Resources manages the State Park System. Presently, the system is comprised of 66 parks totalling almost 25,000 acres statewide. Maui County has ten (10) State Parks which includes the following:

- Halekii-Piihana Heiaus State Monument
- Iao Valley State Monument
- Kaumahina State Wayside
- Polipoli Spring State Recreation Area
- Puaa Kaa State Wayside
- Waianapanapa State Park
- Wailua Valley State Wayside
- Palaau State Park (Molokai)

The Department of Land and Natural Resources was consulted regarding the appropriate land use classification for State parks. The Department recommended that portions of the Halekii-Pihana Heiaus State Monument and Waianapanapa State Park which are in the Agricultural District be reclassified to the Urban District. However, these sites were considered of lower priority for consideration during the review.

12. Historic Sites

No special studies specifically addressing historic sites were conducted for the boundary review. In addition, a complete inventory of historic sites for the State is not available, with only about 4 percent of the land in the State having undergone archaeological survey.

The boundary review primarily relied upon the general public to identify historic sites which they felt merited reclassification to the Conservation District. The OSP then consulted with the State Historic Preservation Division of the Department of Land and Natural Resources as to the significance of the site and the appropriateness of reclassification to the Conservation District.

The Island of Maui has 34 sites on the Hawaii Register of Historic Places and 18 sites on the National Register of Historic Places. These sites include the Lahaina Historic District, Hale Pai, the Crater Historic District, and various heiaus. These sites are adequately protected as they are on the Hawaii Register.

Molokai has 19 sites on the Hawaii Register and 7 sites on the National Register. These sites include Kalaupapa Leprosy Settlement, Kipapa Fishpond, and Ahina Heiau. Lanai has two historic sites which are placed on both the Hawaii and National Registers. The two sites are Puupehe Platform and Kealiakapu Complex-Kaunolu Village. These sites are also adequately protected as they are on the Hawaii Register.

In addition to those sites listed on the Historic Registers, there are hundreds of other significant sites listed on the DLNR's State Historic Preservation Division's inventory of historic places. Thousands of other historic sites are expected to be present although they have yet to be identified.

13. Game Management Areas

Game management areas provide recreational value, watershed protection and natural and open space areas. Most of the game management areas in Maui County are located in the Conservation District. For those areas located in the Agricultural District, the general rule was to keep them in their existing classification unless some other characteristic or physical resource warranted reclassification to the Conservation District (i.e., high watershed value).

a. Island of Maui

The majority of game management areas on Maui are located in East Maui on the south, east, and northeast slopes of Haleakala. These areas span from the coastline to the bottom edge of Haleakala National Park. Most of

these East Maui game management areas are within the Conservation District. Some areas, at Kipahulu for example, are in the Agricultural District. Game management areas in West Maui are in the West Maui Mountains and appear to be entirely within the Conservation District.

b. Island of Molokai

On Molokai, game management areas are located in the central and eastern portions of the Island. The majority of the acreage is in the Conservation District, although a substantial area in central Molokai mauka of Umipaa is in the Agricultural District.

c. Island of Lanai

The entire half of Lanai, west of Lanai City, is a game management area. The area encompasses primarily Conservation and Agricultural lands, though a portion of the Rural District is included at Halulu.

14. Open Space and Natural Areas

Open space areas act as buffers between communities and provide an aesthetic quality to the landscape. In Maui County, sugarcane and pineapple fields are in abundance, serving dual purposes as both agricultural industries and large open space areas. In Kahului and the Maalaea-Kihei areas, Conservation District lands at Kanaha and Kealia Ponds provide open space in the midst of urbanized areas. On Lanai, the Conservation lands that surround Lanai City offer scenic views for residents.

An assessment was undertaken of lands within the Agricultural District in Maui County which holds open space value. These areas are identified in the report, Assessment of State Agricultural District Lands Having Open Space Value (Maui County), which is on file at the OSP. Although important, these areas were determined to be of lower priority during the current boundary

review. Other areas, such as watersheds and areas with rare or endangered species, were considered of higher priority.

15. Steep Slopes

The Island of Maui is formed by two major mountains connected by a central isthmus. The West Maui Mountains is the older mountain mass and therefore has the sharper topography. Steep slopes (over 20 percent), account for a large part of the land in West Maui. See Figure 33. Most of these lands fall in the Conservation District, although they do reach down into the Agricultural District as well. Haleakala is the second and younger mountain mass on the Island. Because of the relative youth of eastern Maui, steep slopes are not as prevalent, occurring primarily on the south slopes beginning at approximately the 3,000-foot level. Steep slopes also occur in the valleys on the north face of Haleakala. Like West Maui, most of the steep slopes on this half of the Island are in the Conservation District, with bands of steep slope reaching down into the Agricultural District.

On Molokai and Lanai, lands with slope greater than 20 percent are primarily found in the eastern halves of the Islands. (See Figure 34 and Figure 35). On Lanai, steep slopes also exist in the Naupaka area on the western coast. The vast majority of steep slope lands on Molokai and Lanai are in the Conservation District.

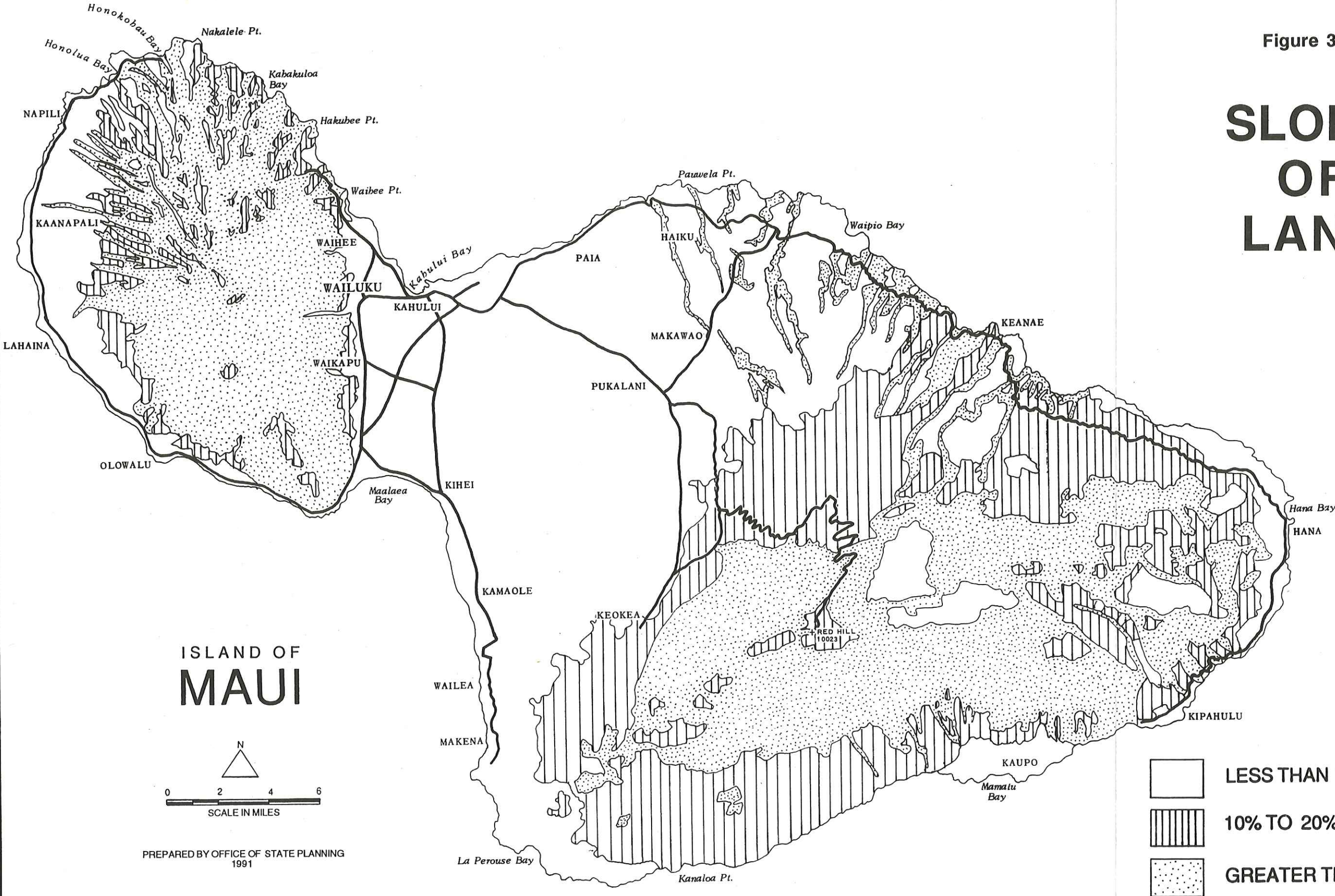
Although steep slopes are a standard for inclusion into the Conservation District because of safety concerns, no recommendations based solely on steep slopes were advanced for Maui County. However, some recommended sites have steep slopes along with other Conservation attributes.

16. Other Uses

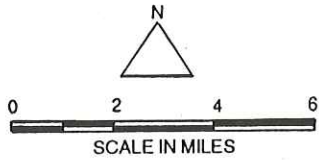
The Conservation District in Maui County also encompasses the Waiehu Golf Course. This is an 18-hole municipal golf course north of Wailuku.

Figure 33

SLOPE OF LAND



ISLAND OF
MAUI



PREPARED BY OFFICE OF STATE PLANNING
1991

- LESS THAN 10% SLOPE
- 10% TO 20% SLOPE
- GREATER THAN 20% SLOPE

Source: U.S. Geological Survey Map

SLOPE OF LAND

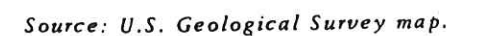
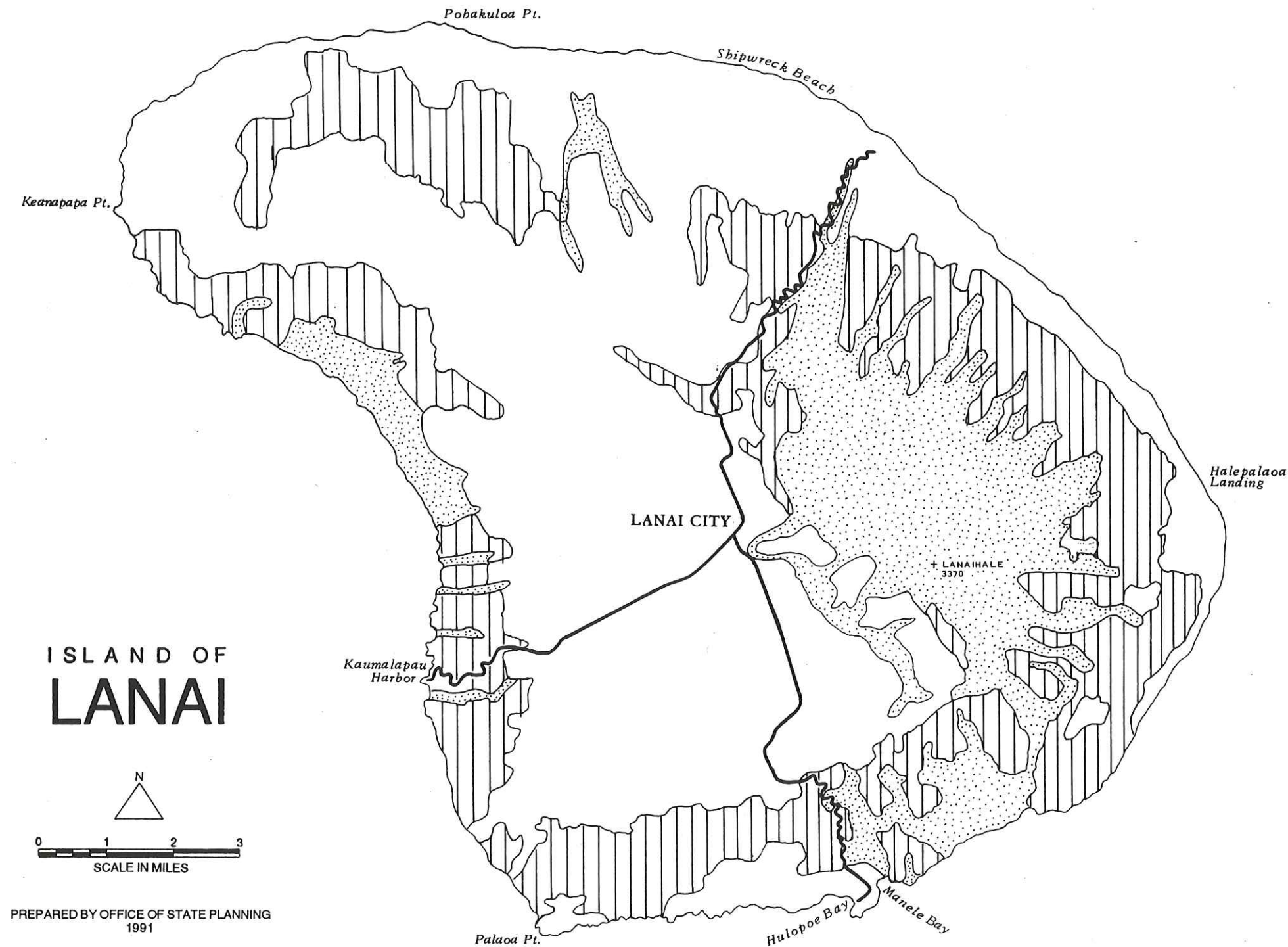
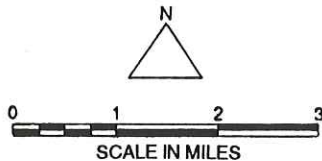


Figure 35


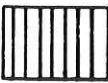
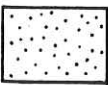
SLOPE OF LAND



ISLAND OF
LANAI



PREPARED BY OFFICE OF STATE PLANNING
1991

-  LESS THAN 10% SLOPE
-  10% TO 20% SLOPE
-  GREATER THAN 20% SLOPE

Source: U.S. Geological Survey Map

17. Conservation District Issues

There are four other important areas of statewide concern that warrant conservation land management and protection. These areas address: 1) the shoreline; 2) perennial streams; 3) anchialine pools; and 4) fishponds.

a. 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 to 40 feet inland from the shoreline. These setbacks can be increased through County rule changes. 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 the responsibility for increased shoreline setbacks rests with the County governments.

b. Perennial Streams

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. See Figure 27 and Figure 28.

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 recommendations in this report.

The inclusion of these selected streams does not suggest that the rest of Hawaii perennial streams or the urbanized sections of 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 because to do so statewide would have potentially 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 100 feet extending from both sides of the stream bank in the Agricultural District and 10 feet in the Urban and Rural District would serve to provide a buffer to protect streams. Corridors such as these have been established in States, Counties and municipalities nationwide for river protection and should be considered at all levels of Hawaii's government.

c. 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.

d. Fishponds

Protection of fishponds particularly on Molokai was raised as an issue warranting consideration during the boundary review. However, fishponds were not studied during the review and further assessment is needed.

18. Analysis of Conservation Lands

The focus of this Five-Year Boundary Review was on identifying areas not currently in the Conservation District which contain conservation resources, and warrant reclassification to the Conservation District. The following guidelines for Maui County were used to identify and recommend lands appropriate for reclassification to the Conservation District during the Five-Year Boundary Review. These land areas include:

1. Watershed and water recharge areas identified in the Watershed Protection Study (University of Hawaii Water Resources Research Center, 1991). An area in East Maui is being recommended pursuant to the Watershed Study.
2. Public and private natural areas including National Parks

(Kalaupapa National Historical Park), U.S. Fish and Wildlife Refuges (portions of Kakahaia Fish and Wildlife Refuge), Natural Area Reserves (LaPerouse Bay/Ahihi-Kinau) and Nature Conservancy Preserves (Waikamoi and Moomomi).

3. Areas containing native ecosystems and rare species meeting one or more of the following criteria:

- relatively intact native forest;
- rare or endangered plants or forest birds in abundance or relatively high concentrations;
- native plant species in abundance or relatively high concentrations in areas which have watershed potential, steep slopes or poor soils; and
- areas that are an important part of a critical core area for protection of endangered forest bird habitat.

These areas include Kekaalaau, a portion of Waikamoi Preserve, Puu O Kali, Kaapahu, La Perouse Bay/Ahihi-Kinau NAR, Moomomi Preserve, Moomomi Dunes, Kaunakakai Gulch, Kamiloloa-Makakupaia, and the Northeast and Southeast Coast and Slopes of Lanai.

4. Special Streams (identified in the Hawaii Stream Assessment) meeting the criteria for reclassification according to stream experts.

5. Wetlands identified for protection and which are important to the recovery of endangered waterbirds as determined by the State Conservation Lands Functional Plan, State Recreation Functional Plan, Hawaiian Waterbirds Recovery Plan, or the Hawaiian Wetlands National Wildlife Refuge Complex Master Plan, or as recommended by DOFAW, DLNR, or USFWS. In Maui County, these include Kealia Wetlands,

Paukukalo Wetlands, Waihee Wetlands, Kakahaia Wetland, Umipaa Wetland, and Paialoa Pond and Wetlands.

6. Beaches or coastal areas recommended by DLNR having high statewide or island wide significance for swimming (Shipwreck Beach area).
7. Significant scenic resources identified primarily through public input or by state agencies and assessed by staff (Palaau Clifftops).
8. Historic sites identified through public input and confirmed by DLNR. These sites include Moomomi Preserve and Wailau Trail/Iililiopae Heiau.
9. Open Space and Natural Areas (Kealia Pond area).
10. Areas identified as Conservation in Community Plans which are a logical extension of the Conservation District.

An assessment of lands which should be taken out of the Conservation District was not undertaken during the review. The above criteria are not intended to be used to identify lands which, lacking one or more of these criteria, should be taken out of the Conservation District.

CHAPTER III

**POLICIES TO GUIDE
STATE LAND USE DISTRICT
BOUNDARY REVIEW**

III. POLICIES TO GUIDE STATE LAND USE DISTRICT BOUNDARY REVIEW

As a result of the baseline studies, public input and a review of district boundaries on all the Islands pursuant to criteria in the Land Use Law and State and County plans and policies, the following policies were developed to guide land use decision-making:

1. The Urban District shall include sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection. Urban growth is directed to specific areas in order to (1) reduce public costs by discouraging scattered development; (2) make maximum use of existing and planned infrastructure; (3) give priority to the development of areas contiguous to existing urban areas; and (4) to avoid development, to the extent possible, of important and unique agricultural lands, areas with high conservation value and areas where rural communities and lifestyles should be maintained. State and County plans have been considered in the designation of urban areas.
2. Sufficient agricultural lands shall be retained in the Agricultural District to assure the viability of the sugar cane and pineapple industries and foster the growth of diversified agriculture. The greatest possible protection shall be given to lands with a high capacity for intensive cultivation. Important agricultural land shall be maintained in the Agricultural District unless reclassification provides overriding public benefits. Lands shall also be maintained in the Agricultural District to provide open space, greenbelts and a buffer between urban communities.
3. Important conservation resources, including but not limited to watershed and forest reserves; areas necessary for conserving endemic plants, fish and wildlife including those which are threatened or endangered; wetlands; beaches and coastal areas; special streams; scenic resources; historic and archaeological resources; parklands; wilderness areas; and recreation resource areas; open space and natural areas shall be protected within the Conservation District. In addition, areas with steep slopes and natural hazards which may cause harm to life and property shall be included in the Conservation District.

Maui County Policies

1. There are sufficient lands in the Urban District in Maui County to accommodate population and economic growth needs to 2000. However, modest additions to the Urban District are recommended. These include expansion of the Urban District at the Puunene Sugar Mill, Paia Sugar Mill, and the Doris Todd Memorial School sites, and the reclassification of the Wainee affordable housing site, or alternatively, the Puukolii affordable housing site.
2. The continued viability of sugar operations in Central and West Maui should be supported.
3. Support diversified agricultural activities by providing sufficient land for their operations. Agricultural lands shall be maintained in Makawao, Pukalani and Kula to promote diversified agriculture. Taro farming shall be encouraged at Waihee and Keanae.
4. Protect watershed and water recharge areas through reclassification to the Conservation District. The East Maui Watershed Area should be included in the Conservation District. The West and East Maui Mountains shall be maintained in the Conservation District to protect their watershed, scenic and recreational values.
5. Maintain native forests, endangered bird habitats and rare and endangered ecosystems in the Conservation District. Expand the Conservation District to include areas such as the Waihee dunes and shorelines, Kekaalaau, Puu O Kali, and Kaapahu on Maui, and Ilio Point to Moomomi on Molokai.
6. Protect important wetlands such as Kealia, Paukukalo, Umipaa, Kakahaia, Paialoa Pond and Wetlands, Waihee Wetland, Olai Pond and Paniaka Pond through Conservation designation.
7. Protect streams and stream corridors.

8. Protect areas with heritage resources, including rare and endangered species habitat, native forests, historic, archaeological and cultural resources, and open space.
9. Discourage development in areas with steep slopes or areas prone to tsunamis, earthquakes and subsidence, erosion and flooding, or require mitigating measures. Consideration should also be given to the threat of storm waves, high winds, and heavy rains associated with tropical hurricanes.

Regional Policies

1. Island of Maui

- a. Provide for future residential growth in Kahului, Wailuku, Waiehu, Waikapu, Lahaina and Kihei-Makena.
- b. The following areas are designated as secondary support communities, providing housing for the County's work force - Makawao, Pukalani, Kula and Paia.
- c. Maintain Hana as a rural community with limited resort use consistent with the lifestyle of the community.

2. Island of Molokai

- a. No reclassifications to the Urban District are recommended during the boundary review. However, future resort expansion should be directed to Kaluakoi and future moderate residential expansion allowed at Maunaloa and Kaunakakai.
- b. Maintain lands in the Agricultural District to promote diversified agriculture.
- c. Reclassify Urban lands at Ualapue to Rural.
- d. Maintain the river valleys and mountains of East Molokai, from Waialeia to Halawa Valleys in the Conservation District for their

ecological, scenic and recreational values.

- e. Protect the Moomomi dunes as a fragile environmental resource.

3. Island of Lanai

- a. Direct resort development to Manele and Koele.
- b. Assure that the phasing out of pineapple operations takes place gradually and in a manner which causes the least disruption to Lanai's people and environment.
- c. Promote diversified agriculture to maximize use of State Agricultural District lands.
- d. Protect the Central Lanai aquifer which is the Island's major water source by maintaining it within the Conservation District.

CHAPTER IV

FINDINGS

IV. FINDINGS

A. WAILUKU-KAHULUI

1. Urban and Rural Districts

The existing Urban District include the towns of Wailuku and Kahului, the communities of Waihee, Wailuku Heights, Waikapu and Puunene and the coastal area between Kahului and Paia. The Rural District includes Waiehu, Waihee Valley and Kahakuloa.

The Wailuku-Kahului planning region shall continue to serve as the Island's major civic, business, and cultural center consistent with the policies expressed in the Community Plan.

There are adequate lands to meet urban growth needs to 2000 with an additional 612 acres available to meet needs beyond the year 2000. Infrastructure constraints exist with respect to water availability and wastewater treatment facilities.

Although there are sufficient Urban District lands in Wailuku-Kahului, the reclassification of 47 acres is recommended to allow for expansion of the Puunene Sugar Mill. The use of the property for mill related activities is not expected to adversely impact infrastructure system capacities.

At Kahului Airport, 210 acres are being recommended for reclassification to the Urban District to allow for extension of the runway and construction of additional airport facilities.

2. Agricultural District

The central isthmus of Maui is one of the most productive agricultural areas in the State. There are vast acreages of land planted in sugar cane and pineapple. In addition, macadamia nuts have been cultivated along the foothills of the West Maui Mountains. Sufficient lands should be maintained in the Agricultural District to assure the viability of the sugar cane and pineapple industries and to protect diversified agricultural activities.

Agricultural lands shall also be protected to provide open space and scenic views.

3. Conservation District

The Conservation District includes the West Maui Mountains, Kanaha Pond, the Kahakuloa Head and a coastal strip extending from Kahakuloa through Waiehu Golf Course.

Recommendations for additions to the Conservation District include the Paukukalo Wetlands and the dunes, wetland and shoreline areas of the former Waihee Dairy site. The land use changes for the former Waihee Dairy site are required under the conditions for the Decision and Order relating to the reclassification of the subject property to the Urban District.

Special Streams recommended for reclassification to the Conservation District include Kahakuloa, Makamakaole and Waihee.

Lands makai of Kahekili Highway at Waihee (approximately 108 acres) are largely unusable due to extreme slopes and promote scenic views along the coastal highway and provide open space value. This area meets the criteria for reclassification to the Conservation District. It is recommended for consideration during future boundary reviews.

B. KIHEI-MAKENA

1. Urban and Rural Districts

The existing Urban District stretches along the coast from Maalaea to Makena. Rural District lands are found at Waiakoa Homesteads and Makena.

Maalaea shall remain a small shoreline community and Kihei shall include residential, commercial and low-rise resort uses as called for in the Community Plan. Resort development shall be directed

to Wailea and Makena.

There are sufficient Urban lands in Kihei-Makena to meet urban requirements to 2000 with an additional 263 acres available to meet needs beyond 2000. There are infrastructure constraints in this planning area including water availability and wastewater treatment capacity. In the Kihei-Makena region, an 18.63 acre area at the Wailea Resort is being recommended for urbanization for expansion purposes. This area is designated for urban use in the Kihei-Makena Community Plan and a portion of the site is already in golf course use.

2. Agricultural District

The northern portion of the Kihei-Makena planning area lies within the Central Maui isthmus and is part of the Central Maui agricultural belt. These agricultural lands are dedicated to sugar cane cultivation and to a limited extent, pineapple cultivation (along the Maalaea foothills of the West Maui Mountains). Sufficient lands shall be maintained in the Agricultural District to assure the viability of the sugar cane and pineapple industries and to provide open space.

3. Conservation District

The Conservation District includes the slopes of Kealaloloa Ridge, portions of Kealia Pond, Puu Olai, Cape Kinau and the area east of La Perouse Bay.

Recommendations for additions to the Conservation District include portions of Kealia Wetland currently in the Agricultural District and a Special Stream, Waikapu.

A portion of the Ahihi-Kinai Natural Area Reserve extends into the Agricultural District and is recommended for reclassification to Conservation. The Kihei-Makena Community Plan designates this area as Park.

C. LAHAINA

1. Urban and Rural Districts

Urban designated lands are located in shoreline areas around the resorts from Kapalua to Kaanapali. Lahaina Town and a band stretching mauka to Lahainaluna High School are also in the Urban District.

Future resort development is directed to the planned resort areas of Kaanapali and Kapalua consistent with the Community Plan. Urban infill shall occur at Lahaina and Honokowai-Napili.

Although the Urban Land Requirements Study projects a need for an additional 465 acres of Urban land in the planning area by 2000, this figure does not take into account the recently approved urban reclassification of lands for the HFDC's Lahaina Master Plan project. Infrastructure deficiencies exist with respect to highways, water systems and wastewater treatment facilities.

The site of Amfac/JMB Hawaii's proposed Wainee Affordable Housing Project, or alternatively, its Puukolii site, is recommended for reclassification to the Urban District.

2. Agricultural District

The Agricultural District includes the sugar cane lands of Pioneer Mill and the pineapple lands of Maui Land and Pineapple in the north. Sufficient agricultural lands shall be maintained in the Agricultural District to maintain the viability of these industries.

3. Conservation District

The Conservation District includes the upland areas of the West Maui Mountains. Two bands of Conservation District lands occur along the coast; the first from Hawea Point northward including Honolua and Honokohau Bays; the second from just north of Launiupoko Park to Maalaea.

A 280 acre triangular parcel bordered on two sides by the West Maui Forest Reserve at Kekaalaau is recommended for reclassification to the Conservation District. It contains four types of native natural communities and possesses watershed value.

One Special Stream, Honokohau, is recommended for reclassification to the Conservation District.

D. MAKAWAO-PUKALANI-KULA

1. Urban and Rural Districts

The Urban and Rural Districts are found in the communities of Makawao, Pukalani and Haiku.

Makawao and Pukalani shall remain primarily suburban and rural communities while Kula shall maintain its rural and agricultural character consistent with the County Community Plan.

The planning area has sufficient Urban lands to meet population and economic development needs to 2000 with an additional 223 acres available to meet needs beyond 2000. There are infrastructure constraints including roads, water systems and wastewater treatment. No Urban District reclassifications are recommended.

2. Agricultural District

Diversified agriculture is a major contributor to the economy of this planning area. Agricultural lands should be maintained in the Agricultural District to support diversified agriculture and provide open space.

3. Conservation District

The Conservation District includes the higher elevation lands of Haleakala Mountain.

The following areas are recommended for inclusion into the

Conservation District: Waikamoi Preserve and Puu O Kali which contains one of the best remaining examples of lowland dry vegetation in Maui.

In addition, the Auwahi-Kanaio area was identified as containing significant biological resources and is recommended for consideration for future inclusion in the Conservation District (after additional flora and fauna surveys have been undertaken).

E. PAIA-HAIKU

1. Urban and Rural Districts

The existing Urban District includes lower and upper Paia and stretches along the coast from lower Paia to Kuau. The communities of Haiku and Kuiaha include Urban and Rural District lands.

Paia shall remain the population and employment center of the planning area with Haiku acting as a second but predominantly rural population center consistent with the County Community Plan.

There are sufficient Urban lands to meet urban growth needs to 2000 with an additional 57 acres available to meet needs beyond 2000. Infrastructure deficiencies exist with respect to roads, sewerage and water systems.

The Paia-Haiku Community Plan has designated approximately 29 acres adjacent to the existing Urban lands at Paia as Single Family Residential. These lands are currently in the State Agricultural District. A&B Hawaii, Inc. has proposed reclassification of 15 acres at this site for single family residential use and potential expansion of existing school facilities. Given the scale of the proposed use, the development's impacts upon other infrastructure systems and public services do not appear to be adverse. Reclassification of 29 acres designated for Single Family Residential on the Community Plan is recommended.

The Community Plan also designates 28 acres next to the existing Urban District encompassing the Paia Sugar Mill as Heavy Industrial. The lands are in the existing Agricultural District. A&B has requested reclassification of 15.5 acres for expansion of the Sugar Mill. Reclassification to the Urban District is recommended.

2. Agricultural District

Agriculture is the predominant economic activity in the planning area and includes sugar cane, some pineapple, small truck farms and cattle raising. Similar to policies for the other districts, important agricultural lands should be maintained in the Agricultural District to insure the viability of the sugar cane and pineapple industries and to promote diversified agriculture. Lands should also be retained in the Agricultural District for their scenic and open space values.

3. Conservation District

The Conservation District includes a coastal strip which begins past the Urban District at Kuau and extends through the planning area. It also includes the Koolau and Makawao Forest Reserves.

The East Maui Watershed Area is recommended for inclusion into the Conservation District for its watershed value.

F. HANA

1. Urban and Rural Districts

There are currently Urban and Rural District lands in Hana and Rural District lands at Hamoa, Mokae, Kakio, along the coast in the vicinity of Oahu Point and Kulepeamo Point and at Muolea and Koali.

Hana shall remain primarily rural in character with small scale resort use in the vicinity of Hana Town.

There is a slight need for additional urban lands to meet

requirements to 2000 (15 acres).

There are infrastructure constraints to further development including roads, water systems and wastewater treatment facilities. For this reason, reclassification of lands to the Urban District is not recommended.

2. Agricultural District

Agricultural District lands should be maintained to promote diversified agricultural activities and support the rural lifestyle of residents of the planning area.

3. Conservation District

The Conservation District includes the upland forest reserve areas, gulches and streams and a coastal strip which is interrupted in some areas by Urban, Rural or Agricultural District lands.

An area at Kaapahu surrounded by Conservation District lands adjacent to Kipahulu Valley is recommended for inclusion into the Conservation District. Kaapahu contains high quality montane wet forest with hapuu understory. It is perhaps the best example of koa and ohia forest on Maui outside of Kipahulu Valley.

Special streams are also recommended for inclusion into the Conservation District: Makapipi, Kapia, Kawakoe, Waieli, Kakiweka, Hahalawe, Puaaluu, Kukuiula, and Alelele.

In addition, two areas which are designated Open Space on the Hana Community Plan but are in the State Rural and Urban Districts are highlighted for future attention. The first area is part of a flat peninsula along the north side of Hana Bay. It is undeveloped and heavily vegetated to form a scenic backdrop to the bay. The second area is an oceanfront parcel makai of Hana Highway which is within the Hana Community Plan's View Enhancement corridor. It offers scenic open space vistas to the

ocean. However, the parcels are 21 and 27 acres in size and are of lower priority during the current review.

G. MOLOKAI

1. Urban and Rural Districts

Urban District lands include the resort area of Kaluakoi and the communities of Kaluakoi, Mauna Loa, Kualapuu, Kalae, Kalaupapa, Kaunakakai and Kamiloloa. It also includes areas along the coast including Ualapue. There are small pockets of Rural lands along the coast and a large Rural area near Pukoo.

It is intended that Molokai remain primarily rural and agricultural in character with resort development directed to Kaluakoi. On the east end of Molokai, land uses shall promote and be compatible with traditional Hawaiian lifestyles.

There is a surplus of 537 acres needed to meet urban requirements to 2000. There are infrastructure constraints to further development including roads, water systems and wastewater treatment facilities.

No reclassification of land to the Urban District is recommended. Reclassification of a portion of the Urban designated lands at Ualapue to the Rural District is recommended to establish uniformity and consistency with the existing rural character of the surrounding east Molokai community.

2. Agricultural District

Agricultural District lands on Molokai shall be maintained to promote diversified agriculture, provide open space and to retain a rural and agricultural lifestyle on the Island.

3. Conservation District

The Conservation District includes areas along the coastline and the mountains, ridges and valleys of northeast Molokai.

The following areas are recommended for reclassification to the Conservation District because of their biological significance: Moomomi Preserve and Dunes, Kalaupapa National Historical Park and Kauhako Crater.

The following wetlands are recommended for inclusion into the Conservation District: Kakahaia National Wildlife Refuge and Paialoa Pond and Wetlands. Umipaa Wetland is also recommended for reclassification to the Conservation District.

An area in east Molokai, approximately midway between Kaluaaha and Pukoo is recommended for reclassification from the Agricultural to Conservation District. It contains the Ililiopae Heiau and Wailau Trail and is characterized by a rugged and mountainous terrain. The clifftops on either side of Palaau State Park are considered necessary to enhance the scenic value of the cliffs below and is also recommended for reclassification.

In addition, the following areas are suspected to contain significant biological resources and are recommended for inclusion into the Conservation District pending the completion of flora and fauna surveys: lands along the lower boundary of the southeastern Conservation District including the Kaunakakai Gulch system and Kamiloloa-Makakupaia.

Moomomi Preserve and the Moomomi Dunes are recommended for inclusion into the Conservation District. Waiakuilani Gulch is recommended for Conservation reclassification consistent with its Community Plan designation of Conservation.

A public request to reclassify the Kawela East and West Gulches and the central ridge formed by the gulches from the Agricultural District to the Conservation District because of its scenic and open space values was also considered. The area is characterized by steep and mountainous terrain and reported to have historic

significance. However, there are many other areas along the band of Agricultural District land in southeastern Molokai which contain similar characteristics; that is, steep slopes, scenic and open space value. Further survey work is required for this area and reclassification is not recommended at this time.

Special streams recommended for inclusion into the Conservation District include Honouliwai, Honomuni, Kawela, Waialua, Papio, Piinaau and Wailuanui.

H. LANAI

1. Urban and Rural Districts

The Urban District includes Lanai City and the areas surrounding Manele and Hulopoe Bays. In addition, Urban and Rural District lands run in an alternating band along the northeast and southern coastline of Lanai. Kaumalapau Harbor and the surrounding area are in the Urban and Rural Districts. There are also Rural District lands north and adjacent to Urban District lands at Lanai City.

Future resort development is directed to the resort areas at Manele and Koele. Lanai City shall continue to serve as the primary commercial and residential area on the Island.

Lanai has sufficient Urban lands to meet urban requirements to 2000. In addition, there is a surplus of 1,169 acres available to meet needs beyond 2000.

Reclassification of lands to the Urban District is not recommended.

2. Agricultural District

Agricultural District lands on Lanai includes the central plateau area and a band along the northeast of the Island. The central area is largely planted in pineapple which is due to be phased out shortly. Alternative crops including oats, vegetables and other diversified agricultural crops are being raised. The band along the northeast

coast consists of rugged, steep and dry lands which were reported to have been used for cattle grazing at one time are currently not being used.

The Agricultural District lands on Lanai should be retained in the Agricultural District to support diversified agricultural activities and provide open space. The Agricultural District lands in northeast Lanai have open space value and contains native grassland and trees and rare plants. This area needs further survey work but does not appear valuable for agricultural use (i.e., steep slopes, poor soils, low rainfall) and is recommended for Conservation designation.

3. Conservation District

The Conservation District includes the steep watershed area above Lanai City and the sloping coastal area in the northwest (which is a large game management area) and west. There are also pockets of Conservation lands along the southern coastline.

Three areas along the south coast with open space value have been identified. However, immediate attention to these areas is not required at this time and they are of lower priority during the current State Land Use District Boundary Review.

The Lanai Community Plan designates Open Space areas within the State Rural and Urban Districts which are part of an undeveloped coastal corridor stretching along the northeast shoreline. The Open Space designation is designed to maintain the natural and open character of this region. The isolated character of this area, its distance from infrastructure and its potential to maintain natural and coastal resource values establishes a rational basis for considering their reclassification to the Conservation District.

However, there are some houses along the coast, as well as

possible kuleana lands. Therefore, a Rural designation may be appropriate for this area.

The Lanai Community Plan also designates as Open Space, areas in the Rural District along the northeast to southeast coast of Lanai. These undeveloped areas have been designated Open Space to maintain continuity with the adjoining Conservation District lands which band the coastal areas of this portion of the Island. Reclassification of these areas would provide for the long-term maintenance for the undisturbed open space character of this part of the Island which includes Shipwreck Beach.

Finally, a pocket of Rural land (which is designated Open Space in the Community Plan) is found in the Conservation District above Lanai City. This area, which appears to have steep slopes and is surrounded by Conservation District lands, should be considered for future reclassification to the Conservation District.

CHAPTER V
PRIORITY LISTING

V. PRIORITY LISTING

Given the large number of recommendations identified by the technical assessment, priorities for reclassification were established by OSP to optimize SLUC consideration and action on areas recommended for boundary amendment.

A. RECLASSIFICATIONS TO THE CONSERVATION OR AGRICULTURAL DISTRICT

Priority #1: These are areas that OSP will likely petition for in FY 1992-93 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. See Table 23.

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. See Table 24.

B. RECLASSIFICATIONS TO THE URBAN AND RURAL DISTRICTS

OSP 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, and the availability of manpower and financial resources. See Table 25.

C. DHHL LANDS

DHHL lands containing conservation resources 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. See Table 26.

All petitions for reclassification will require notification of the respective landowners. A preliminary compilation of land ownership information for each recommendation is presented in Appendix C.

Table 23

PRIORITY LISTING - PRIORITY 1 CONSERVATION AND AGRICULTURAL DISTRICT RECOMMENDATIONS

Island	Recommended for Action	Rec.	Acreage	Reasons for Recommendation
Maui	Makamakaole Stream	A to C	236.3	Abundance of native aquatic species.
Maui	Waihee River	A to C	148	Outstanding aquatic resources.
Maui	Paukukalo Wetlands	U to C	34	Wetland. Endangered water bird habitat.
Maui	East Maui Watershed Area	A to C	1271	Watershed, steep slopes.
Maui	Wailuanui Steam (State-owned portion)	A to C	50	Outstanding aquatic resources.
Maui	Kawakoe/Mokulehua and Kukuiula Streams	A to C	91	Outstanding aquatic resources.
Maui	Waieli, Kakiweka, Hahalawe, and Puaaluu Streams	A to C	320.7	Abundance of native aquatic species and presence of Lentipes (ooppu alamoo).
Maui	Alelele Stream	A to C	278	Abundance of native aquatic species.
Maui	Kaapahu ¹	A to C	795	High quality koa/ohia forest.
Maui	Addition to Kealia Wetland	A to C	615	Wetland. Endangered water bird habitat. Provides a buffer and transition zone between Kealia Pond and surrounding agricultural uses. Consistent with Community Plan Open Space designation.
Maui	Waikapu Stream	A to C	140	Recovery habitat, threatened and endangered birds, rare plants.

¹

Alternative options are under consideration for Kaapahu (1) reclassification into the Conservation District or (2) participation by the landowner in the State's Forest Stewardship Program (FSP) or Natural Area Partnership Program (NAP) in conjunction with a perpetual conservation easement. The NAP and FSP are State cost-sharing programs with a private landowner for ongoing enhancement of wildlife and reforestation and requires an approved management plan. A conservation easement is a legally binding agreement which may set restriction in the range of allowable uses.

Table 23 continued
PRIORITY LISTING - PRIORITY 1 CONSERVATION AND AGRICULTURAL DISTRICT RECOMMENDATIONS

Island	Recommended for Action	Rec.	Acreage	Reasons for Recommendation
Molokai	Papio Stream	A to C	151	Outstanding aquatic resources.
Molokai	Honouliwai Stream	A to C	249.6	Outstanding aquatic or riparian resources.
Molokai	Waialua Stream	A to C	375	Outstanding aquatic resources.
Molokai	Honomuni Stream	A to C	209	Outstanding aquatic resources.
Molokai	Paialoa Pond and Wetlands	A to C	31	Contains a wetland providing habitat for endangered Hawaiian stilts and indigenous black-crowned night heron.
Molokai	Kawela Stream	A to C	386	Outstanding aquatic resources.
Molokai	Kakahaia Wetland	A to C	16	National wildlife refuge for endangered water birds.
Molokai	Moomomi Dunes (non-DHHL portion) ²	A to C	202.5	Historical and archaeological importance. Area is considered to be part of the best remaining sand dune ecosystem in the main Hawaiian Islands.
² Alternative measures of protection for this site are under discussion with the landowner including a perpetual conservation easement.				

Table z4

PRIORITY LISTING - PRIORITY 2 CONSERVATION AND AGRICULTURAL RECOMMENDATIONS					
Island	Recommended for Action	Rec.	Acreage	Reasons for Reclassification	Additional Comments Regarding Priority 2 Recommendations ¹
Maui	Waihee Agricultural Area ²	U to A	22	Achieve consistency with Land Use Commission's Condition 3 contained in original Petition's Decision and Order.	D
Maui	Waihee Dunes ²	A to C	80	Endangered dwarf naupaka and uncommon plant communities. Potential archaeological resource. Protection of coastal resources.	D
Maui	Waihee Shoreline ²	A to C	10	Become consistent with the Community Plan designation of Agriculture.	D
Maui	Waihee Wetland ³	A to C	37	Endangered dwarf naupaka and uncommon plant communities. Potential archaeological resource. Protection of coastal resources.	D
Maui	Portion of Waikamoi Preserve	A to C	665	Contains native shrublands and forests providing habitat for three endangered forest birds and at least six rare plants. Nature Conservancy preserve.	C
Maui	Piinaau, Kapia and Makapipi Streams	A to C	168	Outstanding aquatic or riparian resources.	B
Maui	Wailuanui Stream (private-owned portion)	A to C	26	Outstanding aquatic resources.	B
Maui	La Perouse Bay/Ahihi-Kinau NAR	A to C	42	Natural Area Reserve.	C
Maui	Kekaalaau	A to C	240	Area contains four types of native natural communities and one of the last lowland virgin koa tracts in West Maui.	A
Maui	Honokohau Stream	A to C	87	Outstanding aquatic resources.	B
Maui	Kahakuloa Stream	A to C	3	Outstanding aquatic resources.	B

¹ Key to "Additional Comments Regarding Priority 2 Recommendations"

A - Further information needed.

B - Manpower/funding constraints.

C - Government or Nature Conservancy ownership with conservation objectives.

D - Covered under Land Use Commission Decision and Order.

² This is placed in the Priority 2 category since the landowner has agreed to file a petition to reclassify all land within the project area, makai of the 200-foot setback, into the Conservation District and to grant a conservation easement to the State of Hawaii and/or County of Maui for portions of the sand dune, lands within the Conservation District and within 200-feet of the shoreline, whichever is greater, and portions of land along Waihee Stream as specified in the Decision and Order.

³ Developer has proposed a wetlands management plan to protect and enhance the wetland.

Table 24 continued
PRIORITY LISTING - PRIORITY 2 CONSERVATION AND AGRICULTURAL RECOMMENDATIONS

Island	Recommended for Action	Rec.	Acreage	Reasons for Reclassification	Additional Comments Regarding Priority 2 Recommendations ¹
Molokai	Palaau Clifftops	A to C	565	To provide open space buffer to enhance the scenic and open space value of the adjoining cliffs.	B
Molokai	Wailau Trail/Iliiopae Heiau	A to C	200	The heiau is the largest on Molokai and considered the oldest on the island. The terrain is mountainous and rugged.	A
Molokai	Waiakuilani Gulch	A to C	332	Gulches contain native forests and shrublands. Also provides habitat for rare land snails.	A
Molokai	Kamiloloa-Makakupaia (portion)	A to C	761	Contains native forest and a rare ohai shrubland and other native shrub communities.	A
Molokai	Kaunakakai Gulch System (non-DHHL portion)	A to C	214	Steep slopes. Pockets of native vegetation. Sandalwood, wiliwili and koaia are present.	A
Molokai	Moomomi Preserve	A to C	808.5	Historical and archaeological importance. Area is considered to be part of the best remaining sand dune ecosystem in the main Hawaiian Islands.	C
Molokai	Kalaupapa NHP and Kauhako Crater (non-DHHL portion)	A to C	1,917	Consistency with designation as National Historic Park. Area contains a rare anchialine pool and a remnant native forest.	A

Table 24 continued
PRIORITY LISTING - PRIORITY 2 CONSERVATION AND AGRICULTURAL RECOMMENDATIONS

Island	Recommended for Action	Rec.	Acreage	Reasons for Reclassification	Additional Comments Regarding Priority 2 Recommendations ¹
Lanai	Rural Area in Northeast Mountains	R to C	86	Surrounded by Conservation land.	A
Lanai	Shipwreck Beach	R to C	160	Consistency with Lanai Community Plan designation of Open Space. Contains rare coastal vegetation, including the rare akoko. There are lithified dunes along the coast. Has significant scenic and recreational resource value.	A
Lanai	Northeast and Southeast Slopes	A to C	11000	Native grasslands, shrubland and native trees. Contains rare plants and the largest stand of Hawaiian cotton in the State.	A
Lanai	Southeast Coast	U to C	888 189	Consistency with Lanai Community Plan designation of Open Space. Contains rare coastal vegetation, including the rare akoko. There are lithified dunes along the coast.	A

Table 25

URBAN AND RURAL RECLASSIFICATIONS

Island	Recommended for Action	Rec.	Acreage	Reasons for Recommendation
Maui	Puunene Sugar Mill Expansion	A to U	47	Intended to meet mill expansion requirements. Urban designation would be consistent with the Wailuku-Kahului Community Plan.
Maui	Kahului Airport Expansion	A to U	210	Area is needed for airport expansion.
Maui	Paia Sugar Mill Expansion	A to U	16	Intended to accommodate mill expansion. Urban designation would be consistent with the Paia-Haiku Community Plan.
Maui	Paia - Doris Todd Memorial School	A to U	29	Proposed residential use. Adjacent to Urban District. Consistent with Paia-Haiku Community Plan.
Maui	Wailea Resort Infill	A to U	18.63	Site is designated for urban use in Kihei-Makena Community Plan and a portion of the site is already in golf course use.
Maui	Ohukai Subdivision	A to U	24.28	Area is proposed to conform the State land use designation to the existing use.
Maui	Wainee Affordable Housing Site	A to U	100	Area is targeted for a master-planned affordable housing community. Consistent with Community Plan designation.
Maui	Puukolii Affordable Housing Site	A to U	100	Area is targeted for a master-planned affordable housing community.
Molokai	Ualapue	U to R	203	Ualapue is a rural community. The Molokai Community Plan designates the majority of the area as Rural.

