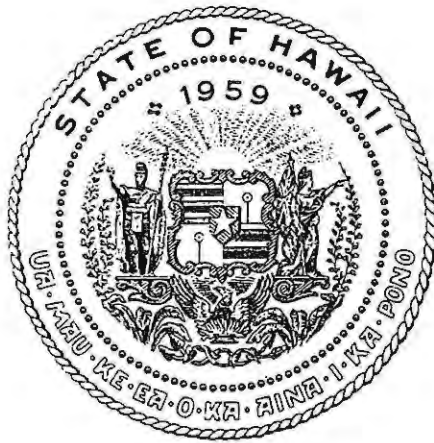


STATE LAND USE DISTRICT BOUNDARY REVIEW

OAHU



Office of the Governor
OFFICE OF STATE PLANNING

1992



EXECUTIVE CHAMBERS
HONOLULU

JOHN WAIHEE
GOVERNOR

FOREWORD

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

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

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

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

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

JOHN WAIHEE



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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

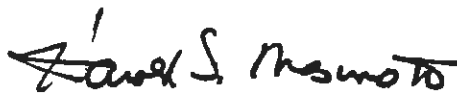
Therefore, a major focus of the review was to protect Hawaii's special areas before they were placed in jeopardy or irretrievably lost.

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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CITY AND COUNTY OF HONOLULU

I. INTRODUCTION

Purpose of the Five-Year Boundary Review

The purpose of the Five-Year Boundary Review is to conduct a statewide, comprehensive, policy-oriented examination of State land use district classifications. It provides the Land Use Commission 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 for the Island of Oahu. Separate reports have been prepared for Hawaii, Kauai, Maui, Molokai and Lanai.

The review recommends no changes in the classifications for Niihau and the Northwestern Hawaiian Islands and, therefore, a separate report has not been prepared on these areas.

1991-92 Review - Direction and Scope

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

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

- (1) Statutory provisions which require the review to focus on the Hawaii State Plan and County Plans;

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

A. Statutory Provisions

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

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

B. Continuing Discussions Over LESA

There have been a number of proposals put forward to implement Article XI, Section 3, of the Hawaii State Constitution which calls for the identification and protection of important agricultural land. One of these proposals recommended by the Land Evaluation and Site Assessment (LESA) Commission would have taken all non-important agricultural land out of the Agricultural District and placed these lands and Urban District lands into a new district under County jurisdiction. Of the approximately 1.9 million agriculture acres in the existing Agricultural District, 700,000 acres would be retained as important agricultural land

while 1.2 million acres would go into this new district. The State would still have land use responsibilities in regulating conservation land and important agricultural land. For these conservation and important agricultural lands, the existing dual land management system would apply since both State and County approvals would be required for development.

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

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

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

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

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

D. Water Resources Protection Plan

The 1978 Hawaii State Constitutional Convention proposed and the electorate approved a new section on water resources which became Article XI, Section 7. This section in part states that the State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people. The State Water Code, Act 45-87, was adopted pursuant to Article XI, Section 7, of the Hawaii State Constitution. The Hawaii Water Plan and its component Water Resources Protection Plan were prepared as required by the Water Code. The plan calls for increased protection of watersheds. Therefore, a Watershed Protection Study was conducted for the Five-Year Boundary Review to identify areas which should be protected as important watersheds. High priority areas were identified for study as budgetary limitations precluded a study of the entire State.

E. Urban Land Needs and Infrastructure Planning

Infrastructure is a major limiting factor affecting growth and development in all Counties of the State. In addition, new wastewater rules do not allow individual wastewater systems for developments exceeding 50 dwelling units. As such, infrastructure planning among landowners/developers and between the public and private sector will become even more critical in the years ahead. The Land Use Commission (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 5 percent vacancy factor were used; household size was projected to decrease significantly and the redevelopment of existing urban areas at higher densities was not taken into account.

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

Background of the Boundary Review

The 1969 Review

There are no readily available statistics on acreages reclassified during the 1969 boundary review. However, the review found that there was sufficient vacant urban land to meet projected growth for the next ten years on Oahu and Maui County. Additions to the Urban District

were primarily made to refine district boundaries to include areas of existing urban use or accommodate public facilities. For Hawaii County, the study found that available vacant urban lands could accommodate three times the anticipated growth of resident population. Changes were made primarily to refine district boundaries. Many resort area proposals were submitted for Hawaii County. Available growth projections did not substantiate the need for redistricting most of the areas at the time of the review. However, some changes were made in response to detailed requests. For Kauai County, although the present Urban Districts were sufficient to accommodate foreseeable growth, the location and distribution of these areas did not necessarily provide for specific locational needs determined in the County General Plan. Adjustments were made for residential areas, and the proposed resort areas at Princeville and Keoniloa Bay at Poipu were urbanized.

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

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

The 1974 Review

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

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

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

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

II. STUDY METHODOLOGY

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

Baseline Studies

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

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

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

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

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

Public Information and Participation

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

Highlights of the Land Use Stakeholder Survey include the following:

- The major land use concerns and priorities of participants in the survey varied according to the interests and organizational affiliations of the individuals involved. For example, developers and landowners were most concerned with reducing the burden of land use regulations and streamlining the review process, while environmentalists were most interested in 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 was offered to respondents: "a lot of growth"; "some growth"; "a little growth"; and "no growth at all."

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

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

Resource Mapping/State Geographic Information System

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

Data layers added to the system to assist in the boundary review included State land use districts, vegetation maps which identify areas of native vegetative growth, State forest reserves, State natural area reserves, marine life conservation districts, national wildlife refuges and parks, rare and endangered species from the Heritage Program of The Nature Conservancy, native bird habitats, lands in 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.

III. APPROACH

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

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

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

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

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

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

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

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

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

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

During the review, the question of whether to submit proposed legislation to amend the Land Use Law to allow the Land Use Commission (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

A. Reclassifications to the Conservation or Agricultural District

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

Priority #2. These are areas that are recommended as lower priority. They include, for example, conservation resources: a) which are already protected because of government or non-profit ownership with conservation objectives such as national parks; b) that are significant but not of as high quality or abundance as other areas

or not as critical to meeting a specific conservation objective such as protecting endangered birds; c) which are believed or known to contain conservation resources but further survey work is necessary to either verify resources or determine appropriate boundary lines; d) which are of high quality but resource constraints limit the number of petitions which can be prepared; e) but other methods are available to protect the identified conservation values.

B. Reclassifications to the Urban and Rural Districts

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

C. Department of Hawaiian Home Lands (DHHL)

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

Land Use Commission Petition Stage

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

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

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

IV. CONSERVATION, AGRICULTURAL, RURAL AND URBAN DISTRICT ISSUES

Conservation District Issues

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Coastal Conservation Issues. At several of the public informational meetings, participants proposed that a continuous greenbelt strip along the coastline be placed into the Conservation District. The Office of State Planning has not included this as a boundary review recommendation because this type of blanket statewide change should be addressed through legislation or by the Counties. The 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.

Agricultural District Issues

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

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

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

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

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

² Ibid.

³ Ibid., pp. 17-19.

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

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

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

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

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

Urban District Issues

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

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

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

V. POPULATION AND ECONOMIC CONDITIONS

The City and County of Honolulu's resident population will grow from 838,500 in 1988 to 999,500 in 2010. De facto population will increase from 902,600 to 1,094,700. Ewa will experience the most growth. However, the Primary Urban Center (PUC) and Central Oahu will remain the most populated areas.

Table 1 shows the existing and projected resident population for the City and County of Honolulu as well as for each of the Development Plan areas. These numbers represent the mid-range (100 percent) distribution of Oahu's population as designated by the General Plan which is based upon the Department of Business and Economic Development's M-K population projections.