Table 26

DEPARTMENT OF HAWAIIAN HOME LANDS ¹				
Island	Recommended for Action	Rec.	Acreage	Reasons for Recommendation
Maui	Puu O Kali	A to C	1660	One of the best remaining examples of lowland dry vegetation on Maui. Seven rare plant species.
Molokai	Kalaupapa NHP and Kauhako Crater (DHHL portion)	A to C	488	Consistency with designation as National Historic Park. Area contains a rare anchialine pool and a remnant native forest.
Molokai	Kamiloloa-Makakupaia (DHHL portion)	A to C	135	Contains native forest and a rare ohai shrubland and other native shrub communities.
Molokai	Umipaa Wetland	A to C	160	Habitat for endangered Hawaiian stilts, migratory shorebirds and water birds, and the indigenous black-crowned night heron.
Molokai	Moomomi Dunes (DHHL portion)	A to C	680	Historical and archaeological importance. Area is considered to be part of the best remaining sand dune ecosystem in the main Hawaiian Islands.
Molokai	Kaunakakai Gulch System (DHHL portion)	A to C	1,183	Steep slopes. Pockets of native vegetation. Sandalwood, wiliwili and koaia are present.
¹ These areas have conservation resources. However, DHHL lands are not subject to the State Land Use Law (Hawaiian Homes Commission Act of 1920). Therefore, petitions will not be initiated for these area.				

CHAPTER VI

RECOMMENDATIONS
FOR
STATE LAND USE DISTRICT
BOUNDARY AMENDMENTS

VI. RECOMMENDATIONS FOR STATE LAND USE DISTRICT BOUNDARY AMENDMENTS

Based on the technical studies and evaluations conducted for the Five-Year Boundary Review, recommendations for State land use district boundary amendments have been identified. The recommendations, which are summarized in this Chapter, address policies set forth in Chapter 205, Hawaii Revised Statutes (Sections 205-2 and 205-17), the Objectives, Policies and Priority Guidelines of the Hawaii State Plan (HSP), and the respective Community Plans for the County of Maui. In addition, each recommendation has been assessed with respect to standards for determining district boundaries, as set forth in the Land Use Commission (LUC) Rules.

A. ISLAND OF MAUI

1. Waihee Dunes, Shoreline and Wetland (127 Acres; A to C) and Waihee Agricultural Area (22 Acres; U to A)

The lithified Waihee Sand Dunes and surrounding wetland area are located in Waihee, within the parcel formerly used for Wailuku Agribusiness Company, Inc.'s Waihee Dairy. See Figure 36.

The area includes dunes, coastal dry herblands/shrublands, and fresh/brackish wetlands surrounding a federally-designated wetland of 20+ acres (when flooded). This is the last remaining unconsolidated sand dune on Maui in a relatively unaltered state. It contains a complement of uncommon plant communities and an endangered dwarf naupaka (*Scaevola coriacea*). The wetland provides habitat for endangered Hawaiian stilts and coots, as well as migrant bird species and the indigenous black-crowned night-herons.

The site holds significance as a potential archaeological resource. The sand dune also provides a significant element of the natural visual and environmental setting for this region of the Island. Its proximity to the broad expanse of macadamia nut orchards, the Waihee coastline and the Waihee Stream enhances its value as an open space resource which deserves protection.

In addition, the area has extreme slopes and therefore is largely unusable for agricultural, urban or rural usage. However, it does provide open space value adding to the open expanse of the subject area.

The Waihee Agricultural Area being recommended for reclassification from the Urban to Agriculture District encompasses an area originally planned for roadway, clubhouse, parking and guest cottage uses. See Figure 36. After changes to the area's development plans, these facilities have either been relocated or eliminated, thus removing the basis for an Urban designation.

Waihee Oceanfront Hawaii, Inc. is proposing to develop a golf course in the area which will necessitate the alteration of Waihee Wetland. As part of the Waihee Oceanfront Hawaii, Inc. request to the Land Use Commission to reclassify lands to allow its golf course, several conditions relating to the location of the golf course were included in the action. These are Condition Nos. 3, 4, 5, 6 and 8, which are listed below:

3. Petitioner shall establish a flag lot for the clubhouse area and access roadway, the metes and bounds of which shall be established subsequent to the completion of the golf course. Petitioner shall file a new application reclassifying the remainder of the Urban District, between the flag lot and the Conservation District from the Urban to Agricultural designation.

4. There shall be no golf course construction in the Conservation District or within 200 feet of the shoreline, whichever is greater.

5. Subsequent to construction of the golf course, Petitioner shall file a new application reclassifying all land within the Project Area, makai of the 200 foot setback, into the Conservation District.

6. There shall be no golf course construction in the wetlands unless a Corps of Engineers 404 permit is obtained. Furthermore, Petitioner's 404 permit application for any proposed wetland reconfiguration shall be filed with the Army Corps of Engineers before a Special Management Area Use Permit application is filed with the County of Maui.

* * *

8. Petitioner shall grant a conservation easement(s) to the State of Hawaii and/or the County of Maui for the following areas: that portion of the sand dunes not developed for the golf course; and lands within the Conservation District and within 200 feet of the shoreline, whichever is greater; and that portion of land along Waihee Stream not developed for the golf course.

This recommendation has been placed into the Priority #2 category since the landowner has agreed to file a petition to reclassify all land within the project area, makai of the 200-foot setback, into the Conservation District and to grant a conservation easement to the State of Hawaii and/or County of Maui for portions of the sand dune, lands within the Conservation District and within 200 feet of the shoreline, whichever is greater, and portions of land along Waihee Stream, as specified in the Decision and Order.

Conformance With Chapter 205, HRS:

Section 205-2(e): This proposed reclassification to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas, conserving indigenous and endemic plants, fish and wildlife, including those which are threatened and endangered, and including open space areas which would maintain or enhance the conservation of natural or scenic resources. The subject area provides a habitat for the Island's largest population of *Scaevola coriacea*, a rare coastal naupaka which is a federally listed

endangered plant as well as other uncommon plant communities, endangered Hawaiian stilts and coots, migrant bird species and the indigenous black-crowned night-heron. Its location with respect to the surrounding scenic areas enhances its value as an open area resource.

Section 205-17(3)(A) and (B): The proposed reclassification of the Waihee Dunes, Shoreline and Wetlands from the Agricultural District to Conservation reflects favorably upon areas of State concern set forth under these sections. These include the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical or natural resources.

Section 205-17(3)(C): The proposed reclassification of the Waihee Agricultural Area from the Urban District to Agricultural will support the maintenance of other natural resources relevant to Hawaii's economy, including, but not limited to, agricultural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-7(a)(2) and (b)(6), Objective and Policies for the Economy - Agriculture: The proposed reclassification of the Waihee Agricultural Area conforms to the HSP objective and policy for the agricultural economy which address growth and development of diversified agriculture throughout the State by assuring the availability of agriculturally suitable lands to accommodate present and future needs.

Section 226-11(a)(2) and (b)(6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification of the Waihee Dunes, Shoreline and Wetlands conforms to the HSP objective and policy for the physical environment, specifically, planning for the State's physical environment be directed toward the effective protection of Hawaii's unique and fragile environmental resources and

encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a) and (b)(1), (3) and (4), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification of the Waihee Dunes, Shoreline and Wetlands conforms to the HSP objective and policies relating to the enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources by promoting the preservation and restoration of significant natural and historic resources, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features, and protecting those special areas that are an integral and functional part of Hawaii's ethnic and cultural heritage.

Section 226-103(d)(1), Economic Priority Guidelines: The proposed reclassification of the Waihee Agricultural Area conforms to the HSP Priority Guidelines to promote the growth of diversified agriculture by identifying, conserving, and protecting agricultural lands of importance.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the Waihee Dunes, Shoreline and Wetlands conforms to the HSP Priority Guidelines for regional growth distribution and land resources utilization with respect to identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, open space and natural areas, historic and cultural sites, areas particularly sensitive to reduction in water quality, and protecting and enhancing Hawaii's shoreline, open spaces and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards for determining Conservation District boundaries. These standards relate to the inclusion of lands necessary for the conservation, preservation and enhancement of scenic, cultural, historic or archaeological sites and the inclusion of lands necessary for conserving natural ecosystems of endemic plants, fish and wildlife. In addition to providing a habitat for uncommon and endangered plant and bird species, it also is an area of potential archaeological resource and an open space resource.

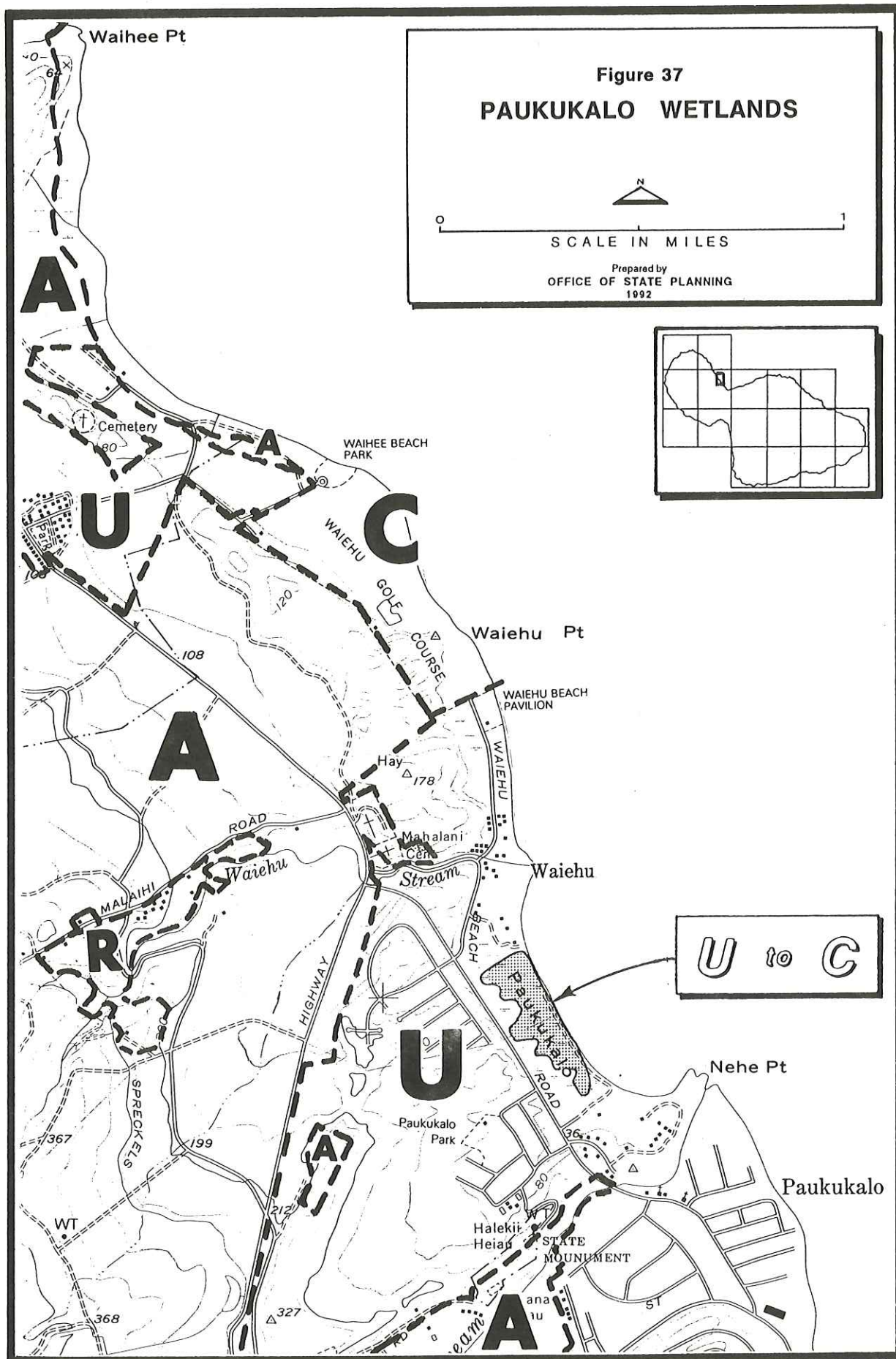
Conformance With County Plans:

The Wailuku-Kahului Community Plan designates the subject area as Project District 4. Included in the objectives of this project district is to provide for the preservation of archaeological sites and existing sand dune features in the former dairy and beach areas.

2. Paukukalo Wetlands (34 Acres; U to C)

The Paukukalo Wetlands are located along the Waiehu Coastline, just north of Iao Stream's outlet to the ocean. See Figure 37. The property is bounded along its mauka extent by Waiehu Beach Road. The wetlands, encompassing areas near the shoreline, totals approximately 13 acres and provide a habitat for endangered water birds. Because of its low elevations and proximity to the coastline, the site is within the coastal high hazard area, as designated by the Flood Insurance Rate Maps. The wetlands are designated as Zone V23, areas of a 100-year coastal flood with velocity (wave action), and Zone A4, areas of a 100-year flood.

A minimum 100-foot buffer zone around the wetland is recommended for a total of 34 acres to be reclassified. Studies have found that buffers are effective in reducing the amount of pollution affecting a waterway (Klein 1990). In addition, maintaining a certain amount of land in Conservation around the wetland would provide for regulating of other uses, e.g. residences, which may



impact the waterbirds.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification to the Conservation District meets criteria which provide that the Conservation District include areas necessary for protecting water sources, preventing floods and erosion, conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered, and open space areas which would enhance the present or potential value of abutting or surrounding communities and maintain or enhance the conservation of natural or scenic resources. Its inclusion into the Conservation District would maintain its status as a shoreline wetland resource.

Section 205-17(3)(A) and (B): The proposed reclassification of the Paukukalo Wetlands from the Urban District to Conservation reflects favorably on the area of State concern set forth in this section with respect to the preservation or maintenance of important natural systems or habitats, and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies relating to the planning for the State's physical environment. The reclassification would support the protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a) and (b)(1), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic

Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies directed towards enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources by promoting the preservation and restoration of significant natural resources.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization which include, but is not limited to, identifying critical environmental areas in Hawaii. Such areas include wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies and areas particularly sensitive to reduction in water quality and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards for determining Conservation District boundaries as related to inclusion of lands susceptible to floods, lands necessary for the protection of the health and welfare of the public by reason of the land's susceptibility to inundation by tsunami and flooding; and lands for conserving natural ecosystems. The Paukukalo Wetlands are designated as an area of coastal flooding by the FIRM and are identified as a shoreline wetland resource on the U.S. Department of Interior Wetland Maps.

Conformance With County Plans:

The wetlands are designated as Open Space areas by the Wailuku-Kahului Community Plan and should be considered for reclassification to the State Conservation District.

3. Puunene Sugar Mill Expansion (47 Acres; A to U)

The subject area consists of approximately 47 acres in Puunene, Maui. See Figure 38. The proposed reclassification from the State Agricultural District to the Urban District is intended to meet mill expansion requirements. The request area includes lands located between the HC&S' Puunene Sugar Mill and an existing mill warehouse facility located to the south. Hansen Road represents the northern limits of the request area. The request area also incorporates existing sugar cane fields to the immediate west of the mill, across Puunene Avenue. Portions of the subject area which are not currently cultivated in sugar cane are either vacant or already utilized for mill-related industrial purposes.

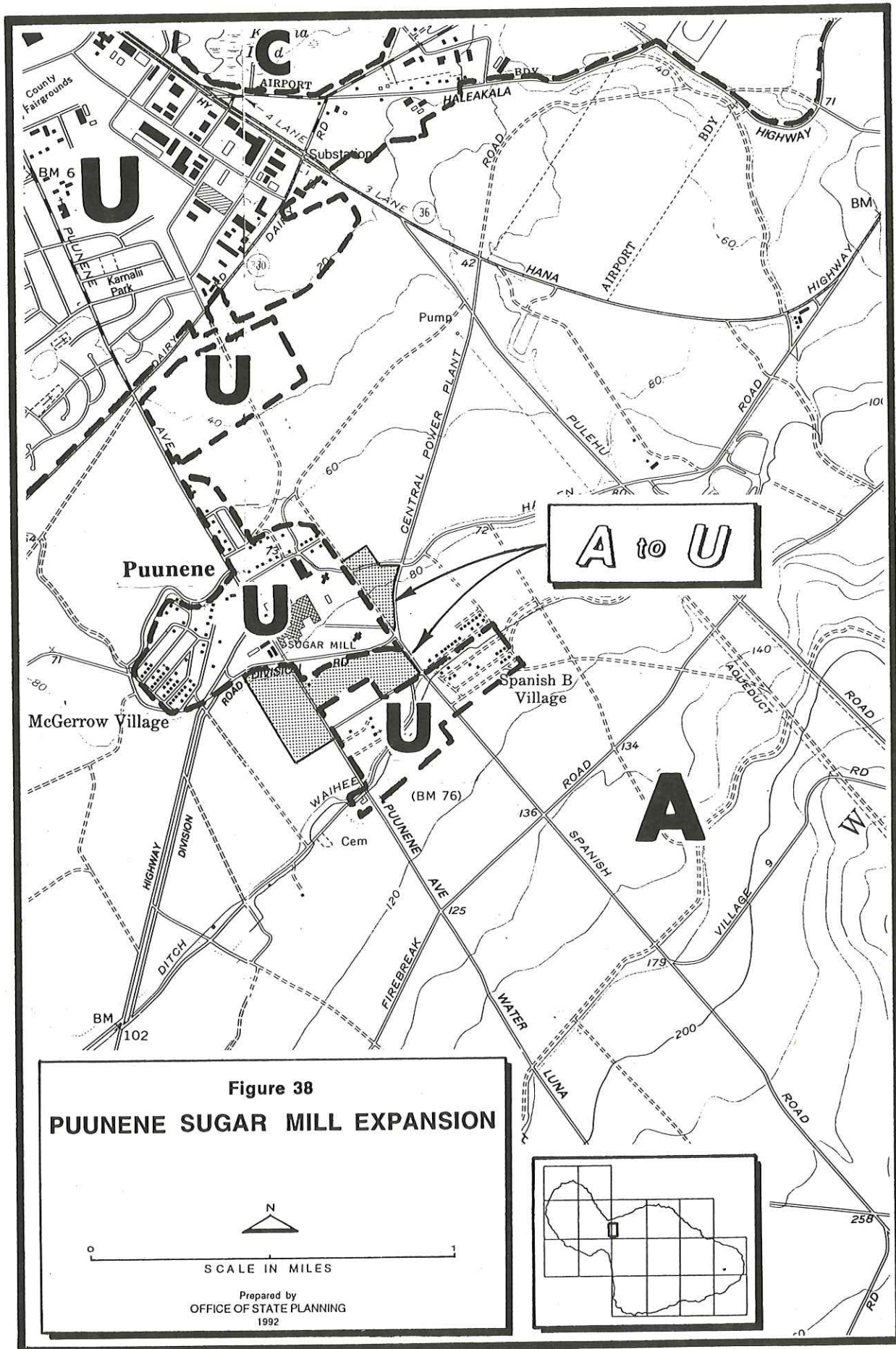
The proposed expansion of the sugar mill is not anticipated to generate new demands upon public service requirements in this region. Moreover, the use of the property for electrical generation and by-product operations are not anticipated to adversely impact infrastructure system capacities. In the context of the existing mill operations, the proposed expansion is not expected to generate adverse environmental impacts.

The proposed expansion of the mill would promote the long-term viability of the Island's sugar industry.

Conformance With Chapter 205, HRS:

Section 205-2(a)(1): The proposed reclassification of the subject area to the Urban District meets criteria which provide that the Urban District shall include those lands now in urban use and a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, the island of Maui will need an additional 108 acres of urban land to meet requirements to the year 2000.

Section 205-17(3)(E): The proposed reclassification of the Puunene Sugar Mill Expansion site is consistent with the provision



for employment opportunities and economic development.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-6(a)(1), Objectives and Policies for the Economy - in General: The proposed reclassification conforms to the HSP objective and policy for the economy by providing for increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

Section 226-7(a)(1) and (b)(12), Objective and Policies for the Economy - Agriculture: The proposed reclassification of the subject area conforms to the HSP objective and policy for the agricultural economy relating to the continued viability in Hawaii's sugar industry. The reclassification would facilitate the transition of agricultural lands in economically nonfeasible production to economically viable agricultural uses.

Section 226-104(b)(2), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth distribution and land resource utilization by making available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the Agricultural District.

Conformance With LUC Standards:

Section 15-15-18: The proposed reclassification of the subject area conforms to the LUC standards for determining Urban District boundaries, as related to the provision of sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection; proximity to employment centers, basic infrastructure and social services; reasonable freedom from natural hazards; contiguous boundaries with existing Urban Districts; and consideration of urban growth as shown on County General Plans. The subject area is located adjacent to the Puunene Sugar Mill

which is a principal source of employment for the Island community. Moreover, the request area is in close proximity to services (e.g., electrical power) necessary for heavy industrial mill operations. Reclassification would result in the establishment of a contiguous Urban District. With respect to natural hazards, the reclassification area is situated on lands designated as Zone C by the Flood Insurance Rate Map (FIRM) which are areas of minimal flooding.

Conformance With County Plans:

The Wailuku-Kahului Community Plan designates the subject property for Heavy Industrial and Agriculture use. Areas within the Heavy Industrial category would be consistent with the proposed State Urban District. However, a Community Plan amendment would be required for the area designated Agriculture.

4. Kahului Airport Expansion (Approximately 210 acres; A to U)

Kahului Airport, with two runways, is located on the north coast of Maui near Kahului. The main runway is oriented northeast to southwest and is 7,000 feet in length. The shorter, east-west oriented runway, is 5,000 feet in length. Over 4.9 million passengers used the Airport in 1990. Recent improvements (approximately \$146 million) to the terminal area complex, and roadway access, have ensured that the Airport terminal can support projected passenger growth beyond the year 2000.

The projected number of passengers will increase to 6.2 million (1.4 million overseas) in 1995 and 9.0 million (2.4 million overseas) in 2010. Cargo volume is also projected to increase significantly. Aircraft operations are forecast to increase from 183,000 in 1990 to 306,000 in 2010. In response to these anticipated increases, the Department of Transportation is currently updating the Kahului Airport Master Plan.

The Airport is located primarily on Urban designated lands. This

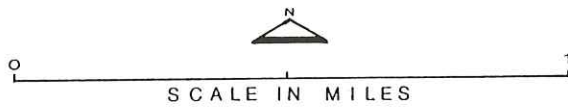
district extends south from the Airport's northern boundary along the coast. Some Agricultural lands are found within the eastern and southern limits of the Airport. The western boundary is adjacent to the Kanaha Pond Wildlife Refuge and Kanaha Beach Park. These two areas are within the Conservation District. Any improvements or extensions beyond the existing limits of Kahului Airport would require reclassification of the additional land to be acquired to the east and west. Boundary changes are needed for recommended airport improvements before the year 2000. Additional urban lands are needed to accommodate proposed improvements within the next ten years.

The subject area consists of 2 parcels which total approximately 210 acres in Kahului, Maui. See Figure 39. The proposed reclassification from the State Agricultural District to the Urban District is intended to meet airport expansion requirements. The request area includes two parcels owned by the State Airports Division and identified as Area 1 and Area 2 on Figure 39.

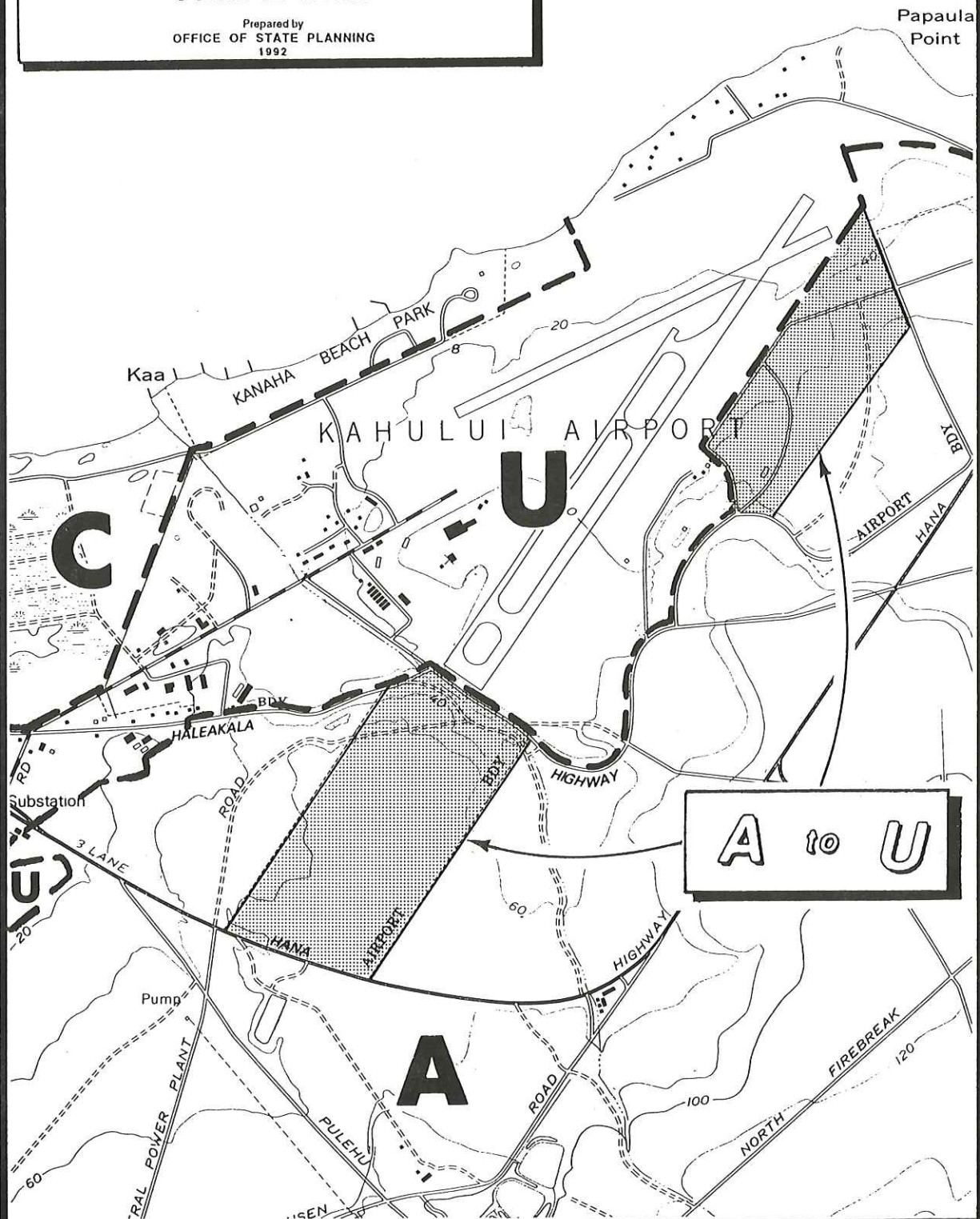
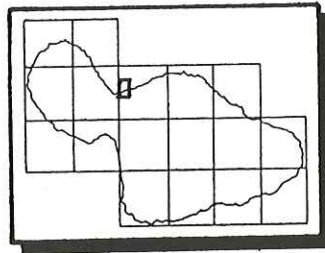
Area 1 consists of approximately 125 acres and will be utilized in extending the primary runway (Runway 02-20) by 2,600 feet. This extension will allow aircraft now in regular service to take off fully loaded for the West Coast. It would also allow these aircraft to fly non-stop to cities in the Midwest (e.g., Chicago, Dallas, Fort Worth, Denver, etc.) without compromising economic loads. Although Area 1 is classified in the Agricultural District, it is located within the existing County Airport District and consequently not rated for its agricultural productivity.

Area 2 (approximately 85 acres) consists of aviation related facilities that were constructed prior to 1964 and, therefore, predate the State Land Use Law. The intent here is to reclassify this area into the Urban District to bring the existing facilities into conformance with the rest of the Airport as well as rezone some additional lands needed for general aviation and other airport

Figure 39
KAHULUI AIRPORT



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related uses within the foreseeable future. Area 2 is also classified in the Agricultural District, however, it also is located within the existing County Airport District.

Conformance with Chapter 205, HRS:

Section 205-2(a)(1): The proposed reclassification of the subject areas to the Urban District meets criteria which provide that the Urban District shall include those lands now in urban use and a sufficient reserve area for foreseeable urban growth.

Section 205-17(3)(E): The proposed reclassification of the subject areas at Kahului Airport is consistent with the provision for employment opportunities and economic development. Construction of the proposed facilities will generate new jobs on the island. Expansion of the Airport's facilities will help to promote economic development by improving the opportunities to ship cargo to and from Maui.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 225-4, State Goals: The proposed reclassification of the subject areas would contribute to the attainment of the Hawaii State Plan's overall goals by creating both short- and long-term employment opportunities for residents of Maui, achieving continued reliability associated with increasing import/export cargo services vital to Maui's daily activities, and enhancing transportation services for residents and the visitor industry which is important to the stability of Maui's economy.

Section 226-6, Objectives and Policies for the Economy - In General: The extension of Runway 2-20 to 9,600 feet will provide increased market opportunities for Maui and other Hawaii businesses to transport their products to Mainland markets.

Extension of the runway, construction of the proposed highway interchange and access road, and expansion of cargo, general

aviation, and other facilities will also generate a significant amount of construction activities, along with new private jobs in related and secondary activities; these would create opportunities for upward mobility and family economic security. The construction activity would provide steady employment for local construction workers as well as provide employment opportunities for other types of construction trades. Operation of these facilities will provide employment opportunities for service and other trades.

Section 226-8(a) and (b)(1, 2, and 5) - Objectives and Policies for the Economy - Visitor Industry: The proposed projects would improve the level of service provided by air transportation facilities. Development of the facilities would provide short- and long-term construction and other employment to residents of Maui. The projects would be carefully designed and developed to meet existing and future market demands, especially those generated by the visitor industry.

Section 226-10(a) and (b)(1) - Objectives and Policies for the Economy - Potential Growth Activities: The extension of Runway 2-20 to 9,600 feet would maintain and enhance market opportunities for Maui and other Hawaii businesses to transport their existing products to Mainland markets, reducing the island's exposure to regional economic contractions. Development of the proposed highway interchange and access road will improve access to the terminal areas, which will in turn improve the efficiency of businesses relying upon the Airport's facilities.

Section 226-14(a) and (b)(1, 2, 3, and 4) - Objectives and Policies for Facilities Systems - In General: The proposed development of the subject areas is in response to present and forecast needs. It will assist in providing the air transportation facilities required to serve Hawaii, and especially Maui's people and visitors; and will be financed through airport bond issues, concession revenues, and airport user fees.

Section 226-17(a)(1 and 2) and (b)(6-8) - Objectives and Policies for Facility Systems - Transportation: The proposed facilities would provide short- and long-term employment and enhance economic opportunities; e.g., improvements in the overall volume and handling of cargo shipments. In addition, the projects would be planned and designed to complement existing and future airport facilities.

Kahului Airport is a major component of the State's multi-modal transportation system. The proposed improvements would accommodate the present and future air transportation needs of Maui and upgrade the Airport to a more efficient and convenient air transportation facility for the movement of residents, visitors and cargo.

Conformance with LUC Standards:

Section 15-15-18: The proposed reclassification of the subject areas conform to the LUC standards for determining Urban District boundaries, as related to the provision of sufficient reserve areas for urban growth in appropriate areas based on a ten-year projection; proximity to employment centers, basic infrastructure and social services, reasonable freedom from natural hazards, and contiguous boundaries with existing Urban Districts. The subject areas are located at the existing Kahului Airport which is a principal source of employment and economic activity for the island of Maui. The proposed improvements represent expansions of existing airport facilities and supporting infrastructure and are consistent with the Department of Transportation's Master Plan for Kahului Airport. With regard to natural hazards, the proposed improvements are not subject to potential hazards.

Conformance with County Plan: The proposed runway extension and airport improvements are both situated within the Airport District as depicted in the Wailuku-Kahului Community Plan, and are therefore consistent with the plan. The proposed

interchange is located in an area identified for Agriculture on the Community Plan. The proposed runway extension conflicts with Section IV.A.1.(1)(a) of the Maui County General Plan, which establishes a prohibition on the extension of runways beyond a total length of 7,000 feet. The proposed interchange and airport improvement areas are both consistent with the intent of the General Plan.

5. Paia Sugar Mill Expansion (16 Acres; A to U)

The area proposed for reclassification from the State Agricultural District to the State Urban District is located adjacent to HC&S' existing Paia Sugar Mill. The area encompasses non-contiguous parcels to the east, west, and south of the Sugar Mill. See Figure 40.

Portions of the area which border the Sugar Mill to the east and west include cultivated sugar cane fields. The portion of the request area located to the south of the Mill encompasses undeveloped land partially covered with scrub vegetation.

Lands falling within the State Urban boundary are situated to the north and south of the proposed reclassification area. Urban District lands to the north of the request area incorporate the commercial and business district of Paia. To the south, State Urban lands are occupied by an existing single-family subdivision. State Agricultural lands cultivated in sugar cane are found to the east and west.

The Paia-Haiku Community Plan designates the request area as Heavy Industrial and Agriculture.

The proposed expansion of the Sugar Mill is not anticipated to generate additional demands for public services in this region. In addition, the use of the property for electrical generation and by-product operations are not anticipated to adversely impact

A scale bar labeled "SCALE IN MILES" with a north arrow above it.

[illegible]

A to U

infrastructure system capacities. Like the Puunene Mill site, the environmental impacts of the proposed use are not considered adverse in the context of the existing heavy industrial environment. The proposed reclassification would facilitate the expansion of mill operations of HC&S and support and promote the Island's sugar industry.

Conformance With Chapter 205, HRS:

Section 205-2(a)(1): The proposed reclassification of the Paia Sugar Mill request area meets the criteria which provide that the Urban District shall include those lands now in urban use and a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, the island of Maui will need an additional 108 acres of urban land to meet requirements to the year 2000.

The proposed reclassification of the Paia Sugar Mill site to the Urban District is in conformance with the Chapter 205 policy of including activities or uses as provided by ordinances or regulations of the county within which the Urban District is situated.

Section 205-17(3)(E): The proposed reclassification of the Paia Sugar Mill Expansion site will support the provision for employment opportunities and economic development.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-6(a)(1), Objectives and Policies for the Economy - in General: The proposed reclassification conforms to the HSP objective of achieving increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

Section 226-7(a)(1) and (b)(12), Objective and Policies for the Economy - Agriculture: The proposed reclassification conforms

to the HSP objective and policy of supporting the continued viability in Hawaii's sugar industry by facilitating the transition of agricultural lands in economically unfeasible production to economically viable agricultural uses.

Section 226-104(b)(2), Population Growth and Land Resources

Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth distribution and land resource utilization to make available marginal or non-essential agriculture lands for appropriate urban uses while maintaining agricultural lands of importance in the Agricultural District.

Conformance With LUC Standards:

Section 15-15-18: Applicable LUC standards for determining Urban District boundaries relate to providing sufficient reserve areas for urban growth in appropriate locations based on a ten-year projection, the parcel's proximity to trading and employment centers, basic infrastructure and social services. In addition, the property has reasonable freedom from natural hazards; has contiguous boundaries with existing Urban Districts; and is projected for urban growth as shown on the County General Plans. The proposed reclassification area is located adjacent to the existing mill site which is situated within the State Urban District and is in close proximity to commercial and residential land uses located to the north and south of the subject areas. Accordingly the request areas are in close proximity to infrastructure and social services. With respect to natural hazards the reclassification area is designated Zone C by the FIRM (e.g., areas of minimal flooding).

Conformance With County Plans:

The Paia-Haiku Community Plan designates the request area as Heavy Industrial and Agriculture. Those areas falling within the Heavy Industrial category would be consistent with the proposed Urban District. The area designated as Agriculture by the Community Plan would require a Community Plan amendment.

6. **Paia (Doris Todd Memorial School) (29 Acres; A to U)**

The subject area consisting of 29 acres is located mauka of Paia Town, along Baldwin Avenue. See Figure 41. Across Baldwin Avenue (to the south of the site) is an existing single-family subdivision. East of the request area are fields cultivated in sugar cane. Paia Elementary School, the Holy Rosary Church, and a few single-family residences are found along Baldwin Avenue, to the north of the subject area. Approximately 4 acres of the subject area are occupied by the Doris Todd Memorial School.

Surrounding State land uses include Agricultural lands to the south and east, with Urban-designated lands situated to the north and west. These Urban lands include the Paia Sugar Mill and the Lower Paia commercial and business district. An Urban pocket consisting of single-family residences is located directly across the site, to the south. Beyond this subdivision are additional cultivated fields of sugar cane.

The proposed reclassification area is designated Single-Family and Public/Quasi-Public by the Paia-Haiku Community Plan. Public/Quasi-Public uses include schools, libraries, fire/police stations, government buildings, hospitals, churches, cemeteries and community centers.

Given the scale of the proposed residential use for the request area, the development's impacts upon other infrastructure systems and public services do not appear to be adverse. The proposed request would result in the removal of less than 29 acres of cultivated sugar fields. The limited withdrawal of sugar cane associated with this request is not anticipated to adversely impact the sugar industry.

Conformance With Chapter 205, HRS:

Section 205-2(a)(1): The proposed reclassification of the Doris Todd Memorial School area in Paia from the Agricultural District to

Figure 41

**PAIA - DORIS TODD
MEMORIAL SCHOOL**

N

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SCALE IN MILES

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Hookipa

C

100

132

ROAD

Kuau

es

HANA

Flume

Lower Paia

Pump

100

167

LOWER

UPPER

HAMAKUAPOKO

Siphon

H

A

M

Cem

Baldwin Park

20

36

Pumping Sta

MAKAWAO WAILUKU ROAD

Qlopua

100

DISTRICT

APPROXIMATE PAIA DISTRICT BOUNDARY

200

200

PAIA

BM 166

SUGAR MILL

U

Paia

Paia School

Kahaka

BOUNDARY

Kailua

RD

A

H

A 400'

A to U

U

Urban meets the criteria which provide that the Urban District shall include those lands now in urban use and a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, the island of Maui will need an additional 108 acres of urban lands to meet requirements to the year 2000.

The proposed reclassification to the Urban District is in conformance with the policy of including activities or uses as provided by ordinances or regulations of the County within which the Urban District is situated.

Section 205-17(3)(F): The proposed reclassification of the Doris Todd Memorial School area will support the provision of housing opportunities for all income groups, particularly the low, low-moderate and gap groups.

Conformance with Chapter 226, HRS, The Hawaii State Plan:
Section 226-13(a) and (b)(7), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification of the subject area conforms to the HSP objective and policy relating to the maintenance and pursuit of improved quality in Hawaii's land, air, and water resources by encouraging urban developments in close proximity to existing services and facilities.

Section 226-19(2) and (b)(5), Objectives and Policies for Socio-Cultural Advancement - Housing: The proposed reclassification conforms to the HSP objective and policy relating to the orderly development of residential areas sensitive to community needs and other land uses and promoting the 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.

Section 226-106(4), Affordable Housing Priority Guidelines:

The proposed reclassification conforms to the HSP Priority Guidelines for affordable housing to create incentives for development which would increase home ownership and rental opportunities for Hawaii's low and moderate-income households, gap-group households, and residents with special needs.

Conformance With LUC Standards:

Section 15-15-18: The proposed reclassification conforms to the LUC standards for determining Urban District boundaries. Specifically, the site is in proximity to trading and employment centers, basic infrastructure and social services; has reasonable freedom from natural hazards; has contiguous boundaries with existing Urban Districts; and is projected for urban growth, as shown on the County General Plans. The subject area is adjacent to an existing urban area which is used for single-family and commercial uses. The Paia-Haiku Community Plan designates the area as Single-Family and Public/Quasi-Public which is in keeping with the State Urban District. The subject area is designated as Zone C, areas of minimal flooding, according to the FIRM.

Conformance With County Plans:

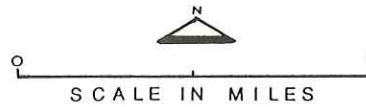
The proposed area is designated Single-Family and Public/Quasi-Public by the Paia-Haiku Community Plan and is consistent with the proposed Urban District.

7. East Maui Watershed Area (1,271 Acres; A to C)

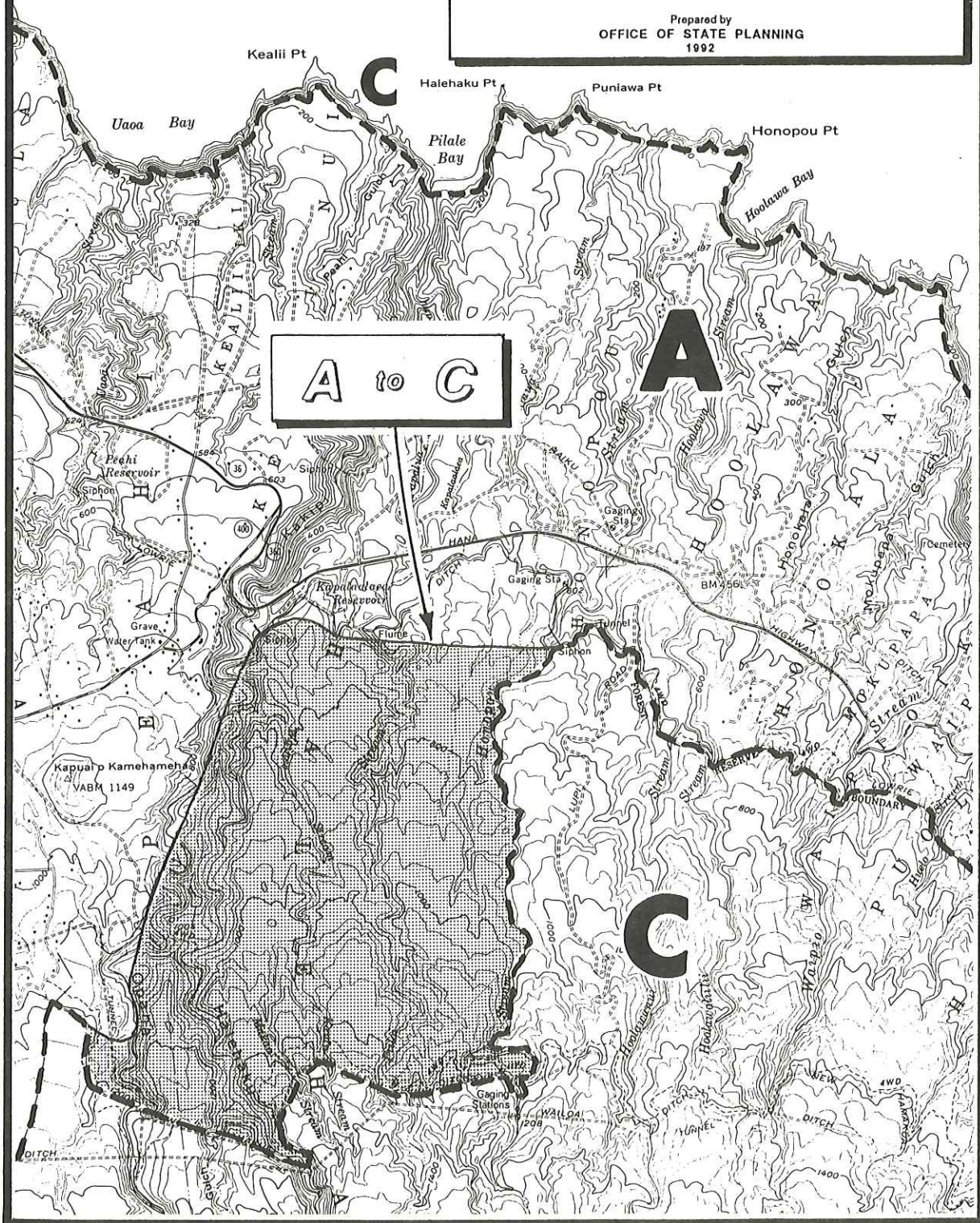
The East Maui Watershed Area is located along the northern slope of Haleakala between Honopou and Opana Gulches between the 700- and 1220-foot contours. See Figure 42. This proposed expansion to the Conservation District will not affect any lands used for residential or agricultural purposes.

The University of Hawaii Water Resources Research Center identified this area as having water resources protection and

Figure 42
EAST MAUI WATERSHED AREA



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enhancement values. The site is a healthy forested area and a former forest reserve. It is situated to the west of the existing Conservation District and has an average annual rainfall of 120 inches.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for protecting watersheds and water resources. The inclusion of the subject area would provide protection to the region's water resources.

Section 205-17(3)(A) and (B): The proposed reclassification of the East Maui Watershed Area from the Agricultural District to Conservation will impact favorably on the preservation or maintenance of important natural systems or habitats and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources:

The proposed reclassification conforms to the HSP objective and policies for planning for the State's physical environment with regard to land-based, shoreline, and marine resources. Specifically, the proposed reclassification would promote the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(b)(2), (3), and (4), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification conforms to the HSP objectives and policies relating to the enhancement of

Hawaii's scenic assets, natural beauty, and multicultural/historical resources by promoting the proper management of Hawaii's land and water resources, promoting effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters, and fostering recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures, and visitors.

Section 226-13(a)(1) and (b)(2), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification of the subject area conforms to the HSP objective and policy of achieving the maintenance and pursuit of improved quality in Hawaii's land, air, and water resources and promoting the proper management of Hawaii's land and water resources.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not be limited to, watershed and recharge areas, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, open space and natural areas, and areas particularly sensitive to reduction in water quality.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards of determining Conservation District boundaries. Standards applicable to the proposed reclassification relate to the inclusion of lands necessary for protecting watersheds and water resources, and lands with a general slope of twenty percent (20%) or more which provide for open space amenities or scenic values.

Conformance with County Plans:

The Paia-Haiku and Makawao-Pukalani-Kula Community Plans designates the East Maui Watershed Area as Agriculture. An

amendment to the Community Plan would be required.

8. Portion of Waikamoi Preserve (665 Acres; A to C)

The Waikamoi Preserve (Makawao) site is located on the west-facing slope of Haleakala, mauka of Olinda. The Makawao Forest Reserve and the Koolau Forest Reserve border the site to the north. See Figure 43.

This area contains native shrublands and forests that provide habitat for three endangered forest birds ('akepa, 'akohekohe, and Maui parrotbill) and at least six rare plants. The portion of The Nature Conservancy's Waikamoi Preserve, just north of Ukulele, is the core area and contains primarily koa and 'ohi'a forest with a rich understory of ferns, lobeliads, and a diverse array of native plants. Pockets of native vegetation extend down to approximately 4,000 feet elevation and include some scattered sandalwood (*Santalum* sp.) and rare Hawaiian nohoanu (*Geranium arboreum*). Pohakuokala Gulch harbors a rich fauna of native invertebrates, including three species of endemic spiders in the genus *Tetragnathid*.

The Waikamoi Preserve is under conservation management.

Conformance With Chapter 205, HRS:

Section 205-2(e): Reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas for conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. The inclusion of the subject area would protect the native shrublands and forests which provide a habitat to various native flora and fauna and provide a buffer zone for the Waiakamoi Preserve, Haleakala National Park and Koolau Forest Reserve.

Section 205-17(3)(A): The proposed reclassification of the Waikamoi area from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats.