Table 1. EXISTING AND PROJECTED RESIDENT POPULATION

	<u>1990</u>	<u>2000</u>	<u>2010</u>
PUC	464,324	473,663	473,945
Ewa	40,201	72,695	117,015
Central Oahu	118,634	139,218	156,015
East Honolulu	51,064	55,169	57,654
Koolaupoko	120,405	121,964	123,383
Koolauloa	14,275	12,743	11,228
North Shore	16,960	18,443	19,091
Waianae	<u>35,737</u>	<u>38,904</u>	<u>40,537</u>
Total	861,600	932,799	998,868

Source: City and County of Honolulu, Department of General Planning, based on M-K projections as cited in Wilson Okamoto & Associates, Inc., Urban Land Requirements Study, 1991.

The Office of State Planning is currently evaluating the M-K population projections, particularly the visitor industry projections. There is a concern that the visitor industry projections are too high, reflect an over-reliance on that industry and may become a self-fulfilling prophecy. However, at the present time, these projections are still recommended for planning purposes and have been used in this review. There were over five million visitors to the County in 1989. According to the M-K projections, the average visitor census is projected to increase from 65,300 in 1989 to 113,400 in 2010. The number of hotel units will increase from 38,600 in 1985 to 55,800 by 2010.⁴

⁴ Department of Business and Economic Development, Population and Economic Projections for the State of Hawaii to 2010, Series M-K, November 1988.

At the present time, however, the visitor industry is in a slump. 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.

The construction industry surpassed the \$2 billion mark for the first time in 1988. Recent trends show the industry growing at a rapid pace. Most of the new construction activity will take place on the Ewa Plains and in Central Oahu where major housing developments have been approved.⁵

The military continues to be a large contributor to the County's economy. In 1988, there were 64,053 military personnel in the State with 63,824 stationed on Oahu. Military activity on Oahu may increase if the military withdraws from some of its Asia/Pacific bases and deploys forces in Hawaii instead.

Manufacturing and retail trade are other significant economic activities on Oahu. High technology manufacturing is making its mark in the County. In Central Oahu, the Mililani Technology Park, a high technology park, currently houses various tenants in four buildings. Expansion of Mililani Technology Park is underway as two additional buildings are being constructed this year.

The State has been actively working to encourage local high-tech industries and to attract companies to Hawaii. Major projects include the Kaimuki Technology Enterprise Center, Small Business Innovation Research Program, Manoa Innovation Center, and the Software Service Center.

Agricultural activities include sugarcane, pineapple, diversified agriculture and aquaculture. In 1990, there were over 23,000 acres in sugarcane and 12,700 acres in pineapple in the County.⁶

Diversified agricultural activities on Oahu include dairy, beef/cattle, feed/forage, eggs/poultry, flowers/nursery, bananas, fruits, swine, guava, papaya and aquaculture. Exploratory industries include corn seed, coffee, cocoa, salmon, alfalfa and potatoes.⁷

⁵ First Hawaiian Bank, Economic Indicators, May/June 1989.

⁶ Hawaii Agricultural Statistics Service, Statistics of Hawaiian Agriculture, 1990.

⁷ Department of Land and Natural Resources, Commission on Water Resource Management, Water Resources Protection Plan, June 1990.

Honolulu also has profitable interests in the film industry, petroleum products, clothing and textiles, jewelry, printing and publishing, stone, clay and glass products, handicraft items, packaged foods and music and entertainment.⁸

Research and development (R&D) activity has grown substantially during the past few years on Oahu, especially in the areas of oceanography, geophysics, astrophysics, hydrology and biomedicine. Research facilities include the University of Hawaii (home of the Hawaii Institute of Geophysics, Pacific Biomedical Research Center, Hawaii Institute of Marine Biology, Look Laboratory of Oceanographic Engineering and the Water Resources Research Center), and the State's High Technology Development Corporation which is responsible for the development of industrial parks for high technology use.

The Federal government oversees such R&D agencies as the National Marine Fisheries Service, the Institute of Pacific Islands Forestry, the Environmental Science Services Administration, and the Hawaii Natural Energy Institute.

Private research and development agencies include the Bishop Museum, the Oceanic Institute, and the Hawaii Sugar Planters' Association Experiment Station.

⁸ Ibid.

VI. OAHU GENERAL PLAN AND DEVELOPMENT PLANS

The Oahu General Plan seeks a year 2010 distribution of Oahu's residential population which would be in accord with the following table:

Table 2. DISTRIBUTION OF RESIDENT POPULATION

<u>Planning Districts</u>	<u>2010^a</u>	<u>% of Year 2010 Island-wide Population</u>
Primary Urban Center	450,800 - 497,800	45.1 - 49.8
Ewa	119,800 - 132,900	12.0 - 13.3
Central Oahu	148,900 - 164,900	14.9 - 16.5
East Honolulu	53,000 - 58,000	5.3 - 5.8
Koolaupoko	109,900 - 121,900	11.0 - 12.2
Koolauloa	13,000 - 14,000	1.3 - 1.4
North Shore	16,000 - 18,000	1.6 - 1.8
Waianae	38,000 - 42,000	3.8 - 4.2
Total	949,400 - 1,049,500	95.0 - 105.0

^{a/} General Plan distribution of Department of Business and Economic Development M-K projections.

Source: Department of General Planning, City and County of Honolulu, Development Plan Status Review, September 1, 1991.

The 1988 Oahu General Plan, as amended, contains objectives and policies to:

- Facilitate the full development of the primary urban center.
- Encourage development within the secondary urban center at Kapolei and the Ewa and Central Oahu urban-fringe areas to relieve developmental pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.
- Manage physical growth and development in the urban-fringe and rural areas so that:
 - a. An undesirable spreading of development is prevented; and
 - b. Their population densities are consistent with the character of development and environmental qualities desired for such areas.
- Provide for the long-term viability of Waikiki as Oahu's primary resort area by giving the area priority in visitor industry related public expenditures.

- Permit the development of secondary resort areas in West Beach, Kahuku, Makaha, and Laie (Kahuku is the area encompassing Kuilima).
- Provide sufficient agricultural land in Ewa, Central Oahu, and the North Shore to encourage the continuation of sugar and pineapple as viable industries.
- Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck farming, flower growing, aquaculture, livestock production, and other types of diversified agriculture.
- Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei.
- Encourage the continuation of a high level of military-related employment in the Hickam-Pearl Harbor, Wahiawa, Kailua-Kaneohe, and Ewa areas.
- Develop Honolulu (Waialae-Kahala to Halawa), Aiea and Pearl City as the island's primary urban center.
- To develop a secondary urban center in Ewa with its nucleus in the Kapolei area.
- Coordinate plans for development within the Ewa and Central Oahu urban-fringe areas with the State and Federal governments and with the sugar, pineapple, and other emerging agricultural industries.

The Development Plans are relatively detailed guidelines for the physical development of the County. The Development Plans designate as growth areas the Primary Urban Center, Ewa and Central Oahu.⁹

East Honolulu and Koolaupoko are designated urban fringe areas. The overall pattern of development with East Honolulu is to continue to be linear, running parallel with the shoreline and bounded by the mountainous conservation lands and the sea. Suburban residential development is to remain on the lower ridges, inner valley floors and along Kalaniana'ole Highway. Some low- and medium-density apartment uses will be permitted in Hawaii Kai, as designated on the land use map.

In Koolaupoko, suburban single-family development is to be the predominant residential use surrounded by substantial amounts of open space and agricultural land. Limited apartment uses will be permitted close to regional commercial and industrial centers, but future apartments will be low rise in keeping with the overall open space setting of Koolaupoko.