Conformance With Chapter 226, HRS, The Hawaii State Plan:
Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies for planning for the State's physical environment with regard to land-based, shoreline, and marine resources. The reclassification would promote the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-13(a)(2), (b)(2), (3) and (4), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification of the subject area conforms to the HSP objective and policies for planning for the State's physical environment with regard to land, air, and water quality. The reclassification would encourage a greater public awareness and appreciation of Hawaii's environmental resources by promoting the proper management of Hawaii's land and water resources, promoting effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters, and fostering recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures, and visitors.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas

in Hawaii to include, but not be limited to, watershed and recharge areas, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites and areas particularly sensitive to reduction in water quality, and scenic resources.

Conformance With LUC Standards:

Section 18-18-20: The proposed reclassification conforms to the LUC standards for determining Conservation District boundaries. The applicable standard relates to the inclusion of lands necessary for conserving natural ecosystems of endemic species.

Conformance with County Plans:

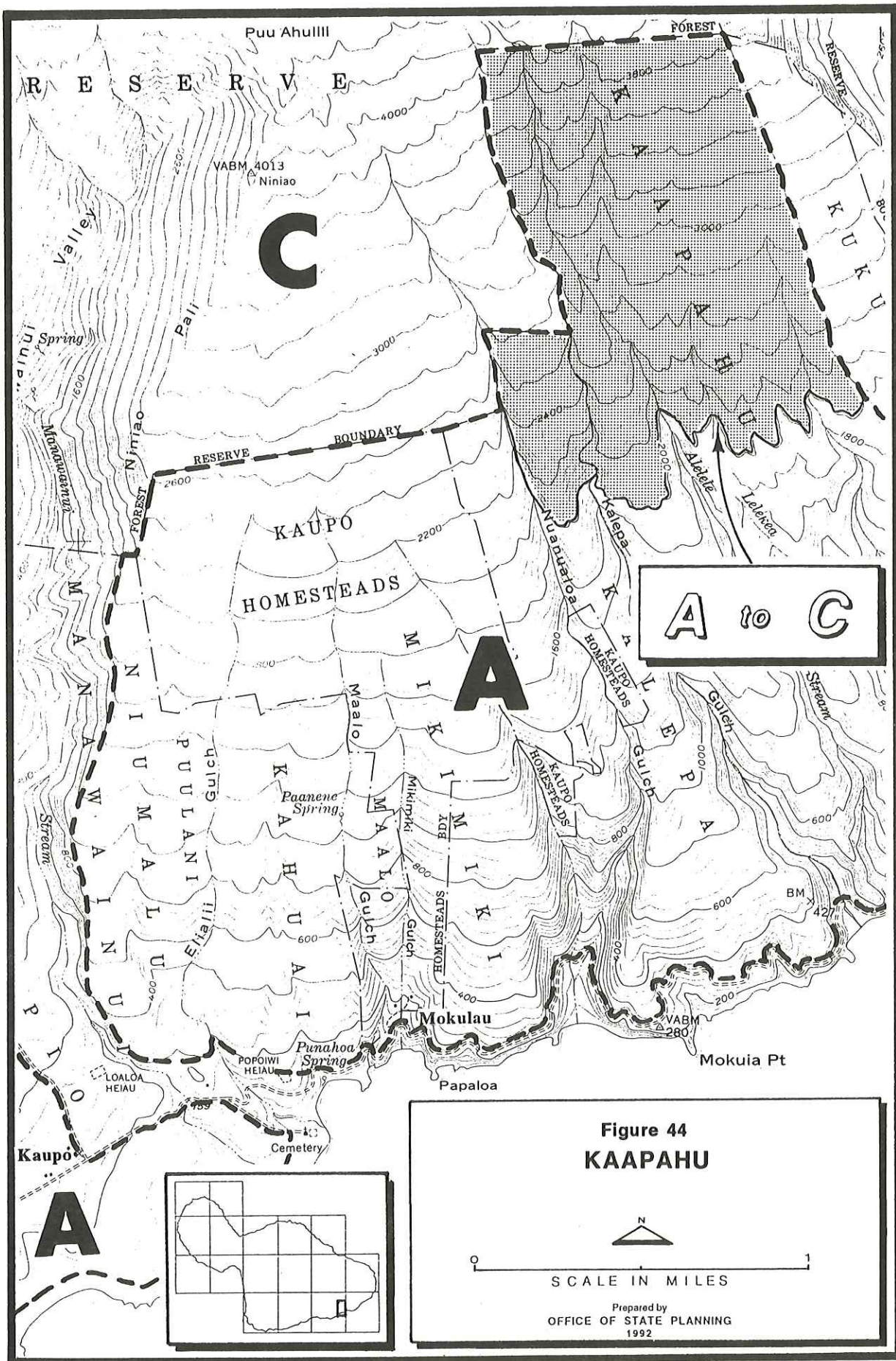
The Makawao-Pukalani-Kula Community Plan designates the Waikamoi subject area as Agriculture. As such, an amendment to the Community Plan would be needed.

9. Kaapahu (795 Acres; A to C)

The Kaapahu area is located on the southeast slopes of Haleakala between Niniao Pali to the west and Kipahulu Valley to the northeast. See Figure 44. This area, proposed for reclassification from Agricultural to Conservation, would provide a buffer zone for the Kipahulu Forest Reserve and Haleakala National Park, and could increase protection for habitat used by endangered birds.

The subject area is surrounded by Conservation zoned lands adjacent to Kipahulu Valley. The upper boundary for this area is at the 4,200-foot elevation. A lower boundary at approximately 2,000-foot elevation would coincide with the lower edges of native vegetation. General slope for the area exceeds 20 percent.

Kaapahu contains a high quality koa/'ohi'a montane wet forest with a hapu'u (*Cibotium* sp.) understory approximately above the 2,400-foot elevation. This is perhaps the best example of koa and 'ohi'a



forest on Maui outside of Kipahulu Valley. The proximity of this area to Kipahulu Valley and the Manawainui Planeze make it a likely place for threatened and endangered native birds, including 'akohekohe (*Palmeria dolei*), Maui 'akepa (*Loxops coccineus ochraceus*), and Maui parrotbill (*Pseudonestor xanthophrys*).

OSP is presently considering two options for the identified parcel: (1) reclassification into the State Conservation District; or (2) participation by the landowner in the State's Natural Area Partnership (NAP) and/or Forest Stewardship Program (FSP) in conjunction with a conservation easement. The NAP and FSP are State cost-sharing programs with a private landowner for ongoing enhancement of wildlife habitat and reforestation that require an approved management plan. The conservation easement is a legally binding agreement between parties which grants a property interest to the easement holder and may set restrictions on the range of allowable land uses for the landowner.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas for conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered, 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. Inclusion of the subject area would provide a buffer zone for the Kipahulu Forest Reserve, Haleakala National Park and could increase habitat protection.

Section 205-17(3)(A): The proposed reclassification of the Kaapahu subject area from the Agriculture District to Conservation will support the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:
Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for
the Physical Environment - Land-based, Shoreline, and Marine
Resources:

The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, and open space and natural areas.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification of the subject area conforms to the LUC standard relating to the inclusion of lands necessary for conserving natural ecosystems of endemic species and lands with a general slope of 20 percent or more. In addition to providing a buffer zone for the adjacent Kipahulu Forest Reserve and Haleakala National Park, reclassification of the subject area would also protect the high-quality koa-ohia montane wet forest within the subject area which provides a likely habitat for threatened and endangered native birds. The proposed reclassification would also preserve open space and scenic values in these relatively steep sloped lands.

Conformance with County Plans:

The Hana Community Plan designates the Kaapahu area as Agriculture. As such, an amendment to the Community Plan would be required.

10. La Perouse Bay/Ahihi - Kinau NAR (42 Acres; A to C)

This area consists of two components each of which shares a boundary contiguous with the existing Conservation District. They are part of the Ahihi-Kinau NAR and as such are part of an area possessing natural features unique to Maui and to the State. The NAR consists of three interrelated terrestrial and marine systems originating with the most recent lava flows on Maui and include a marine reserve, a lava flow reserve and a tidepool and pond reserve. See Figure 45.

At the present time portions of the NAR extends beyond the boundaries of the existing Conservation District and into the Agricultural District. The inclusion of this portion of the NAR into the Conservation District would bring it in conformance with the Island's Community Plan designations of Park and Conservation.

Conformance With Chapter 205:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for conserving indigenous or endemic plants, fish or wildlife, including those which are threatened or endangered, and including open space areas which would maintain or enhance the conservation of natural or scenic resources. The subject area includes a portion of the Ahihi-Kihau NAR which is recognized as having unique natural features.

Section 205-17(3)(E): The proposed reclassification of the La Perouse Bay/Ahihi-Kinau NAR from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP

objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites, areas particularly sensitive to reduction in water quality, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards for determining Conservation District boundaries. Applicable standards relate to lands used for State parks; lands necessary for conserving natural ecosystems of endemic species; lands having an elevation below the shoreline; and marine waters, fish ponds and tide pools. Although not specifically designated a park, the subject area includes a portion of the NAR, which is under the jurisdiction of the State DLNR. The terrestrial and marine ecosystems found in the area are situated on lands designated Agricultural and as such are inconsistent with the area's designation as a NAR.

Conformance With County Plans:

The proposed reclassification would conform to the Kihei-Makena Community Plan which designates the area as Park and Conservation.

11. Wailea Resort Expansion (18.63 acres; A to U)

The subject area consists of 18.63 acres in the Wailea Resort and is located in the northeast corner of the Kaukahi Street-Wailea Alanui Drive intersection. There is also a portion of the subject area located on the makai side of Wailea Alanui Drive. The eastern portion of the site on the mauka side of Wailea Alanui Drive is occupied by the first fairway of the Wailea Blue Golf Course. The remainder of this portion is undeveloped. The subject area is surrounded by resort uses including the Wailea Blue Course, the Wailea Orange Course, a hotel, and a single family home subdivision currently under construction. See Figure 46.

The area proposed for reclassification is at the boundary of the existing State Urban and Agricultural Districts. Lands to the north of the site are in the Urban District and lands to the south of the mauka portion fall into the Agricultural District. The area south of the makai portion of the subject area is in the Urban District.

Conformance with Chapter 205, HRS:

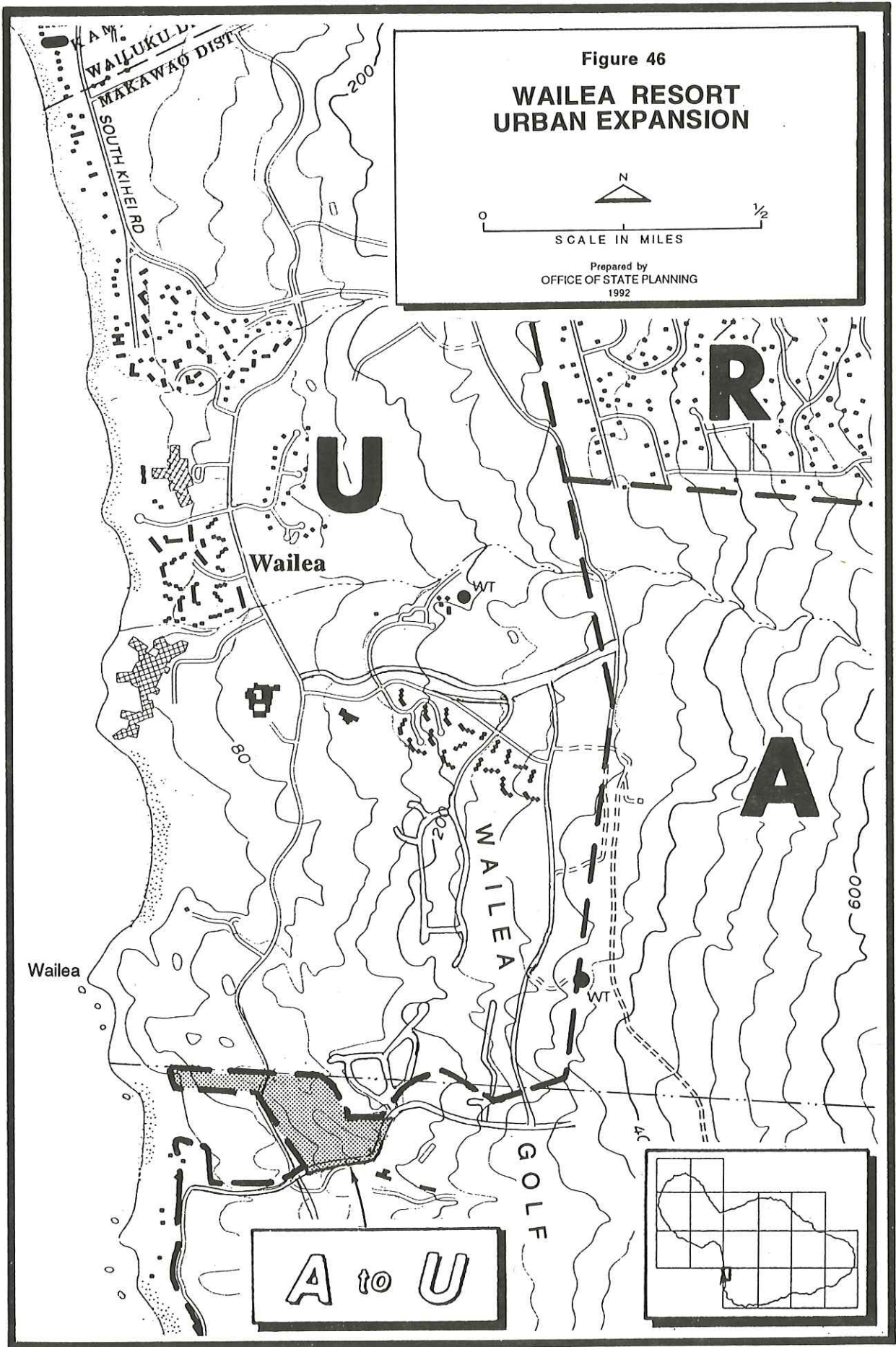
Section 205-2: The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District lands now in urban use and a reserve for foreseeable urban growth. According to the Urban Land Requirements Study, the island of Maui will need an additional 108 acres of urban land to meet requirements to 2000.

Section 205-17(E): The proposed reclassification will provide for employment opportunities and economic development.

Section 205-17(A-C): The site contains no known important natural systems nor cultural, historical, natural, or agricultural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

The proposed reclassification conforms to Section 226-8 of the



Hawaii State Plan in that it is directed toward the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.

Conformance with LUC Standards:

Section 15-15-18: The proposed reclassification conforms to the Land Use Commission standards for determining Urban District boundaries. Specifically, the site is characterized by "city-like" concentrations of people, structures, streets, and other related land uses. Kaukahi Street and Wailea Alanui Drive, for example, are urban standard roads. Sewer and water facilities are available to serve the site and underground electrical, telephone, and cable TV facilities are adjacent to the site.

The proposed site is adjacent to the existing Urban District and is within close proximity to centers of trading and employment.

The site has a gentle mauka-makai slope and contains no topographic or drainage constraints. The soil is primarily a very stable blue rock base.

Conformance with County Plans:

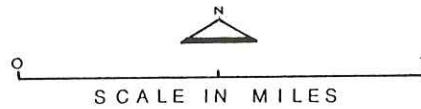
The undeveloped portion of the site is designated Multi-Family in the Kihei-Makena Community Plan.

12. Puu O Kali (1,660 Acres, A to C)

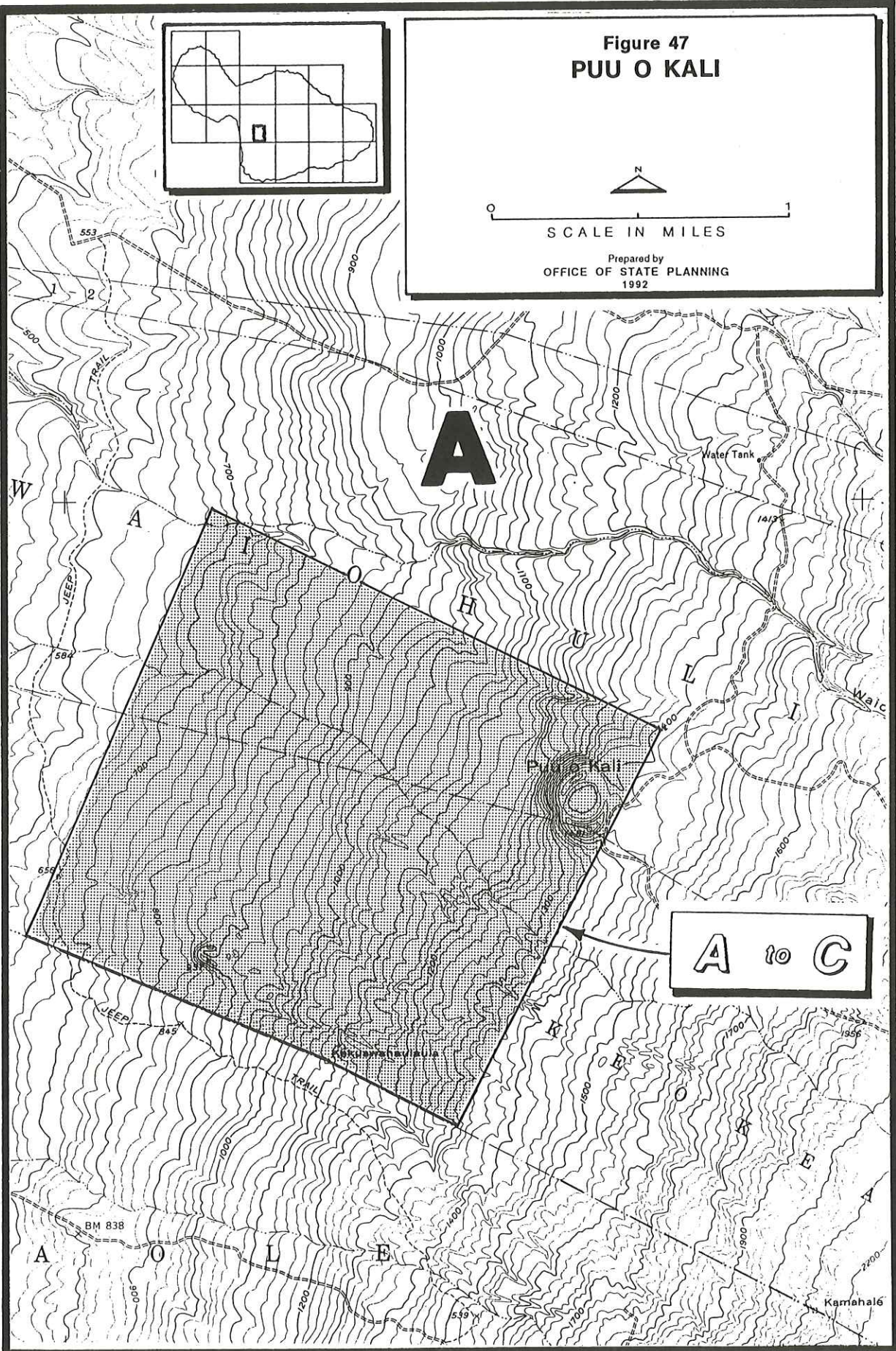
The Puu O Kali site is located upslope of Kihei, roughly between the 500-foot and 2000-foot elevation contours. The Puu O Kali cinder cone is located near the northeastern extent of the site. See Figure 47. This area is identified as containing conservation resources. However, no action will be taken on this site because it is DHHL land.

With rich wiliwili (*Erythrina sandwicensis*) lowland dry forest, 'a'ali'i (*Dodonaea viscosa*) and 'ilima (*Sida fallax*) shrublands, Puu O Kali

Figure 47
PUU O KALI



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has the best remaining examples of lowland dry vegetation on Maui. It represents the last remaining example of the vegetation that covered the low dry areas of East Maui before agricultural conversion. Seven rare plant species are present, including *Achyranthes splendens* var. *splendens*, and the best populations of ma'o-hau-hele (*Hibiscus brackenridgei* ssp. *brackenridgei*) and ko'oloa'ula (*Abutilon menziesii*).

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the Puu O Kali area to the Conservation District meets criteria which provide that the Conservation District include areas for indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. Inclusion of this area into the Conservation District would protect one of the best remaining examples of lowland dry vegetation on Maui which includes seven rare plant species.

Section 205-17(3)(A): The proposed reclassification of the Puu O Kali subject area from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies for planning for the State's physical environment with regard to land-based, shoreline, and marine resources. The reclassification would support the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, areas with endangered species of plants and wildlife, and open space and natural areas.

Conformance With LUC Standards:

Section 15-15-20: LUC standards for determining Conservation District boundaries applicable to this area relate to the inclusion of lands necessary for conserving natural ecosystems of native species. Reclassification would provide protection to the lowland dry forest and the rare plant species found at Puu O Kali.

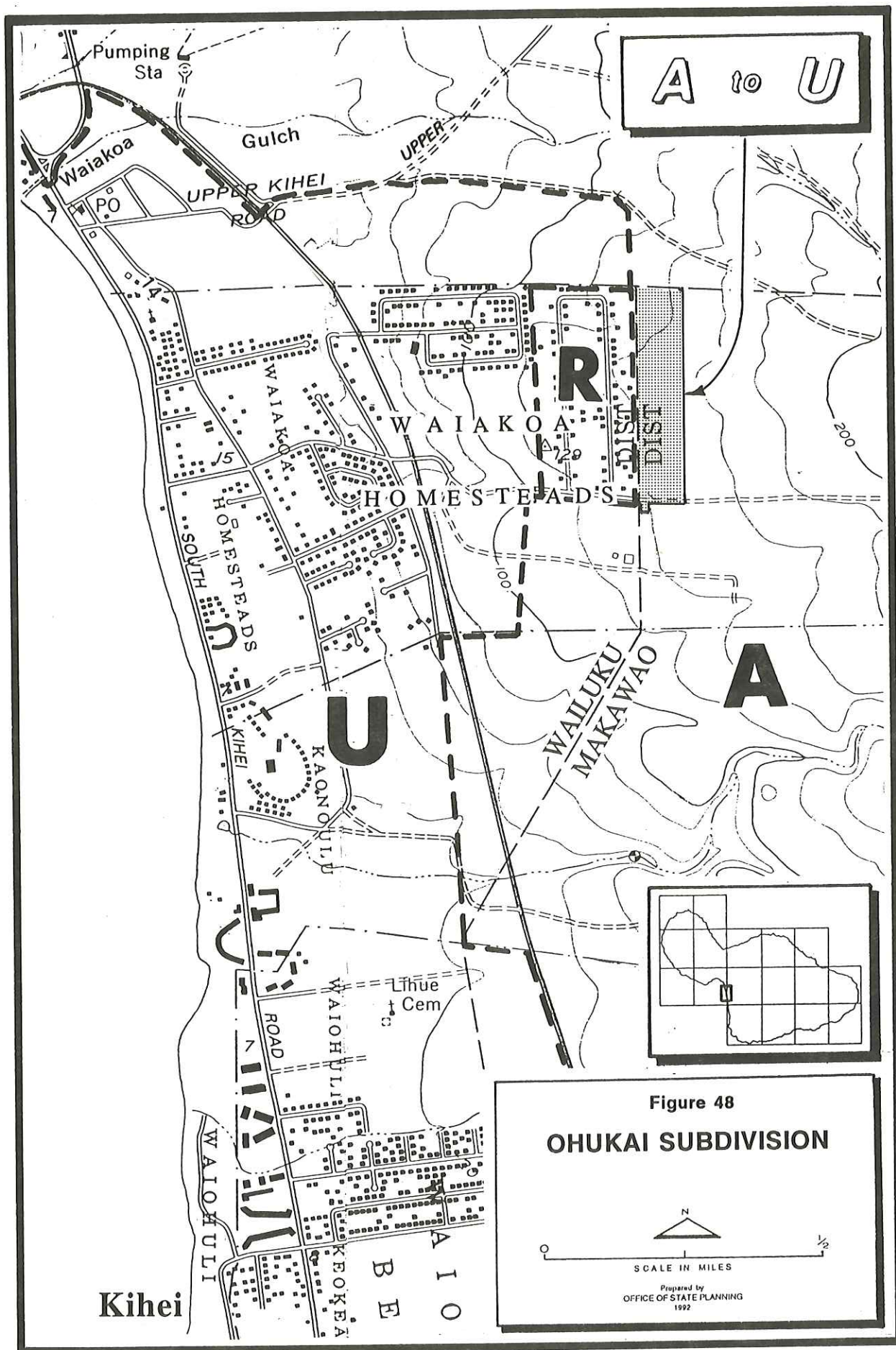
Conformance with County Plans:

The Makawao-Pukalani-Kula Community Plan designates the Puu O Kali subject area as Agriculture. As such, an amendment to the Community Plan would be required.

13. Ohukai Subdivision (24.28 acres; A to U)

The area proposed for reclassification from the State Agricultural District to State Urban District is located in the Kihei-Makena region. The site is mauka of the Piilani Highway and just south of the Piilani Highway-Mokulele Highway junction. Ohukai Subdivision was developed in the 1985-1987 period. This area is therefore being proposed for reclassification in order to conform the State land use designation to the existing use.

Ohukai Subdivision is surrounded by the Makai Heights Subdivision and vacant lands. The western edge of the subject area is adjacent to the Rural District; all other sides are adjacent to the Agricultural District. The northwest corner of the subject area is contiguous to the Urban District. See Figure 48.



The Kihei-Makena Community Plan designates the site as Single Family.

The proposed reclassification will not generate additional demands on public service in the region. Ohukai Subdivision already contains two- and three-bedroom homes which were sold in fee to qualified low-moderate income buyers. This subdivision was developed by the County of Maui under Section 359G-4.1, which at the time exempted the County from Land Use Commission provision. Because of the existing Agricultural designation, some homeowners have experienced difficulties in making improvements to their lots.

Conformance with Chapter 205, HRS

Section 205-2(a)(1): Reclassification is consistent with this section as the subject area contains land which is now in urban use.

Section 205-17(2) and (3)(F): The proposed reclassification conforms to the standards for the Urban District and supports the provision for housing opportunities for the low-moderate group.

Conformance with Chapter 226, HRS, The Hawaii State Plan

Section 226-19(a)(2): The proposed reclassification conforms to the Hawaii State Plan objective for the orderly development of residential areas sensitive to community needs and other land uses.

Section 226-19(b)(1): The proposed reclassification supports the objective to effectively accommodate the housing needs of Hawaii's people.

Conformance with LUC Standards:

Reclassification of Ohukai Subdivision is consistent with the following LUC standards for determining Urban District boundaries:

Section 15-15-18(1): The subject area is city-like in character.

Section 15-15-18(2): The subject area is in proximity to jobs in the communities of Kihei, Kahului, and Wailuku. The area already contains basic services.

Conformance with County Plans:

The subject area is designated as Single Family in the Kihei-Makena Community Plan.

14. Addition to Kealia Wetland (615 Acres; A to C)

Kealia Pond is located along the southern extent of the Central Maui isthmus. See Figure 49. Bordering Maalaea Bay, Kealia Pond is a low-lying wetland which receives stormflow from the surrounding agricultural fields and the Waikapu Stream. The area proposed for reclassification provides a buffer and transition zone between the wetlands, which is a habitat for endangered water birds, and surrounding agricultural uses. The proposed boundary change follows the boundaries of the lands recently donated and sold to the U.S. Fish and Wildlife Service by A&B, Inc., for a future national wildlife refuge. It is smaller than the area designated as Open Space on the Kihei-Makena Community Plan map. The Community Plan designates an additional 346 acres as Open Space to buffer existing Conservation Districts.

This area is not suitable for agricultural use as evidenced by its U.S. Department of Agriculture, Soil Conservation Service classification as a soil characterized by high salt content.

Most of the area is also designated as Zone A or A4, areas of a 100-year flood and Zone V18, areas of a 100-year coastal flood with velocity (wave action), by FIRM. As an extension of an open space buffer to the Kealia Pond, this area is considered suitable for reclassification consideration.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for protecting water sources, conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered, and open space areas which would enhance the present or potential value of abutting or surrounding communities, preventing floods and soil erosion, and which would maintain or enhance the conservation of natural or scenic resources. The inclusion of this area would provide a buffer and transition zone between Kealia Pond (a low-lying wetland which provides a habitat for endemic avifauna) and the neighboring agricultural fields.

Section 205-17(3)(A) and (B): The proposed reclassification of the subject area from the Agricultural District to Conservation will impact favorably on areas of State concern set forth under these sections. This includes the preservation or maintenance of important natural systems or habitats, and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1), and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policy relating to land-based, shoreline, and marine resources. These resources should be directed towards achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources and by encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a) and (b)(1), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies directed towards enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources by promoting the preservation and restoration of significant natural resources.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth and land resource utilization with respect to identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, open space and natural areas, areas particularly sensitive to reduction in water quality, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification of the subject area conforms to the LUC standards for Conservation District boundaries which advances the inclusion of lands necessary for the conservation of sites of ecologic significance, conservation of natural ecosystems, endemic species, land susceptible to floods, lands necessary for the protection of the health and welfare of the public by reason of the lands' susceptibility to inundation by tsunami and flooding, and the inclusion of lands with soils that may not be normally adaptable for urban, rural or agricultural use. In addition to its ecosystem value, Kealia Pond is a vital component for the area's natural drainage system and serves a collection basin for local storm runoff from Waikapu Stream. Although the surrounding area is in agricultural use, due to its high salt content the subject area is unsuitable for agricultural use. Its inclusion into the Conservation District would provide a buffer zone between the

pond and adjacent agricultural uses. The area of proposed addition to Kealia Pond also is a coastal inundation area and subject to flooding.

Conformance With County Plans:

The Kihei-Makena Community Plan designates the subject property as Open Space. Reclassification would bring the subject area into conformance with the Community Plan.

15. Wainee Affordable Housing Site (100 Acres; A to U)

The subject area is located in Lahaina Town, mauka of the Lahaina Recreation Center. See Figure 50. The site is targeted for a master-planned affordable housing community. In this regard, the proposed use of the land for affordable housing will help to meet housing needs in the West Maui region. With the exception of the existing Wainee Village, the area is planted in sugar cane. The area is in close proximity to major urban services and infrastructure systems and warrants reclassification consideration.

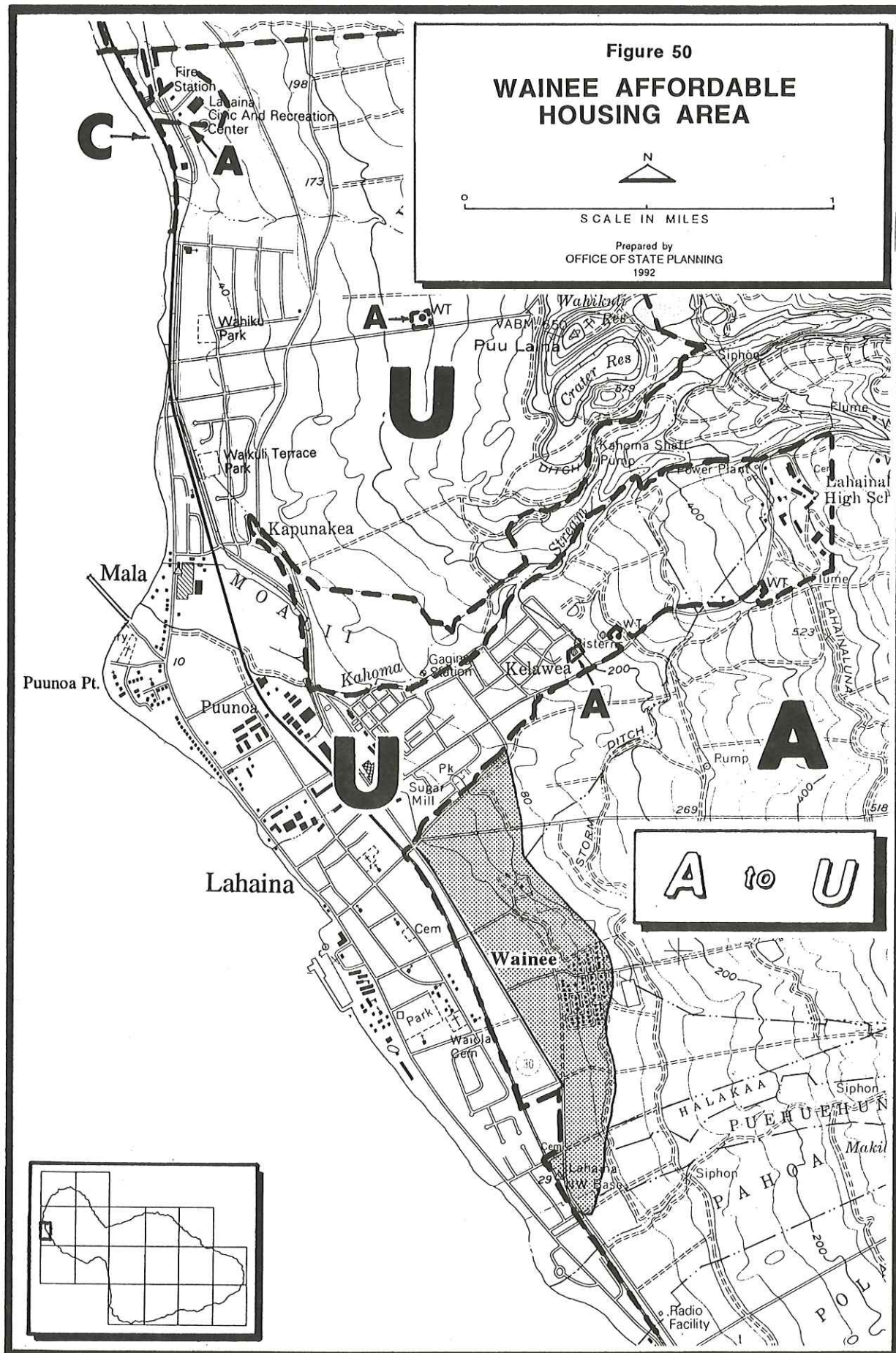
It is noted, however, that the development of the Wainee Affordable Housing Site has been delayed due to concerns regarding flooding and drainage. In the event that Wainee cannot be developed in a timely manner, Puukolii is recommended as an alternate site.

Conformance With Chapter 205, HRS:

Section 205-2(a)(1): The proposed reclassification of the subject area to the Urban District meets criteria which provide that the Urban District shall include those lands now in urban use and a sufficient reserve area for foreseeable urban growth.

Section 205-17(3)(F): The proposed reclassification of the Wainee Affordable Housing Site will impact favorably upon the area of State concern set forth under this section by providing housing opportunities for all income groups, particularly the low, low-moderate, and gap groups.

WAINEE AFFORDABLE HOUSING AREA



Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-13(a) and (b)(7), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification conforms to the HSP objective and policy for achieving the maintenance and pursuit of improved quality in Hawaii's land, air, and water resources by encouraging urban developments in close proximity to existing services and facilities.

Section 226-19(2) and (b)(5), Objectives and Policies for Socio-Cultural Advancement - Housing: The proposed reclassification conforms to the HSP objective and policy relating to the orderly development of residential areas sensitive to community needs and other land uses and promoting the 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.

Section 226-106(4), Affordable Housing: The proposed reclassification conforms to the HSP Priority Guidelines for affordable housing by creating incentives for development which would increase home ownership and rental opportunities for Hawaii's low and moderate-income households, gap-group households, and residents with special needs.

Conformance With LUC Standards:

Section 15-15-18: The proposed reclassification conforms with the LUC standards (for determining Urban District boundaries) to include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses; lands having proximity to centers of trading and employment, to basic infrastructure and social services; lands having reasonable freedom from natural hazards; and lands having contiguous boundaries with existing Urban Districts. In addition, consideration for planned urban growth as shown on the County General Plans

is applicable to the subject area. The recommended area is adjacent to the urban center of Lahaina which provides employment and social services to the surrounding areas. Accordingly, the request area is in close proximity to infrastructural services necessary for urban operations. With respect to natural hazards, the subject area is designated as Zone C by the FIRM which indicates areas of minimal flooding. Reclassification of the subject area would bring it into conformance with the Lahaina Community Plan.

Conformance With County Plans:

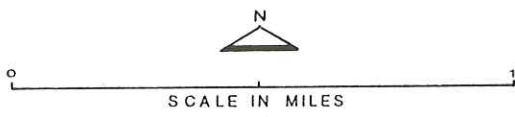
The Lahaina Community Plan designates the subject area as Single- and Multi-Family. Areas within both categories would be consistent with the proposed State Urban District.

16. Puukooli Village (100 Acres, A to U)

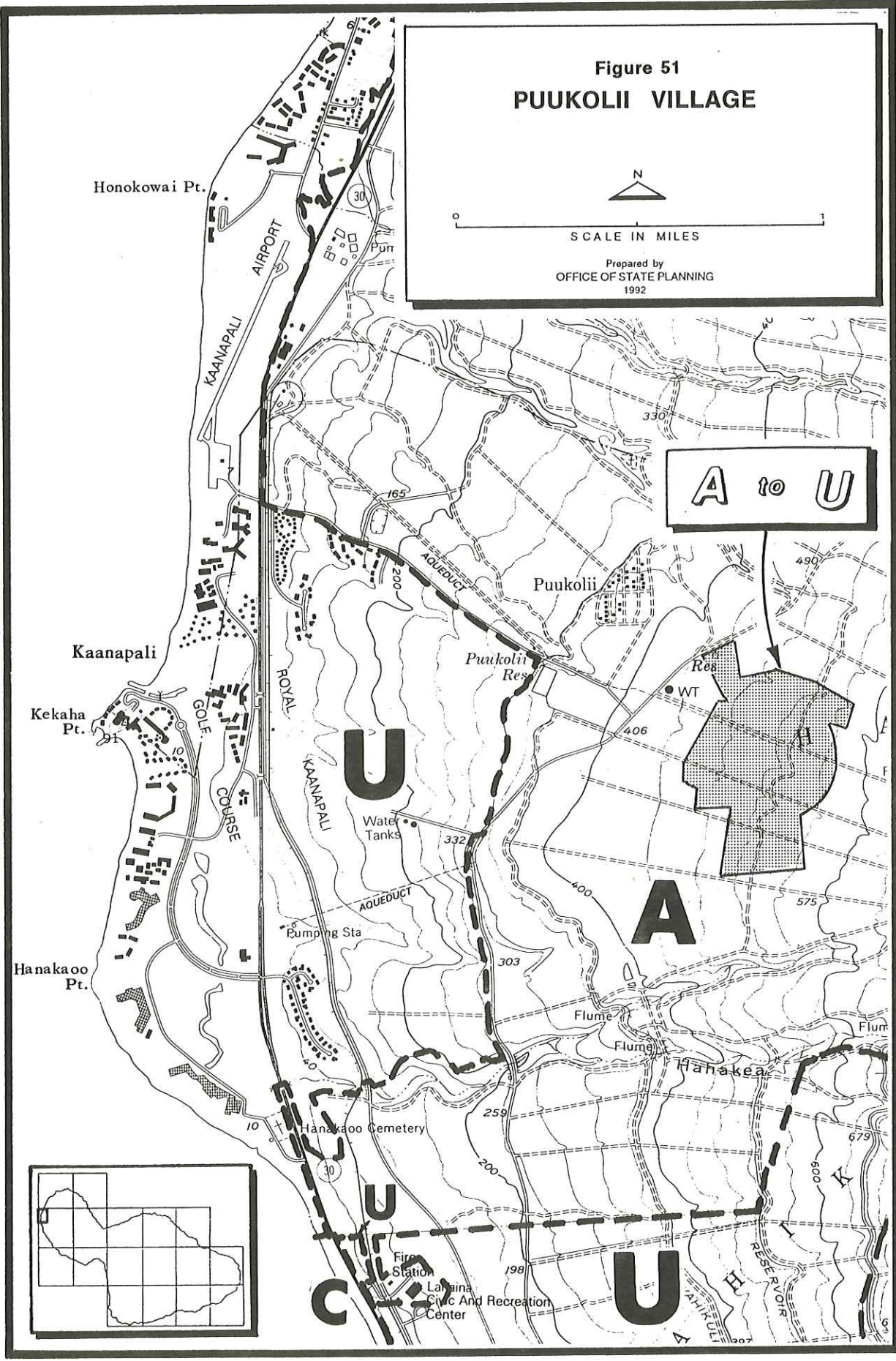
The subject area is located east of the Kaanapali Resort in West Maui. See Figure 51. The area is being considered as an alternate master-planned community to the Wainee Affordable Housing Site mentioned previously. The proposed project will be a master-planned residential community with supporting commercial, public/quasi-public, and park/open space uses. The residential component will include single- and multi-family units in both the affordable and market housing brackets. The project will help meet housing needs in the West Maui region.

Reclassification of this alternate housing area is recommended to give Amfac/JMB Hawaii, Inc. flexibility to meet the housing needs of West Maui. Their current project at Wainee is dependent upon the construction of drainage facilities by the Soil Conservation Service (SCS). Originally scheduled for completion in 1993, the schedule for the project has been revised to commence in 1995 with a completion date in 1998. This, in turn, would delay the housing development at Wainee.

Figure 51
PUUKOLII VILLAGE



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The existing land use of the project site is sugar cane cultivation. The subject area is in close proximity to major urban services and infrastructure systems and warrants reclassification consideration.

It should be noted that Amfac/JMB Hawaii, Inc. will be processing this development under the provisions of Act 15 which will expedite the approval process. The total development area to be processed under Act 15 is approximately 200 acres.

Conformance with Chapter 205, HRS:

Section 205-2(a)(1): The proposed reclassification of the Puukolii Village area from the Agriculture District to Urban meets criteria which provide that the Urban District shall include a sufficient reserve area for foreseeable urban growth.

Section 205-17(3)(F): The proposed reclassification of the Puukolii Village will support the provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-13(a) and (b)(7), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification of the subject area conforms to the HSP objective and policy of planning for the State's physical environment. The proposed reclassification would support the maintenance and pursuit of improved quality in Hawaii's land, air and water resources by encouraging urban developments in close proximity to existing services and facilities.

Section 226-19(2) and (b)(5), Objectives and Policies for Socio-Cultural Advancement - Housing: The proposed reclassification conforms to the HSP objective and policy of planning for the State's socio-cultural advancement with regard to housing. The reclassification would promote the orderly development of residential areas sensitive to community needs and other land uses

and promote 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.

Section 226-106(4), Affordable Housing Priority Guidelines:

The proposed reclassification conforms to the HSP Priority Guidelines for affordable housing to create incentives for development which would increase home ownership and rental opportunities for Hawaii's low and moderate-income households, gap-group households, and residents with special needs.

Conformance With LUC Standards:

Section 15-15-18: The proposed reclassification conforms with the LUC standards (for determining Urban District boundaries) to include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses; lands having proximity to centers of trading and employment, to basic infrastructure and social services; lands having reasonable freedom from natural hazards. The recommended area is near to Kaanapali Resort which provides employment and social services to the surrounding areas. Accordingly, the request area is in close proximity to infrastructural services necessary for urban operations. With respect to natural hazards, the subject area is designated as Zone C by the FIRM which indicates areas of minimal flooding.

Conformance With County Plans:

The Lahaina Community Plan designates the subject area as Agriculture. Reclassification of the subject area would require an amendment to the Lahaina Community Plan.

17. Kekaalaau (240 Acres, A to C)

This triangular parcel, encompassing the Honokahua Stream mauka of Kapalua, is contiguous to the West Maui Forest Reserve (State Conservation lands). The parcel's triangular definition is created by Puu Kaeo, Puu Makina and Kekaalaau. See Figure 52.

The general area around Kekaalaau contains four types of native natural communities: koa-'ohi'a (*Acacia-Metrosideros*) lowland wet forest, 'ohi'a-uluhe (*Metrosideros-Dicranopteris*) lowland wet forest, uluhe lowland wet shrubland, and mamaki (*Pipturus* spp.) lowland wet shrubland. In addition, the area contains one of the few remaining lowland virgin koa forest tracts on West Maui, as well as the rare alani (*Pelea orbicularis*). The area is also known as a habitat for rare *Partulina* sp. land snail.

Documented findings of rare or endangered species in regions immediately adjacent to this parcel indicate a high probability of other, as yet undiscovered, occurrences of rare or endangered species within the parcel itself. Kekaalaau is an important watershed which includes the Honokahua Stream system. If reclassified to Conservation, the area would fall under the active management of Maui Land & Pineapple Company's Puu Kukui Watershed Department.

Slopes for the subject parcel range from 3 percent to over 20 percent.

Although there have been discussions regarding a conservation easement between the landowner and the Nature Conservancy, no agreement has been reached. (Telecon with Mark White, Nature Conservancy, 7/24/92).

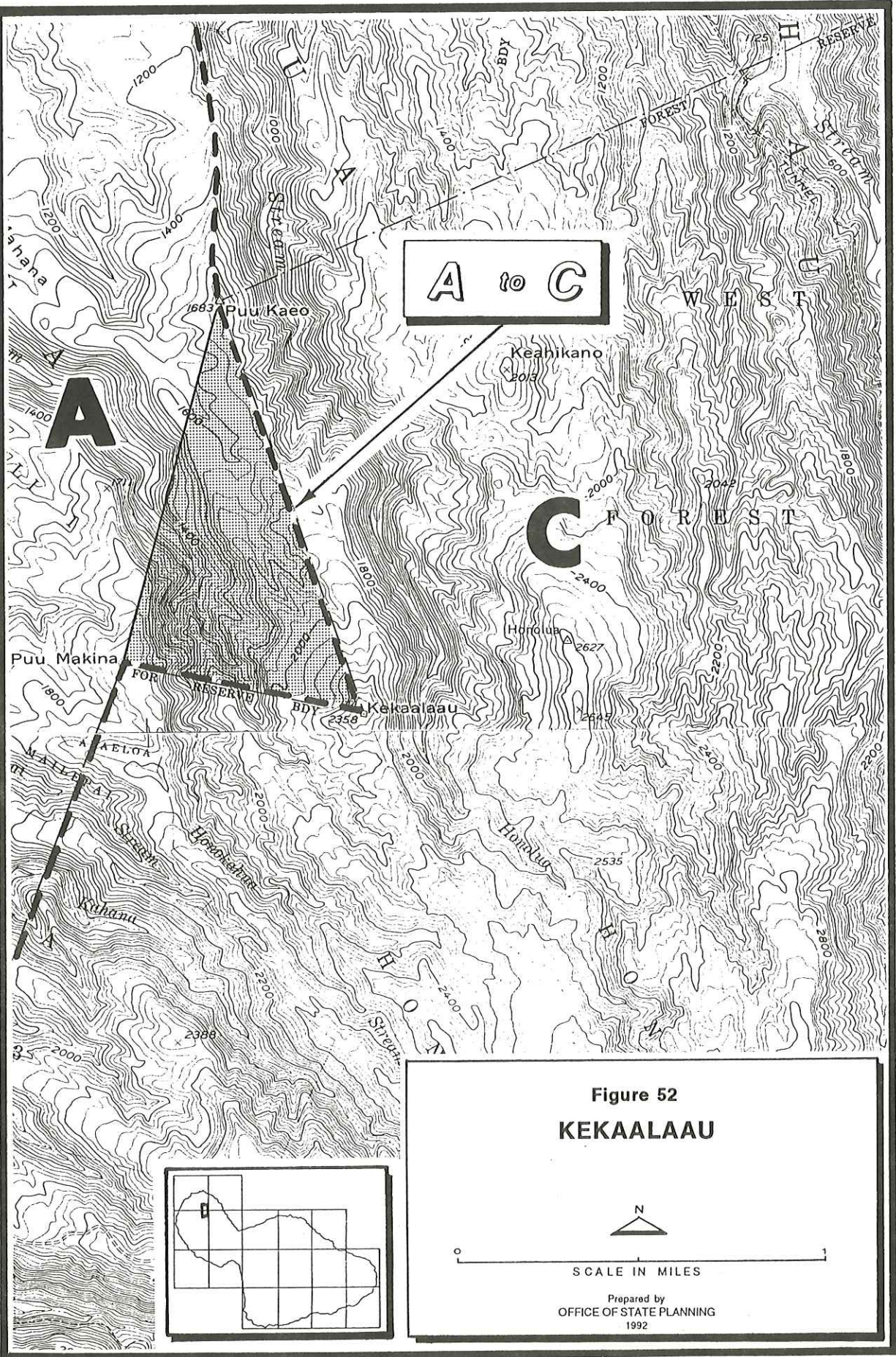


Figure 52
KEKAALAAU

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Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for protecting watersheds and water resources and conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered. The reclassification of the subject area into the Conservation District would protect the watershed value of this area as well as the native ecological communities and endangered species found here.