⁹ Department of General Planning, City and County of Honolulu, Development Plan Status Review, Vol. II, September 1, 1989.

It is intended that the communities of Kailua and Kaneohe will remain stable, predominantly single-family suburban "bedroom communities" and that Waimanalo will remain a rural community having extensive acreage devoted to diversified agricultural pursuits surrounding a small low-density residential area. The communities of Kahaluu, Waiahole-Waikane and Kualoa are to remain relatively lightly settled, rural areas with the exception of limited areas in Heeia Kea and Ahuimanu Valley, where residential development of a low-density suburban character already exists.

The Development Plans designate as rural areas Koolauloa, North Shore and Waianae. The predominantly rural character of Koolauloa is to be preserved by allowing only limited single-family residential development and confining further tourist-oriented development to the Kahuku Point-Kawela Bay area. Further development within the Koolauloa area, particularly in the Kahuku Point-Kawela Bay area, is to be sensitive to the delicate co-existence between the natural scenic, recreational, and agricultural resources of the area. The existing balance between the single-family residential character of Laie-Kahuku Town and the tourist-oriented activities of the Polynesian Cultural Center and the Kahuku Sugar Mill, is to be maintained so that those resort and commercial activities do not dominate.

The open space character of the North Shore is to be retained, with the exception of some increases in residential development in the Haleiwa-Waialua area. The General Plan recognizes the importance of this district to the agricultural industry.

For Waianae, the Development Plan states that the pattern of urban development shall generally remain linear along Farrington Highway, with relatively low building heights. The overall agricultural and open space setting is to be retained. The area between Keaau Beach Park and Kaena Point shall be left undeveloped. With the exception of minor in-fillings, no further urban development shall be allowed on the makai side of Farrington Highway other than parks and single-family residential dwellings.

The majority of new development on Oahu will occur in Ewa and Central Oahu. Ewa will experience the most growth as it is being transformed from predominantly agricultural use to urban use. Oahu's secondary urban center will be located in Kapolei with the outlying areas of Makakilo, NAS Barbers Point, Ewa and Ewa Beach comprising designated urban-fringe areas. Central Oahu contains most of the prime agricultural lands on Oahu as well as statewide. To this end, most of the area will remain in agricultural use. Waipahu, Mililani, Wheeler AFB, Schofield Barracks, and Wahiawa comprise designated urban-fringe areas with most of the growth being directed towards Waipahu, Mililani and Wahiawa.

Analysis of County Development Plan Map Designations and Existing State Land Use Districts

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

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

The City and County of Honolulu Development Plan maps reflect the County's land use policies and designate areas for residential (RES), apartment (LDA, MDA, HDA), commercial (C), industrial (I), resort (R), agriculture (AG), parks and recreation (PK), preservation (PR), military (M), public and quasi-public uses (PF).

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

The following table summarizes the areas of inconsistency which were found. The largest category is comprised of areas which are classified as Agriculture or Conservation by the State but are designated Military by the County (18,398 acres). The second largest category consists of areas which are classified as Urban by the State but are designated Agriculture by the County (6,440 acres). The third largest category consists of areas classified as Urban by the State but designated Preservation by the County (3,905 acres). (In addition, 894 acres in the State Agricultural District are designated Preservation by the County.) The fourth largest category consists of areas which are classified as Agricultural by the State but are proposed for some type of urban use by the County, e.g., residential, apartment, commercial, industrial or resort (1,345 acres).

Table 3. STATE AND COUNTY LAND USE DESIGNATIONS

STATE LAND USE	COUNTY LAND USE DESIGNATIONS												TOTAL
	RES	LDA	MDA	HDA	C	I	R	AG	PK	PR	M	PF	
Agriculture	180	399	62		378	281	45		1,063	894	13,751	800	17,853
Conservation						98					4,647	114	4,859
Rural													0
Urban								6,440		3,905			10,345
Total Acres	180	399	62	0	378	379	45	6,440	1,063	4,799	18,398	914	33,057

Each of the parcels mapped as inconsistent has been reviewed to determine the appropriate State land use classification. Parcels which met the Land Use Law criteria and State Land Use District Boundary Review policies and have been recommended for reclassification are discussed in the sections of the report dealing with the Urban, Rural, Agricultural and Conservation Districts.

In summary, the review found that:

1. Areas designated State Urban/County Agricultural in Waialua and Waianae should be retained in the Urban District because these areas are adjacent to existing residential areas of Waialua Town, Haleiwa, Waianae, Maili, and Nanakuli.
2. Areas designated State Urban/County Agricultural in Ewa should be retained in Urban (Quad 0-6, 2 parcels totalling 1,057 acres). These parcels represent the Villages of Kapolei and areas around Ewa Village.
3. Lands in the Gentry Waiawa project area which are designated Agriculture or Preservation on the Development Plan, should be retained in the Urban District except for the area identified as the hydrologic zone of contribution for the Waiawa Shaft which is recommended for reclassification to the Conservation District. As the project was approved by the Land Use Commission in May 1988, the developer should be given the opportunity to perform pursuant to representations made before the Land Use Commission for the remainder of the area.
4. Areas currently in the State Urban or Agricultural District and designated Preservation on the Development Plan because of recreational, scenic, or coastal resource values should be considered for reclassification to Conservation if they meet other boundary review criteria specified in the section on Conservation District. Information provided in parentheses indicate the quad, acreage, and identifier number in the County Plans and State Land Use District Review and Mapping Project.
 - a. Queen's Beach (Quad 0-15, 378 acres, #23)
 - b. Sandy Beach (Quad 0-5, 40 acres, #25)
 - c. Mokuleia Beach Parcels (Quad 0-1, 16 and 30 acres, #25)
 - d. Kahe Point coastline (Quad 0-6, 28 acres, #1)
 - e. Upper Kaluanui Stream, Sacred Falls Park (Quad 0-8, 329 acres, #3)
5. Areas currently in the Urban or Agricultural District and designated Preservation on the Development Plan because of wetlands resources should be reclassified to Conservation. Information provided in parentheses indicate the quad, acreage, and identifier number in the County Plans and State Land Use District Review and Mapping Project.
 - a. Punahoolapa Wetlands (Quad 0-7, 58 acres, #1)
 - b. James Campbell National Wildlife Refuge at Punamano (Quad 0-7, 38 acres, #2)
 - c. James Campbell National Wildlife Refuge at Ki (Quad 0-7, 105 acres, #4)
 - d. Portion of Pearl Harbor National Wildlife Refuge at Waiawa (Quad 0-9, 37 acres, #38)

- e. Periphery of Kawainui Marsh Complex
(Quad 0-14; 26, 95, 35 and 47 acres, #6, 9, 11 & 15)
 - f. Heeia Marsh and Meadowlands (Quad 12, 393 acres, #9)
6. Areas currently in the State Urban or Agricultural District and designated Preservation on the Development Plan because of slopes greater than 20 percent if such sites include one of the following: 1) adjacent to an existing Conservation District, 2) of large size, 3) have other environmental values associated with them, and 4) part of a significant land formation, e.g., portions of east Punchbowl Crater, should be reclassified to Conservation. However, these were considered of lower priority for action during the review. Information provided in parentheses indicate the quad, acreage, and identifier number in the County Plans and State Land Use District Review and Mapping Project.
- a. Lower slopes of Puu Heleakala--Lualualei (Quad 0-5, 74 acres, #13)
 - b. Waikakalaua Gulch (Quad 0-9, 187 acres, #6)
 - c. Upper Waimalu Stream (Quad 0-9, 37 acres, #34)
 - d. Upper Aiea Gulch (Quad 0-9, 90 acres, #35)
 - e. Area of steep slopes near Hoomaluhia Botanical Gardens
(Quad 0-12, 24 acres, #14)
 - f. Mid and Upper Kalihi Valley (Quad 0-13, 28 and 48 acres, #2 & 3)
 - g. Lower east side of Punchbowl Crater (Quad 0-13, 21 acres, #4)
 - h. Kaiwa Ridge parcel (Quad 0-14, 35 acres, #16)
 - i. Upper Wailupe Gulch (Quad 0-15, 100 acres, #13)
 - j. Upper Kaalakei Valley (Quad 0-15, 41 acres, #14)
 - k. Kaluanui Ridge (Quad 0-15, 28 and 24 acres, #16 & 17)
 - l. Upper Kamilonui Valley (Quad 0-15, 166 acres, #18)
 - m. Lower northwest Koko Head Crater (Quad 0-15, 30 acres, #21)
 - n. Mauka of Hawaii Kai Golf Course (Quad 0-15, 108 acres, #22)
 - o. Waahila Ridge (Quad 13, 94 acres, #6)
 - p. Makaha Valley (Quad 0-2, 181 acres, #4)
 - q. Puu Paheehee (Quad 0-2, 33 acres, #12)

VII. EXISTING STATE LAND USE DISTRICTS

Conservation District

The existing Conservation District is comprised of two principal areas--the Koolau mountain range and the Waianae mountain range. They are significant as water resource areas, wilderness and scenic areas. A number of other scenic sites have been recognized and were originally included in the Conservation District--Diamond Head, Punchbowl, Koko Head and Ulupau Crater. In addition, significant shorelines such as Kaena Point, Mokapu Point and Koko Head are in the Conservation District. Kawainui Marsh in Kailua and wetlands and Laulaunai Island Fishpond in West Loch are also in the Conservation District.

Agricultural District

The Agricultural District is concentrated on the broad, sloping plains of the central area between the Waianae and Koolau mountain range. Sugarcane is grown on the lower, easily irrigated lands and pineapple on the upper, drier areas. Agricultural District lands are also found on the North Shore, Koolauloa, Koolaupoko, Waimanalo and Waianae. Diversified agriculture is pursued in these areas.

Urban and Rural Districts

There are no Rural Districts on Oahu. The Urban District includes the Primary Urban Center and East Honolulu, stretching through the downtown area up through the backs of valleys along the Koolau Mountain range to Hawaii Kai.

In Central Oahu, the towns of Waipahu and Wahiawa together with portions of Schofield Barracks and all of Wheeler Air Force Base are in the Urban District. Near Wahiawa, the residential communities of Whitmore Village, Melemanu Woodlands, Mililani Town, Mililani Mauka and Mililani Technology Park are designated Urban. The Urban District near Waipahu includes the residential communities of Crestview, Waipio Gentry and Village Park, the developing subdivisions of Waikele and Royal Kunia and the proposed Waiawa development.

Ewa's existing communities of Makakilo, the Ewa Plantation Villages and Ewa Beach are designated Urban. Developing communities of Ko Olina, the new city of Kapolei including Kapolei Knolls and Kapolei Village, West Loch Estates and portions of the planned Ewa Marina development are also included in the Urban District. The Campbell Industrial Park, Barbers Point Harbor, Barbers Point Naval Air Station and a large area between Kahe Point and the Ewa/Waianae judicial district boundary are in the Urban District.

On the North Shore, the Urban District includes small, coastal residential strips at Mokuleia, Kawailoa Beach, Waimea, Sunset Beach and the communities of Haleiwa and Waialua.

In Waianae, the Urban District includes Makaha Valley, Waianae, Maili and Nanakuli.

In Koolauloa and Koolaupoko, the Urban District includes communities at Kawela Bay, Kahuku, Laie, Hauula, Punaluu, Kaaawa, Waikane, Waiahole, Kahaluu, Ahuimanu, Kaneohe, Kailua and Waimanalo.

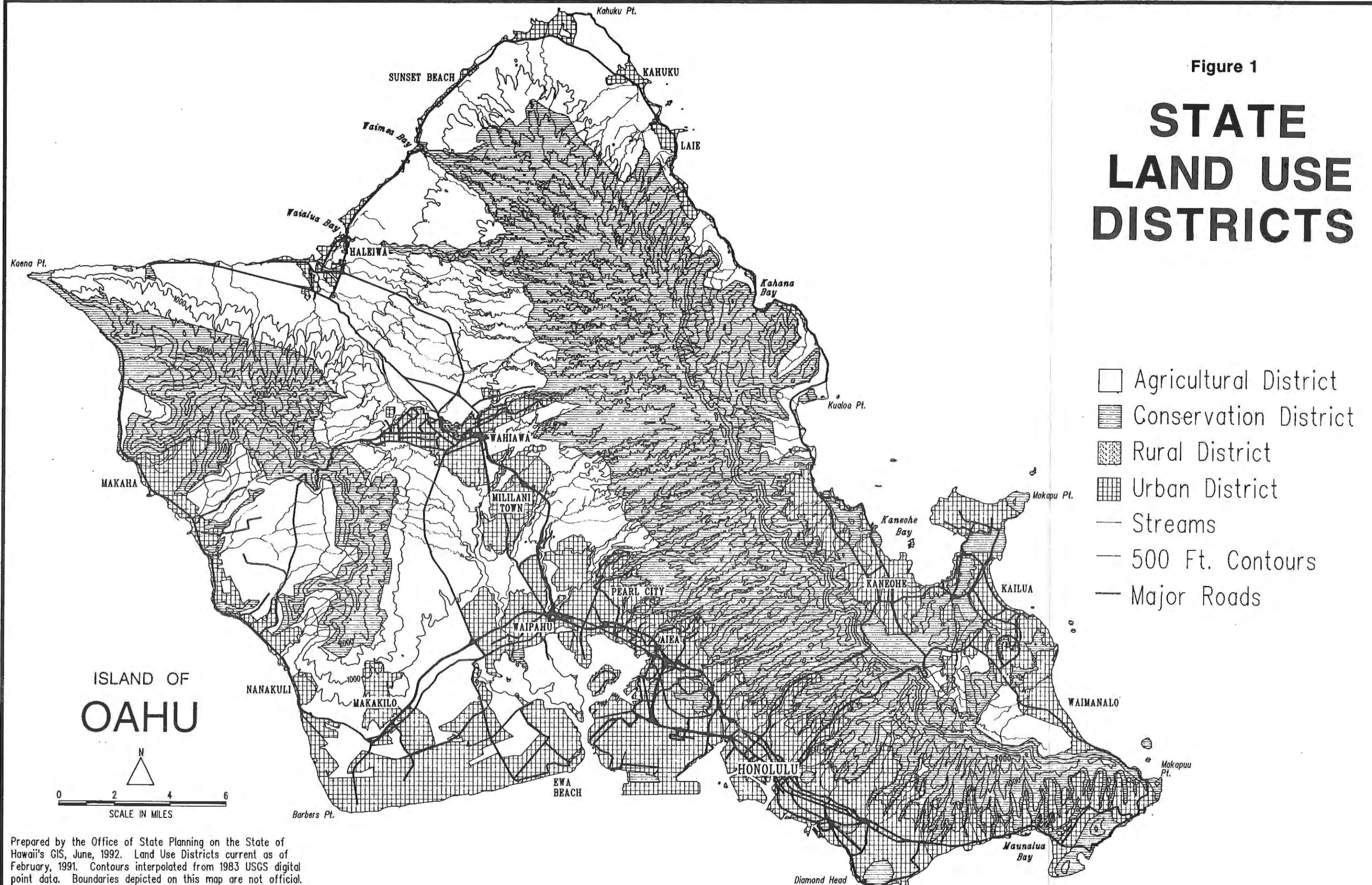
Table 4. ESTIMATED ACREAGE OF LAND USE DISTRICTS - 1990