Section 205-17(3)(A): The proposed reclassification of Kekaalaau from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources:

The proposed reclassification of the subject area conforms to the HSP objective and policies for land-based, shoreline, and marine resources. The proposed reclassification will support the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources and by encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(b)(2), (3) and (4), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources:

The proposed reclassification of the subject area conforms to the HSP objective and policies relating to the enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources by promoting the proper management of Hawaii's land and water resources, promoting

effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters, and fostering recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures, and visitors.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth and land resource utilization with regard to identifying critical environmental areas in Hawaii to include, but not be limited to, 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 and areas particularly sensitive to reduction in water quality, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards (for determining Conservation District boundaries) which relate to the inclusion of lands necessary for protecting watersheds and water resources, and for conserving natural ecosystems of endemic species. Most of the subject area has a slope of greater than 20 percent. Reclassification would provide protection to the watershed, native communities, endangered species and preserve open space amenities found in this area.

Conformance With County Plans:

The Lahaina Community Plan designates the Kekaalaau subject area as Agriculture. As such, an amendment to the Community Plan would be needed.


18. Streams

Streams represent an integral component of the natural Hawaiian ecosystem and provide a unique and essential habitat for both flora and fauna. Moreover, streams are a part of larger ecological systems represented by wetlands and estuaries. Valued resources associated with streams include aquatic, riparian, cultural and scenic and recreational resources.

Maui has sixteen (16) streams that have been identified as Special Streams. See Figure 53, Figure 54, Figure 55, Figure 56, Figure 57, Figure 58, Figure 59, Figure 60, Figure 61, Figure 62, Figure 63, and Figure 64. These streams are noted as having outstanding aquatic resources or outstanding riparian resources associated with waterbird recovery habitat. These streams are as follows:

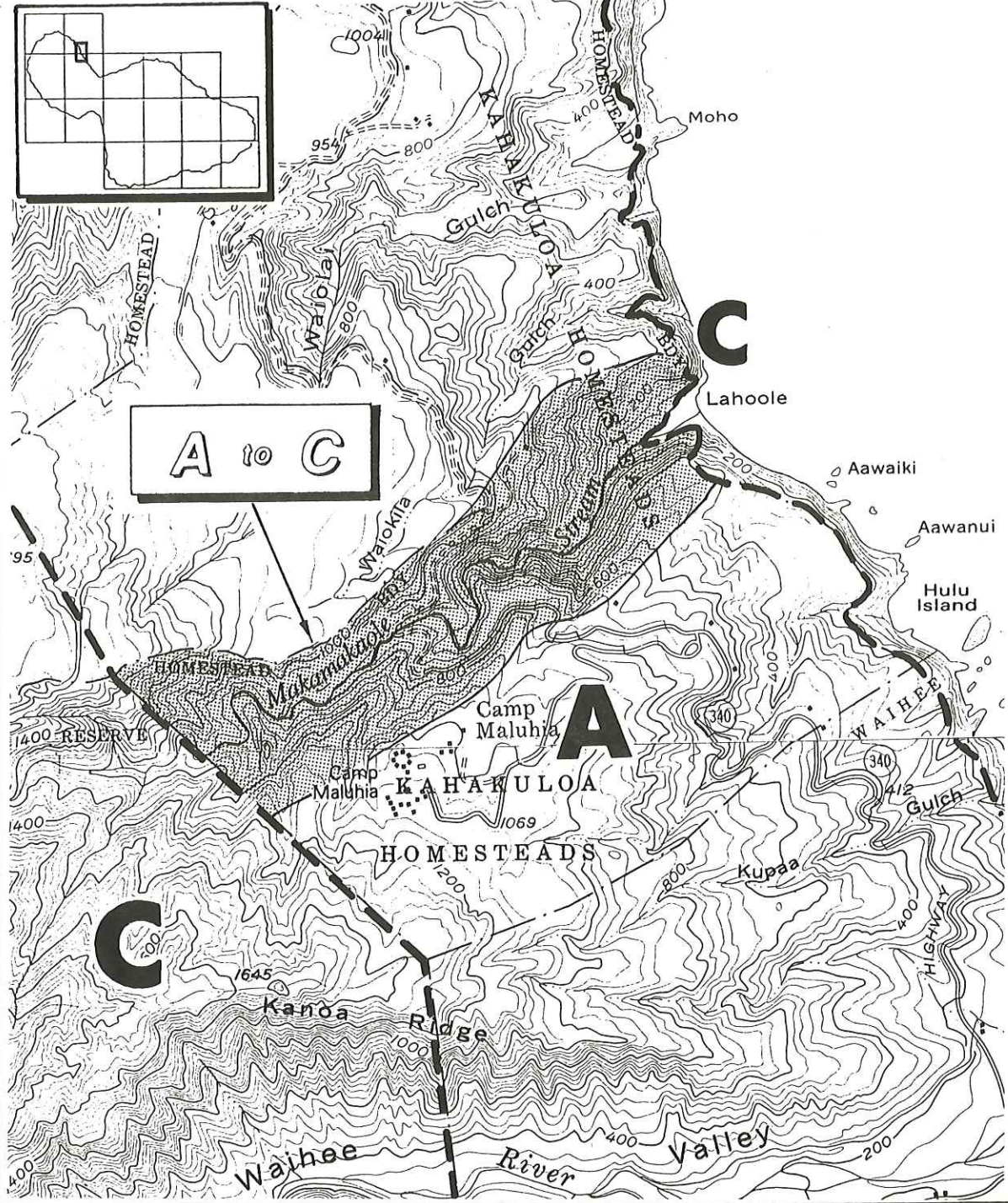
Figure 53

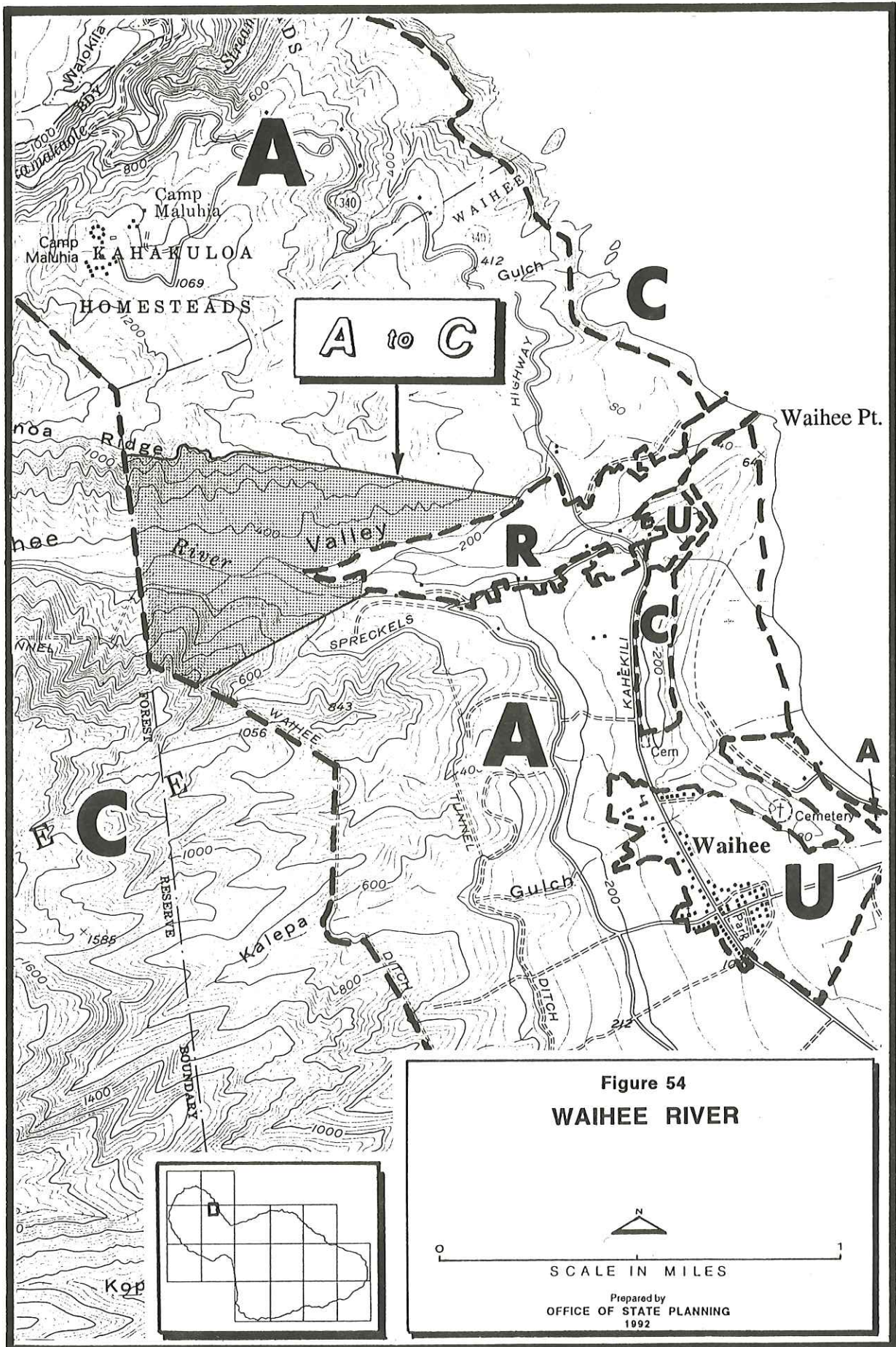
MAKAMAKAOLE STREAM



SCALE IN MILES

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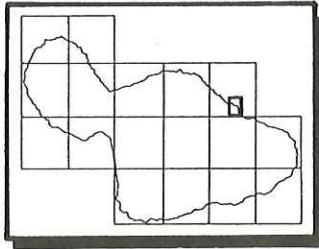


Figure 55

PIINAAU AND WAILUANUI STREAMS



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SCALE IN MILES

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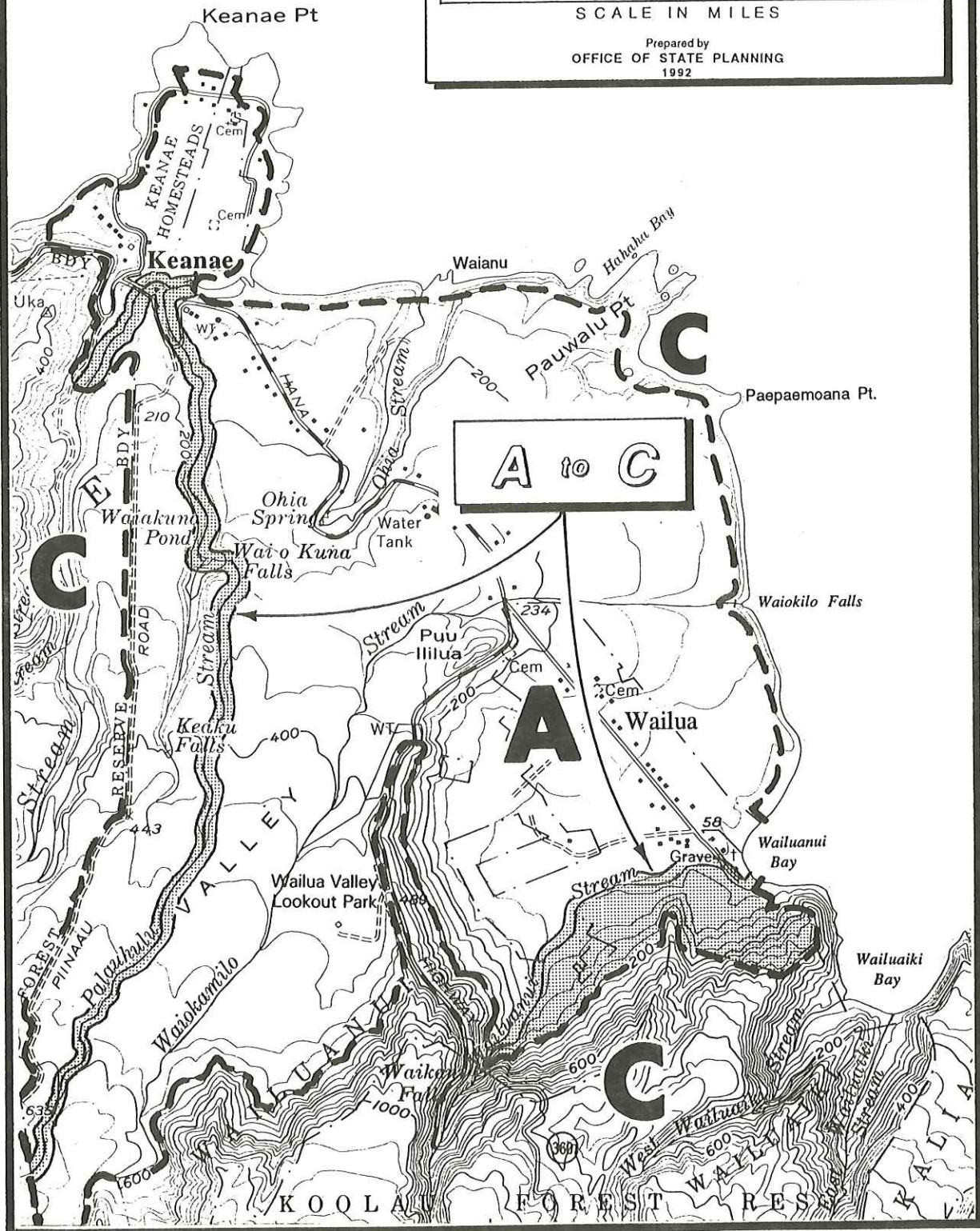


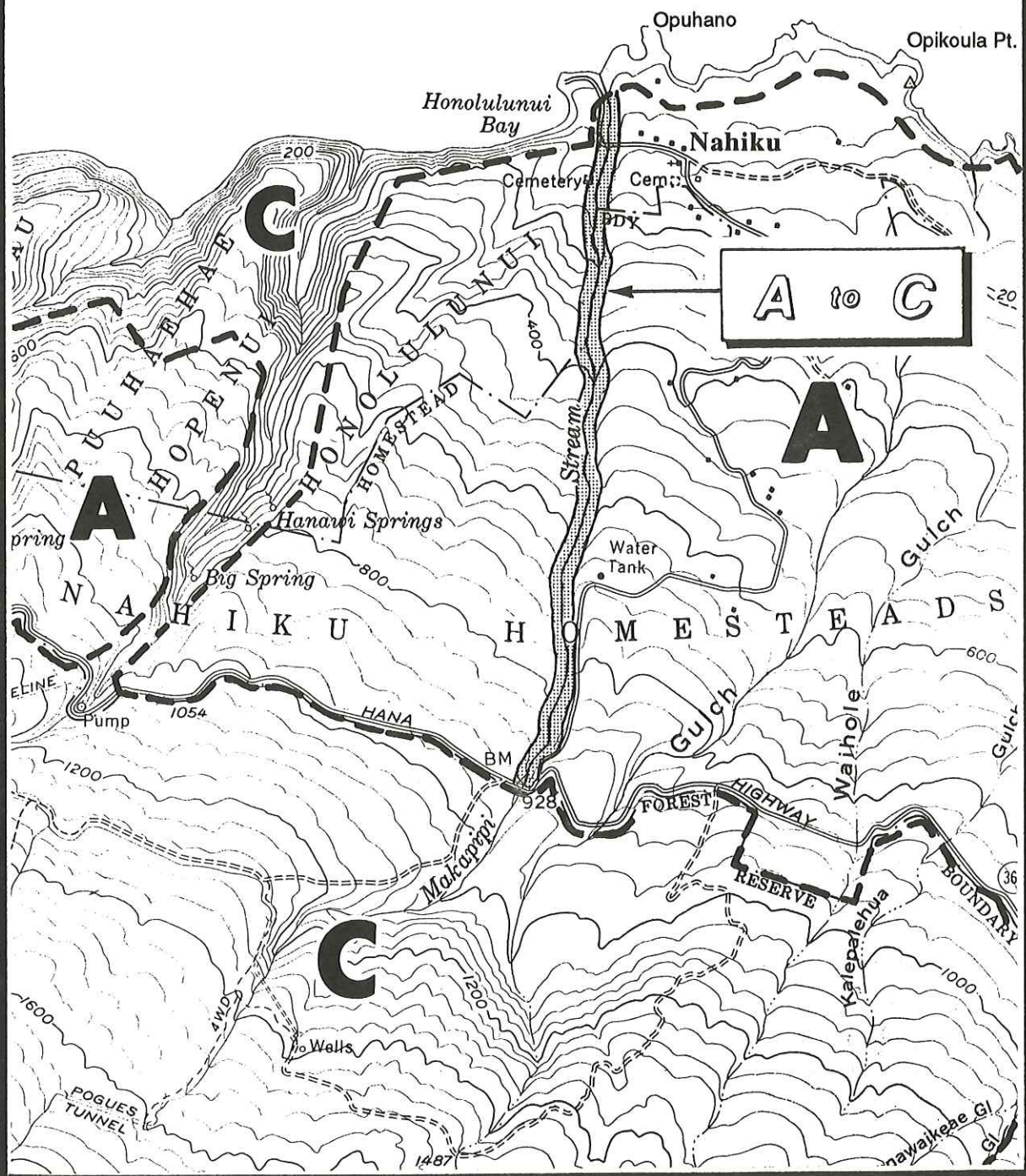
Figure 56
MAKAPIPI STREAM

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KAWAKOE AND MOKULEHUA STREAMS

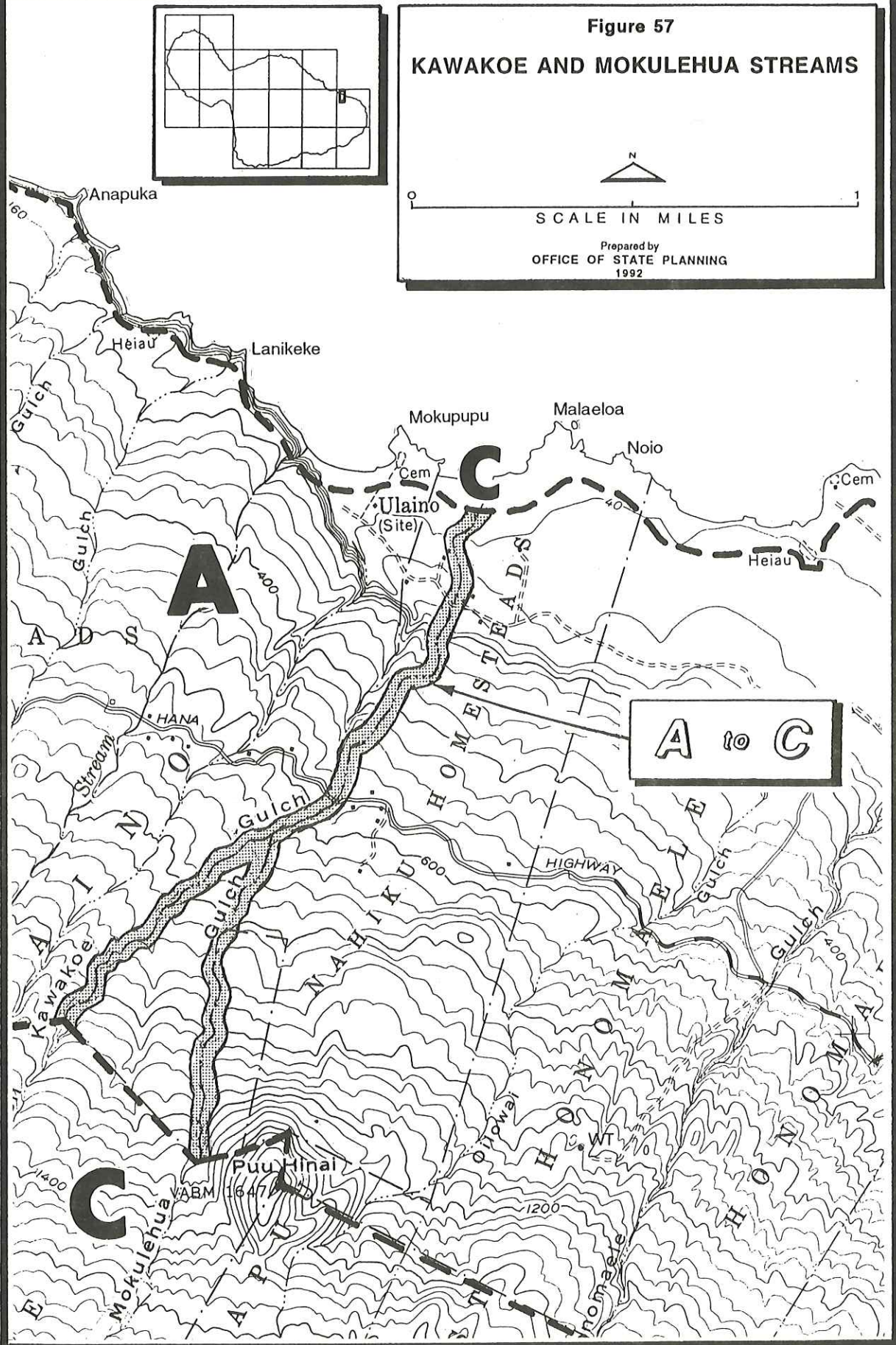
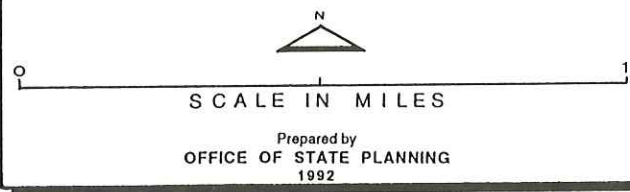
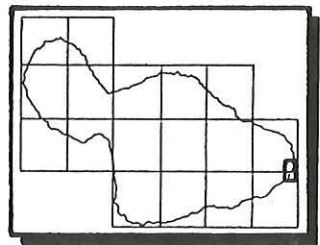
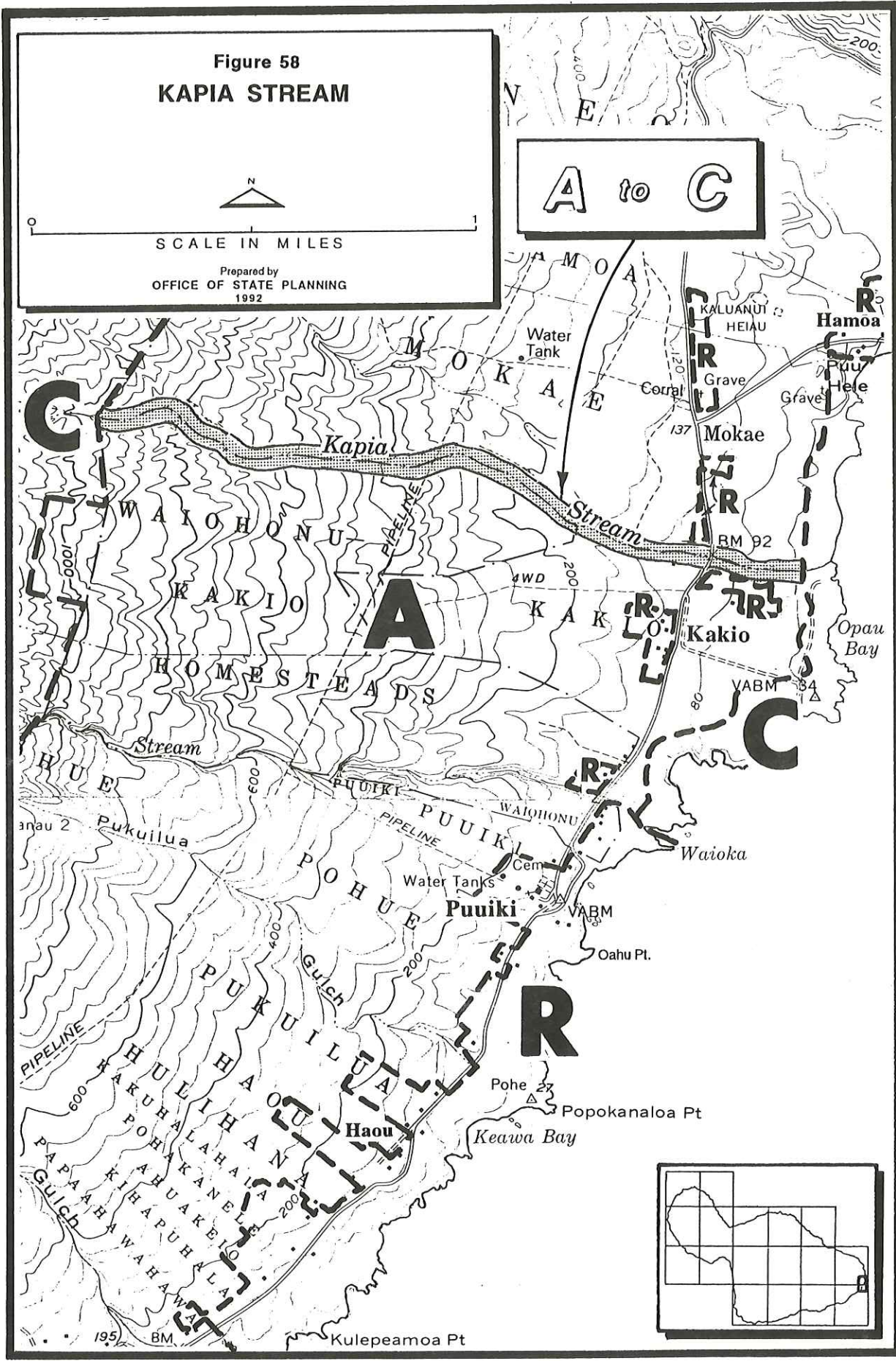


Figure 58
KAPIA STREAM



A to C



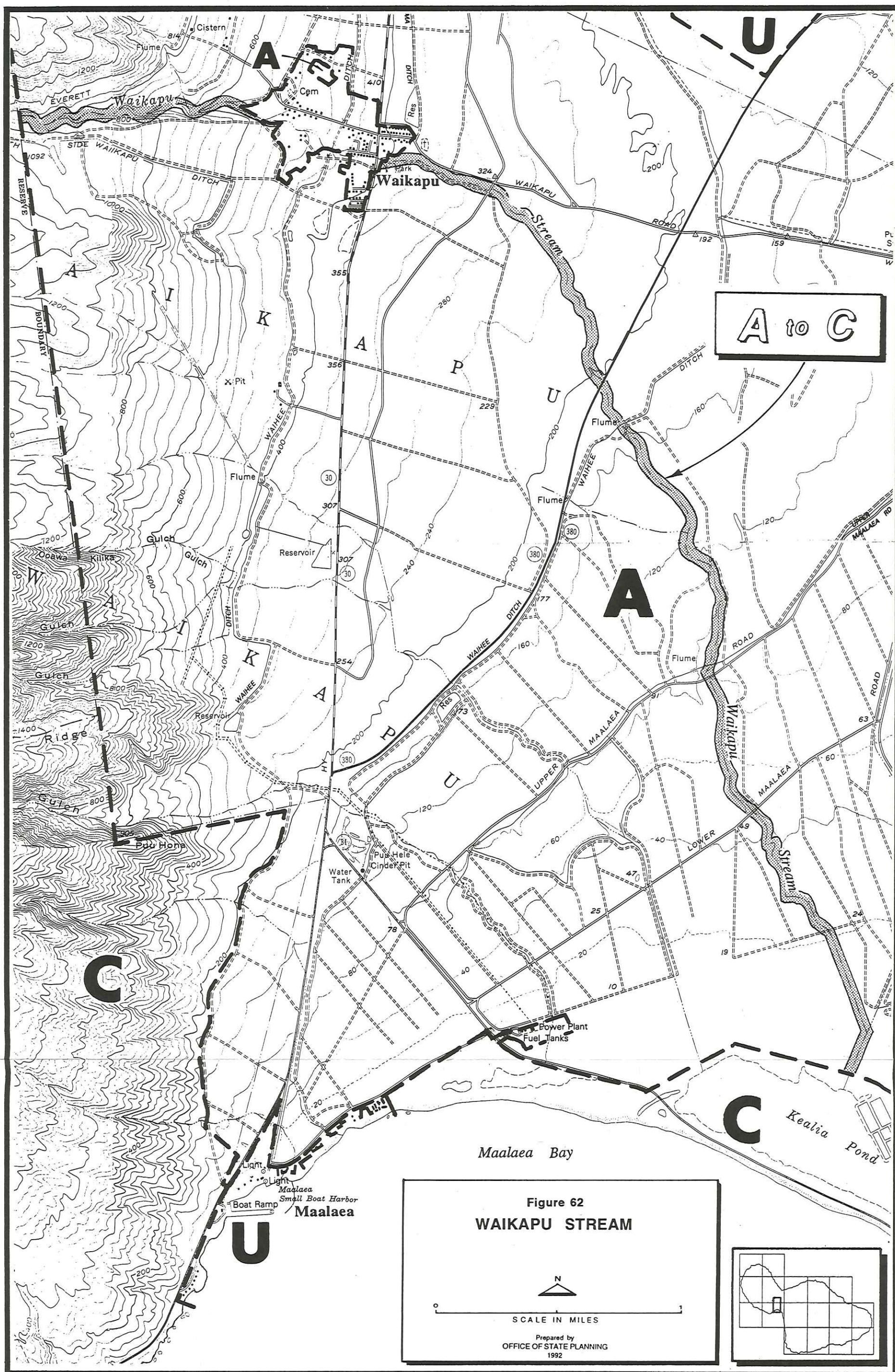
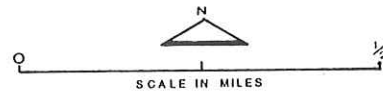
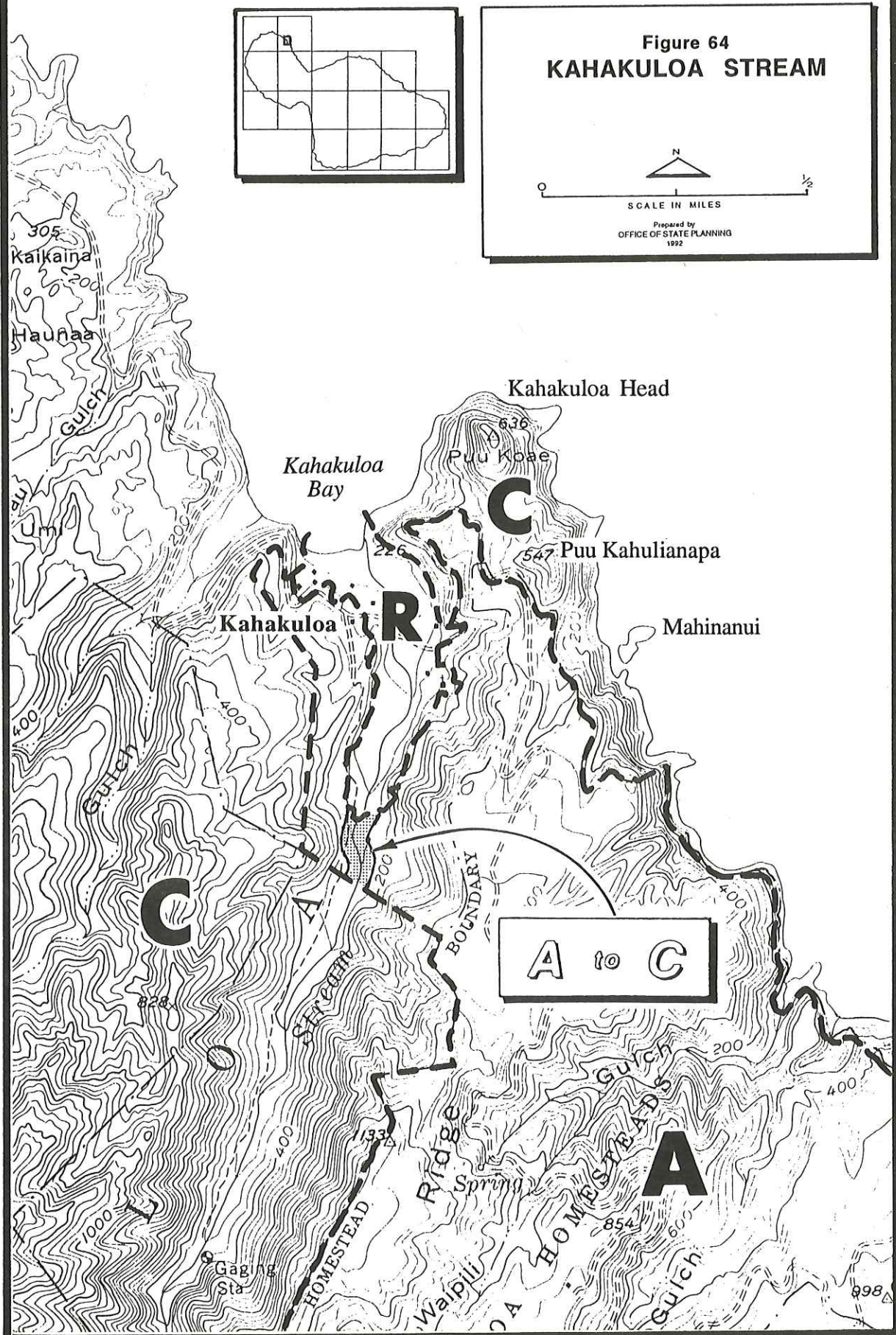


Figure 64
KAHAKULOA STREAM



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- | | |
|----------------------------------|------------------------|
| • Makamakaole ^d | • Kakiweka |
| • Waihee | • Hahalawe |
| • Piinaau and Wailuanui | • Puaaluu |
| and its tributaries ^e | • Kukuiula |
| • Makapipi | • Alelele ^f |
| • Kawakoe/Mokulehua | • Waikapu |
| • Kapia | • Honokohau |
| • Waieli | • Kahakuloa |

^d When the U.S. Soil Conservation Service acted in conjunction with the Maui County Department of Public Works to channelize about 1,700 linear feet of lower Honokowai Stream in the mid- to late 1980's, it did so without acquiring the necessary Section 404 permit(s) from the Department of the Army, Corps of Engineers. This apparent violation of law was brought to the Corps' attention after construction of the channel had been completed. The Corps declined to prepare a permit violation report; however, it did require the SCS/County to apply for an after-the-fact permit. In so doing, the SCS/County was advised to work with the U.S. Fish and Wildlife Service and DLNR to identify and provide appropriate compensation for the loss of aquatic habitat.

USFWS took the lead in negotiations with the County. Over a period of months, USFWS met with State, County and West Maui Soil and Water Conservation District representatives to reach a consensus on an appropriate means to compensate for the environmental damage done by the channelization. The meetings were usually chaired by Anne Takabuki, then the Managing Director of the County of Maui.

Numerous alternatives were weighed in these discussions, consistent with the USFWS' Mitigation Policy. These included: removal of the channel and complete restoration of the stream, adding a low flow channel (after-the-fact) similar to the low flow channel in Iao Stream, and long-term conservation and increased management of an ecologically important stream on Maui. In these joint-agency meetings, it was decided by agreement (not by USFWS mandate) that it would be most appropriate to set aside a high quality stream, preferably on West Maui. There were two candidate streams for protection: Kahakuloa and Makamakaole. Since Kahakuloa had many hui-owned kuleana properties along its length, it was dropped from consideration.

Despite its relatively small drainage basin and discharge, Makamakaole supports a full complement of native aquatic species. The majority of its lower reaches lie within State-owned lands. The upper reaches border the Kahakuloa Nature Area Reserve. Thus, the perpetual protection of Makamakaole from future detrimental land and water uses was deemed appropriate compensation for the channelization. However, USFWS was unable to achieve consensus on the means to protect the drainage. Alternatives included county, state or national park, wildlife sanctuary or refuge, natural area reserve, etc. To date, neither the land area nor the stream flow for Makamakaole has been protected (John Ford, July 21, 1992).

^e The Wailuanui and Piinaau Streams flow through Keanae, an area famous for its extensive taro fields. In most cases, taro cultivation practices can be compatible with riparian and aquatic conservation values. The wetland agricultural crop provides habitat for waterbirds and has, in some areas, become essential to the recovery of endangered waterbird species. In addition, although a small amount of stream water must be diverted to irrigate the taro loi once used, it is usually returned to the stream. The result is that there is little change to the instream flow and thus little effect on the aquatic environment. (Exceptions to this compatibility could result with extensive use of chemical fertilizers or biocides.) For these reasons, the Keanae Peninsula is an area where a taro subzone of the conservation district could be applied. An example of this subzone language is provided in Appendix D.

^f Currently under consideration and review by State agencies is a proposal to exclude a house site on the east side of the valley from the recommendation area. However, certain restrictions would apply to this site to address environmental and archaeological concerns.

These streams are recognized for their resource attributes and are recommended for reclassification into the Conservation District or are identified as worthy of such reclassification.

Watershed protection is recommended for streams. Where that is not possible because of existing uses, a 100-foot buffer extending from either side of the stream bank is recommended. Conservation designation will provide for regulation of uses along the stream, for example, construction of residences, and to assure stream protection.

As stated earlier in this report, Conservation District stream protection corridors have only 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 corridors for portions of those streams that flow within the Urban or Rural District as Priority #2 areas.

This recommendation affects Waikapu Stream which flows through the Urban District, Waihee Stream which flows through the Urban and Rural Districts and the Kahakuloa and Kapia Streams which flow through the Rural District.

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.

Table 27 illustrates slope, soil type and flood hazard parameters for those streams under consideration.

Table 27

SLOPE, SOIL TYPE AND FLOOD HAZARD PARAMETERS FOR ISLAND OF MAUI SPECIAL STREAMS			
Stream	Slope	Soil Type	Flood Hazard
Makamakaole	Exceeds 20 percent	<p>Rock land (rRK): This consists of areas where exposed rock covers 25-90 percent of surface. Rock outcrops and very shallow soils are its main characteristics. In many areas, the soil material associated with the rock outcrops is very sticky and very plastic. Has high shrink-swell potential.</p> <p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Honolua silty clay, 15-25 percent slopes (HwD): Runoff is medium and erosion hazard is moderate.</p> <p>Halawa silty clay, 3-25 percent slopes (HID): Occurs as narrow tracts bounded by gulches. Permeability is moderately rapid, runoff is slow to medium, and the erosion hazard is slight to moderate.</p>	Areas near stream mouth designated as Zone V29, areas of 100-year coastal flood with velocity (wave action). Remainder of area designated Zone C, areas of minimal flooding.
Waihee River	Approximately 6 percent near river. Land closer to ridges exceeds 20 percent slope.	<p>Naiwa silty clay loam, 3-20 percent slopes (NAC): This soil is on the smooth side slopes and intermediate slopes in the uplands. Permeability is moderately rapid. Runoff is medium, and the erosion hazard is moderate to severe.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p>	Zone C, areas of minimal flooding. (However, the subject area is beyond limits of detailed study.)

Table 27 continued
SLOPE, SOIL TYPE AND FLOOD HAZARD
PARAMETERS FOR ISLAND OF MAUI SPECIAL STREAMS

Stream	Slope	Soil Type	Flood Hazard
Piinaau and Wailuanui Stream and Tributaries	Near Palauhulu Stream tributary, slope ranges from 4-10 percent. Near the Piinaau Stream area, slope exceeds 20 percent. Near the Wailuanui Stream area, slopes range from 6 percent to over 20 percent.	<p>Stony alluvial land (rSM): This consists of stones, boulders and soil deposited by streams along the bottoms of gulches and on alluvial fans.</p> <p>Honolua silty clay, 7-15 percent slopes (HwC): This soil is on smooth interfluvies on uplands. Permeability is moderately rapid. Runoff is slow to medium and the erosion hazard is slight to moderate.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Kailua silty clay, 3-25 percent slopes (KBID): This soil is on low uplands. Soil is very strongly acid in surface layer and strongly acid to medium acid in the subsoil. Permeability is moderately rapid. Runoff is slow and the erosion hazard is slight.</p>	<p>Piinaau and Palauhulu Streams are designated Zone C, areas of minimal flooding.</p> <p>Wailuanui Stream - unknown.</p>

Table 27 continued
SLOPE, SOIL TYPE AND FLOOD HAZARD
PARAMETERS FOR ISLAND OF MAUI SPECIAL STREAMS

Stream	Slope	Soil Type	Flood Hazard
Waieli, Kakiweka, Hahalawe, and Puaaluu Streams	Exceeds 20 percent	<p>Makaalae silty clay, 7-25 percent slopes (MID): This soil is on rough, low mountain slopes. Soil is strongly acid in surface layer and medium to slightly acid in the subsoil. Permeability is moderate, runoff is slow to medium and erosion hazard is slight to moderate.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Rock land (rRK): This consists of areas where exposed rock covers 25-90 percent of the surface. Rock outcrops and very shallow soils are its main characteristics. In many areas, the soil material associated with the rock outcrops is very sticky and very plastic. Has high shrink-swell potential.</p> <p>Makaalae extremely stony silty clay, 7-25 percent slopes (MJD): This soil is similar to Makaalae silty clay, 7-25 percent slopes, except that stones cover 3-15 percent of the surface.</p>	Zone C, areas of minimal flooding.
Kukuiula Stream	Slopes range from 10 percent to over 20 percent	<p>Makaalae silty clay, 7-25 percent slopes (MID): This soil is on rough, low mountain slopes. Soil is strongly acid in surface layer and medium to slightly acid in the subsoil. Permeability is moderate, runoff is slow to medium and erosion hazard is slight to moderate.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p>	Zone C, areas of minimal flooding.
Alelele Stream	Exceeds 20 percent	<p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Hydrandepts-Tropaquods Association (rHT): This consists of well-drained to poorly drained soils on uplands. Soils in this association have low bearing capacity and low shear strength. Because of their ability to absorb water and transmit it rapidly, these soils are important for maintenance of groundwater.</p> <p>Makaalae silty clay, 7-25 percent slopes (MID): This soil is on rough, low mountain slopes. Soil is strongly acid in surface layer and medium to slightly acid in the subsoil. Permeability is moderate, runoff is slow to medium and erosion hazard is slight to moderate.</p> <p>Makaalae clay, 7-40 percent slopes (MWE): Surface layer of this soil developed in a mixture of volcanic ash, and the subsoil derived from basic igneous rock. Surface layer is very sticky and very plastic.</p>	Small portion at Alelele Stream mouth designated as Zone A, areas of 100-year flood; base flood elevations and flood hazard factors not determined. Remainder is designated as Zone C, areas of minimal flooding.

Table 27 continued
SLOPE, SOIL TYPE AND FLOOD HAZARD
PARAMETERS FOR ISLAND OF MAUI SPECIAL STREAMS

Stream	Slope	Soil Type	Flood Hazard
Makapipi Stream	Slopes range from 8-14 percent.	<p>Makaalae silty clay, 7-25 percent slopes (MID): This soil is on rough, low mountain slopes. Soil is strongly acid in surface layer and medium to slightly acid in the subsoil. Permeability is moderate, runoff is slow to medium and erosion hazard is slight to moderate.</p> <p>Honomanu silty clay, 5-25 percent slopes (rHOD): This soil is on the wettest parts of the northeastern slopes of Haleakala. Soil is extremely acid in the surface layer and subsoil. Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight.</p>	Zone C, areas of minimal flooding.
Kawakoe/ Mokulehua Stream	Slopes range from 14 percent to over 20 percent.	<p>Hana very stony silty clay loam, 3-25 percent slopes (HKLD): This soil is on smooth, low mountain slopes. Permeability is moderately rapid. Runoff is slow to medium and the erosion hazard is slight to moderate.</p> <p>Malama extremely stony muck, 3-25 percent slopes (MYD): This series consists of excessively drained, extremely stony, very shallow, organic soils on uplands. Permeability is very rapid. Runoff is very slow, and erosion hazard is no more than slight. These soils used mostly for water supply.</p>	Up to approximately 500 feet from stream mouth, the area is designated as Zone V29, areas of 100-year coastal flood with velocity (wave action). Remainder of Kawakoe and Mokulehua Stream areas are designated Zone C, areas of minimal flooding.
Kapia Stream	Slopes range from 5-20 percent.	<p>Makaalae silty clay, 7-25 percent slopes (MID): This soil is on rough, low mountain slopes. Soil is strongly acid in surface layer and medium to slightly acid in the subsoil. Permeability is moderate, runoff is slow to medium and erosion hazard is slight to moderate.</p> <p>Makaalae extremely stony silty clay, 7-25 percent slopes (MJD): This soil is similar to Makaalae silty clay, 7-25 percent slopes, except that stones cover 3-15 percent of the surface.</p> <p>Hana very stony silty clay loam, 3-25 percent slopes (HKLD): This soil is on smooth, low mountain slopes. The soil is strongly acid to medium acid in the surface layer and slightly acid in the subsoil. Permeability is moderately rapid. Runoff is slow to medium and the erosion hazard is slight to moderate.</p> <p>Hana extremely stony silty clay loam, 3-25 percent slopes (HKMD): This soil has a profile like that of Hana very stony silty clay loam, 3-25 percent slopes, except that stones cover 3-15 percent of the surface.</p> <p>Hana silty clay loam, moderately deep variant, 3-15 percent slopes (HKNC): This soil is nonstony and moderately deep. Runoff is slow to medium, and erosion hazard is slight to moderate.</p> <p>Hana extremely stony silty clay loam, moderately deep variant, 3-15 percent slopes (HKOC): This soil has a profile like that of Hana silty clay loam, moderately deep variant, 3-15 percent slopes, except that stones cover 3-15 percent of the surface.</p>	The area of Kapia Stream is classified as Zone V23, areas of 100-year coastal flood with velocity (wave action). Up to approximately 2,700 feet inland from the shore, areas adjacent to Kapia Stream are designated as Zone A, areas of 100-year flood; base flood elevations and flood hazard factors not determined. Remainder of Kapia Stream is designated as Zone C, areas of minimal flooding.

Table 27 continued
SLOPE, SOIL TYPE AND FLOOD HAZARD
PARAMETERS FOR ISLAND OF MAUI SPECIAL STREAMS

Stream	Slope	Soil Type	Flood Hazard
Waikapu	Approximately 2 percent	<p>Kealia silt loam (KMW): Soil is poorly drained with a high content of salt. Permeability is moderately rapid. Runoff is slow to very slow.</p> <p>Jaucas sand, 0-15 percent slopes (JaC): Jaucas series consists of excessively drained, calcareous soils. Permeability is rapid. Runoff is very slow to slow.</p> <p>Pulehu silt loam, 0-3 percent slopes (PpA), Pulehu silt loam, 3-7 percent slopes (PpB), Pulehu cobbly silt loam, 3-7 percent slopes (PrB): This series of soils consist of well-drained soils on alluvial fans and stream terraces and in basins.</p> <p>Puuone sand, 7-30 percent slopes (PZUE): This soil is on sandhills near the ocean. Permeability is rapid above the cemented layer. Runoff is slow, and the hazard of wind erosion is moderate to severe.</p> <p>Iao clay, 3-7 percent slopes (IcB): This soil is on smooth alluvial fans and valley fill. Permeability is moderately slow. Runoff is medium, and erosion hazard is slight to moderate.</p>	Areas around Waikapu Stream designated Zone A, areas of 100-year flood; base flood elevations and flood hazard factors not determined. Zone A boundaries extend as much as 700 feet from the stream bank near Kealia Pond. Upstream, Zone A boundaries average approximately 50 feet from stream bank. Neighboring lands are designated Zone C, areas of minimal flooding.
Honokohau Stream	3 percent slope for most of subject area, although small portions significantly exceed 20 percent slope	<p>Tropaquepts (TR): These are poorly drained soils that are periodically flooded by irrigation in order to grow crops that thrive in water.</p> <p>Stony alluvial land (rSM): This consists of stones, boulders and soil deposited by streams along the bottoms of gulches and on alluvial fans.</p> <p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p>	Most of the subject area is designated as Zone A, areas of 100-year flood; base flood elevations and flood hazard factors not determined. Remainder is designated Zone C, areas of minimal flooding.
Kahakuloa Stream	Approximately 12 percent	<p>Stony alluvial land (rSM): This consists of stones, boulders and soil deposited by streams along the bottoms of gulches and on alluvial fans.</p> <p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p> <p>Rock land (rRK): This consists of areas where exposed rock covers 25-90 percent of the surface. Rock outcrops and very shallow soils are its main characteristics. In many areas, the soil material associated with the rock outcrops is very sticky and very plastic. Has high shrink-swell potential.</p>	Zone C, areas of minimal flooding.