<u>Total</u>	<u>Urban</u>	<u>Rural</u>	<u>Agricultural</u>	<u>Conservation</u>
386,188	93,675	--	137,667	154,846

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

Figure 1

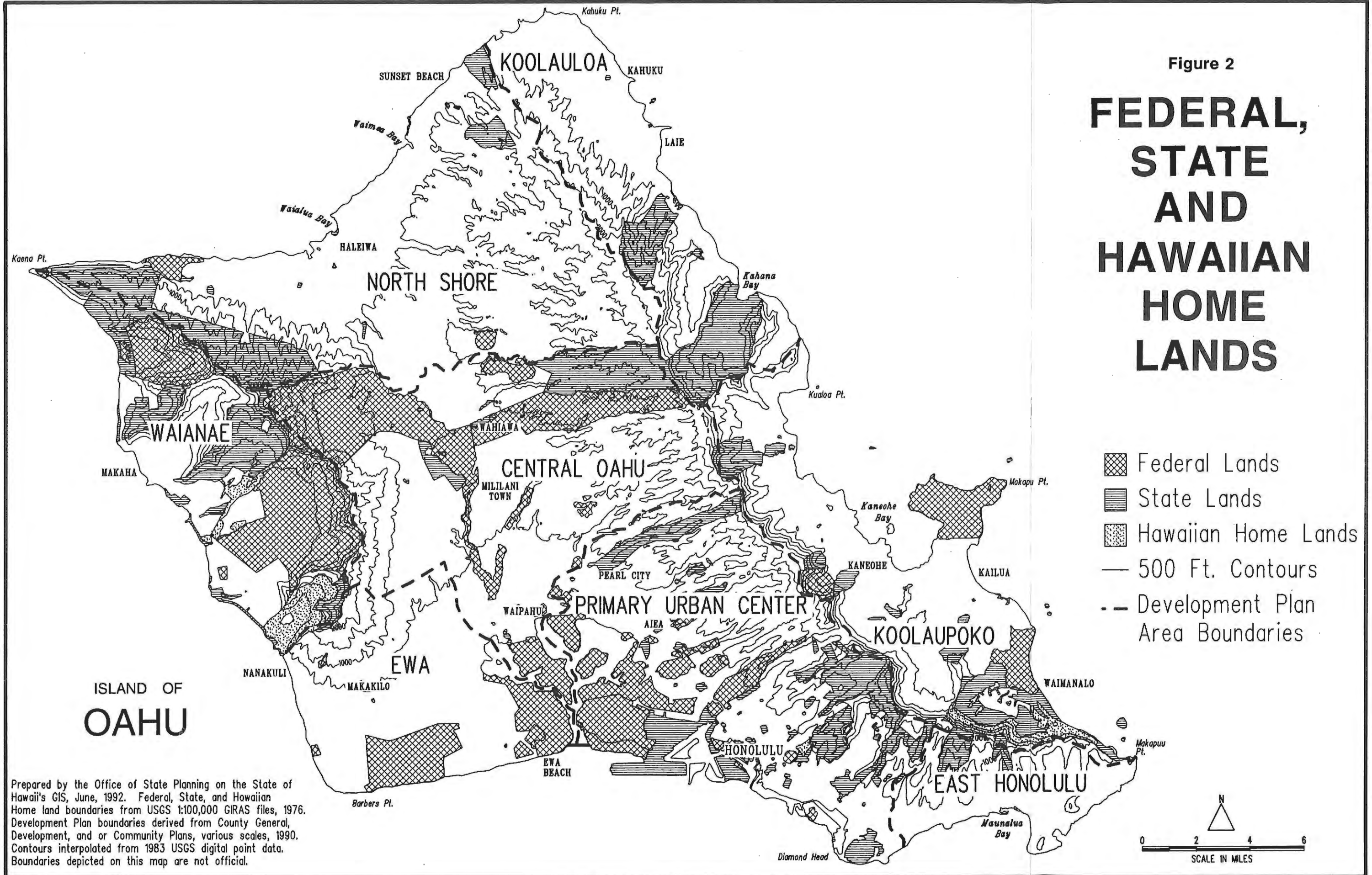
STATE LAND USE DISTRICTS



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.

Figure 2

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.

VIII. URBAN DISTRICT

Existing Land Uses

Residential. Major residential areas are found in the Primary Urban Center, East Honolulu, Central Oahu, Ewa, Kailua and Kaneohe. There are also numerous smaller residential communities on Oahu.

Resort. Resort areas on Oahu include Waikiki, West Beach, Kuilima at Kawela Bay and Makaha.

According to the Department of Business, Economic Development & Tourism, the average visitor census will increase from 82,000 in 1990, to 113,400 by 2010. Hotel units are projected to increase from 41,500 to 55,800 over the same time period.

Table 5. VISITOR INDUSTRY PROJECTIONS FOR THE
CITY AND COUNTY OF HONOLULU, 1985 to 2010
(In Thousands)

	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>
Average visitor census	65.3	82.1	89.3	96.8	104.9	113.4
Occupied hotel units*	31.6	35.3	38.6	42.0	44.8	47.5
Total hotel units	38.6	41.5	45.4	49.4	52.7	55.8

*Includes condominiums.

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

Commercial and Industrial. There are numerous commercial areas on Oahu. They are located in most of the urbanized communities on the island. Industrial areas on Oahu include the Campbell Industrial Park, Mililani Technology Park, the Gentry light industrial area and numerous smaller industrial areas.

Military. Department of Defense installations in the north section of the Koolau range include the Army's Kahuku and Kawaihoa training areas, Nike-Hawaii Site 2, Punamano AFS and the Navy Opana Communication Facility. Along the northwest and western tip of the Waianae range lie the Dillingham and Makua Valley military reservations. Major military installations located in the Schofield plateau and the West-Central Waianae range slopes include Schofield Barracks, Wheeler AFB, NAVCAMS EASTPAC, Helemano Military Reservation and NAVMAG Lualualei. In the Barbers Point-Pearl Harbor-West Honolulu area, major military installations include NAS Barbers Point, NAVMAG

Lualualei (West Loch branch), the Pearl Harbor Naval Complex, Hickam AFB, Fort Shafter, Tripler Army Medical Center, Camp H.M. Smith, Aliamanu Military Reservation and Fort Kamehameha. East of the Koolau range are two major installations--Kaneohe Bay MCAS and Bellows AFS.¹⁰

State and Federal Lands. The State owns 69,541 acres on Oahu of which 6,600 acres are Department of Hawaiian Homes lands.

Urban Land Requirements

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

According to Land Use Commission records, statewide, there have been 53,414 acres of land reclassified to the Urban District since 1964, an increase of 45.3 percent. For the City and County of Honolulu, during the 15-year period between 1976 and 1990, there were 9,608 acres reclassified to the Urban District. Of the acres reclassified, 6,665 acres (69 percent) were in the Central Oahu area and 1,588 acres (17 percent) were in the Ewa district. This trend reflects the General Plan policies of the City and County of Honolulu for the direction of growth towards the Central Oahu and Ewa areas.

The number of acres reclassified to Urban during the five-year period from 1986 to 1990 is more than double the amount reclassified during the preceding ten years, 1976-1985.

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

¹⁰ Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Military Property Requirements in Hawaii (MILPRO-HI), April 1979.

Table 6. URBANIZED LANDS (1976-1990)
by Development Plan Areas
(in acres)

	<u>1976-80</u>	<u>1981-85</u>	<u>1986-90</u>	<u>Total</u>
Primary Urban Center	11	894	36	941
Ewa	116	181	1,291	1,588
Central Oahu	590	1,136	4,939	6,665
Koolaupoko	3	42	45	90
Koolauloa	0	6	236	242
North Shore	49	8	0	57
Waianae	<u>25</u>	<u>0</u>	<u>0</u>	<u>25</u>
Total	794	2,267	6,547	9,608

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

There are approximately 10,881 acres of developable lands on the island of Oahu, much of which are located in the Ewa and Central Oahu districts. This figure drops to 8,393 when lands in the Urban District which are zoned Preservation are excluded. Within the Ewa district, developable lands in the Urban District include undeveloped areas of the Ko Olina Resort, Kapolei Villages, Makakilo, Campbell Industrial Park, Ewa Marina and Ewa Gentry developments. In Central Oahu, undeveloped urban areas are located in Royal Kunia, in the Mililani High Technology Park and in the Waikakalua Stream area.

In the North Shore area, some of the larger undeveloped urban areas include makai of Ukoa Pond and southwest of Kaiaka Bay. In Waianae, developable parcels are in Makaha Valley mauka of Farrington Highway, south of Lualaualei Homestead Road as well as in the towns of Maili and Nanakuli.

In East Honolulu, there are developable areas in the upper Kamilonui Valley, upper Kalama Valley and Queen's Beach areas.

In Koolaupoko, a sizable parcel is located makai of Olomana Golf Course and Bellows Air Force Base. Other areas are in Heeia and Ahuimanu. In Koolauloa, the area in the vicinity of Kahuku Point west of Turtle Bay resort is developable.

These findings are based on January 1991 data. They do not take into account lands that have been urbanized since January 1991. For example, at Mililani Mauka, Increment 2, 477 acres were reclassified to the Urban District by the Land Use Commission in 1992.

Table 7. DEVELOPABLE URBAN LANDS ^a

	<u>Total Acres</u>
Primary Urban Center	535
Ewa	2,635
Central Oahu	2,002
East Honolulu	605
Koolaupoko	671
Koolauloa	304
North Shore	267
Waianae	<u>1,374</u>
Total	8,393

^aExcludes Urban District lands which are zoned Preservation.

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

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

Recent census figures for 1990 show the resident population for the City and County of Honolulu at 25,000 persons less than the M-K projections. 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.

Population distributions were based on the Oahu General Plan.

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

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

In addition, 2,488 acres of vacant developable land in the County's Preservation District were excluded from the supply category in recognition of the purpose of the Preservation District.

Overall, there is a deficit of developable urban lands on Oahu totaling 356 acres for 1995 and 3,685 acres for 2000. For the year 2010, however, a shortage of 10,376 acres is projected. (See Appendix A for additional tables on urban land requirements.)

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

Table 8. URBAN LAND REQUIREMENTS
CITY AND COUNTY OF HONOLULU
1995-2010

	<u>1995</u>	<u>2000</u>	<u>2010</u>
Primary Urban Center	38	(277)	(755)
Ewa	1,350	387	2,325
Central Oahu	429	(276)	(1,360)
East Honolulu	(4)	(166)	(429)
Koolaupoko	(936)	(1,129)	(1,434)
Koolauloa	124	129	115
North Shore	165	125	68
Waianae	228	(62)	(502)
Subtotal	1,394	(1,269)	(6,622)
25% Flexibility Factor	(1,750)	(2,416)	(3,754)
Total	(356)	(3,685)	(10,376)

Surplus (Deficit) in Acres

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

Table 9

**AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
CITY AND COUNTY OF HONOLULU
2000
(in acres)**

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-			TOTAL			TOTAL 2000 DEMAND
	ZONED DEV. URBAN	2000 DEMAND	SURPLUS/ (DEFICIT)	ZONED DEV. URBAN	2000 DEMAND	SURPLUS/ (DEFICIT)	ZONED DEV. URBAN	2000 DEMAND	SURPLUS/ (DEFICIT)	ZONED DEV. URBAN	2000 DEMAND	SURPLUS/ (DEFICIT)	ZONED DEV. URBAN LANDS	2000 DEMAND	SURPLUS/ (DEFICIT)	OTHER DEV. URBAN	2000 DEMAND	PUBLIC AREA 2000 DEMAND	
BAN CTR	345	539	(194)	55	67	(12)	105	182	(77)	0	0	0	505	0	0	30	81	24	81
HU	783	1,681	(888)	78	198	(120)	352	183	169	82	54	28	1,305	1,330	2,635	1,330	132	132	2,242
ULU	246	1,806	(1,560)	39	151	(112)	119	227	(108)	0	0	0	404	1,598	2,002	1,598	94	94	2,272
D	557	733	(176)	7	26	(19)	0	4	(4)	0	0	0	564	41	605	41	8	8	777
E	281	1,770	(1,489)	11	24	(13)	0	3	(3)	0	0	0	292	378	671	378	3	3	1,803
	81	102	(11)	13	11	2	0	1	(1)	119	81	58	223	81	304	81	0	0	17
	67	132	(65)	8	6	2	0	1	(1)	0	0	0	75	182	267	182	3	3	14
	458	1,392	(834)	11	20	(9)	13	2	11	27	16	11	509	865	1,374	865	6	6	1,433
BTOTAL	2,838	8,155	(5,317)	222	503	(281)	589	603	(14)	228	131	97	3,877	4,516	8,383	4,516	270	270	9,653
CTY FACTOR		2,039			126			151			33						68	68	2,107
TOTAL	2,838	10,194	(5,317)	222	629	(281)	589	754	(14)	228	164	97	3,877	4,516	8,383	4,516	338	338	12,760

County-zoned agricultural and rural districts, but excludes conservation districts.
Land Requirements Study, Wilson Okamoto and Associates, 1991.

Infrastructure¹¹

Transportation, sewerage and water supply are major infrastructure concerns on Oahu. Traffic congestion along the H-1 and H-2 freeways, as well as major highways including Likelike Highway, Pali Highway and Kalaniana'ole Highway, are commonplace. Current problems relate to the capacity of the freeway and highways and inadequate ingress and egress.

Aging sewerage infrastructure is a concern for the older communities on Oahu. For the growth areas of Ewa and Central Oahu, there is a need for increased sewerage capacity. The current capacity of the Honouliuli Wastewater Treatment Plant (WWTP) which services Ewa and Central Oahu, is adequate to handle the present level of use but not future levels associated with the new development approved for these areas. Expansion for the Honouliuli WWTP is proposed. However, there is disagreement over the approval for primary treatment by the Environmental Protection Agency. In addition to Honouliuli, improvements to sewerage systems in Koolaupoko, Koolauloa, North Shore, and Waianae have been proposed by the City and County of Honolulu.¹² Less developed areas of Oahu are serviced primarily by cesspools. However, the State Department of Health has provided notice that new cesspools will not be allowed on Oahu after 1990.

Future water demands have been identified in the Hawaii Water Plan. Areas requiring the greatest amount of water by the year 2010 are Ewa, the Primary Urban Center and Central Oahu. The Honolulu Board of Water Supply's island-wide integrated system is expected to provide the necessary additional supply for Ewa, the Primary Urban Center and Central Oahu over the next 20 years.

Airports.¹³ Honolulu International Airport is a joint use and owned civil and military airport. It is the largest airport within the Statewide Airport System and serves as the major destination for domestic and international overseas as well as inter-island flights. The airport supports airline, air taxi, general aviation and military activities. It occupies approximately 4,500 acres of land, about half of which is submerged land within Keehi Lagoon.

¹¹ Portions of this section are taken from the report, Five-Year Boundary Review: Infrastructure Constraints and Opportunities to 2010, Eugene Dashiell, AICP.

¹² Department of General Planning, City and County of Honolulu, Development Plan Status Review, Vol. II, September 1, 1989.