Sources: Federal Emergency Management Agency, June 1, 1981.
Soil Conservation Service, August 1972.
U.S. Geological Survey Quadrangle Maps, 1968.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of Maui's Special Streams to the Conservation District meets criteria which provide that the Conservation District include areas necessary for protecting watersheds and water resources, preventing floods and soil erosion, preserving scenic areas, conserving indigenous and endemic plants, fish and wildlife, including those which are threatened and endangered, and areas of value for recreational purposes. Inclusion of these streams and their respective surrounding areas would protect the various resources associated with them.

Section 205-17(3)(A) and (B): The proposed reclassification of the Special Streams from the Agricultural District to Conservation will promote the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical or natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies for achieving the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-13(a)(1) and (b)(2), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality, Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification of the subject area conforms to the HSP objective and policy of achieving the maintenance and pursuit of improved quality in Hawaii's land,

air, and water resources and promoting the proper management of Hawaii's land and water resources.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include but not be limited to the watershed and recharge areas, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites and areas particularly sensitive to reduction in water quality, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms with the LUC standards for determining Conservation District boundaries. Standards which are applicable to the reclassification of the Special Streams address lands necessary for protecting watershed, water resources, and water supplies; lands susceptible to floods, and soil erosion; lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic or archaeological sites; lands necessary for providing and preserving wilderness and for conserving natural ecosystems of endemic plants, fish and wildlife; lands with topography, soils, climate or other related environmental factors that may not be normally adaptable for urban, rural or agricultural use; and lands with a general slope of twenty percent or more which provide for open space amenities or scenic values. Reclassification of Maui's Special Streams would provide protection of resource values associated with each stream.

Conformance With County Plans:

Makamakaole, Kahakuloa and Waihee Streams and that portion of Waikapu Stream within the Wailuku-Kahului planning region are designated as Agriculture by the Wailuku-Kahului Community Plan.

The remainder of Waikapu Stream is within the boundaries of the Kihei-Makena planning region and is designated as Agriculture by the Kihei-Makena Community Plan.

Honokohau Stream is designated as Agriculture by the Lahaina Community Plan.

Streams in the Hana planning region include Kakiweka, Hahalawe, Puaaluu, Alelele, Piinaau, Wailuanui, Makapipi, Kawakoe/Mokulehua, Kapia and Kukuiula Streams and are all designated as Agriculture by the Hana Community Plan.

All the aforementioned streams would require an amendment to the respective Community Plans.

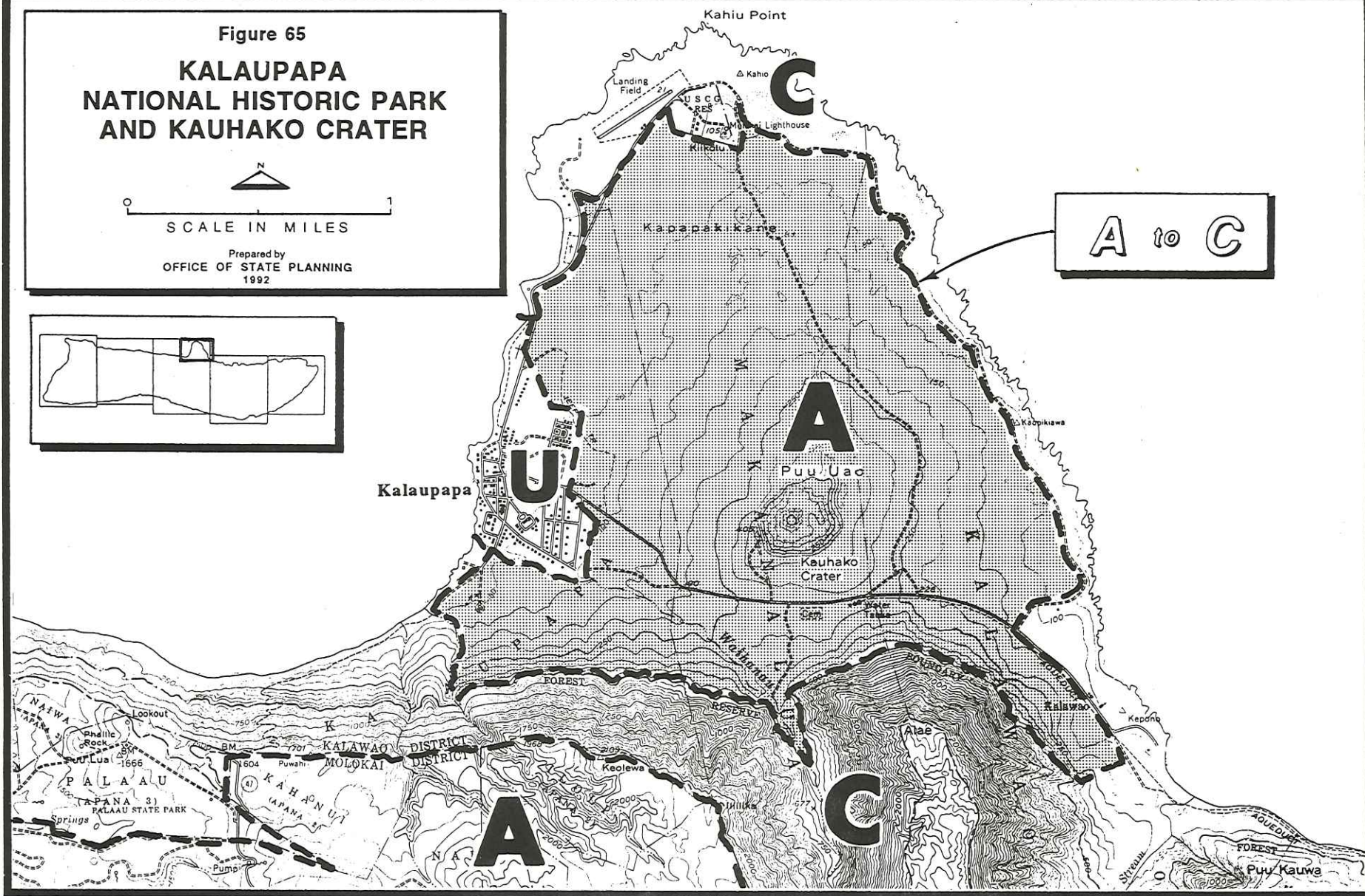
B. ISLAND OF MOLOKAI

1. Kalaupapa National Historical Park and Kauhako Crater (2,405 Acres; A to C)

The Kalaupapa National Historical Park is located on Molokai's northern coast on what is geographically known as the Kalaupapa Peninsula, and includes Puu Uao, Kauhako Crater, and Waihanau Stream among its features. The entire Kalaupapa Peninsula is designated as a National Historical Park. See Figure 65.

This area has been identified as containing conservation resources. However, no action will be taken on this site because it is DHHL land.

The critical core area encompasses approximately 53 acres around Kauhako Crater, up to the 250-foot elevation, and contains a rare anchialine pool and a remnant native forest. The eastern slope contains a lava tube system that runs from the Crater to the coast, where at least two native cave animals are found. A windward native coastal strand community extends several hundred feet inland on the east/northeast slope of the Crater. Sea turtles have been observed along the coast.



The entire peninsula is known to contain abundant archaeological features having cultural significance.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas and conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. The inclusion of the subject area into the Conservation District would afford protection the various ecosystems found in the area as well as the numerous archaeological sites there. The reclassification would be in keeping with the area's designation is as National Historic Park.

Section 205-17(3)(A) and (B): The proposed reclassification of the Kalaupapa National Historical Park and Kauhako Crater from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical, or natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a), (b)(1), (3), and (4), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification conforms to the HSP objective and policies for the enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources through promoting the preservation and restoration of significant natural and historic resources, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features, and protecting those structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not be limited to, watershed and recharge areas, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites, areas particularly sensitive to reduction in water quality, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The reclassification of the subject area would conform to the LUC standards of determining Conservation District boundaries. Applicable standards address lands used for national parks; lands necessary for the conservation, preservation and enhancement of scenic, cultural, historic and archaeologic sites; sites of unique ecologic significance; and lands necessary for preserving parklands and for conserving natural ecosystems of endemic species. The inclusion of the subject area to the Conservation District would bring it into consistency with its designation as a National Historic Park as well as afford protection

the various native ecosystems and native flora and fauna within the area.

Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Conservation. As such, reclassification of the subject parcel would bring it into conformance with the Community Plan.

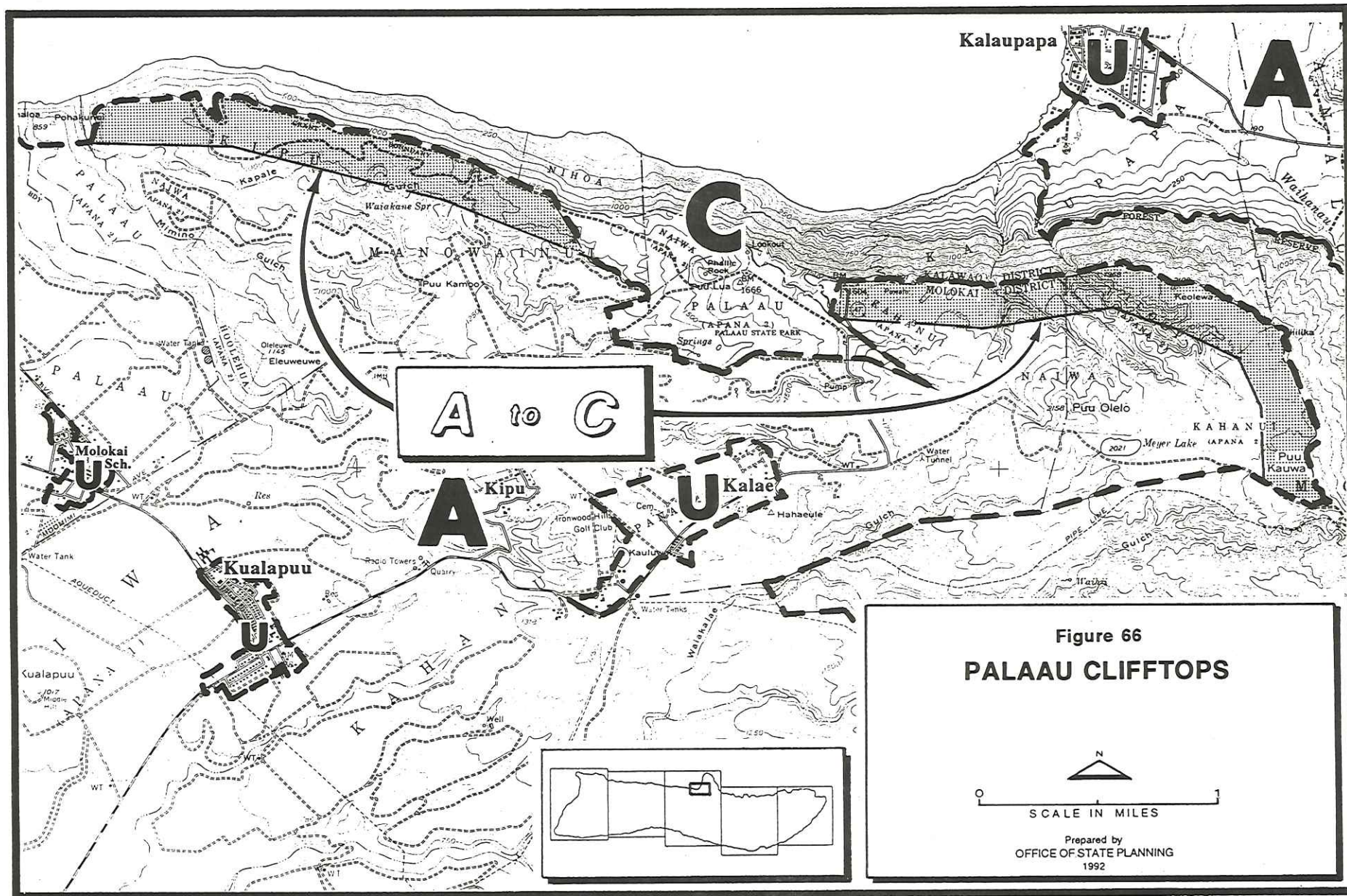
2. Palaau Clifftops (565 Acres; A to C):

The Palaau Clifftops are two areas located along the northern coast of Molokai, west of the Kalaupapa Peninsula. See Figure 66. The western half begins near Pohakunui in the west and follows the cliffs eastward until the Palaau State Park's western boundary. The eastern half begins at the eastern boundary of the park and parallels the cliffs until Puu Kauwa. In combination with the coastal cliffs, this area is noted for its scenic resource value. Reclassification of the subject areas would provide an open space buffer to enhance the scenic and open space value of the adjoining cliffs (DLNR, November 12, 1991).

Conformance With Chapter 205, HRS:

Section 205-2(e): The reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic areas and open space areas whose existing openness, natural condition or present state of use, if retained, would maintain or enhance the conservation of natural or scenic resources. Inclusion of the subject areas, both of which share contiguous borders with Palaau State Park and Kalaupapa National Historical Park, would enhance the scenic resources associated with the cliffs below.

Section 205-17(3)(A): The proposed reclassification of the Palaau Clifftops subject area from the Agriculture District to Conservation will promote the preservation or maintenance of important natural



systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources:

The proposed reclassification conforms to the HSP objective and policies which provide for the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a) and (b)(3), Objective and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources:

The proposed reclassification conforms to the HSP objective and policies which provide for planning for the State's physical environment towards the achievement of enhancing Hawaii's scenic assets and natural beauty by promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes and other natural features.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines:

The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, open space and natural areas and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The reclassification of the subject area conforms to the LUC standards of determining Conservation District boundaries with respect to including lands with soils that

may not be normally adaptable for agricultural use and lands necessary for the enhancement of scenic resources. The Land Study Bureau classifies the eastern sector of the subject area as having soils with overall productivity ratings of "D" and "E". The western sector is a mixture of "C", "D", and "E" rated lands. Reclassification would also provide an open space buffer to enhance the scenic and open space value of the adjoining cliffs.

Conformance with County Plans:

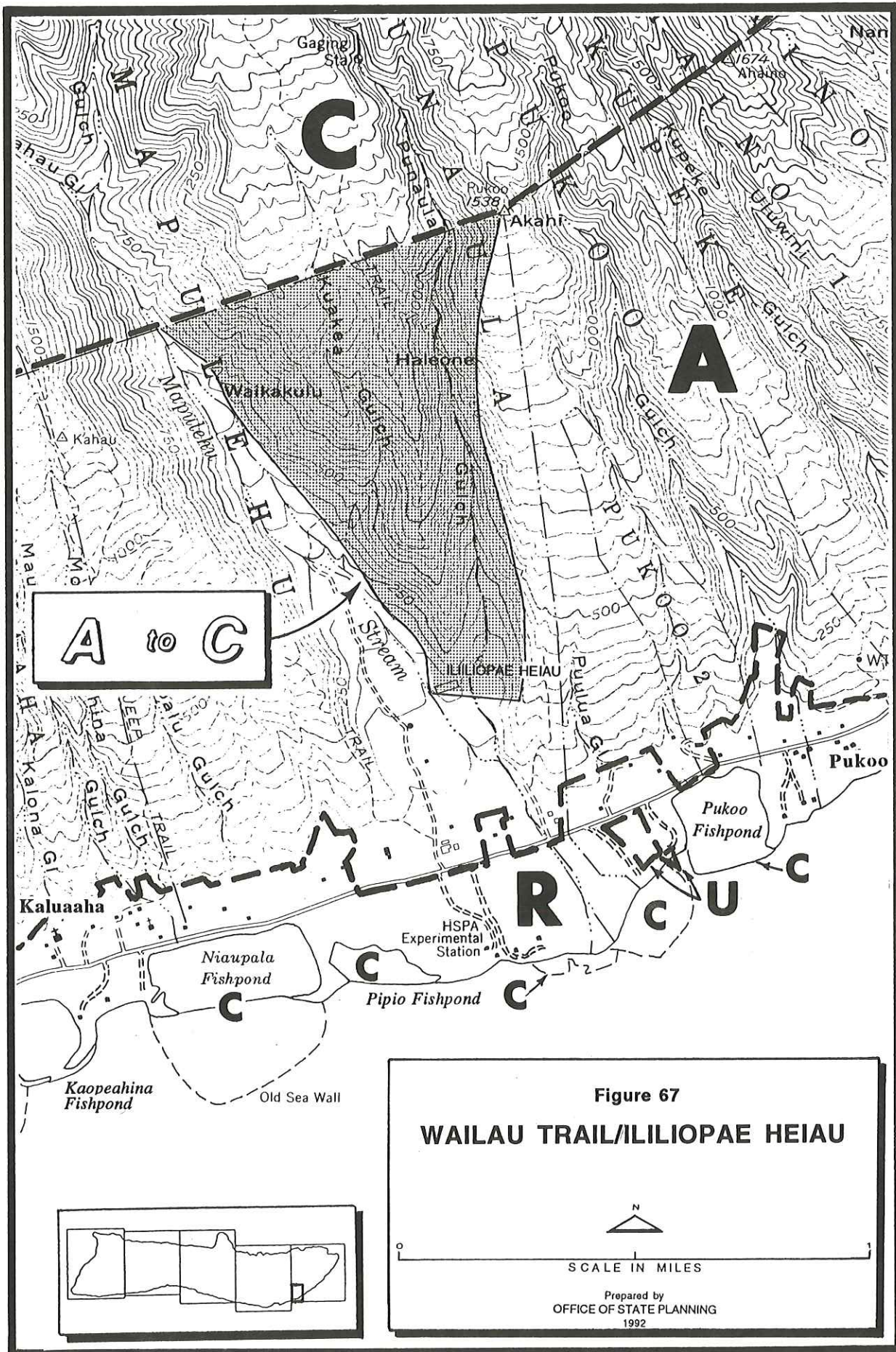
The Molokai Community Plan designates the proposed reclassification area as Conservation. As such, reclassification of the subject parcel would bring the subject area into conformance with the Community Plan.

3. Wailau Trail/Ililiopae Heiau (200 Acres; A to C)

The subject area is located in East Molokai, approximately midway between Kaluaaha and Pukoo. See Figure 67. A noted feature of the recommended area is the Ililiopae Heiau, located mauka of the Niaupala Fishpond, at elevation 40-feet. The Heiau is the largest on Molokai and is considered the oldest on the Island (Pukui, 1974). This platform heiau measures 286-feet by 87-feet and ranges in height from 11- to 22-feet. The Wailau Trail is an overland trail which begins at the Ililiopae Heiau, winding through the mountain regions of East Molokai and ending at the bottom of Wailau Valley.

The area and surrounding lands are characterized by a rugged and mountainous terrain common to the southeast Molokai region. The coastal plains to the south of the area are within the State Rural District. Conservation lands lie mauka (north) of the request area. (The Wailau Trail continues mauka into the State Conservation District.)

The Molokai Community Plan designates the Heiau site as Park with the surrounding lands which encompass the Wailau Trail



designated Agriculture.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas. Although falling within the Agricultural District, the area is considered largely unsuitable for agricultural purposes and holds historic and scenic conservation value.

Section 205-17(3)(B): The proposed reclassification of the Wailau Trail/Iliiopae Heiau area will promote the maintenance of valued cultural, historical, or natural resources.

Conformance With Chapter 226, HRS, The Hawaii State Plan:

Section 226-12(a) and (b)(3), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies for enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources by promoting the preservation and restoration of significant natural and historic resources, and by promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines for regional growth distribution and land resource utilization identifying critical environmental areas in Hawaii to include, but not be limited to, historic or cultural sites and scenic resources and to protect and enhance Hawaii's shoreline, open spaces and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: LUC standards which apply to the proposed reclassification relate to the inclusion of lands necessary for the conservation, preservation and enhancement of scenic cultural, historic or archaeological sites. The recommended area is part of a larger undeveloped open space region and holds historic and scenic values which establish the character of the region.

Conformance with County Plans:

Ililiopae Heiau is designated by the Community Plan as Park which is consistent with the State Conservation District. The remaining areas are Community Planned Agriculture. Reclassification of the portion of the subject parcel designated Agriculture would require an amendment to the Community Plan.

4. Ualapue (203 Acres; U to R)

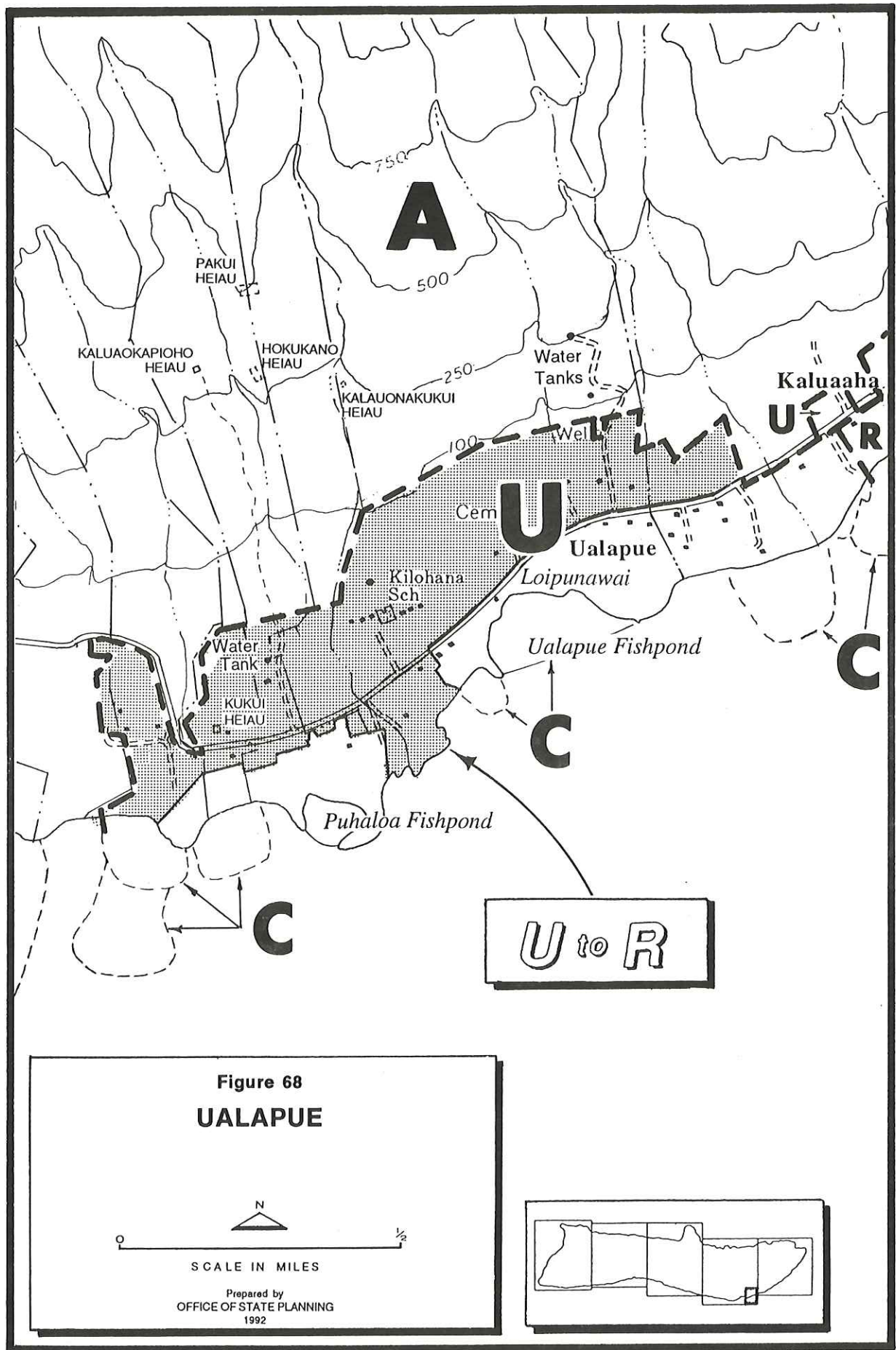
The Ualapue area involves the reclassification of the entire area currently designated Urban to the Rural District. See Figure 68.

Ualapue is a rural community located along Molokai's southeast coast. The area consists of small individual lots ranging in size from one-half acre to 4.0 acres or more. The majority of lots in this area are between 1.0 to 2.0 acres, reflecting its rural atmosphere.

The subject area is bounded to the north and west by State Agricultural lands. Fishponds dotting the coast fronting Ualapue are classified Conservation, while Rural District lands are found to the east. This area contains several sites of historic significance, including the Kukui Heiau and Tapa Heiau.

Conformance With Chapter 205, HRS:

Section 205-2(c): The reclassification of the Ualapue area to the Rural District meets criteria which provide that the Rural District include activities or uses characterized by low density residential lots of not more than one dwelling per one-half acre, except as



provided by County ordinance, in areas where "city-like" concentration of people, structures, streets and urban level of services are absent and where small farms are intermixed with low density residential lots. Reclassification would also promote the intent of the Molokai Community Plan to maintain the rural lifestyle associated with this area.

Section 205-17(2): The proposed reclassification of the Ualapue area from the Urban District to Rural conforms to applicable district standards.

Conformance with Chapter 226, HRS, The Hawaii State Plan: Section 226-5(a) and (b)(1), Objective and Policies for Population: The proposed reclassification of the subject area conforms to the HSP objective to guide population growth to be consistent with the achievement of physical, economic, and social objectives through the policy of managing population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.

Section 226-25(a) and (b)(2), Objectives and Policies for Socio-Cultural Advancement - Culture: The proposed reclassification conforms to the HSP objective and policy for the enhancement of cultural identities, traditions, values, customs and arts of Hawaii's people through the policy of supporting activities and conditions that promote cultural values, customs, and arts that enrich the life styles of Hawaii's people and which are sensitive and responsive to family and community needs.

Section 226-104(b)(11), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guideline for regional growth distribution and land resource utilization to identify all areas where priority should be given to preserving rural character and lifestyle.

Conformance With LUC Standards:

Section 15-15-21: The proposed reclassification of the subject area conforms to the LUC standards for determining Rural District boundaries. It is the intent of the Molokai Community Plan to maintain the subject area as part of a larger rural community. The area promotes the unique rural lifestyle found in this region of Molokai, which is characterized by low residential densities.

Conformance With County Plans:

The Molokai Community Plan designates the majority of the subject area as Rural. A Single-Family designation is established makai of Kamehameha V Highway, surrounding the Puhaloa Fishpond.

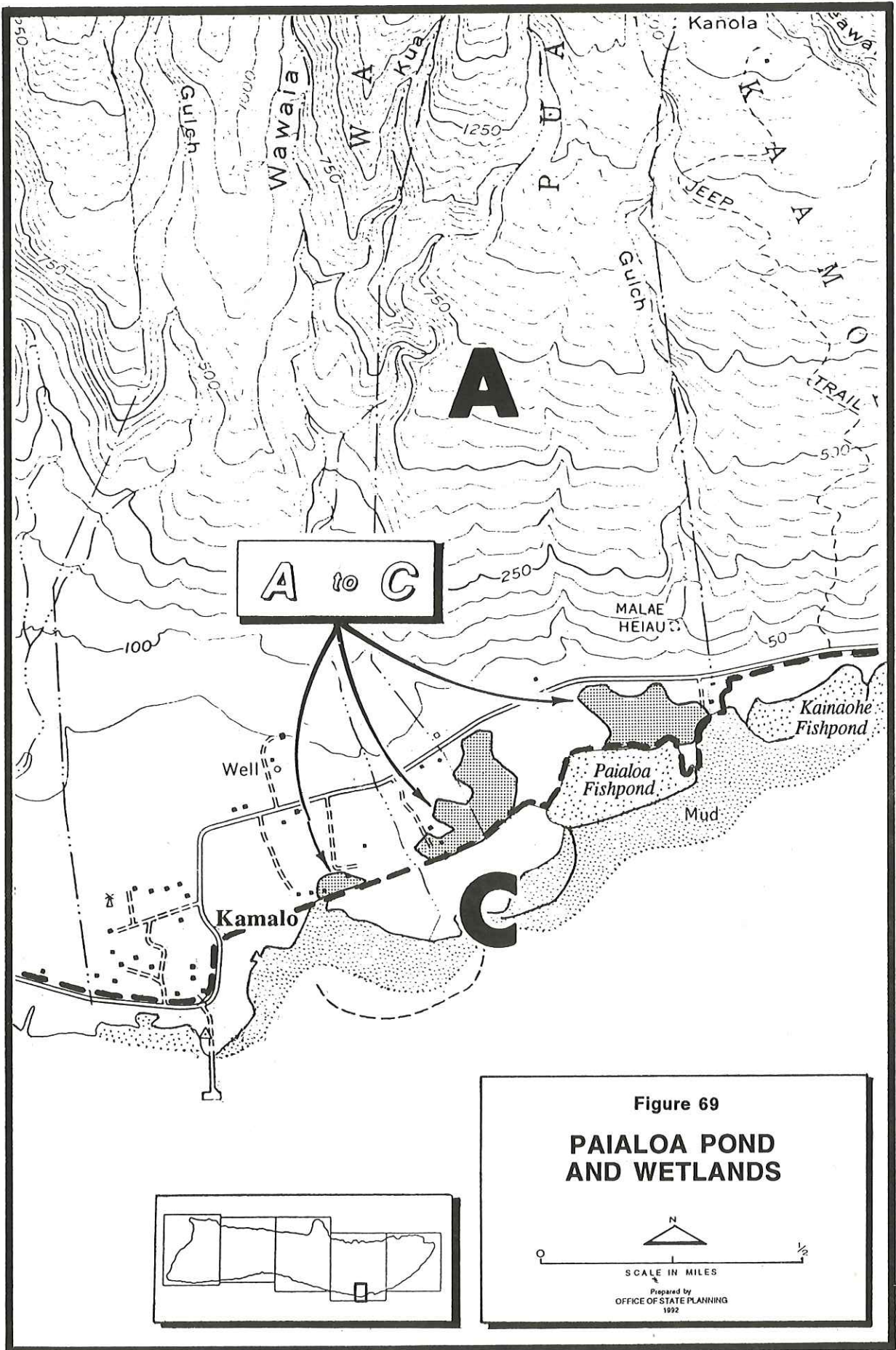
5. Paialoa Pond and Wetlands (31 Acres; A to C)

Paialoa Pond and the adjacent wetlands are found on Molokai's southeast coast, east of Kamalo and makai of Malae Heiau. See Figure 69.

The Paialoa Pond and Wetlands area contains a fishpond designated as Conservation. The surrounding wetlands which are designated Agriculture provide a habitat for endangered Hawaiian stilts (*Himantopus mexicanus knudseni*) and indigenous black-crowned night-herons (*Nycticorax nycticorax hoactli*).

Paialoa Pond and Wetlands are identified as important in the State Conservation Lands Functional Plan, Hawaiian Waterbirds Recovery Plan and Regional Wetlands Concept Plan.

A minimum 100-foot buffer zone around the wetland is recommended. Studies have found that buffers are effective in reducing the amount of pollution affecting a waterway (Klein, 1990). In addition, Conservation designation around the wetland will provide for regulation of uses (e.g. construction of residences) which may impact waterbirds.



The wetland area around Wawaia Gulch and Kalokoiki Fishpond are within the 100-year flood boundary.

Conformance With Chapter 205, HRS:

Section 205-2(e): Reclassification of the subject area to the Conservation District, as proposed, meets criteria which provide that the Conservation District include areas necessary for conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered, and open spaces 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 inclusion of the subject area would provide a buffer zone to Paialoa Pond which is already designated Conservation as well as protect the surrounding wetland habitat for the endangered and indigenous avifauna which utilize it. The proposed reclassification also aids in preventing damage from floods.

Section 205-17(3)(A) and (B): The proposed reclassification of the Paialoa Pond and Wetlands from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats, and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies relating to the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies and areas particularly sensitive to reduction in water quality.

Conformance With LUC Standards:

Section 15-15-20: The recommended reclassification of the site conforms to the LUC standards of determining Conservation District boundaries. These standards relate to the inclusion of lands necessary for conserving the natural ecosystems of endemic species, lands susceptible to floods, and lands necessary for the protection of the health and welfare of the public by reason of the lands' susceptibility to flooding. The reclassification of the subject area would provide a buffer zone for Paialoa Fishpond, and protect the wetlands which serves as a habitat to endangered and indigenous avifauna. A portion of the proposed reclassification area is also subject to flooding.

Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Agriculture. Reclassification of the subject parcel would require an amendment to the Community Plan.

6. Waiakuilani Gulch (332 Acres; A to C)

The Waiakuilani Gulch area is located along Molokai's southeast coast, northwest of Kamalo Harbor. See Figure 70. The gulches in this area contain native forests and shrublands, clusters of native plants, and scattered populations of 'ohai (*Sesbania tomentosa*). The area provides habitat for rare *Achatinellid* land snails (*Perdicella helena*).

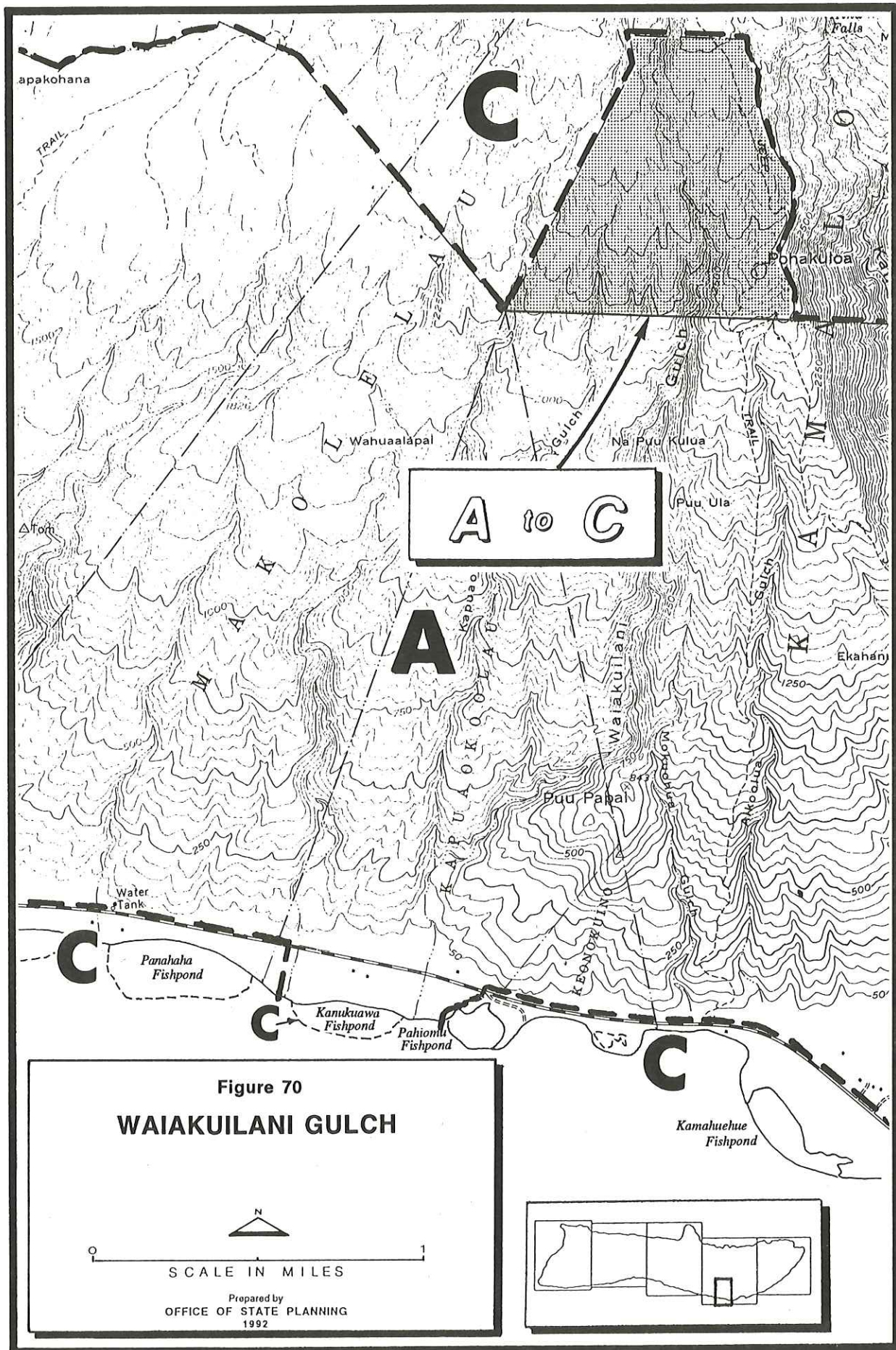


Figure 70
WAIAKUILANI GULCH

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 SCALE IN MILES

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Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. Reclassification would afford protection to the native flora and fauna found within the area.

Section 205-17(3)(A): The proposed reclassification of the Waiakuilani Gulch area from the Agricultural District to Conservation will promote the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources:

The proposed reclassification conforms to the HSP objective and policies for the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines:

The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, open space and natural areas, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the

LUC standards which relate the inclusion of lands necessary for conserving natural ecosystems of endemic plants, fish and wildlife. Reclassification of the subject area would give protection to the various native plants, land snails and gobies found within its boundaries. A portion of the subject area is contiguous with the existing Conservation District and reclassification from the Agricultural District to the Conservation District would bring it into conformance with the Molokai Community Plan.

Conformance with County Plans:

The inclusion of this area into the Conservation District would bring it into conformance with the Molokai Community Plan which designates the area as Conservation.

7. Kakahaia Wetland (16 Acres; A to C)

This area is located on the southeast coast of Molokai and includes the Kakahaia National Wildlife Refuge (NWR), seasonally flooded wetland areas, and a buffer zone. See Figure 71.

Kakahaia is a National Wildlife Refuge for endangered waterbirds, which includes the endangered Hawaiian stilt and the indigenous black-crowned night heron.

The water portion of the refuge is currently within the Conservation District, however, all surrounding lands north of Kamehameha V Highway is in the Agricultural District.

A minimum 100-foot buffer zone around the wetland is recommended. Studies have found that buffers are effective in reducing the amount of pollution affecting a waterway (Klein, 1990). In addition, Conservation designation around the wetland will provide for regulation of uses (e.g. construction of residences) which may impact waterbirds.

According to the Flood Insurance Rate Map, most of the proposed

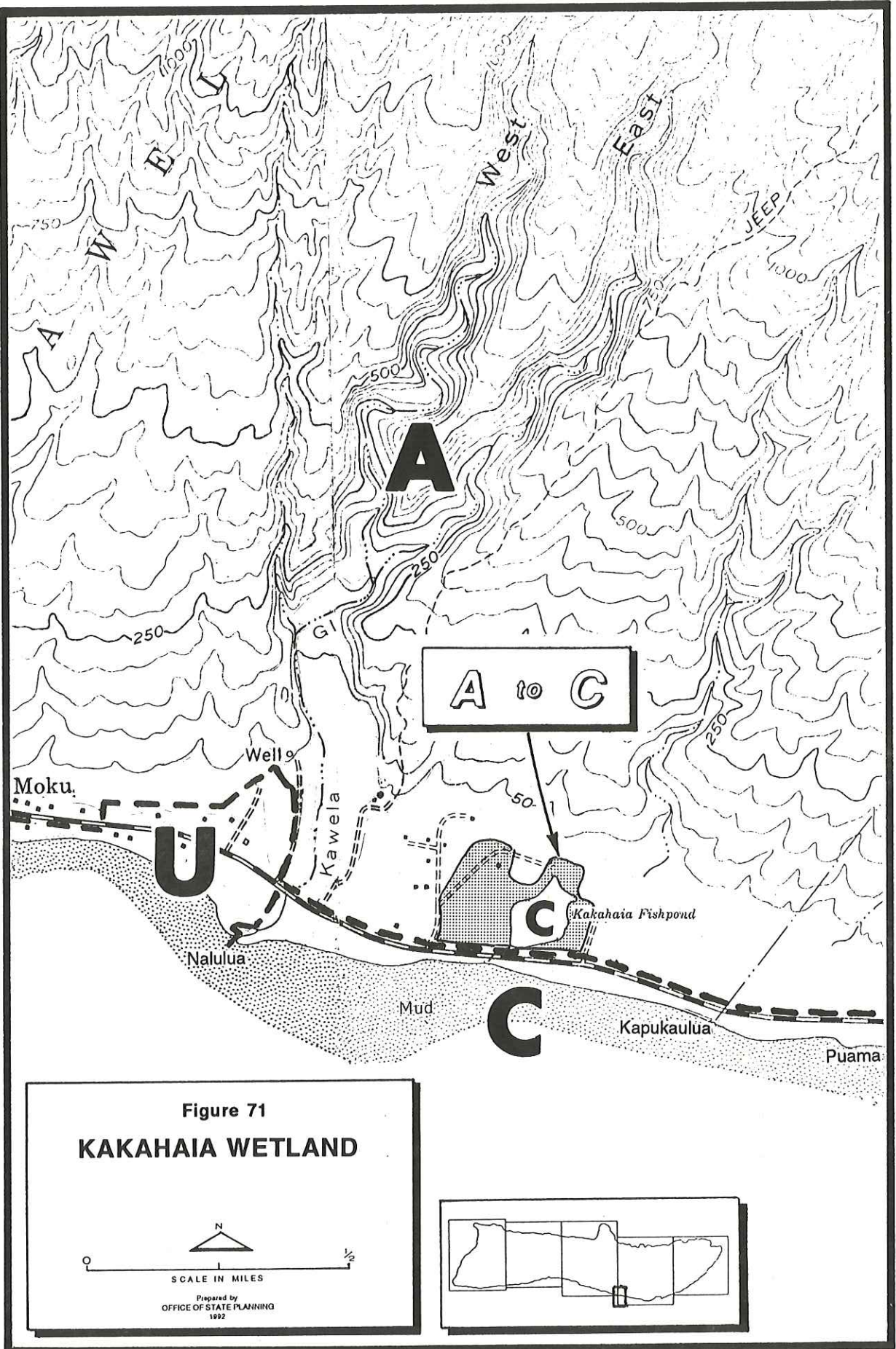
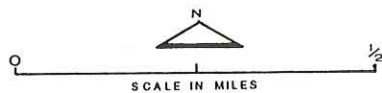
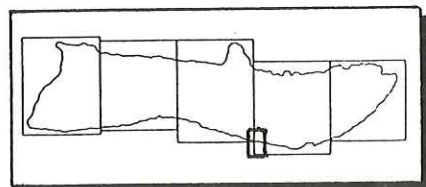


Figure 71
KAKAHAIA WETLAND



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1992



area is designated as Zone A, areas of 100-year flood.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the Kakahaia Wetland to the Conservation District meets criteria which provide that the Conservation District include areas necessary for conserving indigenous or endemic plants, fish or wildlife, including those which are threatened or endangered, 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. The proposed reclassification also aids in preventing damage from floods and erosion. The inclusion of the subject area would bring these parts of the Kakahaia NWR, which are currently designated as Agricultural, into a district compatible with its status as a NWR. Moreover, the proposed reclassification would afford protection to the wetland areas, including the native avifauna using them.

Section 205-17(3)(A) and (B): The proposed reclassification of the Kakahaia Wetlands from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats, and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies relating to the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies and areas particularly sensitive to reduction in water quality.

Conformance With LUC Standards:

Section 15-15-20: LUC standards for determining Conservation District boundaries which apply to this recommendation involve the inclusion of lands used for national parks and necessary for preserving parklands; lands necessary for conserving natural ecosystems of endemic species; lands susceptible to floods; and lands necessary for the protection of the health and welfare of the public by reason of the lands' susceptibility to flooding. The reclassification of the subject area would not only bring the site into consistency with its status as a NWR, but would also protect the ecosystems associated with the wetlands. Significantly, the wetlands surrounding the pond which serve not only as a buffer area to the pond but also as a habitat of endangered avifauna, will also be preserved. The area of the proposed reclassification is also subject to flooding.

Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Agriculture. As such, reclassification of the subject parcel would require an amendment to the Community Plan.

8. Kamiloloa-Makakupaia (896 Acres; A to C)

The subject area forms an extension to the east of the Kaunakakai Gulch System area. The area encompasses the region from Kamiloloa Gulch to Makakupaia, between the 1,000-foot elevation

contour at its lower extent, to the mauka Molokai Forest Reserve line. See Figure 72. The gulch contains native forest, a type of rare 'ohai (*Sesbania tomentosa*) shrubland, and other native shrubland communities.

A portion of this site is under the jurisdiction of DHHL and is not subject to the State Land Use Law.

Conformance With Chapter 205, HRS:

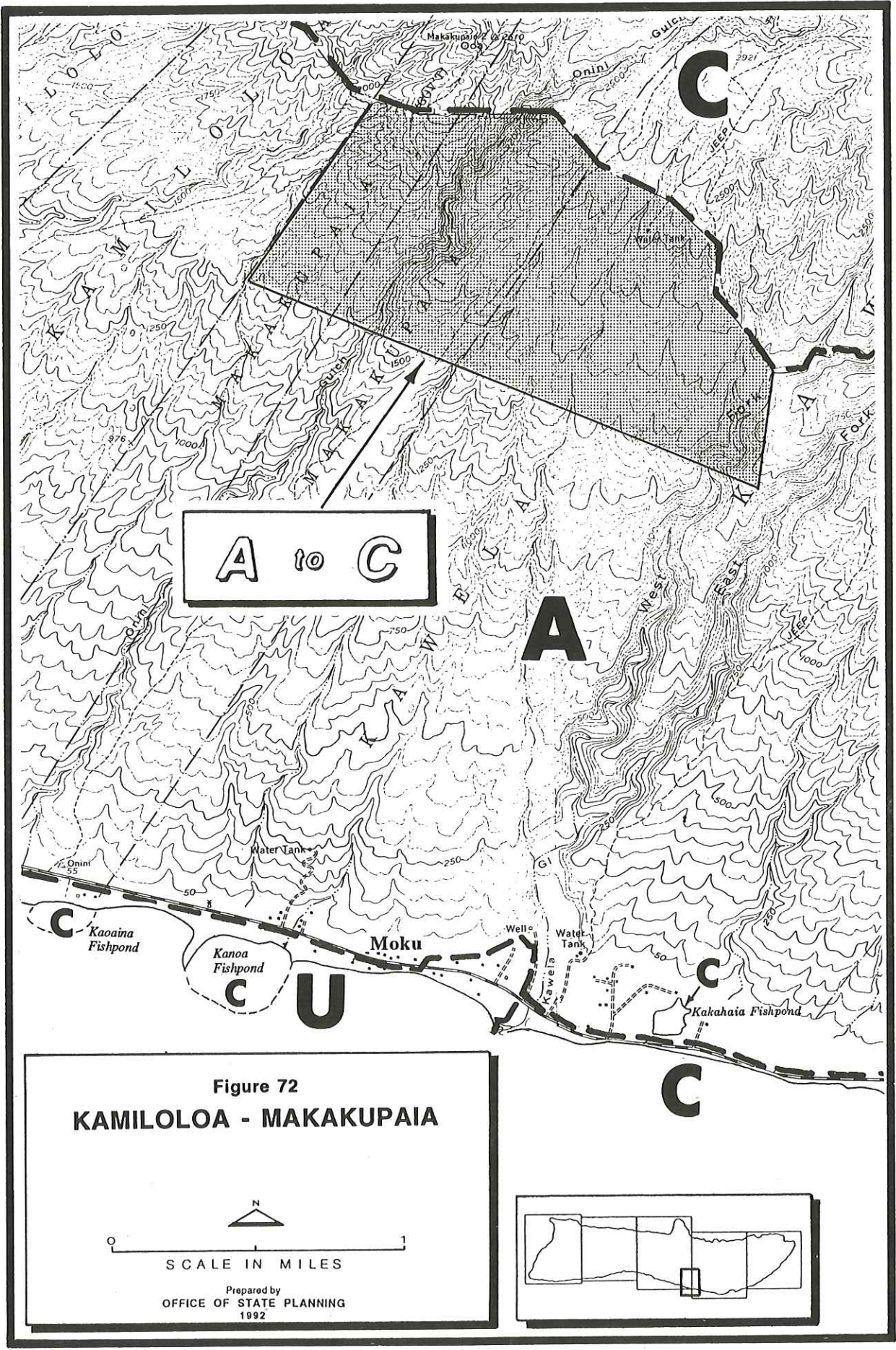
Section 205-2(e): The reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. The reclassification of the subject area would afford protection to the native forest, 'ohai and other native shrubland communities.