¹³ Portions of this section are from the State Department of Transportation's correspondence to the Office of State Planning, dated February 5, 1992.

The fast land portion of the airport is classified Urban as are the surrounding lands. The Keehi Lagoon portion of the airport and the area within the airport known as the marine pond are classified Conservation. To accommodate present and forecast demands in air travel, the following improvements are underway: 1) acquisition of properties adjacent to the airport along Ualena Street; 2) relocation of the inter-island maintenance and cargo facilities; 3) realignment and construction of new taxiways; 4) construction of a new interisland terminal building, overseas air cargo facility and an automated people-mover system including maintenance facilities and additional passenger gates; 5) renovation of the existing overseas terminal; and 6) redevelopment of the "South Ramp" area north of Lagoon Drive. Future projects include relocation of the Airport Satellite Fuel Facility, construction of an airport hotel-parking complex, construction of additional passenger gates, and development of Keehi Lagoon for recreational, commercial, industrial, and transportation-related activities. The lessees of the acquired Ualena Street property will be relocated to approximately four acres of land on Nimitz Highway adjacent to Honolulu Harbor and to five acres of land at Kapalama Military Reservation. The proposed airport expansion located on existing fast lands and the properties used for the relocation of Ualena Street lessees will not require land use reclassification.

Dillingham Airfield is a general aviation facility located on Dillingham Military Reservation in Mokuia. The airfield encompasses approximately 273 acres of land leased from the United States Army, 61 acres of which are ceded land. The land is classified Agricultural with adjacent parcels to the north and west classified as Conservation. To the northwest, there is a small community classified Urban. The remaining land neighboring the military reservation is classified Agriculture. The Department of Transportation is in the process of developing a master plan for Dillingham Airfield and is pursuing the acquisition of Dillingham Military Reservation from the Federal government. If the State is successful in acquiring the military reservation or needs more private land for expansion, the possible reclassification of lands from the Agricultural to Urban District would need to be assessed. Concerns here include whether Urban classification is appropriate in a primarily rural area or whether a special use permit should be utilized and the need to take into consideration community input on any proposed reclassification.

Harbors. Honolulu Harbor is Oahu's major port in terms of vessel capacity and cargo volume. It is experiencing increasing use as a passenger vessel port and the demand for passenger vessel pier space has increased significantly. Honolulu Harbor handles nearly all container, general cargo and bulk cargo in the form of sugar, pineapple, construction materials, oils and lubricants. It is a major port for commercial fishing vessels including long-liners and purse seiners. Improvements are proposed at Honolulu Harbor to upgrade cargo and handling capability. As Honolulu Harbor is in the Urban District and is surrounded by Urban District lands, no changes in boundaries are needed to accommodate the proposed improvements.

Barbers Point is Oahu's second commercial deep-draft harbor. The major cargo components are in bulk form including construction materials, oils and lubricants. Barbers Point Harbor has been designated as a major deep-water port for Oahu and a break-bulk center for the other islands. Its development and expansion has been coordinated with the development of the Campbell industrial area as a major primary center of ocean shipping (both exports and imports) in Hawaii.

The Department of Transportation plans to improve piers and cargo handling facilities at Barbers Point Harbor. These improvements will require expansion of the Urban District at Barbers Point. It is recommended that 140.5 acres adjacent to existing urban lands at Barbers Point Harbor be reclassified from the Agricultural to Urban District to accommodate the improvements and expansion needs.

Roads.¹⁴ Transportation plans and policies for the City and County of Honolulu are set forth in the Oahu Regional Transportation Plan prepared by the Oahu Metropolitan Planning Organization (OMPO) which is responsible for coordinating transportation planning for Oahu. City and State transportation and planning departments were active participants in the planning process. Released in 1991, the Oahu Regional Transportation Plan identifies programs and facilities to meet travel demands forecasted to the year 2005. Components of the plan are the development trends and assumptions which provide the basis for future action; highways; public transportation which includes bus services, rapid transit, water transit, and private sector initiatives; transportation system management; bicycles; and financing.

Major assumptions guiding the plan are that physical and financial constraints limit capacity expansion and that land use policies must emphasize the reduction of travel needs as well as promote more efficient use of existing facilities. Three key features guiding the actions in the plan are the development of the second city at Kapolei, including Ko Olina Resort and the Campbell Industrial Park, to create a second major employment center; emphasizing infill residential development adjacent to Downtown and in Kakaako; and developing more employment in East Honolulu and Central Oahu.

Freeways, highways, and roads provide the basic transportation network on Oahu with approximately 52 miles of freeways and 1,417 miles of highways and streets. Maintenance of this network is provided by the State of Hawaii Department of Transportation and the City and County of Honolulu Departments of Transportation Services and Public Works. Oahu is divided into five major travel

¹⁴ The majority of information for this section is from the Oahu Regional Transportation Plan, Oahu Metropolitan Planning Organization, June 1991.

corridor segments: Central Oahu-North Shore Corridor, Waianae-Ewa-Waipahu Corridor, Central Honolulu Corridor, East Honolulu Corridor, and the Windward/Trans-Koolau Corridor. Traffic congestion in all of these segments have increased as traffic volume has increased. Major roadway projects have been proposed along key sections of major highway corridors to increase capacity. Most of these projects, however, have been delayed by funding constraints, environmental concerns, and/or controversy over project descriptions or alignments.

Table 10 summarizes traffic data for Oahu by Development Plan area. Overall, there will be a 35 percent increase in person trips from 4.3 million person trips in 1980 to nearly 5.9 million person trips by 2005. A significant rise in the number of person trips is projected for the following planning areas: Ewa (263 percent); Koolauloa (95 percent), Waianae (59 percent); North Shore (56 percent); Central Oahu (54 percent); and East Honolulu (49 percent). Koolaupoko (25 percent) and the Primary Urban Center (16 percent) both have a moderate rise in the number of person trips projected.¹⁵

Table 10. PROJECTED TRAVEL INCREASE BY DEVELOPMENT PLAN AREA^a

DP Area	Person Trip Origins and Destinations ^b				Percent Increase
	1980	% of Total	2005	Diff.	
Primary Urban Center	2,507,241	57.7	2,901,822	394,581	16
Ewa	124,436	2.9	451,698	327,262	263
Central Oahu	857,141	19.7	1,318,474	461,333	54
East Honolulu	167,867	3.9	249,377	81,510	49
Koolaupoko	459,490	10.6	575,169	115,679	25
Koolauloa	58,691	1.3	114,465	55,774	95
North Shore	42,780	1.0	66,596	23,816	56
Waianae	127,680	2.9	203,605	75,925	59
Total	4,345,326	100.0	5,881,206	1,535,880	35

^a Trips by Oahu residents only; excludes tourist trips.

^b Total number of person trip ends made by motor vehicle that are generated by or attracted to each area, as projected by the Hali 2005 study computer travel forecast model. This includes automobile drivers and passengers, motorcycles, and bus and van passengers, but excludes bicycle and pedestrian trips.

¹⁵ Wilbur Smith Associates, Hali 2005 Regional Transportation Plan, 1990.

Extensive planning and consideration have been given to transportation system management such as implementing High Occupancy Vehicle (HOV) lanes. Traffic operation management measures are also being implemented through reversible lanes, peak period restrictions, and computerized signals. In addition, Transportation Demand Management (TDM) measures such as flexible working hours, carpooling, parking benefits, subsidized bus passes, and subsidized carpooling are being implemented. Long-run increases in roadway capacity are limited by such factors as natural features, community impacts, and financial constraints. In the recent past, environmental concerns, funding constraints, alignment and other problems have caused road improvements to be delayed and not keep up with growing demand. Each of the five travel corridors on Oahu has planned improvements identified by both the City and County of Honolulu and the State of Hawaii up to the year 2005 to assist in alleviating traffic congestion.