Section 205-17(3)(A): The proposed reclassification of the Kamiloloa-Makakupaia subject area from the Agricultural District to Conservation will promote the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies providing for effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines by



identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, open space and natural areas, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The reclassification of the subject area conforms to the LUC standards for determining Conservation District boundaries. Applicable standards support the inclusion of lands necessary for conserving natural ecosystems of endemic plants; and lands with a general slope of twenty percent (20%) or more which provides for open space amenities or scenic values. Inclusion of the subject area into the Conservation District would protect the native forest, a type of rare 'ohai and other shrubland communities. The subject area also has lands which have slopes greater than twenty-seven percent (27%).

Conformance with County Plans:

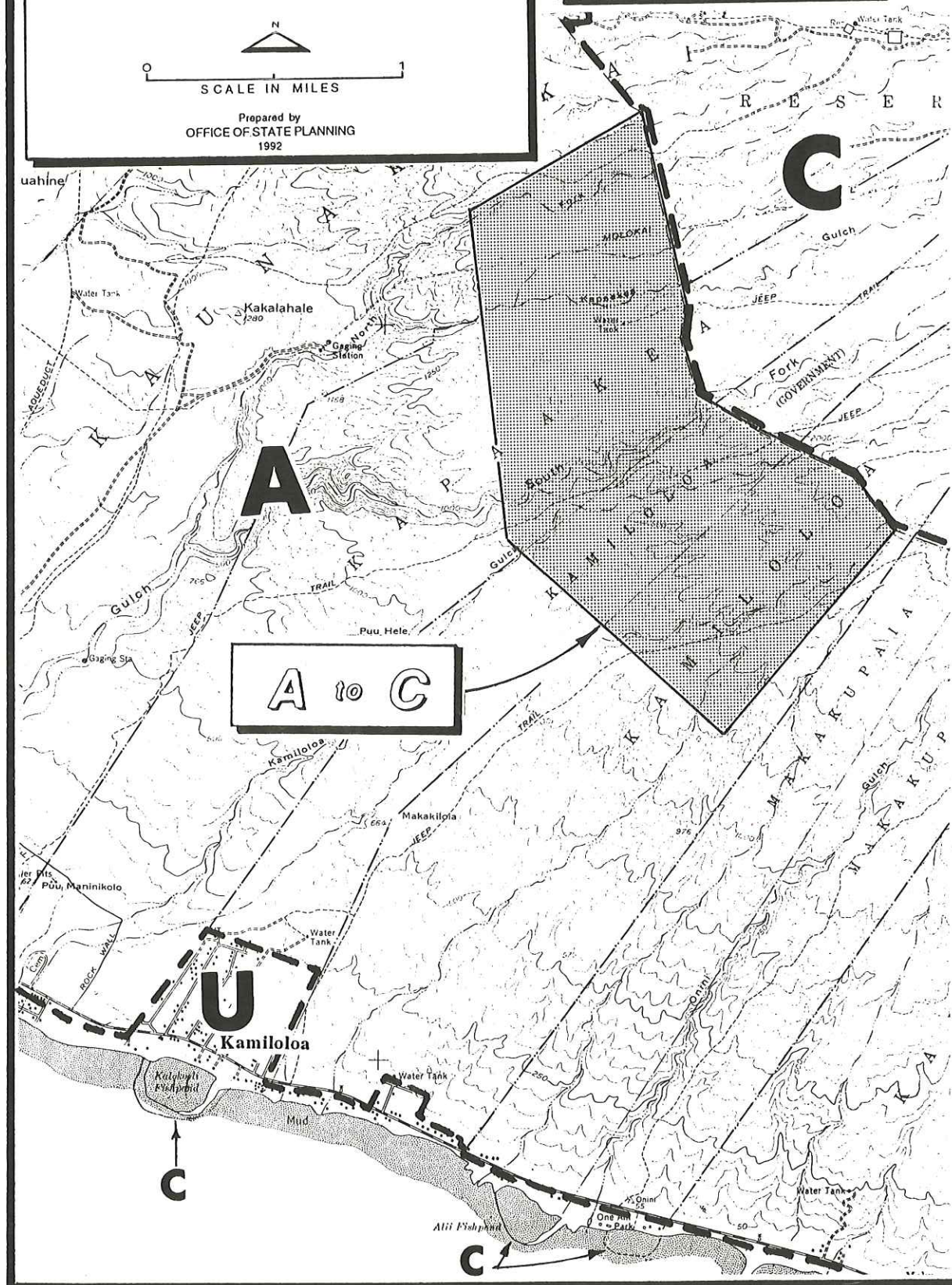
The Molokai Community Plan designates the proposed reclassification area as Agriculture. Reclassification of the subject parcel would require an amendment to the Community Plan.

9. Kaunakakai Gulch System (1,400 Acres; A to C)

The Kaunakakai Gulch System encompasses the rugged East Molokai slopes between the Kahuaawi Gulch and Kapaakea Gulch. The area spans from the 1,000-foot elevation, extending mauka to the Molokai Forest Reserve boundary. See Figure 73. Although the ridgetops are no longer dominated by native plants, there are large pockets of native vegetation in the gulches, including some sandalwood (*Santalum* sp.), wiliwili (*Erythrina sandwicensis*), and koai'a (*Acacia koaia*).

Recent fires have impacted much of the area's vegetative cover. However, certain native plants have quick regenerative powers in

KAUNAKAKAI GULCH SYSTEM



the aftermath of burn outs. Therefore, the area is recommended for protection.

Conformance With Chapter 205, HRS:

Section 205-2(e): As proposed, the reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for conserving indigenous or endemic plants, including those which are threatened or endangered. Some of these plants which existed in large pockets in the gulches, have quick regenerative capabilities even after the area is burned out by fires. Inclusion into the Conservation District would protect these plants.

Section 205-17(3)(A): The proposed reclassification of the Kaunakakai Gulch System from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies which provide for the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization which includes identifying critical environmental areas in Hawaii to include but not be limited to wildlife habitats, and areas with endangered species

of plants and wildlife.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards relative to the inclusion of lands necessary for conserving natural ecosystems of endemic plants. The subject area contains large pockets of native vegetation which include sandalwood, wiliwili and koai'a.

Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Agriculture. As such, reclassification of the subject parcel would require an amendment to the Community Plan.

10. Umipaa Wetlands (160 Acres; A to C)

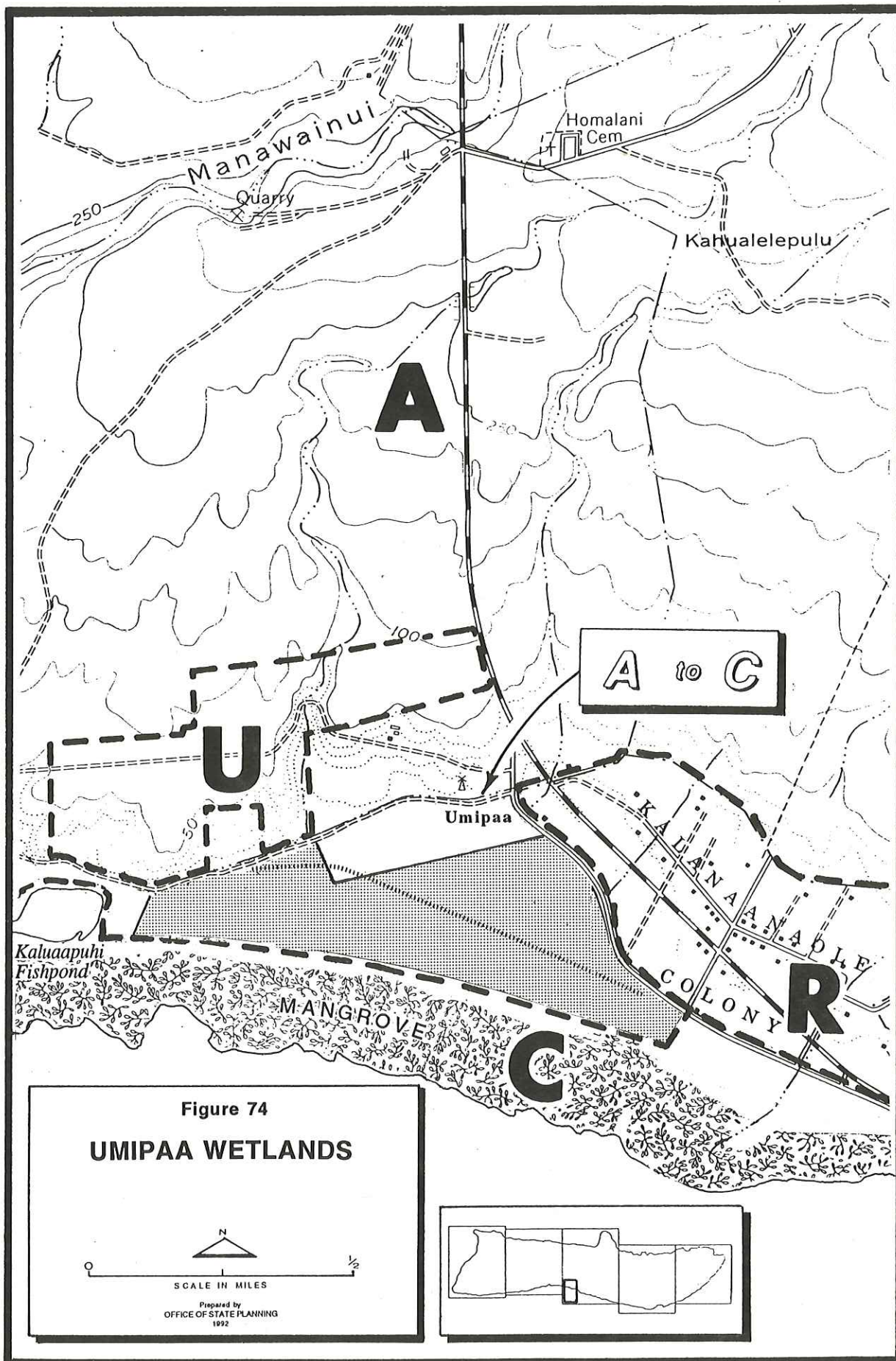
The Umipaa Wetlands are located on Molokai's southwest coast, adjacent to the Kaunakakai landfill. See Figure 74. The area includes the inlet stream south of Maunaloa Highway and the exit channel at the coast, exclusive of the landfill. These boundaries include a 20-yard buffer around the wetlands.

This area has been identified as containing conservation resources. However, no action will be taken because these are DHHL lands.

The wetlands appear to be seasonally flooded and provide a habitat for endangered Hawaiian stilts, migratory shorebirds and waterbirds, and the indigenous black-crowned night-herons.

This area also contains remnant Hawaiian fishpond walls. The birds at Umipaa are threatened by feral dogs, and the area was highly recommended for protection and management, possibly as a national wildlife refuge or state wildlife sanctuary.

Makai portions of the area proposed for reclassification are



designated Zone A4, areas of the 100-year flood.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving historic areas and conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. The inclusion of the subject area would provide protection to the wetlands and the indigenous, endemic and/or endangered species found there. Protection would also be afforded to the archaeological sites associated with the fishpond. The proposed reclassification would also aid in preventing damage from flooding.

Section 205-17(3)(A) and (B): The proposed reclassification of the Umipaa Wetlands from the Agricultural District to Conservation will promote the preservation or maintenance of important natural systems or habitats, and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification of the subject area conforms to the HSP objective and policies relating to the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical

environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies and areas particularly sensitive to reduction in water quality.

Conformance With LUC Standards:

Section 15-15-20: As proposed, the reclassification of the subject area conforms to LUC standards of determining Conservation District boundaries. Specifically addressed are standards relating to the inclusion of lands necessary for the conservation and preservation of cultural, historic or archaeologic sites, lands required for conserving natural ecosystems of endemic species, lands susceptible to floods, and lands necessary for the protection of the health and welfare of the public, by reason of the lands' susceptibility to flooding. The reclassification would afford protection to the wetland habitat and its native flora and fauna, and the historic/archaeologic sites in the subject area. A makai portion of the subject area is also subject to flooding.

Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Agriculture. Reclassification of the subject parcel would require an amendment to the Community Plan.

11. Moomomi Preserve (808.5 Acres; A to C)

Moomomi Preserve is located on Molokai's northwest coast between Kaa Gulch to the west and Moomomi to the east. See Figure 75. Under the protection of the Nature Conservancy the area is composed of dunes from approximately the 700-foot elevation in Keonelele to the coast, and from Kapalauoa in the west to Kawaaloo Bay in the east.

This area has historical and archaeological importance as an ancient Hawaiian burial ground and is being studied by the Smithsonian Institute.

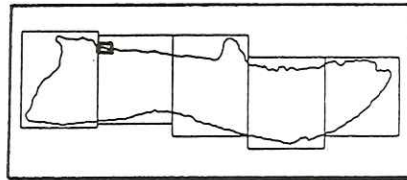
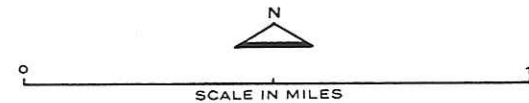
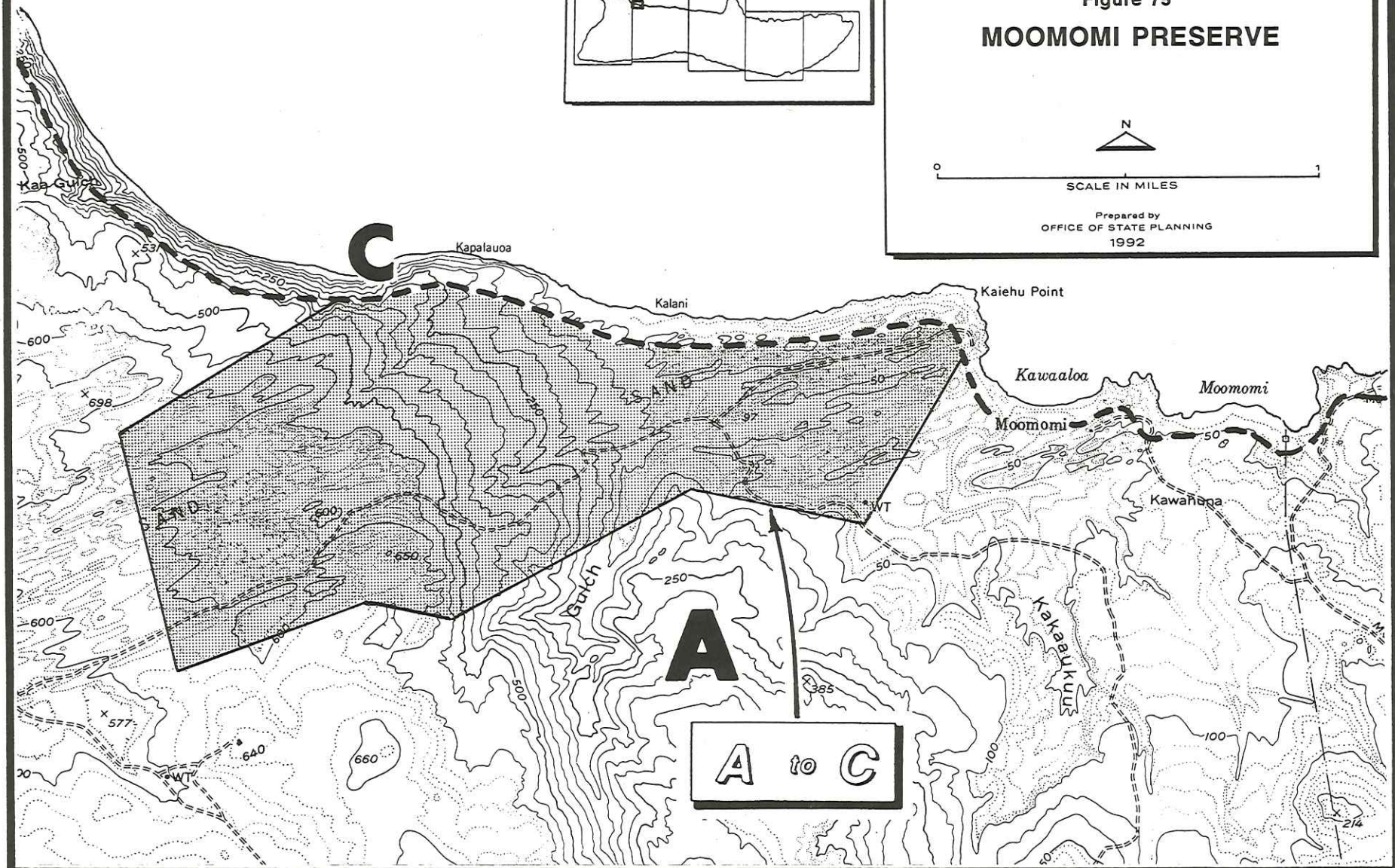


Figure 75
MOOMOMI PRESERVE



Prepared by
OFFICE OF STATE PLANNING
1992



Moomomi is considered the best remaining sand dune ecosystem in the main Hawaiian Islands. The area contains native coastal shrublands and grasslands, and a high density of rare native plants. The inland area contains lithified dunes, dominated by native plants. Monk seals may occasionally be found on beaches here. The area includes the only recorded nesting site on Molokai for the threatened green turtle (*Chelonia mydas*).

Conformance With Chapter 205, HRS:

Section 205(e): The proposed reclassification to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas and conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. The inclusion of the subject area would protect its historical and archaeological importance as well as the sand dune ecosystem found there.

Section 205-17(3)(A) and (B): The proposed reclassification of the Moomomi Preserve subject area from the Agricultural District to Conservation will promote the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical, or natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a), (b)(1),(3), and (4), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification conforms to the HSP objective and policies for the enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources through promoting the preservation and restoration of significant natural and historic resources, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features, and protecting those structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, open space and natural areas, historic and cultural sites, areas particularly sensitive to reduction in water quality, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The reclassification of the subject area would conform to the LUC standards of determining Conservation District boundaries. Applicable standards relate to the inclusion of lands necessary for the conservation and preservation of historic or archaeological sites; sites of unique ecologic significance; and lands necessary for conserving natural ecosystems of endemic species. The inclusion of the subject area would provide protection to the sand dune ecosystem, native coastal shrublands and grasslands, lithified dunes as well as to the monk seals and green sea turtles which utilize the area. The area's historic and archaeological resources would also be protected.

Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Conservation. As such, reclassification of the subject parcel would bring it into conformance with the Community Plan.

12. Moomomi Dunes (882.5 Acres; A to C)

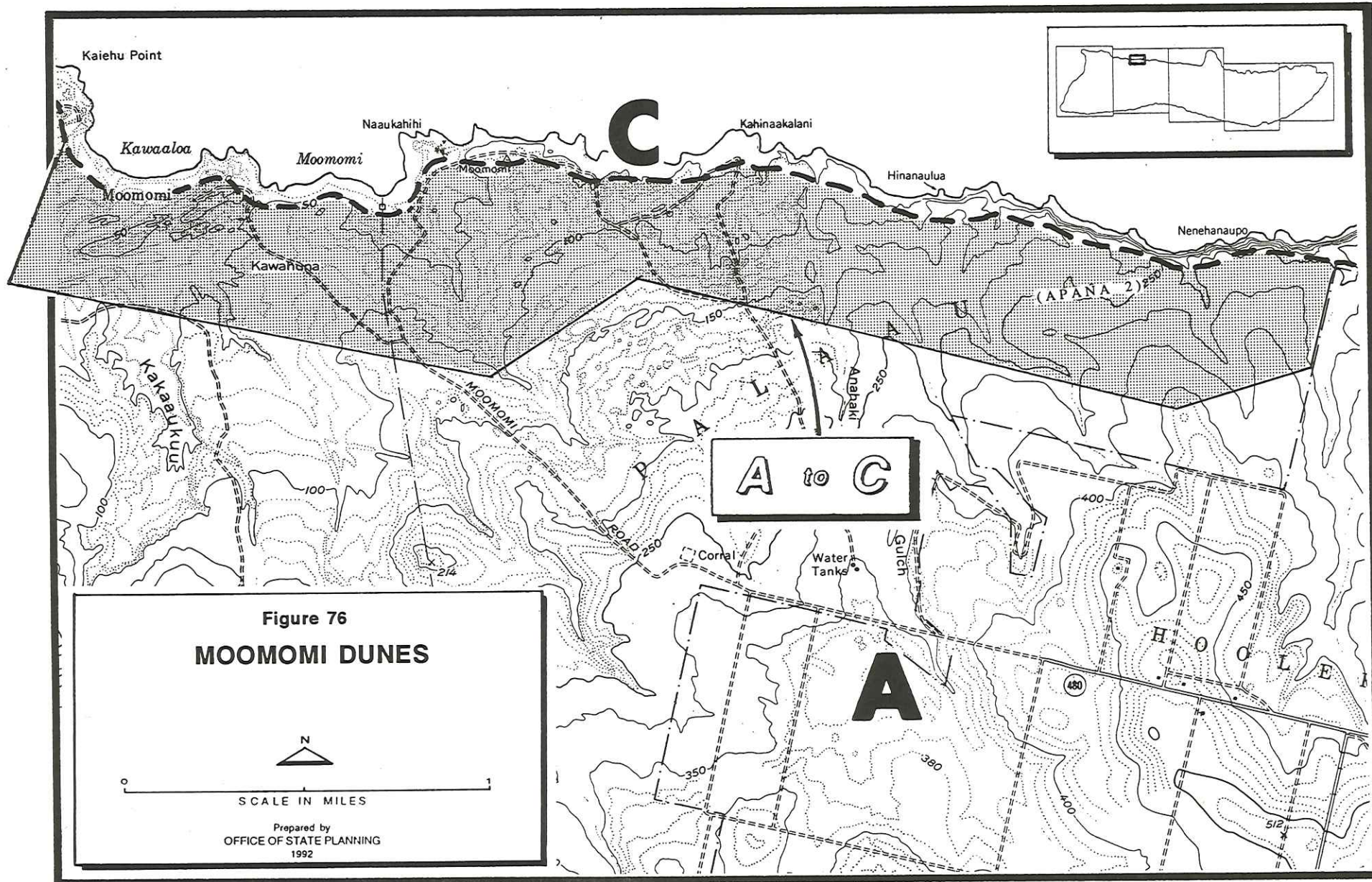
The subject area begins at the Preserve's eastern boundary at Kawaaloa Bay and continues east beyond Anahaki Gulch. See Figure 76. Like the Nature Conservancy Preserve, this area is noted for having the best remaining sand dune ecosystem in the main Hawaiian Islands. The area contains native coastal shrublands and grasslands, and a high density of rare native plants. Monk seals are occasional visitors to the area's beaches, and the entire area including the Preserve is known as the only recorded nesting site of the threatened green sea turtle on Molokai.

In addition to the native flora and fauna found here, the area has historical and archaeological importance as a Hawaiian burial ground. Alternative measures of protection for this site are under discussion with the landowner including a perpetual conservation easement.

A portion of this site is under the jurisdiction of DHHL. No action will be taken on these lands because they are not subject to the State Land Use Law.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas and conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered. The inclusion of the subject area in the Conservation District would protect its historical and archaeological importance



as well as the sand dune ecosystem found there.

Section 205-17(3)(A) and (B): The proposed reclassification of the Moomomi Dunes from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical, or natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:
Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-12(a), (b)(1), (3), and (4), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification conforms to the HSP objective and policies for the enhancement of Hawaii's scenic assets, natural beauty, and multicultural/historical resources through promoting the preservation and restoration of significant natural and historic resources, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features, and protecting those structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not

be limited to, watershed and recharge areas, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites, areas particularly sensitive to reduction in water quality, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification of the subject area conforms to LUC standards relative to the inclusion of lands necessary for the conservation and preservation of historic or archaeological sites, sites of unique ecologic significance and for conserving natural ecosystems of endemic species. The inclusion of the subject area would provide protection to the sand dune ecosystem, native coastal shrublands and grasslands, lithified dunes as well as to the monk seals and green sea turtles which use the area. The area's historic and archaeological resources would also be protected.

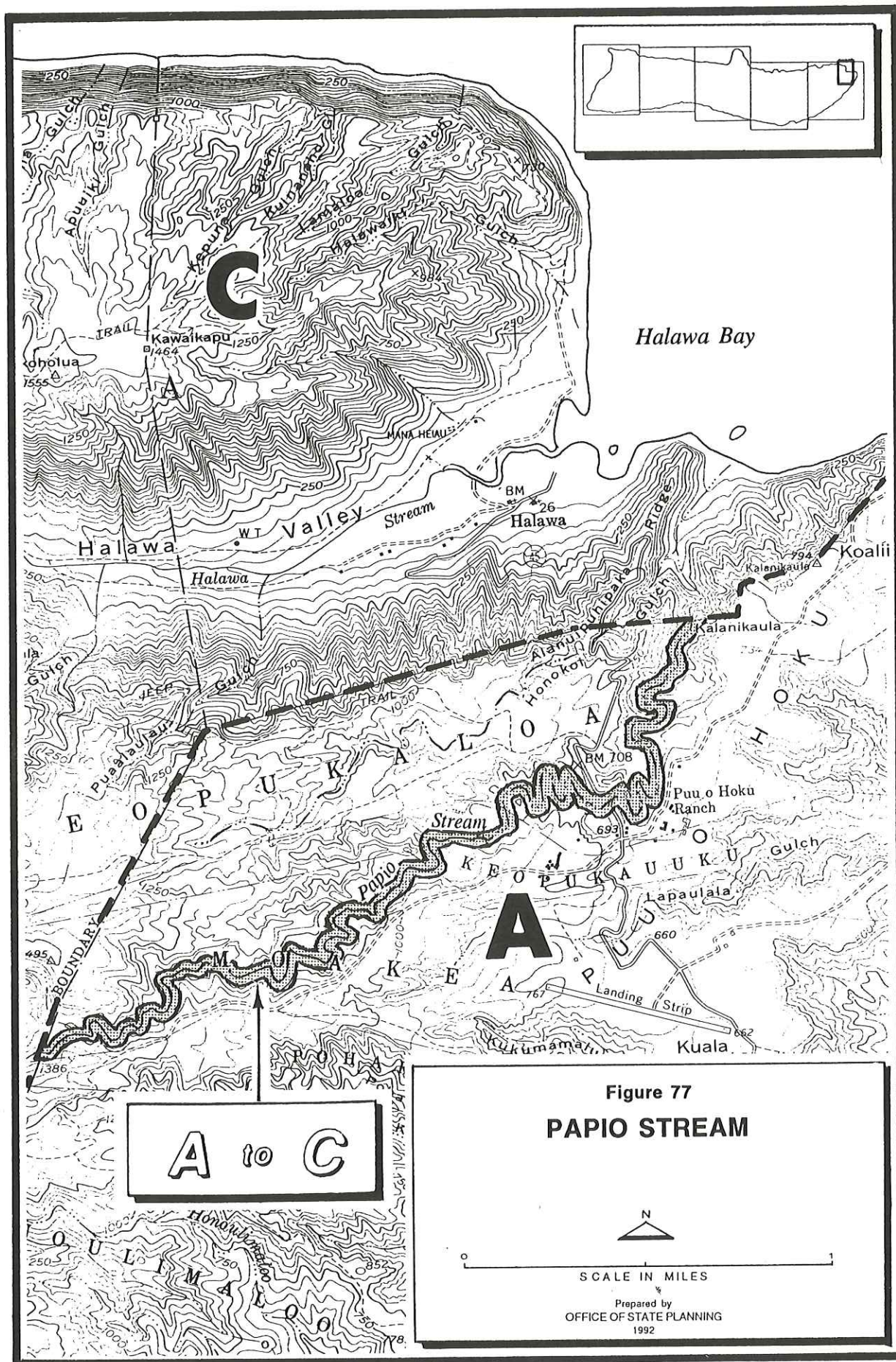
Conformance with County Plans:

The Molokai Community Plan designates the proposed reclassification area as Conservation. As such, reclassification of the subject parcel would bring it into conformance with the Community Plan.

13. Streams

Molokai has five (5) streams which have been identified as Special Streams. See Figure 77, Figure 78, Figure 79, Figure 80, and Figure 81. These streams are noted as having outstanding aquatic resources. These streams are listed as follows:

- Papio and tributaries
- Honouliwai
- Waialua and tributaries
- Honomuni
- Kawela and tributaries



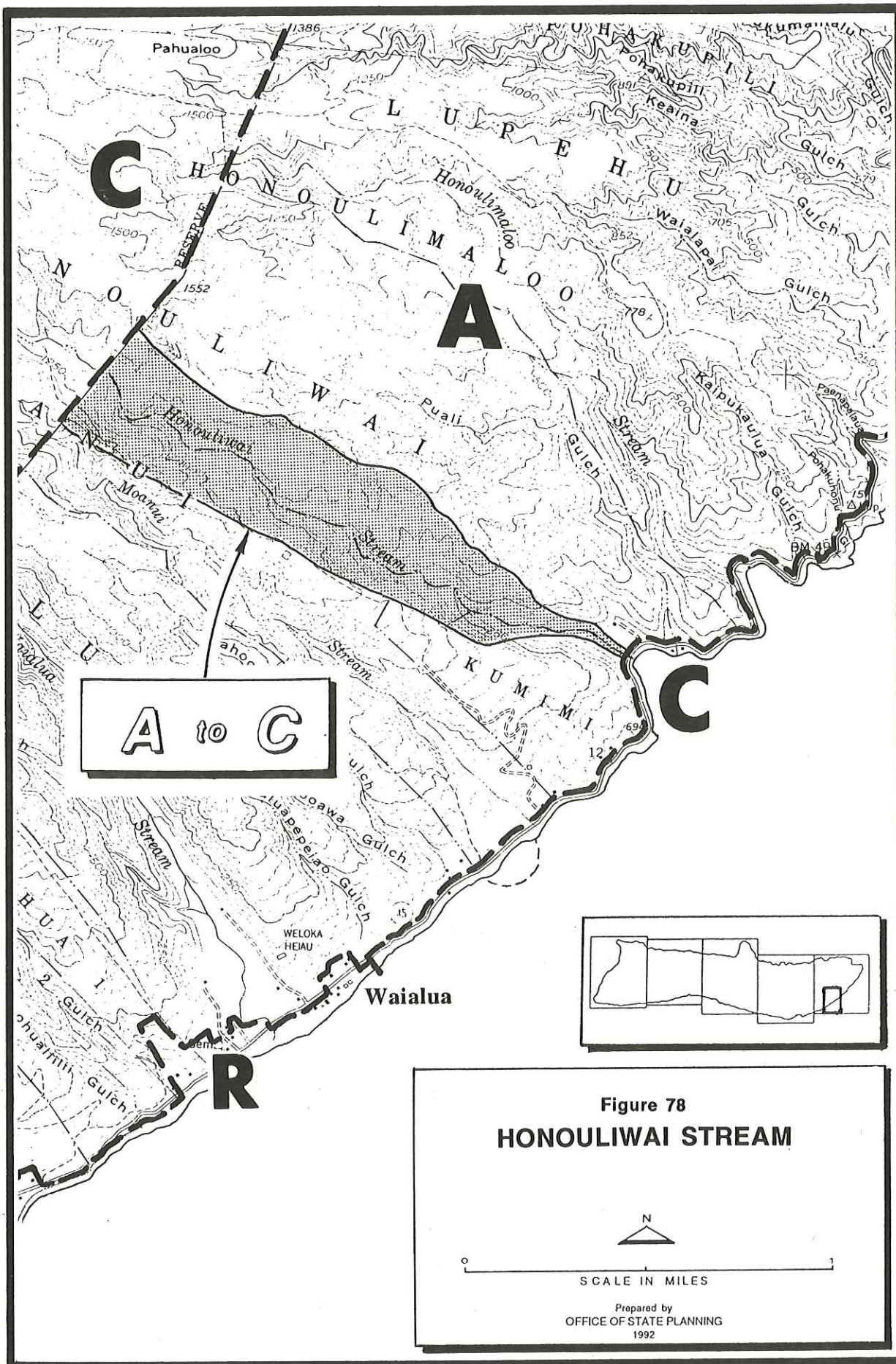
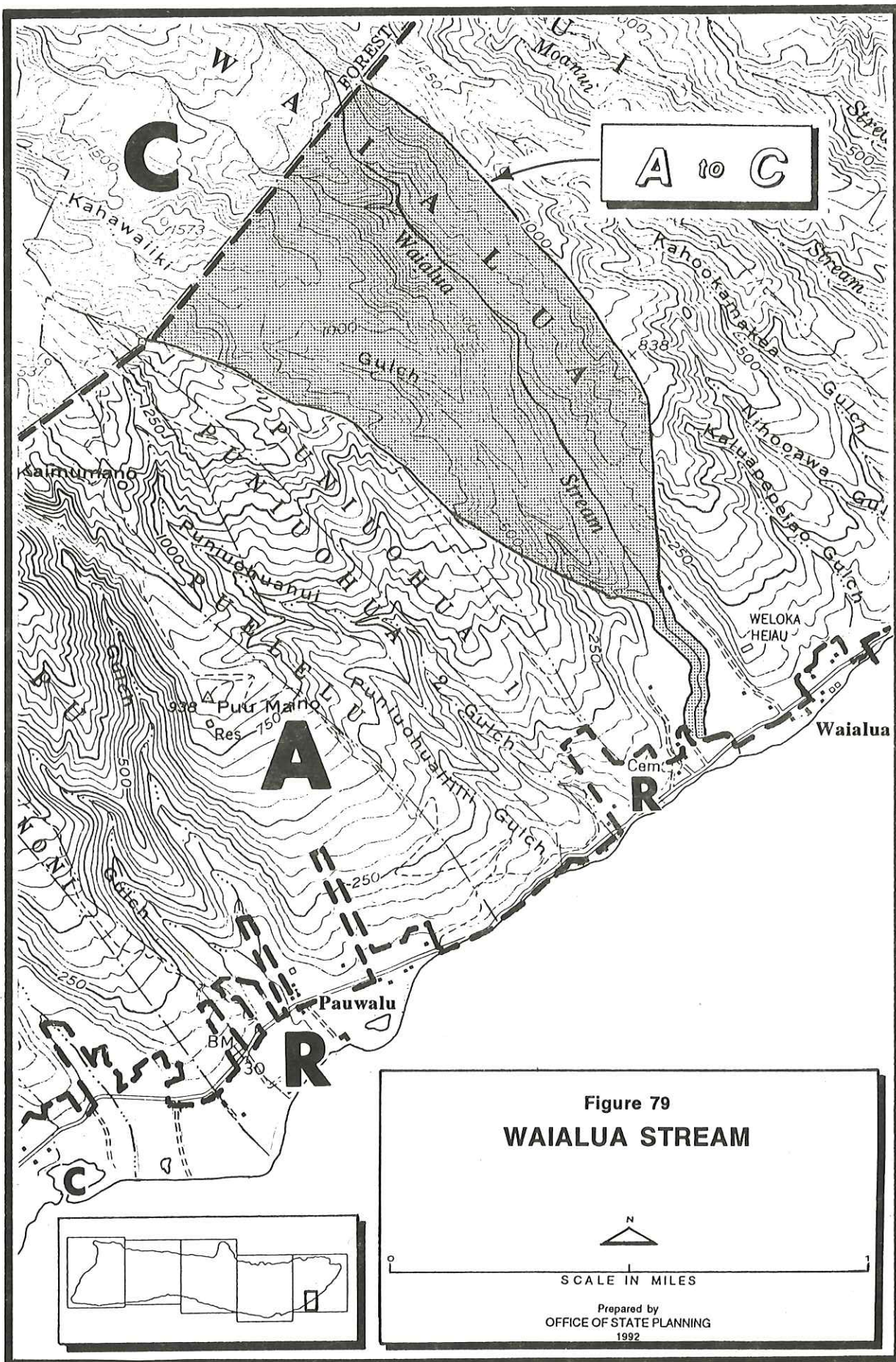
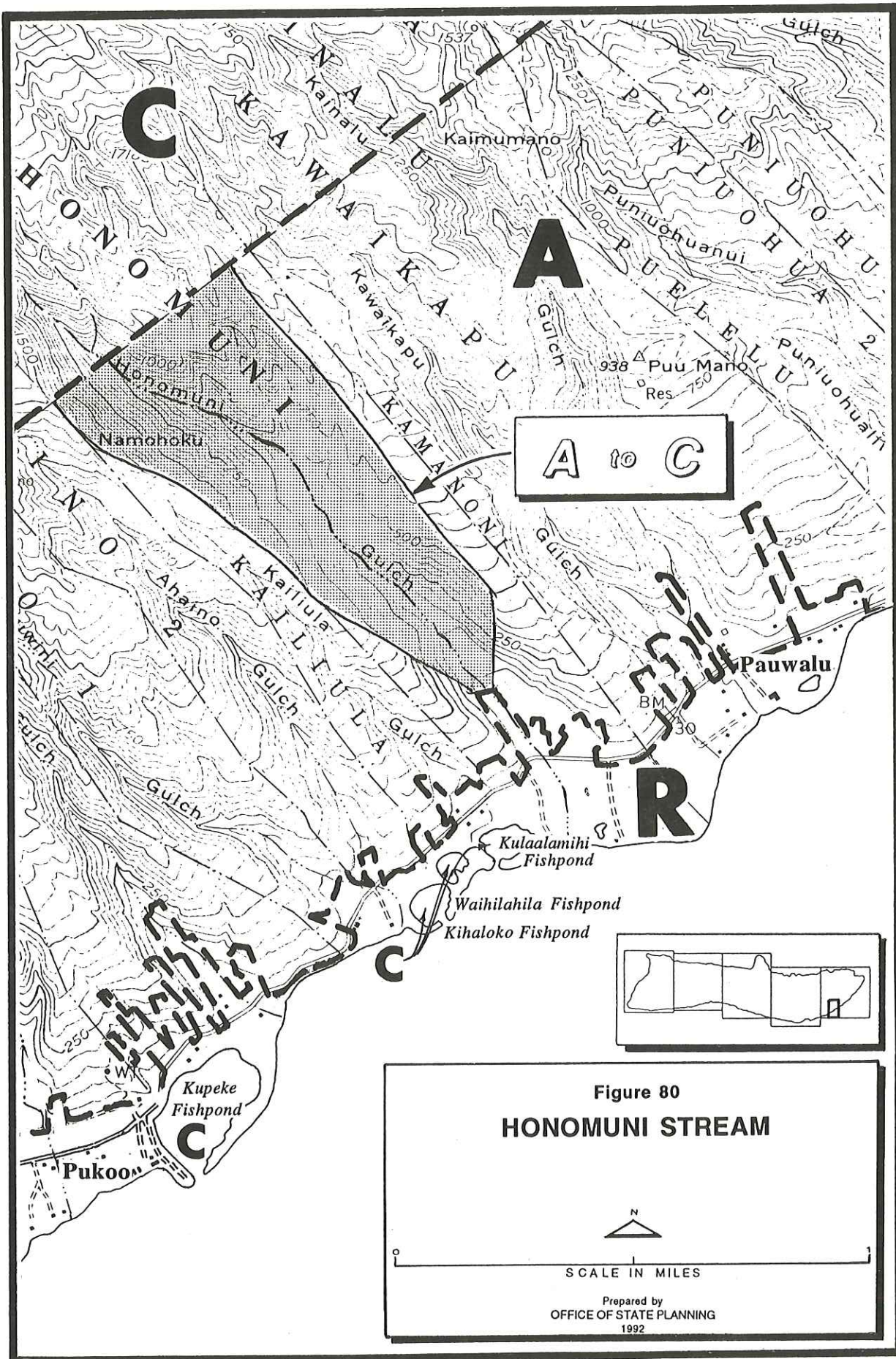
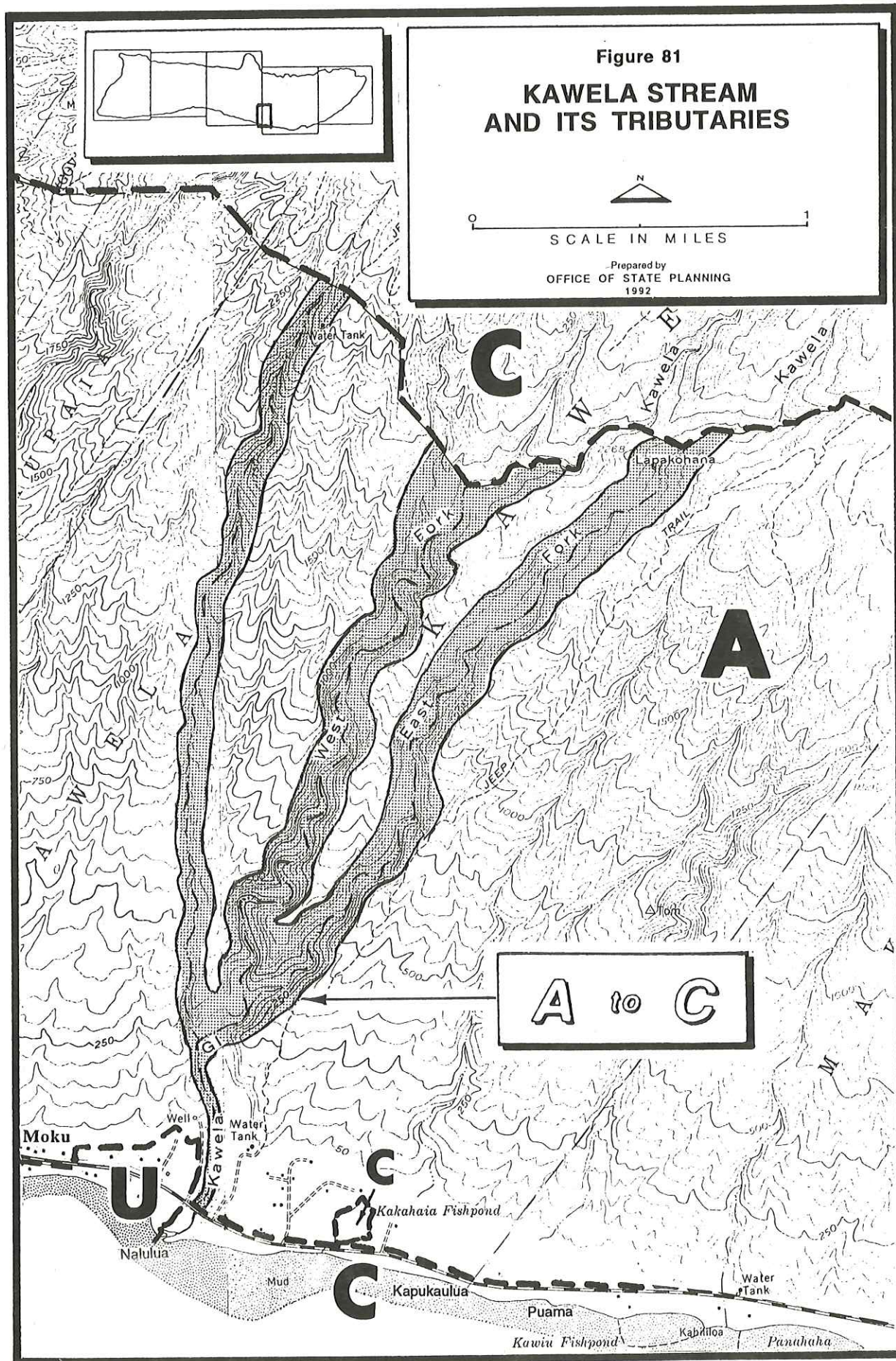


Figure 78
HONOULIWAI STREAM







Buffer areas to protect these streams generally extending along the ridge lines have been recommended for inclusion into the Conservation District. A Conservation designation will provide for regulation of uses (e.g. construction of residences) to assure stream protection.

As stated earlier in this report, Conservation District stream protection corridors have only 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 corridors for portions of those streams that flow within the Urban or Rural District as Priority #2 areas.

This recommendation affects the Honomuni and Waialua Streams which flow through the Rural District.

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.

Table 28 illustrates slope, soil type and flood hazard parameters for those streams under consideration.

Table 28

SLOPE, SOIL TYPE AND FLOOD HAZARD PARAMETERS FOR ISLAND OF MOLOKAI SPECIAL STREAMS			
Stream	Slope	Soil Type	Flood Hazard
Papio Stream and Tributaries	Slope ranges from 5 percent to over 20 percent.	<p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Halawa silty clay, 3-25 percent slopes (HID): This soil occurs as narrow tracts bounded by gulches. The soil is strongly acid in the surface layer and very strongly acid in the subsoil. Permeability is moderately rapid. Runoff is slow to medium and the erosion hazard is slight to moderate.</p> <p>Kahanui gravelly silty clay, 3-20 percent slopes (KATD): This soil occurs on ridgetops on the upper slopes of East Molokai. The surface layer is gravelly because of ironstone fragments. Permeability is moderately rapid above the ironstone sheet. Except for cracks, the ironstone sheet is impermeable. Runoff is slow to medium and erosion hazard is slight.</p>	Zone C, areas of minimal flooding.
Honouliwai Stream	Slope ranges from 2 percent near the shoreline to over 20 percent near the ridges.	<p>Kawaihapai clay loam, 0-2 percent slopes (KIA): This soil occupies smooth slopes. Permeability is moderate. Runoff is slow, and erosion hazard is no more than slight.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p> <p>Halawa silty clay, 3-25 percent slopes (HID): This soil occurs as narrow tracts bounded by gulches. The soil is strongly acid in the surface layer and very strongly acid in the subsoil. Permeability is moderately rapid. Runoff is slow to medium and the erosion hazard is slight to moderate.</p> <p>Niulii silty clay loam, 7-30 percent slopes (NLE): This soil occurs in areas where topography is sloping to hilly. Permeability is moderately rapid. Runoff is slow to medium and erosion hazard is slight to moderate.</p>	Areas near shoreline are designated Zones A4 and A, areas of the 100-year flood. The remainder of the subject area is designated as Zone C, areas of minimal flooding.
Waialua Stream and Tributaries	2 percent in lower reaches to over 20 percent towards ridges.	<p>Alaeloa stony silty clay, overwash, 15-35 percent slopes (ANE): This soil is on top slopes and in depressions where fine-textured alluvium has accumulated. Stones and gravel occur throughout the profile. Erosion hazard is severe, and gullies are common.</p> <p>Rough broken land (rRR): Consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid and geologic erosion is active.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Halawa silty clay, 3-25 percent slopes (HID): This soil occurs as narrow tracts bounded by gulches. The soil is strongly acid in the surface layer and very strongly acid in the subsoil. Permeability is moderately rapid. Runoff is slow to medium and the erosion hazard is slight to moderate.</p> <p>Niulii silty clay loam, 7-30 percent slopes (NLE): This soil occurs in areas where topography is sloping to hilly. Permeability is moderately rapid. Runoff is slow to medium and erosion hazard is slight to moderate.</p> <p>Niulii silty clay loam, medium textured variant, 7-30 percent slopes (NME): This soil occurs on narrow ridges bordered by deep gulches. Permeability is moderately rapid. Runoff is slow to medium and erosion hazard is moderate to severe.</p>	Areas near shoreline are designated as Zone V14, areas of 100-year coastal flood with velocity (wave action). Up to approximately 2,800 feet inland, which delineates the limits of detailed study, areas surrounding the stream are designated Zone A6, areas of 100-year coastal flood, and Zone B, areas between limits of the 100-year flood and 500-year flood. Remainder of stream is designated Zone C, areas of minimal flooding.

Table 28 continued

SLOPE, SOIL TYPE AND FLOOD HAZARD PARAMETERS FOR ISLAND OF MOLOKAI SPECIAL STREAMS			
Stream	Slope	Soil Type	Flood Hazard
Honomuni Stream	Slope ranges from 6 percent in lower reaches of stream to over 20 percent towards ridges.	<p>Alaeloa silty clay, 15-35 percent slopes (AeE): This soil occurs on smooth side slopes and top slopes in the uplands. Permeability is moderately rapid. Runoff is medium, and the erosion hazard is moderate.</p> <p>Alaeloa silty clay, 15-35 percent slopes, severely eroded (ALE3): This soil has a profile like that of Alaeloa silty clay, 15-35 percent slopes. However, much of the surface layer and some of the subsoil has been removed by erosion. Runoff is rapid and erosion hazard is severe.</p> <p>Rough mountainous land (rRT): This consists of very steep land broken by numerous intermittent drainage channels. Soil mantle is usually very thin. Saprolite is relatively soft and permeable to roots and water.</p> <p>Kawaihapai very stony clay loam, 0-15 percent slopes (KlbC): The soil occupies smooth slopes but it has enough stones to prevent cultivation. Runoff is medium and erosion hazard is moderate.</p>	Zone C, areas of minimal flooding.
Kawela Stream and Tributaries	Slope ranges from 7 percent in lower reaches to over 20 percent in the West and East Fork.	<p>Jaucas sand, 0-15 percent slopes (JaC): Jaucas series consists of excessively drained, calcareous soils. Permeability is rapid. Runoff is very slow to slow.</p> <p>Kealia silt loam (KMW): Soil is poorly drained with a high content of salt. Permeability is moderately rapid. Runoff is slow to very slow.</p> <p>Pulehu stony sandy loam, 0-7 percent slopes (PoaB): This soil is on alluvial fans and stream terraces and in basins. There are sufficient stones to hinder tillage but not enough to make intertilled crops impractical.</p> <p>Stony alluvial land (rSM): This consists of stones, boulders and soil deposited by streams along the bottoms of gulches and on alluvial fans.</p> <p>Rock land (rRK): This consists of areas where exposed rock covers 25-90 percent of surface. Rock outcrops and very shallow soils are its main characteristics. In many areas, the soil material associated with the rock outcrops is very sticky and very plastic. Has high shrink-swell potential.</p> <p>Rock outcrop (rRO): This consists of areas where exposed bedrock covers more than 90 percent of the surface. This land type is not suitable for farming. It is used for water supply, wildlife habitat and recreation.</p> <p>Very stony land (rVS): This land type consists of areas where 50-90 percent of the surface is covered with stones and boulders.</p>	From the shoreline to approximately 2,800 feet inland, which delineates the limit of detailed study, areas surrounding the stream are designed A4, areas of 100-year flood, and Zone B, areas between limits of the 100-year flood and 500-year flood. Remainder of Kawela Stream and tributaries are designated Zone C, areas of minimal flooding.
Source: Federal Emergency Management Agency, June 1, 1981. Soil Conservation Service, August 1972. U.S. Geological Survey Quadrangle Maps, 1968.			

Conformance With Chapter 205:

Section 205-2(e): The proposed reclassification of Molokai's Special Streams to the Conservation District meets criteria which provide that the Conservation District include areas necessary for protecting watersheds and water resources, preserving scenic and historic areas, conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered, and areas of value for recreational purposes. Inclusion of these streams and their respective surrounding areas would protect the various resources associated with them.

Section 205-17(3)(A) and (B): The proposed reclassification of the Special Streams from the Agricultural District to Conservation will promote the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical or natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-13(a)(1) and (b)(2), Objectives and Policies for the Physical Environment - Land, Air, and Water Quality: The proposed reclassification of the subject area conforms to the HSP objective and policy which seeks the maintenance and pursuit of improved quality in Hawaii's land, air, and water resources through promoting the proper management of Hawaii's land and water resources.

Section 226-104(b)(10), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines by identifying critical environmental areas in Hawaii to include, but not be limited to, watershed and recharge areas, wildlife habitats, areas with endangered species of plants and wildlife, natural streams and water bodies, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites, areas particularly sensitive to reduction in water quality, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms the LUC standards for determining Conservation District boundaries. Standards which are applicable to the reclassification of these Special Streams relate to the inclusion of lands necessary for protecting watershed, water resources, and water supplies; lands susceptible to floods, and soil erosion; lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic or archaeologic sites; lands necessary for providing and preserving wilderness and for conserving natural ecosystems of endemic plants, fish and wildlife; lands with topography, soils, climate or other related environmental factors that may not be normally adaptable for urban, rural or agricultural use; and lands with a general slope of twenty percent or more which provide for open space amenities or scenic values. Reclassification of Molokai's Special Streams would provide protection to the resource values associated with each stream.

Conformance with County Plans:

Honouliwai, Papio and its tributaries, Honomuni, Kawela and its tributaries, and Waialua Stream and its tributaries are designated Agriculture by the Molokai Community Plan.

All the aforementioned streams would require an amendment to the

Community Plan.

C. ISLAND OF LANAI

1. Rural Area in Northeast Mountains (86 Acres; R to C)

Northeast of Koele along the Keomuku Road is an area of Rural designated land surrounded by Conservation District lands. See Figure 82. The subject area is relatively small in size and is located outside Lanai City's physical limits. There are no utilities extending to the subject area.

Conformance With Chapter 205, HRS:

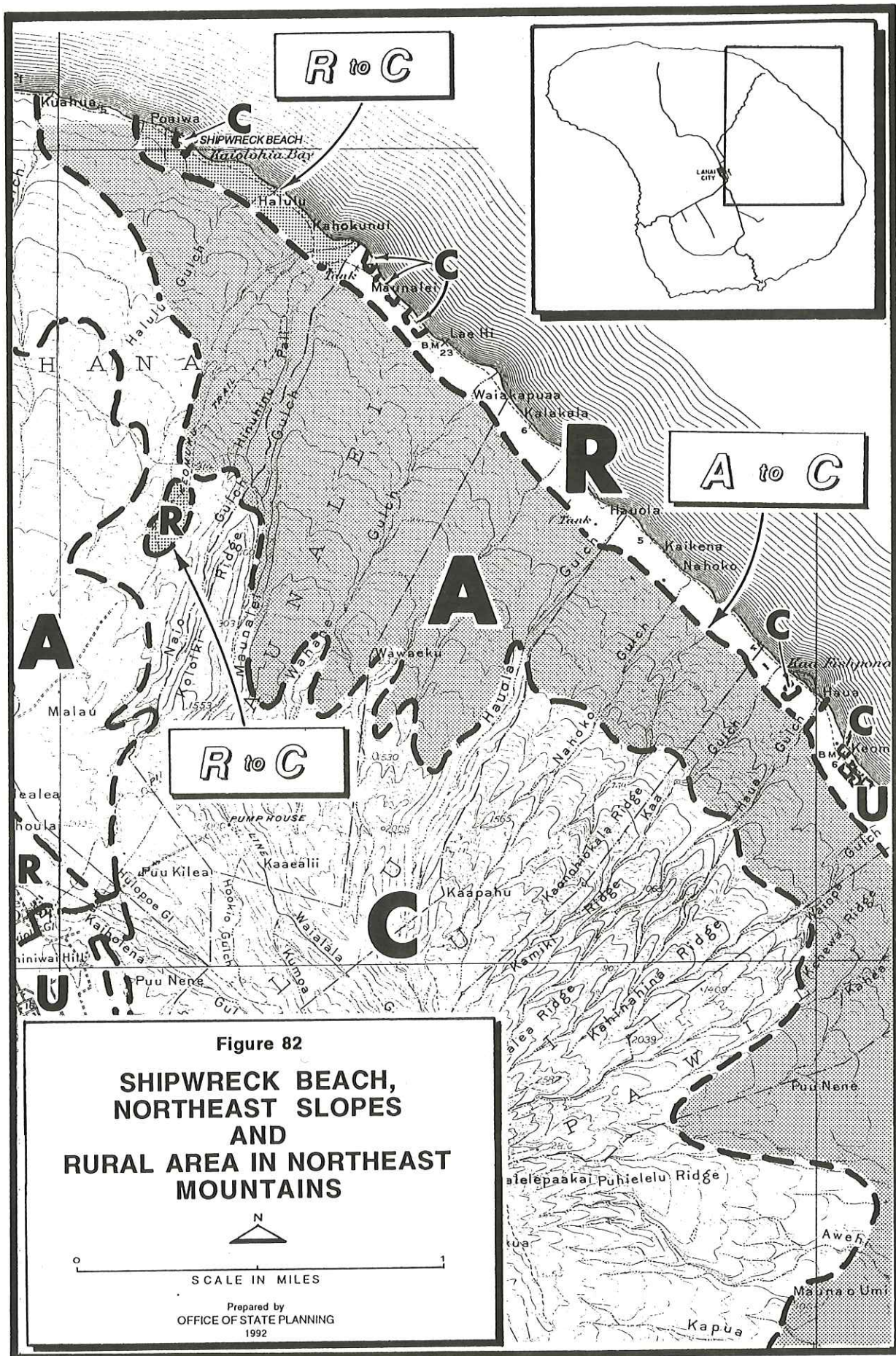
Section 205-2(e): Reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic areas. The inclusion of the subject area into the Conservation District would bring it into conformance with the Lanai Community Plan's designation of Open Space.

Section 205-17(3)(A) and (B): The proposed reclassification of this Rural area on Lanai's Northeast mountains to Conservation conforms with applicable district standards.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-12(a) and (b)(3), Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of enhancement of Hawaii's scenic assets and natural beauty by promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, scenic landscapes and other natural features.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for



regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, open space and natural areas, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: LUC standards for determining Conservation District boundaries, which are applicable, relate to the inclusion of lands necessary for the conservation, preservation and enhancement of scenic sites. The inclusion of the subject area into the Conservation District would bring it into conformance with the Lanai Community Plan's designation of Open Space.

Conformance With County Plans:

Reclassification of the subject area would bring it into conformance with the Lanai Community Plan which designates the area as Open Space.

2. Shipwreck Beach (160 Acres; R to C)

The Shipwreck Beach area is located on Lanai's northeast coast between Poaiwa Gulch to the north and Kahokunui to the south. See Figure 82.

The isolated character of this area, its distance from infrastructure and its potential to maintain natural and coastal resources make this area ideal for its County designation of Open Space and as a scenic and recreational resource. Lithified dunes along the coast extend inland to approximately 650 feet.

Shipwreck Beach is without equal on Lanai for coastal wildland recreation. This 8-mile stretch of wild coastline consists of a series of white sand beaches fronted by a wide fringing reef and contains numerous small, but good swimming areas. It also contains a small petroglyph field. This area can provide varied coastal

wildland recreation opportunities, including swimming, sunbathing, shorefishing, beachcombing, picnicking, camping, hiking, nature appreciation, photography, quiet relaxation, and enjoyment of the sweeping view of Molokai and Maui, as well as the views of the shipwrecks on the reef. Existing development is essentially limited to a modest recreation camp, some fisherman shacks, unimproved roads, and a coastal trail.

The area is not desirable for urban use because of the lack of infrastructure, lack of water and distance from other urban areas.

Conformance With Chapter 205, HRS:

Section 205-2(e): As proposed, the reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas, providing wilderness and beach reserves, and areas of value for recreational purposes. Reclassification of the subject area would preserve the scenic and recreational values characteristic of this coastline.

Section 205-17(3)(A) and (B): The proposed reclassification of Lanai's Shipwreck Beach from the Rural and Urban Districts to Conservation will support the preservation or maintenance of important natural systems or habitats and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(1) and (b)(4), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the prudent use of Hawaii's land-based, shoreline and marine resources by managing natural resources and their environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, scenic and recreation shoreline resources, open space and natural areas, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

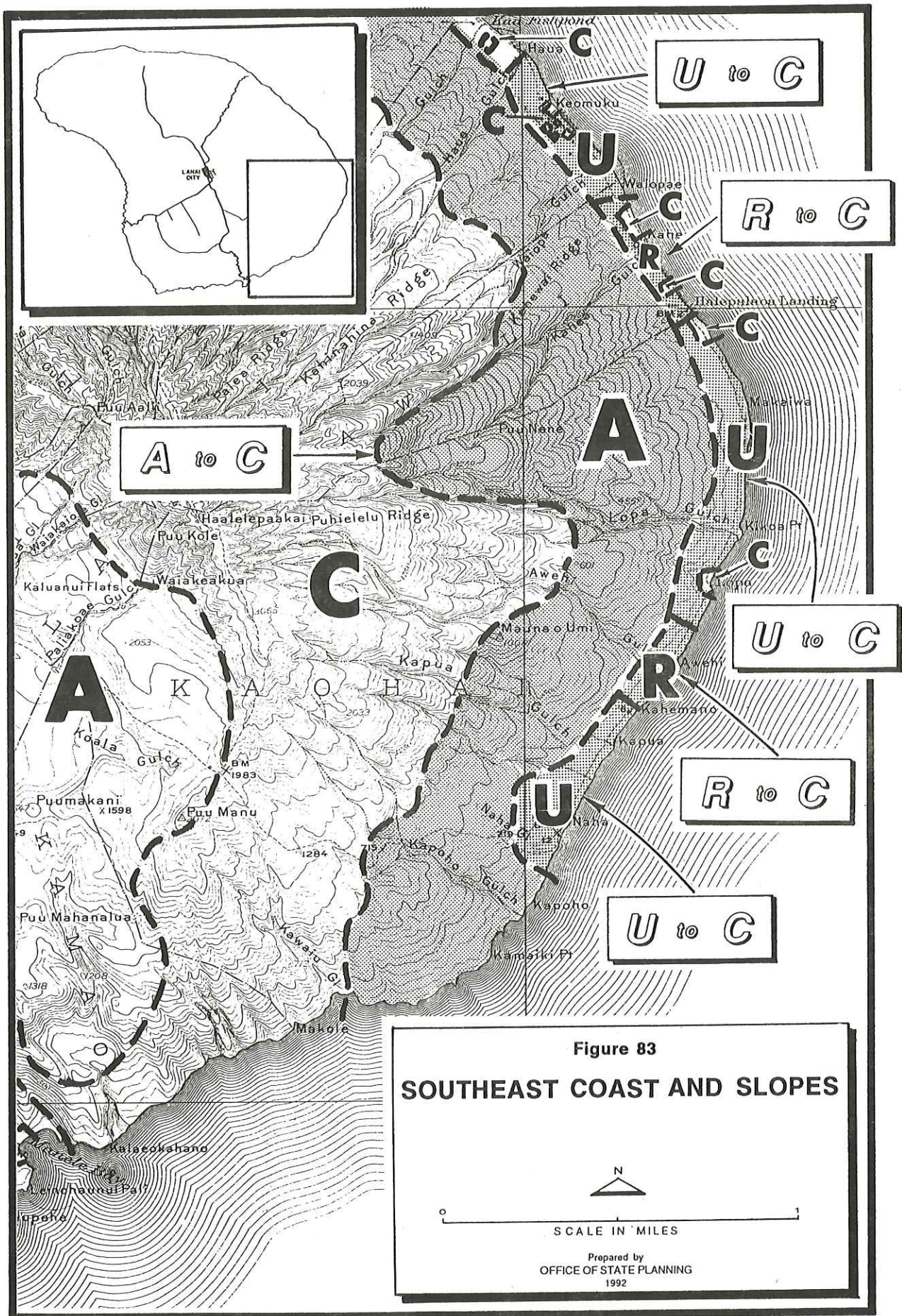
Section 15-15-20: The proposed reclassification conforms to the LUC standards of determining Conservation District boundaries. Specifically, the proposed reclassification would be supported by standards which promote the inclusion of lands necessary for the conservation, preservation and enhancement of sites of unique physiographic significance. Reclassification of the subject area would protect the unique limestone formation found within the boundaries.

Conformance With County Plans:

The Lanai Community Plan designates these areas as Open Space to maintain continuity with the adjoining Conservation District lands which band the coastal areas of this portion of the Island. Reclassification of these areas would provide for the long-term maintenance of the undisturbed open space character of this part of the Island.

3. Northeast and Southeast Slopes (11,000 Acres; A to C)

The area includes all the Agricultural-designated lands between the existing mauka Conservation District boundary to the existing Urban and Rural District boundaries near the coast. Beginning at Shipwreck Beach, between Kuahua and Poaiwa Gulches, the area continues south toward the area between Kawaiu and Naha Gulches. See Figure 82 and Figure 83. The area provides a vast open space buffer between the coastline and the mauka



Conservation lands. The Shipwreck Beach area is also a wilderness coastline and an area of value for recreational purposes. A portion of the coastal area just south of the Shipwreck Beach area is being excluded from the recommendation because of the presence of a number of structures.

This entire area is 'a'ali'i (*Dodonaea viscosa*) shrubland, with pili (*Heteropogon contortus*) grassland in the southernmost portion. The area from Maunalei Gulch to Hauola Gulch is representative of native grassland and shrubland and contains some of the oldest native trees left on Lanai, including olopua (*Nestegis sandwicensis*) stands that extend down from the summits with pockets in the valleys. This area also contains rare plants, including 'akoko (*Chamaesyce celastroides* var. *laehiensis*), *Hibiscus brackenridgei* ssp. *brackenridgei*, and the best known and largest stand of Hawaiian cotton or ma'o (*Gossypium tomentosum*) in the State. The area above Lae Hi Beach contains a unique exposed limestone formation that may not be of marine origin, extending from the coast inland to approximately 750 feet elevation.

This area is not of high agricultural value as it contains poor soils and steep slopes.

The maximum sustainable yield on Lanai is 6.0 MGD. However, the Water Commission has set a limit of 4.3 MGD as a management guide. Present water consumption is 3.01 MGD. The average demand estimated for 2010 is 4.4 MGD. All of the listed projects upon which estimates of future demand were based are located in western Lanai, primarily at Manele and Koele (M&E Pacific, Inc., 1992). Since water delivery to existing and planned areas on Lanai would likely receive priority and this area receives only 10 to 15 inches of rain per year, it does not have high potential for agricultural use.

Conformance With Chapter 205, HRS:

Section 205-2(e): The proposed reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas, beach areas, conserving indigenous and endemic plants and open space areas. The reclassification would protect a variety of native Hawaiian flora found in this part of the Island.

Section 205-17(3)(A) and (B): The proposed reclassification of Lanai's North- and Southeast Slopes from the Agricultural District to Conservation will support the preservation or maintenance of important natural systems or habitats and the maintenance of valued cultural, historical or natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources, and encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to, wildlife habitats, areas with endangered species of plants and wildlife, scenic and recreation shoreline resources, open space and natural areas, historic and cultural sites, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and

scenic resources.

Conformance With LUC Standards:

Section 15-15-20: Applicable LUC standards for determining Conservation District boundaries relate to the inclusion of lands necessary for the conservation preservation and enhancement of sites of unique physiographic significance and for conserving natural ecosystems of endemic plants. The proposed reclassification would protect the variety of native vegetation zones found here and the unique limestone formation above Lae Hi Beach which may be non-marine in origin.

Conformance with County Plans:

The Lanai Community Plan designates the proposed reclassification area as Agriculture. As such, reclassification of the subject parcel would require an amendment to the Community Plan.

4. Southeast Coast (888 Acres, U to C; 189 Acres, R to C)

Following Lanai's southeast coast between Kaa Fishpond to the north and Naha Gulch to the south is a narrow band of coastline with a variety of natural resources. See Figure 83. Land use designations in this area alternate between Urban and Rural designations.

Because of the isolated character of this area, its distance from infrastructure and its potential to maintain natural and coastal resources, the area meets the criteria for the Conservation District. The subject area also contains lithified dunes extending inland to approximately 650 feet.

The area is not desirable for urban use because of the lack of infrastructure, lack of water and distance from other urban areas.

It should be noted that the Northeast Coastline which is in the

Rural District was also reviewed. However, there are a number of existing dwellings in this area and reclassification was not recommended in order to keep structures out of the Conservation District.

Conformance With Chapter 205, HRS:

Section 205-2(e): As proposed, the reclassification of the subject area to the Conservation District meets criteria which provide that the Conservation District include areas necessary for preserving scenic and historic areas, providing wilderness and beach reserves, and areas of value for recreational purposes. Reclassification of the subject area would protect a unique limestone formation found within its boundaries and preserve the scenic values characteristic of this coastline.

Section 205-17(3)(A) and (B): The proposed reclassification of Lanai's Southeast Coast from the Rural and Urban Districts to Conservation will support the preservation or maintenance of important natural systems or habitats and the maintenance of valued natural resources.

Conformance with Chapter 226, HRS, The Hawaii State Plan:

Section 226-11(a)(2), (b)(1) and (6), Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources: The proposed reclassification conforms to the HSP objective and policies relating to the achievement of the effective protection of Hawaii's unique and fragile environmental resources by exercising an overall conservation ethic in the use of Hawaii's natural resources.

Section 226-104(b)(10) and (13), Population Growth and Land Resources Priority Guidelines: The proposed reclassification of the subject area conforms to the HSP Priority Guidelines for regional growth and land resource utilization by identifying critical environmental areas in Hawaii to include, but not be limited to,

scenic and recreation shoreline resources, open space and natural areas, and scenic resources; and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

Conformance With LUC Standards:

Section 15-15-20: The proposed reclassification conforms to the LUC standards of determining Conservation District boundaries. Specifically, the proposed reclassification would be supported by standards which promote the inclusion of lands necessary for the conservation, preservation and enhancement of sites of unique physiographic significance and for conserving natural ecosystems of endemic plants. Reclassification of the subject area would protect the unique limestone formation found within the boundaries.

Conformance With County Plans:

The Lanai Community Plan designates these areas as Open Space to maintain continuity with the adjoining Conservation District lands which band the coastal areas of this portion of the Island. Reclassification of these areas would provide for the long-term maintenance of the undisturbed open space character of this part of the Island.

REFERENCES

REFERENCES

Ahuimanu Productions, An Ornithological Survey of Hawaiian Wetlands, Volumes I and II, Prepared for the U.S. Army Engineer District, Honolulu, December 1977.

Austin, Tsutsumi and Associates, Inc., Island-Wide Long-Range Highway Plan for Maui, Final Report, Executive Summary, Prepared for Department of Transportation, Highways Division, Planning Branch, October 1990.

Bier, James A., Map of Maui, The Valley Isle, Fourth Ed., 1988.

County of Maui, The General Plan of the County of Maui, June 1980.

County of Maui, Lahaina Community Plan, 1983.

County of Maui, Hana Community Plan, 1982.

County of Maui, Kihei-Makena Community Plan, 1985.

County of Maui, Molokai Community Plan, 1984.

County of Maui, Lanai Community Plan, 1983.

County of Maui, Paia-Haiku Community Plan, 1983.

County of Maui, Wailuku-Kahului Community Plan, 1987.

County of Maui, Makawao-Pukalani-Kula Community Plan, 1987.

Eckbo, Dean, Austin & Williams, State of Hawaii Land Use Districts and Regulations Review, August 15, 1969.

Eugene P. Dashiell Planning Services, Five-Year Boundary Review: Infrastructure Constraints & Opportunities to 2010, Prepared for Office of State Planning, State of Hawaii, July 1991.

Deloitte & Touche, Agricultural Resources Study, Prepared for State of Hawaii, Office of State Planning, January 1991.

Elliot, M.E. and E.M. Hall, Wetlands and Wetland Vegetation of Hawaii, prepared for the U.S. Corps of Engineers, Pacific Ocean Division. Contract #DAC 84-77-C-0014, 1977.

Federal Emergency Management Agency, Flood Insurance Rate Maps, June 1, 1981.

First Hawaiian Bank Research Department, Economic Indicators, County Profiles, July/August 1989.

Ford, John, Natural Area Reserve Commissioner, July 21, 1992.

George A. L. Yuen & Associates, State Water Resources Protection Plan, Volume I, June 1990.

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.

Klein, Richard D., Community and Environmental Defense Associates, Protecting the Aquatic Environment from the Effects of Golf Courses, May 1990.

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

Land Study Bureau -- University of Hawaii, Detailed Land Classification -- Island of Maui, May 1967.

Land Study Bureau -- University of Hawaii, Detailed Land Classification -- Island of Molokai, May 1968.

Land Study Bureau -- University of Hawaii, Detailed Land Classification -- Island of Lanai, May 1967.

Marshall Kaplan, Gans, Kahn & Yamamoto, Report to the People, State Land Use Commission, Second Five-Year District Boundary & Regulations Review, February 1975.

M&E Pacific, Inc., Maui County Water Use and Development Plan, Islands of Maui, Molokai, and Lanai, Review Drafts, February 1992.

Michael T. Munekiyo Consulting, Five-Year Boundary Review, Maui County Assessment (Draft), Prepared for State of Hawaii, Office of State Planning, September 1990.

The Nature Conservancy of Hawaii, The Preserves of the Nature Conservancy of Hawaii.

The Nature Conservancy of Hawaii, Proceedings of the Native Ecosystems and Rare Species Workshops, Prepared for State of Hawaii, Office of State Planning, July 1991.

PBR Hawaii, County Plans and State Land Use District Review and Mapping Study, Five Year Boundary Review, Volume I, Prepared for Office of State Planning, State of Hawaii, December 1990.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther T. Mookini, Place Names of Hawaii, 1974.

Soil and Water Conservation Society, Vegetative Filter Strips, Prepared for U.S. Environmental Protection Agency, Office of Policy Planning and Evaluation, July 1988.

State of Hawaii, Department of Business and Economic Development, The State of Hawaii Data Book 1990, Honolulu, 1990.

State of Hawaii, Department of Business and Economic Development, The State of Hawaii Data Book 1991, Honolulu, 1991.

State of Hawaii, Department of Land and Natural Resources, Division of State Parks, Letter dated November 12, 1991.

State of Hawaii, Department of Land and Natural Resources, Memorandum to Harold Masumoto Regarding Castle and Cooke's Comments on Lanai Boundary Review Recommendations, May 18, 1982.

State of Hawaii, Department of Land and Natural Resources, State Recreation Functional Plan, December 1985.

State of Hawaii, Department of Land and Natural Resources, State Conservation Lands Functional Plan, Draft, 1990.

State of Hawaii, Department of Land and Natural Resources, State Recreation Functional Plan Technical Reference Document, December 1985.

State of Hawaii, Department of Land and Natural Resources, Statewide Recreation Resources Inventory, Principal Swimming Areas, 1987.

State of Hawaii, Department of Land and Natural Resources, Division of Aquatic Resources, Conservation of Hawaiian Freshwater Fishes, Prepared by William S. Devick, J. Michael Fitzsimons and Robert T. Nishimoto, April 1992.

State of Hawaii, Department of Land and Natural Resources, and National Park Service, Hawaii Stream Assessment, A Preliminary Appraisal of Hawaii's Stream Resources, December 1990.

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

Sunderland Smith and Associates, Land Use Stakeholders Survey.

University of Hawaii, Department of Geography, Atlas of Hawaii Second Edition, University of Hawaii Press, Honolulu, 1983.

University of Hawaii, Water Resources Center, Watershed and Water Recharge Area Study, Draft, 1991.

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

U.S. Environmental Protection Agency, Vegetative Filter Strips, brochure prepared by the Soil and Water Conservation Society.

U.S. Fish and Wildlife Service, Hawaii's Unique Ecosystems, Draft, 1980.

U.S. Fish and Wildlife Service, Hawaiian Waterbirds Recovery Plan, 1985.

U.S. Fish and Wildlife Service, Hawaiian Wetlands National Wildlife Refuge Complex Master Plan, 1985.

U.S. Fish and Wildlife Service, National Wetlands Inventory Maps, prepared by the Office of Biological Services for the National Wetlands Inventory.

U.S. Fish and Wildlife Service, Regional Wetlands Concept Plan; Emergency Wetlands Resource Act, 1985.

U.S. Geological Survey, Quadrangle Maps for Maui, Molokai and Lanai, 1968.

Wilson Okamoto & Associates, Inc., Urban Land Requirements Study, Prepared for Office of State Planning, October 1991.

APPENDICES

APPENDIX A
SUMMARIES OF
VACANT AND DEVELOPABLE
URBAN LAND

Table A-1
VACANT URBAN LANDS
COUNTY OF MAUI
(IN ACRES)

	RESIDENTIAL	APARTMENT	COMMERCIAL	INDUSTRIAL	AGRICULTURAL & RURAL	CONSERVATION	HOTEL & RESORT	TOTAL ACRES
WAILUKU-KAHULUI	1,365	0	50	207	249	73	0	1,945
KIHEI-MAKENA	1,010	443	62	68	68	342	153	2,147
LAHAINA	345	78	16	102	2	123	122	789
HANA	44	0	0	0	0	0	0	44
MAKAWAO-KULA	460	39	0	0	0	128	8	635
PAIA-HAIKU	256	0	0	6	0	2	0	264
MOLOKAI	517	195	6	509	893	334	121	2,573
LANAI	1,257	41	0	11	1,158	114	0	2,581
TOTAL	5,254	795	134	903	2,371	1,116	404	10,978
Source: City and County of Honolulu, Real Property Tax Division December, 1990 data Excludes Lahaina HFDC project.								

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

Table A-2

**DEVELOPABLE URBAN LANDS
COUNTY OF MAUI
(IN ACRES)**

	RESIDENTIAL	APARTMENT	COMMERCIAL	INDUSTRIAL	AGRICULTURAL & RURAL	CONSERVATION	HOTEL & RESORT	TOTAL ACRES
WAILUKU-KAHULUI	1,285	0	23	188	249	52	0	1,798
KIHEI-MAKENA	812	95	14	24	68	115	114	1,241
LAHAINA	65	44	16	35	2	63	96	322
HANA	44	0	0	0	0	0	0	44
MAKAWAO-KULA	448	15	0	0	0	87	0	551
PAIA-HAIKU	166	0	0	6	0	2	0	174
MOLOKAI	207	41	0	117	152	187	121	824
LANAI	344	40	0	11	967	111	0	1,473
TOTAL	3,370	235	53	380	1,439	618	331	6,427

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

Table A-3
RESIDENTIAL AREA REQUIREMENTS
1995 - 2010 SUMMARY
COUNTY OF MAUI

	1987 UNITS	1995 DEMAND	ACRES NEEDED	2000 DEMAND	ACRES NEEDED	2005 DEMAND	ACRES NEEDED	2010 DEMAND	ACRES NEEDED
WAILUKU-KAHULUI	8,948	14,099	616	16,102	876	17,793	1,102	19,718	1,365
KIHEI-MAKENA	5,762	6,238	43	7,540	166	8,335	250	9,276	355
LAHAINA	5,489	7,605	204	9,245	385	10,580	538	12,121	720
HANA	519	769	32	853	43	908	51	966	58
MAKAWAO-KULA	5,564	7,050	180	7,479	235	7,748	270	8,129	320
PAIA-HAIKU	2,261	2,820	67	3,004	91	3,152	110	3,322	132
MOLOKAI	2,658	2,863	25	3,096	54	3,259	74	3,494	98
LANAI	786	1,282	67	1,553	104	1,656	118	1,815	139
TOTAL	31,987	42,726	1,234	48,872	1,954	53,432	2,513	58,839	3,188

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

Table A-4

**COMMERCIAL AREA REQUIREMENTS
1995 - 2010
COUNTY OF MAUI**

	1987 COMMERCIAL SQ-FT 1/	1987 COMMERCIAL ACRES 2/	1995 SQ-FT INCREASE 3/	ACRES NEEDED 4/	2000 SQ-FT INCREASE 1/	ACRES NEEDED 5/	2005 SQ-FT INCREASE 3/	ACRES NEEDED 6/	2010 SQ-FT INCREASE 1/	ACRES NEEDED 6/
WAILUKU-KAHULUI	2,440,000	163	164,000	11	266,000	18	382,000	25	497,000	33
KIHEI-MAKENA	276,000	18	1,252,000	83	2,035,000	136	2,742,000	183	3,449,000	230
LAHAINA	937,000	62	800,000	53	1,329,000	89	1,723,000	115	2,116,000	141
HANA	18,000	1	7,000	0	12,000	1	12,000	1	12,000	1
MAKAWAO-KULA	185,000	12	17,000	1	27,000	2	27,000	2	27,000	2
PAIA-HAIKU	105,000	7	6,000	0	10,000	1	14,000	1	18,000	1
MOLOKAI	147,000	10	17,000	1	27,000	2	36,000	2	44,000	3
LANAI	43,000	3	21,000	1	34,000	2	40,000	3	45,000	3
TOTAL	4,151,000	277	2,284,000	152	3,740,000	249	4,976,000	332	6,208,000	414

1/ Austin, Teuteumi & Associates, Highway Plan for Maui.

Molokai and Lanai data estimated from 1980 land use data in Community Plans.

2/ Based on 15,000 gross square feet of commercial space per acre, assumptions used in the above reference.

3/ 1995 and 2005 space needs derived from 2000 and 2010 projections.

4/ Additional acres needed, using density factor.

5/ Acreage needs cumulative from 1995.

Table A-5

**INDUSTRIAL SPACE REQUIREMENTS
1995 - 2010
COUNTY OF MAUI**

	1987 INDUSTRIAL EMPLOYMENT 1/	INDUSTRIAL ACRES 2/	1995 INDUSTRIAL EMPLOYMENT 3/	ADDITIONAL ACRES 4/	2000 INDUSTRIAL EMPLOYMENT	ADDITIONAL ACRES 5/	2005 INDUSTRIAL EMPLOYMENT	ADDITIONAL ACRES 5/	2010 INDUSTRIAL EMPLOYMENT 1/	ADDITIONAL ACRES 5/
WAILUKU-KAHULUI	7,664	690	8,805	103	9,518	167	10,115	221	10,712	275
KIHEI-MAKENA	27	2	1,470	130	2,372	211	3,450	308	4,529	406
LAHAINA	872	79	911	4	935	6	972	9	1,008	12
HANA	30	3	71	4	98	6	127	9	157	11
MAKAWAO-KULA	257	23	257	0	257	0	257	0	257	0
PAIA-HAIKU	381	34	531	13	624	22	734	32	844	42
MOLOKAI	515	46	573	5	608	8	638	11	668	14
LANAI	206	19	306	9	369	15	394	17	419	19
TOTAL	9,951	896	12,923	268	14,781	435	16,687	607	18,594	779

1/ Austin, Teuteumi & Associates, Highway Plan for Maui.
Molokai and Lanai estimated from land use data in Community Plans.
2/ 11.1 employees per acre, based on 9,950 employees and 900 acres in Industrial use.
3/ 1995 and 2005 employment derived from 2010 projections.
4/ Additional acres needed, using density factor.
5/ Acreage needs cumulative from 1995.

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

Table A-6

**RESORT AREA REQUIREMENTS
1995 - 2010
COUNTY OF MAUI**

	1987 VISITOR UNITS 1/	DENSITY UNITS/ACRE 2/	1995 VISITOR UNITS 3/	ADDITIONAL ACRES 4/	2000 VISITOR UNITS	ADDITIONAL ACRES	2005 VISITOR UNITS	ADDITIONAL ACRES	2010 VISITOR UNITS	ADDITIONAL ACRES
WAILUKU-KAHULUI	385	29	396	0	378	0	403	1	405	1
KIHEI-MAKENA	5,047	19	7,523	130	9,544	237	12,043	368	14,449	495
LAHAINA	8,607	28	11,333	97	13,335	169	15,093	232	16,266	274
HANA	128	20	212	4	284	8	378	12	474	17
MAKAWAO-KULA	1	0	1	0	1	0	1	0	1	0
PAIA-HAIKU	0	0	0	0	0	0	0	0	0	0
MOLOKAI	567	12	680	9	720	13	760	16	800	19
LANAI	10	15	355	23	438	29	522	34	605	40
TOTAL	14,745	123	20,500	265	24,700	455	29,200	663	33,000	845

1/ Austin, Teuteuml & Associates, Highway Plan for Maui.

Molokai and Lanai units from Hawaii Visitors Bureau, Visitor Plant Inventory.

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 highway planning
study projections.

4/ Additional units divided by density factor for area; cumulative totals from 1995.

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

Table A-7
PUBLIC AREA NEEDS
SCHOOL SPACE REQUIREMENTS
1995 - 2010
COUNTY OF MAUI

	1990	1995	STUDENT		2000	HOUSEHOLD	STUDENT		2005	HOUSEHOLD	STUDENT		2010	HOUSEHOLD	STUDENT		ACRES
	HOUSE-	HOUSEHOLD	INCREASE		ACRES	INCREASE	INCREASE		ACRES	INCREASE	INCREASE		ACRES	INCREASE	INCREASE		NEEDED
	HOLDS		K-8 1/	HS 1/	2/	3/	K-8	HS	3/		K-8	HS			K-8	HS	
WAILUKU-KAHULUI	11,511	1,917	863	422	7	3,824	1,721	841	39	5,435	2,446	1,196	46	7,268	3,271	1,599	46
KIHEI-MAKENA	4,730	1,211	545	266	7	2,451	1,103	539	7	3,208	1,444	706	14	4,104	1,847	903	39
LAHAINA	5,704	1,539	693	339	7	3,101	1,395	682	7	4,372	1,967	962	39	5,840	2,628	1,285	46
LAHANA	661	71	32	16	0	152	68	33	0	204	92	45	0	259	117	57	0
MAKAWAO-KULA	6,295	419	189	92	0	828	373	182	0	1,084	488	238	7	1,447	651	318	7
PAIA-HAIKU	2,469	217	98	48	0	392	176	86	0	533	240	117	0	695	313	153	0
MOLOKAI	2,469	257	116	57	0	480	216	106	0	635	286	140	0	858	386	189	0
LANAI	939	282	127	62	0	540	243	119	0	639	288	141	0	790	356	174	0
TOTAL	34,778	5,913	2,661	1,301	21	11,768	5,296	2,589	53	16,110	7,250	3,544	106	21,261	9,567	4,677	138

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.

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

Table A-8
PUBLIC AREA NEEDS
PARKS SPACE REQUIREMENTS
1995 - 2010
COUNTY MAUI

	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
WAILUKU-KAHULUI	32,041	4,655	9	8,781	18	12,381	25	16,617	33
KIHEI-MAKENA	13,165	3,070	6	5,950	12	7,645	15	9,725	19
LAHAINA	15,875	3,919	8	7,563	15	10,538	21	14,036	28
HANA	1,839	163	0	324	1	429	1	544	1
MAKAWAO-KULA	17,521	827	2	1,440	3	1,822	4	2,538	5
PAIA-HAIKU	6,873	466	1	742	1	998	2	1,324	3
MOLOKAI	6,873	577	1	976	2	1,264	3	1,748	3
LANAI	2,614	722	1	1,323	3	1,521	3	1,865	4
TOTAL	96,801	14,399	28	27,099	55	36,598	74	48,397	96

1/ See Population Projections Table

2/ Based on 2 acres per 1,000 population.

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

Table A-9
RESIDENTIAL UNIT DEMAND
1990 - 2010
COUNTY OF MAUI

	1987	HOUSING	1990	HOUSE-	TOTAL	1995	HOUSE-	TOTAL	2000	HOUSE-	TOTAL	2005	HOUSE-	TOTAL	2010	HOUSE-	TOTAL
	POP.	UNITS	POP.	HOLDS	DEMAND	POP.	HOLDS	DEMAND	POP.	HOLDS	DEMAND	POP.	HOLDS	DEMAND	POP.	HOLDS	DEMAND
	1/	1/		@2.75 PPH	3/	1/	2/	3/		@2.63 PPH			@2.59 PPH			@2.56 PPH	
WAILUKU-KAHULUI	29,839	8,948	32,041	11,535	12,111	36,696	13,455	14,128	40,822	15,366	16,135	44,422	16,980	17,829	48,658	18,817	19,758
KIHEI-MAKENA	11,561	5,762	13,165	4,739	4,976	16,235	5,953	6,251	19,115	7,195	7,555	20,810	7,955	8,352	22,890	8,852	9,295
LAHAINA	13,801	5,489	15,875	5,715	6,001	19,794	7,258	7,621	23,438	8,823	9,264	26,413	10,096	10,601	29,911	11,567	12,146
HANA	1,800	519	1,839	662	695	2,002	734	771	2,163	814	855	2,268	867	910	2,383	922	968
MAKAWAO-KULA	17,340	5,564	17,521	6,307	6,623	18,348	6,728	7,064	18,961	7,137	7,494	19,343	7,394	7,763	20,059	7,757	8,145
PAIA-HAIKU	6,690	2,261	6,873	2,474	2,598	7,339	2,691	2,826	7,615	2,866	3,010	7,871	3,008	3,159	8,197	3,170	3,328
MOLOKAI	6,645	2,600	6,873	2,474	2,598	7,450	2,732	2,868	7,849	2,955	3,102	8,137	3,110	3,266	8,621	3,334	3,501
LANAI	2,200	840	2,614	941	988	3,336	1,223	1,284	3,937	1,482	1,556	4,135	1,581	1,660	4,479	1,732	1,819
TOTAL	89,876	31,983	96,800	34,848	36,590	111,200	40,773	42,812	123,900	46,639	48,971	133,400	50,991	53,540	145,198	56,151	58,958

1/ Austin, Tsutsumi & Assoc., Highway Plan for Maui. Projections adjusted to conform to M-K projections.

2/ 99% of population in households; declining persons per household factors.

3/ Total demand includes units to satisfy 5% desired vacancy rate.

Source: Urban Lands Requirements Study, Wilson Okamoto & Associates.

NOTE: 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 2.75 persons per household in 1990 to 2.56 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.

APPENDIX B

**KULEANA AND KONOHIKI
RIGHTS**

KULEANA AND KONOHIKI RIGHTS

During the public comment period for the Five Year Boundary Review, there were a number of people who raised concerns relating to kuleana rights and konohiki rights. Within the County of Maui, these concerns were raised for proposed reclassification of lands from the Agricultural District to the Conservation District at Honokohau Stream, Kapia Stream, and Wailuanui Stream. Testimony was also received on the island of Molokai alluding to rights of kuleana practitioners.

Kuleana rights stem from the Great Mahele - or division - which was conducted in 1848 and the subsequent passage of the Act of August 6, 1850 authorizing the award of kuleana - or property - to the maka'ainana, which is literally translated as people of the land. The 1850 Act allowed maka'ainana to apply for land that was "really cultivated" plus a houselot of one-quarter acre.

A central concern is how the proposed reclassification of land to the Conservation District would affect kuleana rights. Since kuleana lands were granted for agricultural purposes with an accessory house lot, testifiers questioned whether Conservation District policies would allow or restrict the activities for which the land was originally intended.

Related to the issue of kuleana rights are konohiki rights. Konohiki were land agents or lesser chiefs. As part of the Great Mahele, lands which were set aside for the chiefs and konohiki became known as konohiki lands.

In order to better understand the context for the issues of kuleana rights and konohiki rights, a discussion of history and background is provided.

Traditional Land Tenure

Hawaiian society, at the time of Captain James Cook's expedition in 1778, utilized a complex landholding system quite different from Western society. An ali'i 'ai moku or mo'i, or high chief controlled an island or section of an island. He could reserve certain lands for his personal use and distributed remaining lands to his loyal chiefs, relatives or allies (MacKenzie, 1991). Each island was divided into a number of districts, called moku. These were geographical subdivisions only and no administrators were assigned to them (Chinen, 1958).

The moku was divided for landholding purposes into ahupua'a. Each ahupua'a was administered by an ali'i 'ai ahupua'a or ahupua'a chief, or sometimes a konohiki. The ideal ahupua'a was an economically sufficient, pie-shaped unit which extended from the sea to the mountains. This enabled its residents to obtain fish and seaweed at the shore, taro, bananas and sweet potatoes from the lowlands and fuel, canoe timber and

forest products from the mountains. In a number of instances, ahupua'a did not extend to either the mountain or the seashore since it could be cut by irregular shapes of adjacent ahupua'a. Smaller ahupua'a could contain as little as a hundred acres of land while larger ones could contain as much as 100,000 acres.

Many ahupua'a were further divided into smaller units called 'ili and 'ili kupono. 'Ili were simply smaller subdivisions of the ahupua'a created for the convenience of the ahupua'a chief, and controlled by konohiki. 'Ili kupono were independent political units administered by konohiki. Tributes were paid not to the ahupua'a chief within which the 'ili kupono was located, but to the high chief or ali'i 'ai moku.

Hawaiian society paralleled the land division pattern. At the top were the ali'i 'ai moku and kahuna nui (priests), then the ali'i 'ai ahupua'a, the ahupua'a konohiki and finally the maka'ainana, who worked the land. By right of conquest, each ali'i 'ai moku controlled all the lands within his jurisdiction. After selecting certain lands for his own personal use, remaining lands were allotted to his chiefs. After reserving lands for their personal use, the chiefs then allotted those remaining lands for their own followers and supporters.

It should be noted that the concept of private fee simple ownership did not exist in Hawaiian society. The ali'i 'ai moku was seen as having divine power and the distribution of all lands were on a revocable basis. However, the power of the ali'i 'ai moku was not without limits. His authority was not a personal power. Rather, it was a power channeled through him by the gods. Thus, his power was analogous to a trustee in terms of land and natural resources (MacKenzie, 1991).

The trust concept continued throughout the political and social hierarchy. The Hawaiian scholar, David Malo, wrote "the king was over all his people; he was the supreme executive, so long, however, as he did right" (Malo, 1951 ed.) The land itself was viewed as belonging not to one individual but to the gods. All the people, including the ali'i, merely administered the land for the benefit of the gods and society as a whole.

Although maka'ainana worked the land under the direction of the chiefs and priests, they were not serfs bound to the land. They could freely move to other areas if treated unfairly. Since the responsibility of an ahupua'a chief was to make the ahupua'a productive, and a stable workforce was needed to achieve that end, abuses by ahupua'a chiefs were minimized. If an ahupua'a chief's treatment of the people resulted in the maka'ainana relocating to another district, then the ali'i 'ai moku would be free to replace the ahupua'a chief for failing to make the land productive.

The maka'ainana worked the common areas within the ahupua'a to support the chiefs and priests. Within the boundaries of the ahupua'a, the maka'ainana also had plots for their own use and had certain gathering rights in the non-cultivated lands of the

ahupua'a. These included the right to hunt, gather wild plants and herbs, fish offshore, and use parcels of land for taro cultivation together with an adequate supply of water.

On the death of a high chief, his successor was free to redistribute the land among his own followers. Upon the death of an ali'i 'ai ahupua'a or 'ili kupono, numerous changes could be made by the high chief, with the heirs of the decedent possibly being displaced in favor of a new group of persons. Maka'ainana generally could stay on the same land even though the ali'i controlling the land changed.

Transition Period

Contact with the West brought startling changes to Hawaiian society. By 1795, King Kamehameha I had expanded his rule to all of Hawaii except for the island of Kauai. In 1810, he gained the allegiance of Kauai's chief. While Kamehameha I divided lands in the customary manner among the lesser chiefs, he also created another administrative level by appointing loyal chiefs to be governors of each island. In this manner, he sought to prevent chiefs on the other islands from gaining sufficient power to challenge his control.

The arrival of Westerners completely altered socio-economic patterns as Hawaii became a provisional stop for European vessels sailing the Pacific and a major supplier of the sandalwood trade. The activity of port communities and demands of the sandalwood trade drew maka'ainana from the land. Agricultural practices suffered and traditional notions of responsibility to chiefs were disrupted (Native Hawaiians Study Commission, 1983).

Moreover, the Hawaiian economy now had to support an enlarged aristocratic class involving a proliferation of administrative levels and an increased emphasis on palace court life. While the economy was being transformed from one largely concerned with subsistence to one largely enmeshed in international trade, an onerous tax system was also instituted (Levy, 1975).

Land tenure patterns reflected and served this new economy. After Kamehameha's death in 1819, his son, Liholiho (Kamehameha II) acceded to the throne and did not redistribute land to his followers, but allowed the majority of his father's subchiefs to retain their land holdings. These sovereign powers descended with the crown to Kamehameha III upon the death of his brother in England in 1824. Foreign traders were anxious to codify the new stability in landholding. When Kamehameha III took the throne at the age of 12, the Council of Chiefs convinced him to adopt a formal policy, later called the Law of 1825, allowing chiefs to retain their lands upon the death of the king and permitting hereditary succession. At the same time, Westerners entered Hawaii's land usage patterns as foreign settlers were "given" lands by the king or the chiefs in return for services or as gifts.

Early commerce in this era focused on the sandalwood trade and whaling industry. But overharvesting soon caused the sandalwood trade to collapse and whaling stocks also diminished. Attention then turned to large scale plantation agriculture as the focus of economic activity. Since the investment of capital required a more stable land tenure system, pressure to change the traditional land tenure system mounted.

In 1839, Kamehameha III proclaimed a Declaration of Rights securing protection to "all the people, together with their lands, their building lots, and all their property... nothing whatever shall be taken from any individual, except for express provision of the laws" (MacKenzie, 1991).

Hawaii's first written constitution, adopted in 1840, and the laws enacted immediately thereafter attempted to deal with the increasing conflicts between Hawaiians and foreigners over land. This constitution changed the Hawaiian government from an absolute monarchy to a constitutional monarchy. Among other things, the constitution established a bicameral legislature and a supreme court.

The Constitution of 1840 decreed that the king could lose no land without his consent. Thus, he could prevent alienation to foreigners. However, to accommodate the growing Western influence in the islands, the Constitution also noted that property already held by foreigners would not be reclaimed by the Crown. In 1841, another concession was made by the adoption of a plan to allow island governors to enter into 50 year leases with foreigners.

An important feature of the 1840 Constitution was the declaration that, though all the land belonged to Kamehameha I, "it was not his private property. It belonged to the chiefs and the people in common, of whom Kamehameha I was the head, and had management of the landed property." This was the first formal acknowledgement by the king that the common people had some form of ownership in the land, aside from an interest in the products of the soil (Chinen, 1958).

Under the Constitution of 1840, the maka'ainana were still unable to acquire absolute ownership of the land which they cultivated and on which they lived. However, they were no longer subject to arbitrary removal by the king or chiefs.

In disputes between the king and the Westerners, the Hawaiian government became acutely aware of the increasing trend of foreign gunboats arriving in Hawaii to enforce the merchants' views. In some instances, foreigners were aided by diplomatic agents of the government to which they owed allegiance. In one such incident, Lord George Paulet, captain of the British warship, Carysfort, took control of the Hawaiian government for five months, partially in response to a lease dispute involving the British counsel. The British government, upon learning of the action, however, repudiated the action and ordered the Carysfort to leave Hawaii.

A second trend involves the increasing numbers of foreigners in important government positions and increasing influence in governmental affairs. The accumulation of land by foreigners was a cause of concern for the Hawaiian Kingdom. The chiefs realized that such holdings would increase the power held by foreigners and decrease their own ability to receive labor dues from the maka'ainana who became part of the Western plantation economy (Levy, 1975).

The Great Mahele

Because of the mounting pressure for change of the land tenure system, an 1845 law was passed establishing the Board of Commissioners to Quiet Land Titles, commonly referred to as the Land Commission. The statute provided that the Commission investigate all land claims of private individuals, whether natives or foreigners, to land acquired prior to the creation of the Commission.

The Commission was required to publish a notice declaring that all persons with land claims present their claims to the Land Commission within two years after such notice had been published. However, since the interests of the king, chiefs, and commoners were intertwined and undivided, the Commission could not act immediately on the bulk of Hawaiian lands. Although only a small number of claims were handled during the first two years of the Commission's existence, a number of fee patents were issued even though fee simple ownership was not yet part of the Hawaiian system (MacKenzie, 1991).

In 1846, the Commission adopted "Principles Adopted by the Board of Commissioners to Quiet Land Titles in their Adjudication of Claims Presented to Them", to guide its work. The Commission perceived its goal to be a total defeudalization of and partition of undivided interests (Levy, 1975). The preface to the principles stated that "there are but three classes of persons having vested rights in the land - 1st, the government (the King), 2nd, the landlord (the chief and konohiki), and 3rd, the tenant.." (Chinen, 1958).

The specifics for fulfilling the principles were debated at length until a formulation drafted by Justice William Lee was accepted by the king and chiefs in Privy Council on December 18, 1847. Under Lee's plan, the king's private lands were distinguished from lands he held as king. Lee proposed that the king be allowed to retain his private lands, with a right in his tenants "to a fee simple title to one-third of the lands possessed and cultivated by them" whenever the king or tenants desired (Chinen, 1958). The remaining lands in the kingdom would be divided into thirds: one-third to the Hawaiian government, one-third to the chiefs, and one-third to the tenant maka'ainana.

The Great Mahele began in January 27, 1848 and ended March 7, 1848. All lands in Hawaii were divided between the king and the chiefs, and recorded in the Mahele Book. The king quitclaimed his interest in specific ahupua'a and 'ili to 245 chiefs. The

chiefs, meanwhile, quitclaimed their interests in the balance of lands to the king. These quitclaims did not confer title on the chiefs or konohiki. It simply acknowledged that the king had no claims to these specific lands and the chiefs had no claim to the king's personal lands.

After the last division of lands between the king and the chiefs, the king held almost 2.5 million acres or 60.3 percent of the total land, while the chiefs had a total of approximately 1.5 million acres. The king then divided his lands into two parts. The larger portion, 1.5 million acres, was "set apart forever to the chiefs and people" of the kingdom. These are commonly referred to as Government lands. The remaining 1 million acres, referred to as Crown lands, were retained for himself, his heirs and successors. All these lands were subject to the rights of tenants.

After the Mahele, the konohiki were still required to go before the Land Commission and make their claim for lands. In addition, they were required to pay a commutation tax of one-third the value of the unimproved land or cede one-third of the land to the government. Full allodial title to their lands was made in the form of royal patents, subject to the rights of native tenants.

Total defeudalization of land holdings required the Commission to divide and parcel out the interests of the common people. The Kuleana Act of August 6, 1850 allowed each tenant to apply for his own plot of land or kuleana. A kuleana parcel could come from the Government lands, Crown lands or lands allocated to the chiefs. Moreover, tenants were not required to pay a commutation tax since the chief or konohiki of the ahupua'a or 'ili kupono in which the kuleana was located was responsible for the commutation.

While kuleana lands were generally among the richest and most fertile in the islands, there were a number of restrictions placed on kuleana claims. A kuleana could only include lands that were "really cultivated" plus a houselot of one-quarter acre. The tenant also had to pay survey costs and bring two witnesses to testify to the tenant's right to the land. All kuleana claims also had to be proven before 1854 giving the maka'ainana four years in which to prove their claims.

The original intent of the king and the chiefs was that the maka'ainana were to receive one-third of the land in Hawaii, after the king partitioned out the Crown lands. It is estimated that of the 8,205 awards given by the Land Commission, 7,500 awards involved kuleana lands. This resulted, however, in only 26 percent of the adult male native population receiving such lands. Moreover, only 28,600 acres, less than one percent of the total amount of land, went to the maka'ainana (MacKenzie, 1991).

Many reasons have been advanced as to the relatively small amount of land which the maka'ainana received after the Great Mahele. One suggestion is that most commoners lacked even the small capital needed for the required survey. Another suggestion is that maka'ainana did not apply for the kuleana grants because they feared reprisal from

the king or chiefs. Another reason could be that the grants were severely limited by the "really cultivated" clause of the Kuleana Act. Historically, the maka'ainana had only small fields to work for their benefit, but they were also able to use other non-cultivated lands in the ahupua'a and cultivated large portions of the ahupua'a in common. Others have suggested that the devastating epidemics of 1848 and 1849 resulted in fewer claims (MacKenzie, 1991).

After the Great Mahele

The years after the Great Mahele brought the growth of large scale plantation agriculture, especially sugar, and the steady loss of lands from Hawaiian control. Numerous kuleana grants were lost as a result of changes in the economy and a misunderstanding by Hawaiians of the Western legal and judicial systems.

The chiefs, as well as the commoners, were unable to maintain control of their lands. The great majority of chiefs were already heavily in debt, primarily to Westerners, for past liabilities linked to a growing demand for material goods. Many of the chiefs paid their debt in land. Some chiefs attempted large scale agriculture but subsequently lost land through foreclosure.

As plantation agriculture flourished, concentration of land ownership and control in Western hands became apparent. The 1890 Census revealed that for every four acres belonging to private owners, three were held by Westerners. Of a total population of approximately 90,000, fewer than 5,000 owned land.

The escalation of Western economic and political control during the late 1800's and early 1900's is well documented with the overthrow of the Hawaiian monarchy, establishment of the Republic of Hawaii, annexation to the United States, and establishment as a territory of the United States. The more recent establishment of the Hawaiian Homes Commission Act in 1921 made available some public lands for homesteading purposes. Hawaii State Constitutional amendments passed in 1978 established the Office of Hawaiian Affairs which is to receive and administer the share of public land trust funds for the betterment of native Hawaiians.

Conclusion

It is against this backdrop that concern about effects of reclassification of kuleana lands to the State Conservation District are being raised. Although the concern regarding restriction of the use of the land is a valid one, there are three major legal obstacles which bar the full use of many kuleana: fractionated ownership, inadequate access, and adverse possession (Levy, 1975).

Fractionated ownership of many kuleana plots arises from the effects of intestate succession (passing of property without a will). Parcels may, therefore, have a number

of owners, with no clear responsibility for payment of taxes or improvements.

Inadequate access is a problem for some kuleana because they are surrounded by larger plantations or developments. If a kuleana property is landlocked, the courts have generally held that the right-of-way need not be absolutely necessary. Instead, the easement must be reasonably necessary, that is, other access must be either difficult or expensive to use. Thus, convenient right-of-way presently used by a kuleana holder can usually be upheld even if the user cannot establish a prescriptive easement (Levy, 1975).

Many kuleana plots have been claimed by persons other than the grantee and his heirs by adverse possession. Adverse possession is a legal principle that permits a person who has occupied land for a statutory period in an open, hostile, notorious and exclusive manner to claim title to that land. The statutory period is currently 20 years. Larger landholders have used adverse possession to absorb the enclosed kuleana of native Hawaiians.

Regarding the Five Year Boundary Review, an issue to be resolved is whether kuleana and konohiki rights can or should be restricted in furtherance of other public goals and objectives. Certainly, ownership of existing kuleana and konohiki property should be perfected to allow its full and beneficial use with consideration for public health, safety, welfare and environmental constraints. However, a significant issue as it relates to the Five Year Boundary Review is whether and to what extent ownership rights also confer other rights over police powers such as land use districting, planning and zoning. A policy issue to be debated is whether kuleana and konohiki rights should supersede State and County land use and zoning powers. Another issue which has been raised is whether kuleana and konohiki rights can be held by non-native Hawaiians since, for example, the purpose of kuleana rights was to provide for the shelter and subsistence of native Hawaiians.

While these are significant issues to be addressed, there are also a number of larger issues which have gained prominence at this time. For instance, many have asserted claims for restitution and reparations based upon the loss of Hawaiian sovereignty and land at the time of the overthrow of the Hawaiian monarchy. There have been demands from the Hawaiian community for self-governance and sovereignty which may increase as the 100th anniversary of the overthrow of the Hawaiian monarchy approaches.

References

Jon J. Chinen, The Great Mahele, 1958.

Jon J. Chinen, Original Land Titles in Hawaii, 1961.

Hawaii State Department of Budget and Finance, Land and Water Management in Hawaii, 1979.

Melody Kapilialoha MacKenzie, ed., Native Hawaiian Rights Handbook, Native Hawaiian Legal Corporation, 1991.

David Malo, Hawaiian Antiquities, 1951 ed.

Native Hawaiians Study Commission, Report on the Culture, Needs, and Concerns of Native Hawaiians, 1983.

Neil M. Levy, Native Hawaiian Land Rights, California Law Review, Vol. 63, No. 4, 1975.

APPENDIX C
PRELIMINARY TMK LISTING
RECOMMENDATIONS
RECLASSIFICATION

sitename	tmk	portion
ALELELE STREAM	1-6-010-001	Y
EAST MAUI WATERSHED	2-8-008-007	Y
HONOKOHAU STREAM	4-1-001-009	Y
HONOKOHAU STREAM	4-1-002-004	N
HONOKOHAU STREAM	4-1-002-005	Y
HONOKOHAU STREAM	4-1-002-006	Y
HONOKOHAU STREAM	4-1-002-007	N
HONOKOHAU STREAM	4-1-002-009	Y
HONOKOHAU STREAM	4-1-002-010	Y
HONOKOHAU STREAM	4-1-002-013	Y
HONOKOHAU STREAM	4-1-002-014	Y
HONOKOHAU STREAM	4-1-002-015	Y
HONOKOHAU STREAM	4-1-002-016	Y
HONOKOHAU STREAM	4-1-002-017	Y
HONOKOHAU STREAM	4-1-002-018	Y
HONOKOHAU STREAM	4-1-002-019	Y
HONOKOHAU STREAM	4-1-002-020	Y
HONOKOHAU STREAM	4-1-002-021	Y
HONOKOHAU STREAM	4-1-002-022	Y
HONOKOHAU STREAM	4-1-002-023	Y
HONOKOHAU STREAM	4-1-002-024	Y
HONOKOHAU STREAM	4-1-002-025	Y
HONOKOHAU STREAM	4-1-002-030	N
HONOKOHAU STREAM	4-1-002-031	Y
HONOKOHAU STREAM	4-1-002-035	Y
HONOKOHAU STREAM	4-1-002-038	N
HONOKOHAU STREAM	4-1-002-039	Y
HONOKOHAU STREAM	4-1-002-040	Y
HONOKOHAU STREAM	4-1-002-042	Y
HONOKOHAU STREAM	4-1-002-043	Y
HONOKOHAU STREAM	4-1-002-044	Y
HONOKOHAU STREAM	4-1-002-045	Y
HONOKOHAU STREAM	4-1-002-046	Y
HONOKOHAU STREAM	4-1-002-047	Y
HONOKOHAU STREAM	4-1-002-048	Y
HONOKOHAU STREAM	4-1-002-049	Y
HONOKOHAU STREAM	4-1-002-050	Y
HONOKOHAU STREAM	4-1-002-051	N
HONOKOHAU STREAM	4-1-002-052	Y
HONOKOHAU STREAM	4-1-002-053	Y
HONOKOHAU STREAM	4-1-002-054	N
HONOKOHAU STREAM	4-1-002-055	Y
HONOKOHAU STREAM	4-1-002-056	Y
HONOKOHAU STREAM	4-1-002-058	Y
HONOKOHAU STREAM	4-1-002-059	Y
HONOKOHAU STREAM	4-1-002-060	Y
HONOKOHAU STREAM	4-1-002-065	Y
HONOKOHAU STREAM	4-1-002-068	Y
HONOKOHAU STREAM	4-1-002-071	Y
HONOKOHAU STREAM	4-1-002-076	Y
HONOKOHAU STREAM	4-1-003-001	Y
HONOKOHAU STREAM	4-1-003-003	Y
HONOKOHAU STREAM	4-1-003-004	Y
HONOKOHAU STREAM	4-1-003-005	Y
HONOKOHAU STREAM	4-1-003-006	Y
HONOKOHAU STREAM	4-1-003-007	Y
HONOKOHAU STREAM	4-1-003-008	Y
HONOKOHAU STREAM	4-1-003-009	Y
HONOKOHAU STREAM	4-1-003-010	Y
HONOKOHAU STREAM	4-1-003-011	Y
HONOKOHAU STREAM	4-1-003-012	Y
HONOKOHAU STREAM	4-1-003-013	Y
HONOKOHAU STREAM	4-1-003-014	N
HONOKOHAU STREAM	4-1-003-015	Y
HONOKOHAU STREAM	4-1-003-016	N
HONOKOHAU STREAM	4-1-003-019	Y
HONOKOHAU STREAM	4-1-003-020	Y
HONOKOHAU STREAM	4-1-003-021	Y

sitename	tmk	portion
HONOKOHAU STREAM	4-1-003-022	Y
HONOKOHAU STREAM	4-1-003-022	Y
HONOKOHAU STREAM	4-1-003-023	Y
HONOKOHAU STREAM	4-1-003-024	N
HONOKOHAU STREAM	4-1-003-025	N
HONOKOHAU STREAM	4-1-003-026	N
HONOKOHAU STREAM	4-1-003-028	Y
HONOKOHAU STREAM	4-1-003-029	Y
HONOKOHAU STREAM	4-1-003-030	Y
HONOKOHAU STREAM	4-1-004-001	Y
HONOKOHAU STREAM	4-1-004-002	Y
HONOKOHAU STREAM	4-1-004-003	Y
HONOKOHAU STREAM	4-1-004-005	N
HONOMUNI STREAM	5-7-005-018	Y
HONOULIWAI STREAM	5-8-001-004	Y
HONOULIWAI STREAM	5-8-002-009	N
HONOULIWAI STREAM	5-8-002-011	Y
HONOULIWAI STREAM	5-8-002-012	Y
HONOULIWAI STREAM	5-8-002-019	Y
HONOULIWAI STREAM	5-8-002-020	N
HONOULIWAI STREAM	5-8-002-021	Y
HONOULIWAI STREAM	5-8-002-022	Y
HONOULIWAI STREAM	5-8-002-023	Y
HONOULIWAI STREAM	5-8-002-024	Y
HONOULIWAI STREAM	5-8-002-025	N
HONOULIWAI STREAM	5-8-002-025	Y
HONOULIWAI STREAM	5-8-002-026	N
HONOULIWAI STREAM	5-8-002-027	Y
HONOULIWAI STREAM	5-8-002-028	N
HONOULIWAI STREAM	5-8-002-029	Y
HONOULIWAI STREAM	5-8-002-030	N
HONOULIWAI STREAM	5-8-002-031	N
HONOULIWAI STREAM	5-8-002-032	N
HONOULIWAI STREAM	5-8-002-033	N
HONOULIWAI STREAM	5-8-002-034	N
HONOULIWAI STREAM	5-8-002-035	N
HONOULIWAI STREAM	5-8-002-036	N
HONOULIWAI STREAM	5-8-002-037	N
HONOULIWAI STREAM	5-8-002-040	N
HONOULIWAI STREAM	5-8-002-041	N
HONOULIWAI STREAM	5-8-002-042	N
HONOULIWAI STREAM	5-8-002-045	N
HONOULIWAI STREAM	5-8-002-046	N
HONOULIWAI STREAM	5-8-002-047	N
HONOULIWAI STREAM	5-8-002-048	N
HONOULIWAI STREAM	5-8-002-049	N
HONOULIWAI STREAM	5-8-002-050	N
HONOULIWAI STREAM	5-8-002-051	N
HONOULIWAI STREAM	5-8-002-052	N
HONOULIWAI STREAM	5-8-002-053	N
HONOULIWAI STREAM	5-8-002-054	N
HONOULIWAI STREAM	5-8-002-055	N
HONOULIWAI STREAM	5-8-002-056	N
HONOULIWAI STREAM	5-8-002-057	N
HONOULIWAI STREAM	5-8-002-058	N
HONOULIWAI STREAM	5-8-002-059	N
HONOULIWAI STREAM	5-8-002-060	N
HONOULIWAI STREAM	5-8-002-061	N
HONOULIWAI STREAM	5-8-002-062	N
HONOULIWAI STREAM	5-8-002-063	N
HONOULIWAI STREAM	5-8-002-064	N
HONOULIWAI STREAM	5-8-002-065	N
HONOULIWAI STREAM	5-8-002-066	N
HONOULIWAI STREAM	5-8-002-069	Y
HONOULIWAI STREAM	5-8-002-069	Y
HONOULIWAI STREAM	5-8-002-070	N
HONOULIWAI STREAM	5-8-002-072	N
HONOULIWAI STREAM	5-8-004-001	N
HONOULIWAI STREAM	5-8-004-002	N

sitename	tmk	portion
HONOULIWAI STREAM	5-8-004-003	N
HONOULIWAI STREAM	5-8-004-004	N
HONOULIWAI STREAM	5-8-004-005	N
HONOULIWAI STREAM	5-8-004-006	N
HONOULIWAI STREAM	5-8-004-007	N
HONOULIWAI STREAM	5-8-004-008	N
HONOULIWAI STREAM	5-8-004-009	N
HONOULIWAI STREAM	5-8-004-010	N
HONOULIWAI STREAM	5-8-004-011	N
HONOULIWAI STREAM	5-8-004-012	N
HONOULIWAI STREAM	5-8-004-013	N
HONOULIWAI STREAM	5-8-004-014	N
HONOULIWAI STREAM	5-8-004-015	N
HONOULIWAI STREAM	5-8-004-016	N
HONOULIWAI STREAM	5-8-004-017	Y
HONOULIWAI STREAM	5-8-015-009	Y
HONOULIWAI STREAM	5-8-015-010	Y
ILIILIOPAE HEIAU AND WILAU TRAIL	5-7-005-002	Y
ILIILIOPAE HEIAU AND WILAU TRAIL	5-7-008-020	N
ILIILIOPAE HEIAU AND WILAU TRAIL	5-7-008-021	N
ILIILIOPAE HEIAU AND WILAU TRAIL	5-7-008-022	N
KAAPAHU	1-6-010-001	N
KAAPAHU	1-7-001-032	N
KAAPAHU	1-7-001-033	Y
KAHAKULOA STREAM	3-1-004-078	Y
KAHAKULOA STREAM	3-1-004-079	Y
KAHAKULOA STREAM	3-1-004-080	Y
KAHAKULOA STREAM	3-1-004-081	Y
KAHAKULOA STREAM	3-1-004-082	Y
KAHAKULOA STREAM	3-1-004-085	Y
KAHAKULOA STREAM	3-1-004-089	Y
KAHAKULOA STREAM	3-1-005-001	Y
KAHAKULOA STREAM	3-1-005-002	Y
KAHAKULOA STREAM	3-1-005-003	N
KAHAKULOA STREAM	3-1-005-004	N
KAHAKULOA STREAM	3-1-005-005	N
KAHAKULOA STREAM	3-1-005-006	N
KAHAKULOA STREAM	3-1-005-007	Y
KAHAKULOA STREAM	3-1-005-008	Y
KAHULUI AIRPORT EXPANSION	3-8-001-019	Y
KAHULUI AIRPORT EXPANSION	3-8-001-073	Y
KAHULUI AIRPORT EXPANSION	3-8-001-134	N
KAHULUI AIRPORT EXPANSION	3-8-001-166	N
KAHULUI AIRPORT EXPANSION	3-8-001-193	N
KAHULUI AIRPORT EXPANSION	3-8-001-211	N
KAHULUI AIRPORT EXPANSION	3-8-001-212	N
KAKAHAIA WETLAND	5-4-001-003	Y
KAKAHAIA WETLAND	5-4-001-005	Y
KAKAHAIA WETLAND	5-4-001-006	N
KAKAHAIA WETLAND	5-4-001-007	N
KAKAHAIA WETLAND	5-4-001-008	N
KAKAHAIA WETLAND	5-4-001-011	Y
KAKAHAIA WETLAND	5-4-001-012	N
KAKAHAIA WETLAND	5-4-001-013	Y
KAKAHAIA WETLAND	5-4-001-014	Y
KAKAHAIA WETLAND	5-4-001-015	Y
KAKAHAIA WETLAND	5-4-001-016	Y
KAKAHAIA WETLAND	5-4-001-019	Y
KAKAHAIA WETLAND	5-4-001-100	N
KAKAHAIA WETLAND	5-4-003-001	Y
KALAUPAPA NHP AND KAUHAKO CRATER	6-1-001-001	Y
KALAUPAPA NHP AND KAUHAKO CRATER	6-1-001-002	Y
KAMILOLOA-MAKAKUPAIA	5-4-003-001	Y
KAMILOLOA-MAKAKUPAIA	5-4-003-003	Y
KAMILOLOA-MAKAKUPAIA	5-4-003-025	Y
KANEPUU PRESERVE	4-9-002-001	Y
KAPIA STREAM	1-4-009-001	Y
KAPIA STREAM	1-4-010-013	Y
KAPIA STREAM	1-4-010-023	Y

sitename	tmk	portion
KAPIA STREAM	1-4-011-017	Y
KAPIA STREAM	1-4-011-019	Y
KAPIA STREAM	1-4-011-021	Y
KAPIA STREAM	1-4-011-023	Y
KAPIA STREAM	1-4-011-024	Y
KAPIA STREAM	1-4-011-028	N
KAPIA STREAM	1-4-011-041	Y
KAPIA STREAM	1-4-011-042	Y
KAPIA STREAM	1-4-011-043	Y
KAPIA STREAM	1-4-011-046	Y
KAPIA STREAM	1-4-011-047	Y
KAUNAKAKAI GULCH SYSTEM	5-3-003-001	Y
KAUNAKAKAI GULCH SYSTEM	5-4-003-003	Y
KAWAKOE STREAM	1-2-003-001	Y
KAWAKOE STREAM	1-2-003-005	Y
KAWAKOE STREAM	1-3-002-018	Y
KAWAKOE STREAM	1-3-002-019	Y
KAWAKOE STREAM	1-3-002-020	Y
KAWAKOE STREAM	1-3-002-022	Y
KAWAKOE STREAM	1-3-002-023	Y
KAWELA STREAM	5-4-001-023	Y
KAWELA STREAM	5-4-001-027	Y
KAWELA STREAM	5-4-001-050	Y
KAWELA STREAM	5-4-003-028	Y
KEALIA WETLAND	3-8-005-002	Y
KEKAALAAU	4-2-001-001	Y
KUKUIULA STREAM	1-6-010-001	Y
KUKUIULA STREAM	1-6-010-002	Y
KUKUIULA STREAM	1-6-010-004	Y
LA PEROUSE BAY	2-1-004-049	Y
LA PEROUSE BAY	2-1-004-113	Y
MAKAMAKAOLE STREAM	3-1-001-021	Y
MAKAMAKAOLE STREAM	3-1-001-029	Y
MAKAMAKAOLE STREAM	3-1-006-001	Y
MAKAPIPI STREAM	1-2-001-001	Y
MAKAPIPI STREAM	1-2-001-015	Y
MAKAPIPI STREAM	1-2-001-018	Y
MAKAPIPI STREAM	1-2-001-023	Y
MAKAPIPI STREAM	1-2-001-024	Y
MAKAPIPI STREAM	1-2-001-025	Y
MAKAPIPI STREAM	1-2-001-026	Y
MAKAPIPI STREAM	1-2-002-001	Y
MAKAPIPI STREAM	1-2-002-005	Y
MAKAPIPI STREAM	1-2-002-006	Y
MAKAPIPI STREAM	1-2-002-007	Y
MAKAPIPI STREAM	1-2-002-008	Y
MAKAPIPI STREAM	1-2-002-009	Y
MAKAPIPI STREAM	1-2-002-011	Y
MAKAPIPI STREAM	1-2-002-012	Y
MAKAPIPI STREAM	1-2-002-013	Y
MAKAPIPI STREAM	1-2-002-019	Y
MAKAPIPI STREAM	1-2-002-020	Y
MAKAPIPI STREAM	1-2-003-016	Y
MAKAPIPI STREAM	1-2-003-018	Y
MAKAPIPI STREAM	1-2-003-023	Y
MOOMOMI DUNES	5-1-002-035	Y
MOOMOMI DUNES	5-2-005-006	Y
MOOMOMI DUNES	5-2-005-019	Y
MOOMOMI PRESERVE	5-1-002-037	N
N EAST AND S EAST SLOPES	4-9-002-001	Y
OHUKAI SUBDIVISION	2-2-023-001	N
OHUKAI SUBDIVISION	2-2-023-002	N
OHUKAI SUBDIVISION	2-2-023-003	N
OHUKAI SUBDIVISION	2-2-023-004	N
OHUKAI SUBDIVISION	2-2-023-005	N
OHUKAI SUBDIVISION	2-2-023-006	N
OHUKAI SUBDIVISION	2-2-023-007	N
OHUKAI SUBDIVISION	2-2-023-008	N
OHUKAI SUBDIVISION	2-2-023-009	N

sitename	tmk	portion
OHUKAI SUBDIVISION	2-2-023-010	N
OHUKAI SUBDIVISION	2-2-023-011	N
OHUKAI SUBDIVISION	2-2-023-012	N
OHUKAI SUBDIVISION	2-2-023-013	N
OHUKAI SUBDIVISION	2-2-023-014	N
OHUKAI SUBDIVISION	2-2-023-015	N
OHUKAI SUBDIVISION	2-2-023-016	N
OHUKAI SUBDIVISION	2-2-023-017	N
OHUKAI SUBDIVISION	2-2-023-018	N
OHUKAI SUBDIVISION	2-2-023-019	N
OHUKAI SUBDIVISION	2-2-023-020	N
OHUKAI SUBDIVISION	2-2-023-021	N
OHUKAI SUBDIVISION	2-2-023-022	N
OHUKAI SUBDIVISION	2-2-023-023	N
OHUKAI SUBDIVISION	2-2-023-024	N
OHUKAI SUBDIVISION	2-2-023-025	N
OHUKAI SUBDIVISION	2-2-023-026	N
OHUKAI SUBDIVISION	2-2-023-027	N
OHUKAI SUBDIVISION	2-2-023-028	N
OHUKAI SUBDIVISION	2-2-023-029	N
OHUKAI SUBDIVISION	2-2-023-030	N
OHUKAI SUBDIVISION	2-2-023-031	N
OHUKAI SUBDIVISION	2-2-023-032	N
OHUKAI SUBDIVISION	2-2-023-033	N
OHUKAI SUBDIVISION	2-2-023-034	N
OHUKAI SUBDIVISION	2-2-023-035	N
OHUKAI SUBDIVISION	2-2-023-036	N
OHUKAI SUBDIVISION	2-2-023-037	N
OHUKAI SUBDIVISION	2-2-023-038	N
OHUKAI SUBDIVISION	2-2-023-039	N
OHUKAI SUBDIVISION	2-2-023-040	N
OHUKAI SUBDIVISION	2-2-023-041	N
OHUKAI SUBDIVISION	2-2-023-042	N
OHUKAI SUBDIVISION	2-2-023-043	N
OHUKAI SUBDIVISION	2-2-023-044	N
OHUKAI SUBDIVISION	2-2-023-045	N
OHUKAI SUBDIVISION	2-2-023-046	N
OHUKAI SUBDIVISION	2-2-023-047	N
OHUKAI SUBDIVISION	2-2-023-048	N
OHUKAI SUBDIVISION	2-2-023-049	N
OHUKAI SUBDIVISION	2-2-023-050	N
OHUKAI SUBDIVISION	2-2-023-051	N
OHUKAI SUBDIVISION	2-2-023-052	N
OHUKAI SUBDIVISION	2-2-023-053	N
OHUKAI SUBDIVISION	2-2-023-054	N
OHUKAI SUBDIVISION	2-2-023-055	N
OHUKAI SUBDIVISION	2-2-023-056	N
OHUKAI SUBDIVISION	2-2-023-057	N
OHUKAI SUBDIVISION	2-2-023-058	N
OHUKAI SUBDIVISION	2-2-023-059	N
OHUKAI SUBDIVISION	2-2-023-060	N
OHUKAI SUBDIVISION	2-2-023-061	N
OHUKAI SUBDIVISION	2-2-023-062	N
OHUKAI SUBDIVISION	2-2-023-063	N
OHUKAI SUBDIVISION	2-2-023-064	N
OHUKAI SUBDIVISION	2-2-023-065	N
OHUKAI SUBDIVISION	2-2-023-066	N
OHUKAI SUBDIVISION	2-2-023-067	N
OHUKAI SUBDIVISION	2-2-023-068	N
OHUKAI SUBDIVISION	2-2-023-069	N
OHUKAI SUBDIVISION	2-2-023-070	N
OHUKAI SUBDIVISION	2-2-023-071	N
OHUKAI SUBDIVISION	2-2-023-072	N
OHUKAI SUBDIVISION	2-2-023-073	N
OHUKAI SUBDIVISION	2-2-023-074	N
OHUKAI SUBDIVISION	2-2-023-075	N
OHUKAI SUBDIVISION	2-2-023-076	N
OHUKAI SUBDIVISION	2-2-023-077	N
OHUKAI SUBDIVISION	2-2-023-078	N

sitename	tmk	portion
OHUKAI SUBDIVISION	2-2-023-079	N
OHUKAI SUBDIVISION	2-2-023-080	N
OHUKAI SUBDIVISION	2-2-023-081	N
OHUKAI SUBDIVISION	2-2-023-082	N
OHUKAI SUBDIVISION	2-2-023-083	N
OHUKAI SUBDIVISION	2-2-023-084	N
OHUKAI SUBDIVISION	2-2-023-085	N
OHUKAI SUBDIVISION	2-2-023-086	N
OHUKAI SUBDIVISION	2-2-023-087	N
OHUKAI SUBDIVISION	2-2-023-088	N
OHUKAI SUBDIVISION	2-2-023-089	N
OHUKAI SUBDIVISION	2-2-023-090	N
OHUKAI SUBDIVISION	2-2-023-091	N
OHUKAI SUBDIVISION	2-2-023-092	N
OHUKAI SUBDIVISION	2-2-023-093	N
OHUKAI SUBDIVISION	2-2-023-094	N
OHUKAI SUBDIVISION	2-2-023-095	N
OHUKAI SUBDIVISION	2-2-023-096	N
OHUKAI SUBDIVISION	2-2-023-097	N
OHUKAI SUBDIVISION	2-2-023-098	N
OHUKAI SUBDIVISION	2-2-023-099	N
OHUKAI SUBDIVISION	2-2-023-100	N
OHUKAI SUBDIVISION	2-2-023-101	N
OHUKAI SUBDIVISION	2-2-023-102	N
OHUKAI SUBDIVISION	2-2-023-103	N
OHUKAI SUBDIVISION	2-2-023-104	N
OHUKAI SUBDIVISION	2-2-023-105	N
OHUKAI SUBDIVISION	2-2-023-106	N
OHUKAI SUBDIVISION	2-2-023-107	N
OHUKAI SUBDIVISION	2-2-023-108	N
OHUKAI SUBDIVISION	2-2-023-109	N
PAIA SUGAR MILL	2-5-005-019	Y
PAIA SUGAR MILL	2-5-005-020	Y
PAIA-DORIS TODD MEMORIAL	2-5-005-019	Y
PAIA-DORIS TODD MEMORIAL	2-5-005-020	Y
PAIA-DORIS TODD MEMORIAL	2-5-005-044	N
PAIA-DORIS TODD MEMORIAL	2-5-005-052	N
PAIALOA POND AND WETLANDS	5-6-005-012	Y
PAIALOA POND AND WETLANDS	5-6-005-012	Y
PAIALOA POND AND WETLANDS	5-6-005-013	N
PAIALOA POND AND WETLANDS	5-6-005-014	N
PAIALOA POND AND WETLANDS	5-6-005-036	Y
PAIALOA POND AND WETLANDS	5-6-005-036	Y
PAIALOA POND AND WETLANDS	5-6-007-001	Y
PAIALOA POND AND WETLANDS	5-6-007-001	Y
PAIALOA POND AND WETLANDS	5-6-007-002	N
PAIALOA POND AND WETLANDS	5-6-008-012	N
PAIALOA POND AND WETLANDS	5-6-008-013	Y
PAIALOA POND AND WETLANDS	5-6-008-019	N
PAIALOA POND AND WETLANDS	5-6-008-020	Y
PAIALOA POND AND WETLANDS	5-6-009-017	Y
PAIALOA POND AND WETLANDS	5-6-009-018	Y
PAIALOA POND AND WETLANDS	5-6-009-019	Y
PAIALOA POND AND WETLANDS	5-6-009-020	Y
PAIALOA POND AND WETLANDS	5-6-010-001	Y
PAIALOA POND AND WETLANDS	5-6-010-013	Y
PALAAU CLIFFTOPS	5-2-013-003	Y
PALAAU CLIFFTOPS	5-2-014-002	Y
PALAAU CLIFFTOPS	5-2-014-063	Y
PAPIO STREAM	5-8-011-007	Y
PAPIO STREAM	5-8-011-009	Y
PAPIO STREAM	5-8-011-010	Y
PAPIO STREAM	5-8-011-011	Y
PAPIO STREAM	5-8-011-012	Y
PAPIO STREAM	5-8-011-015	Y
PAPIO STREAM	5-8-011-017	Y
PAPIO STREAM	5-8-011-019	Y
PAPIO STREAM	5-8-011-020	Y
PAPIO STREAM	5-8-013-001	Y

sitename	tmk	portion
PAPIO STREAM	5-8-013-002	Y
PAPIO STREAM	5-8-013-003	Y
PAPIO STREAM	5-8-013-006	N
PAPIO STREAM	5-8-013-007	N
PAPIO STREAM	5-8-013-008	Y
PAPIO STREAM	5-8-013-010	Y
PAPIO STREAM	5-8-013-011	Y
PAPIO STREAM	5-8-013-012	N
PAPIO STREAM	5-8-013-013	Y
PAPIO STREAM	5-8-013-014	Y
PAPIO STREAM	5-8-013-015	Y
PAPIO STREAM	5-8-013-016	N
PAPIO STREAM	5-8-013-017	Y
PAPIO STREAM	5-8-013-018	Y
PAPIO STREAM	5-8-013-019	Y
PAPIO STREAM	5-8-015-001	Y
PAPIO STREAM	5-8-015-004	Y
PAPIO STREAM	5-8-015-005	Y
PAPIO STREAM	5-8-015-006	Y
PAUKUKALO WETLANDS	3-3-001-001	Y
PIINAAU STREAM	1-1-002-001	N
PIINAAU STREAM	1-1-003-028	Y
PIINAAU STREAM	1-1-003-030	Y
PIINAAU STREAM	1-1-003-031	Y
PIINAAU STREAM	1-1-003-032	Y
PIINAAU STREAM	1-1-008-007	Y
PIINAAU STREAM	1-1-008-008	Y
PIINAAU STREAM	1-1-008-009	Y
PIINAAU STREAM	1-1-008-010	Y
PORTION OF WAIKAMOI PRESERVE	2-3-005-004	Y
PUU O KALI	2-2-002-014	Y
PUUKOLII VILLAGE	4-4-002-002	Y
PUUKOLII VILLAGE	4-4-006-001	Y
PUUNENE SUGAR MILL	3-8-006-001	Y
PUUNENE SUGAR MILL	3-8-006-002	Y
PUUNENE SUGAR MILL	3-8-006-004	Y
RURAL AREA IN N EAST MTNS	4-9-002-001	Y
SHIPWRECK BEACH	4-9-002-001	Y
SHIPWRECK BEACH	4-9-003-022	N
SOUTHEAST COAST	4-9-002-001	Y
SOUTHEAST COAST	4-9-003-009	N
SOUTHEAST COAST	4-9-003-010	N
SOUTHEAST COAST	4-9-003-023	N
SOUTHEAST COAST	4-9-003-027	N
UALAPUE	5-6-002-001	N
UALAPUE	5-6-002-002	N
UALAPUE	5-6-002-003	N
UALAPUE	5-6-002-004	N
UALAPUE	5-6-002-005	N
UALAPUE	5-6-002-006	N
UALAPUE	5-6-002-007	N
UALAPUE	5-6-002-009	N
UALAPUE	5-6-002-010	N
UALAPUE	5-6-002-011	N
UALAPUE	5-6-002-012	N
UALAPUE	5-6-002-013	N
UALAPUE	5-6-002-014	N
UALAPUE	5-6-002-015	N
UALAPUE	5-6-002-016	N
UALAPUE	5-6-002-017	N
UALAPUE	5-6-002-018	N
UALAPUE	5-6-002-019	N
UALAPUE	5-6-002-020	N
UALAPUE	5-6-002-021	N
UALAPUE	5-6-002-022	N
UALAPUE	5-6-002-023	N
UALAPUE	5-6-002-024	N
UALAPUE	5-6-002-025	N
UALAPUE	5-6-002-026	N

sitename	tmk	portion
UALAPUE	5-6-002-027	N
UALAPUE	5-6-002-028	N
UALAPUE	5-6-002-029	N
UALAPUE	5-6-002-030	N
UALAPUE	5-6-002-031	N
UALAPUE	5-6-002-032	N
UALAPUE	5-6-003-007	N
UALAPUE	5-6-003-008	N
UALAPUE	5-6-003-009	N
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UALAPUE	5-7-011-015	N
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UMIPAA WETLANDS	5-2-011-021	N
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WAIALUA STREAM	5-7-001-007	Y
WAIALUA STREAM	5-7-001-008	Y
WAIALUA STREAM	5-7-001-009	Y
WAIALUA STREAM	5-7-001-010	Y
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sitename	tmk	portion
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WAIALUA STREAM	5-7-001-021	Y
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WAIALUA STREAM	5-7-003-044	Y

sitename	tmk	portion
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WAIALUA STREAM	5-7-003-075	Y
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WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-007	Y
WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-008	N
WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-011	N
WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-012	Y
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WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-014	N
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WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-018	Y
WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-026	N
WAIELI,KAKIWEKA,HAHALAWE,PUAALUU STREAMS	1-5-011-027	N
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WAIHEE RIVER VALLEY	3-2-001-004	N
WAIHEE RIVER VALLEY	3-2-004-001	Y
WAIHEE RIVER VALLEY	3-2-004-007	N
WAIHEE RIVER VALLEY	3-2-004-008	N
WAIHEE RIVER VALLEY	3-2-004-009	N
WAIHEE RIVER VALLEY	3-2-004-010	N
WAIHEE SHORELINE	3-2-010-001	Y
WAIHEE SHORELINE	3-2-013-010	Y
WAIHEE URBAN TO AG AREA	3-2-010-001	Y
WAIHEE WETLAND	3-2-010-001	Y
WAIKAPU STREAM	3-5-002-001	Y
WAIKAPU STREAM	3-5-002-007	Y
WAIKAPU STREAM	3-5-004-018	Y
WAIKAPU STREAM	3-6-004-001	Y
WAIKAPU STREAM	3-6-004-002	Y
WAIKAPU STREAM	3-8-005-002	Y
WAIKAPU STREAM	3-8-005-023	Y
WAILEA RESORT URBAN EXPANSION	2-1-008-042	Y
WAILEA RESORT URBAN EXPANSION	2-1-023-003	Y
WAILUANUI STREAM	1-1-006-002	N
WAILUANUI STREAM	1-1-006-003	N
WAILUANUI STREAM	1-1-006-006	N
WAILUANUI STREAM	1-1-006-007	N
WAILUANUI STREAM	1-1-006-008	N
WAILUANUI STREAM	1-1-006-009	N
WAILUANUI STREAM	1-1-006-011	N
WAILUANUI STREAM	1-1-006-012	Y
WAILUANUI STREAM	1-1-006-013	Y
WAILUANUI STREAM	1-1-006-014	Y
WAILUANUI STREAM	1-1-006-015	Y
WAILUANUI STREAM	1-1-006-016	Y
WAILUANUI STREAM	1-1-006-017	Y
WAILUANUI STREAM	1-1-006-018	Y
WAILUANUI STREAM	1-1-006-019	Y
WAILUANUI STREAM	1-1-006-020	N
WAILUANUI STREAM	1-1-006-021	Y
WAILUANUI STREAM	1-1-006-025	N
WAILUANUI STREAM	1-1-006-026	Y
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WAILUANUI STREAM	1-1-006-070	Y
WAILUANUI STREAM	1-1-006-071	Y

sitename

WAILUANUI STREAM

WAILUANUI STREAM

WAINEE AFFORDABLE HOUSING

WAINEE AFFORDABLE HOUSING

WAINEE AFFORDABLE HOUSING

WAINEE AFFORDABLE HOUSING

WAINEE AFFORDABLE HOUSING

WAINEE AFFORDABLE HOUSING

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WAINEE AFFORDABLE HOUSING

tmk

1-1-006-073

1-1-008-001

4-6-011-012

4-6-011-034

4-6-013-001

4-6-013-006

4-6-014-001

4-6-015-001

4-6-016-001

4-6-016-032

4-6-016-033

4-6-016-038

4-6-018-003

portion

Y

Y

N

N

Y

Y

Y

Y

N

N

Y

N

Y

APPENDIX D
TARO SUBZONE

CONSERVATION DISTRICT TARO SUBZONE

§3-2-16 Taro (T) subzone. (a) The objective of this subzone is to protect taro cultivated wetlands that also serve as endangered waterbird habitat while allowing for the necessary maintenance activities for crop viability or wildlife enhancement purposes.

(b) The boundaries for the (T) subzone shall encompass:

- (1) Wetlands currently in taro or luau leaf cultivation;
 - (2) Undeveloped wetlands historically in taro or luau leaf cultivation;
- and
- (3) Wetlands necessary to support the continuation of taro or luau leaf farming.

(c) The following uses are permitted in the (T) subzone:

- (1) All permitted uses stated in the (P), (L) and (R) subzone;
- (2) Construction, maintenance and repair of on-farm water delivery (not diversion) systems such as ditches, dikes, and inlet and outlet structures necessary for the cultivation of taro or luau leaf;
- (3) Farming and harvesting practices such as disking, tilling, leveling, mowing, plowing, planting, prescribed burning, harvesting, Environmental Protection Agency approved herbicide spraying and Cooperative Extension Service approved fertilization;
- (4) Construction, maintenance and repair of structures accessory to these uses such as loi access roads, fences, and agricultural storage buildings without partitions when said facilities are compatible with the natural physical environment;
- (5) Measures to prevent or control crop damage such as fencing and if necessary depredation in accordance with state and federal regulations;
- (6) Rehabilitation of wetlands and enhancement of habitat through the construction of ponds with nesting islands;
- (7) Grazing when used as a part of a wildlife habitat enhancement program or grazing of work horses; and
- (8) Traditional aquaculture practices.

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Fred Talon	Land Use Commission

<u>Name</u>	<u>Affiliation</u>
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Dennis Tulang	Environmental Management Division, Department of Health
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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
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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
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Roderick Wilson	AMFAC/JMB, Hawaii, Inc.
Toni Withington	Citizens for the Protection of the North Kohala Coastline
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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
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