The Central Oahu-North Shore corridor projects seek to increase roadway capacity from the Haleiwa and Mililani areas to the H-1 Freeway. Proposed improvements are construction of an interchange at Paiwa Road to the H-1 Freeway in association with Amfac's Waikale project; construction of a HOV lane in each direction of the H-2 Freeway; construction of the two-lane Haleiwa Bypass Road; widen Kamehameha Highway to four lanes from the H-1 Freeway to Mililani Cemetery Road, then connecting up to the Haleiwa Bypass Road; and widen Kunia Road to four lanes from the H-1 Freeway to the Royal Kunia access road; then all of Kunia Road.

The Waianae-Ewa-Waipahu corridor projects seek to expand the roadway network and capacity to accommodate the development in Ewa. Proposed improvements are the continuation of widening Fort Weaver Road to four lanes into Ewa Beach; improve, modify, and construct interchanges to the H-1 Freeway at Makakilo, Palailai, and between Makakilo and Kunia; designate a HOV lane in each direction between Kunia and Waiawa Interchanges on the H-1 Freeway; add an additional Diamond Head lane on the H-1 Freeway between Kunia Road and the Waiawa Interchange; widen Farrington Highway to four lanes between Fort Weaver Road and Kalaeloa Boulevard as well as between Jade and Ala Hema Streets; extend Aliinui Drive to Kalaeloa Boulevard; construction of a four- to six-lane major arterial roadway going east to west from Ewa Beach area to Kalaeloa Boulevard; construction of a major arterial roadway from the new H-1 Freeway interchange to the East-West Road; and construction of an arterial roadway from Barbers Point Deep Draft Harbor area to Farrington Highway near the existing Honokai Hale subdivision.

The Windward/Trans-Koolau Corridor projects seek to improve access to trans-Koolau routes as well as to improve circulation within the Kaneohe and Kailua areas. Proposed improvements are construction of interchanges for Likelike Highway at both Kahekili Highway and Kamehameha Highway; widen Likelike Highway to six lanes from the H-3 Freeway to Kamehameha Highway; widen Kahekili Highway to six lanes from Likelike Highway to Haiku Road, to four lanes from Haiku

Road to Kamehameha Highway; widen Kamehameha Highway to four lanes from Haiku Road to Ipuka Street; construction or interchanges for Kalanianaʻole Highway at both the Pali Highway and Kailua Road; widen Kalanianaʻole Highway to six lanes from Kailua Road to the Pali Highway, and to four lanes from the Saddle City area to Kahekili Highway; widen Kaneohe Bay Drive to three lanes from Kamehameha Highway to Mokapu Boulevard; widen Kailua Road in the Kailua Town commercial area; and provide widenings and contraflow lane operations on both Pali and Likelike Highways.

The East Honolulu Corridor projects seek to increase the capacity of Kalanianaʻole Highway. Proposed improvements are widening the four-lane section to six lanes between Aina Haina and Hawaii Kai; construction of a climbing lane from Lunalilo Home Road to Hanauma Bay access road at the crest of Koko Crater; additional through lanes for Ewa traffic near Lunalilo Home Road; and an additional lane going Ewa from Laukahi Street to the Kilauea off-ramp.

The Central Honolulu Corridor projects seek to increase roadway capacity as this is the most heavily travelled corridor. Proposed improvements are reconstruction of the Middle Street and University Avenue interchanges as well as the Vineyard off-ramp and Lunalilo on-ramp on the H-1 Freeway; widen H-1 Freeway by one lane in each direction between the Waiawa and Halawa Interchanges as well as between the Middle Street and Kapiolani Interchanges; modification of a section of the H-1 Freeway between Aina Koa Street and the Kapiolani Interchange to permit operation of a reversible lane for HOV's; widen Moanalua Road to four lanes in Aiea area; widen Salt Lake Boulevard to four lanes from Kahuapaani Street to Ala Lilikoi; construction of an interchange at Sand Island Access Road for Nimitz Highway; widen Sand Island Access Road to six lanes mauka of Auiki Street; widen Puuloa Road to four lanes makai of Salt Lake Boulevard; widen Puuhale Road to four lanes between Nimitz Highway and Dillingham Boulevard; widen Kalihi Street to four lanes mauka of Nimitz Highway; widen Mokauea Street to four lanes between Nimitz Highway and Dillingham Boulevard; extend Kamakee Road to Ala Moana Boulevard and realign with Ala Moana Park road; construction of a loop ramp from Keeaumoku Street to Lunalilo Street; widen Kapahulu Avenue to four lanes between Date Street and Harding Avenue; widen McCully Street to five lanes between Kapiolani Boulevard and King Street as well as a modification of the H-1 Freeway overpass section between Beretania Street and Wilder Street.

Public as well as some private transportation services can provide an alternative means for travel on Oahu. The City and County of Honolulu provides an extensive bus system which provides transportation island-wide. As the bus system uses the same road network as automobiles, it is also affected by traffic congestion. In order to increase frequency of service during rush hours, provide express service and add new routes, there are plans to increase the fleet of buses. Additionally, the City and County of Honolulu is proposing to develop a grade separate transit system to serve the densely populated areas of the Primary Urban Center. What is known as the locally preferred alternative for this system runs from Pearl City

to the University of Hawaii at Manoa. In the long run, the bus system will be integrated with the proposed rapid transit system.

Solid Waste.¹⁶ The City and County of Honolulu collects, transports, and disposes of solid waste through the Department of Public Works, Division of Refuse Collection and Disposal. In 1991, the City and County disposed of approximately 1.2 million tons of solid waste and approximately 200,000 tons were disposed of in military and private landfills or recycled.¹⁷

Thirty-five percent of all residential solid waste is collected by the City and County with the remaining 65 percent collected by private companies. Both residential and commercial waste can be hauled to transfer stations, incinerators, and landfills. There are eight transfer stations on Oahu located at Kawaihoa, Laie, Kapaa, Waimanalo, Keehi, Waipahu, Ewa, and Waianae. The Waipahu Incinerator has been in operation since 1970 and processes about 300 tons per day. Another incinerator, known as H-POWER (Honolulu Program of Waste Energy Recovery), began full operation in May of 1990. Designed to process about 2,000 tons per day, the facility also has a gross generation capacity of 57 megawatts of electricity which is bought under a purchase agreement with Hawaiian Electric. Two landfills, Kapaa and Waimanalo Gulch, are owned and operated by the County with four private landfills in operation at Kaneohe MCAS, NAS Barbers Point, Waipahu and Nanakuli.

All disposals eventually end up in one of the five aforementioned landfills. Kapaa Landfill is located in Windward Oahu and is designed to handle approximately 27,000 tons per year. It accepts only noncombustible residential waste and is scheduled to be phased out in the near future. Waimanalo Gulch Landfill, which opened in 1989, is located in Leeward Oahu with a current fill rate of 1,200 tons per day. It accepts residential, commercial, nonhazardous industrial solid waste, demolition debris, and H-POWER ash/residue.

Waimanalo Gulch also accepts wastewater treatment sludges, septic tank wastes, and cesspool pumpings as long as the disposal is in accordance with the landfill's operating guidelines. Additionally, special wastes such as spent lime, contaminated foods, and asbestos can be accommodated. At the present rate, the City and County of Honolulu estimates the landfill capacity will be reached within 15 years. The Waipahu Incinerator Ash Landfill is located in lower Waipahu on Navy-owned lands. As the name implies, it is a monofill used solely for the purpose of disposing of the ash from the Waipahu Incinerator. Its life span is dependent on the Navy's continued permission to use the site.

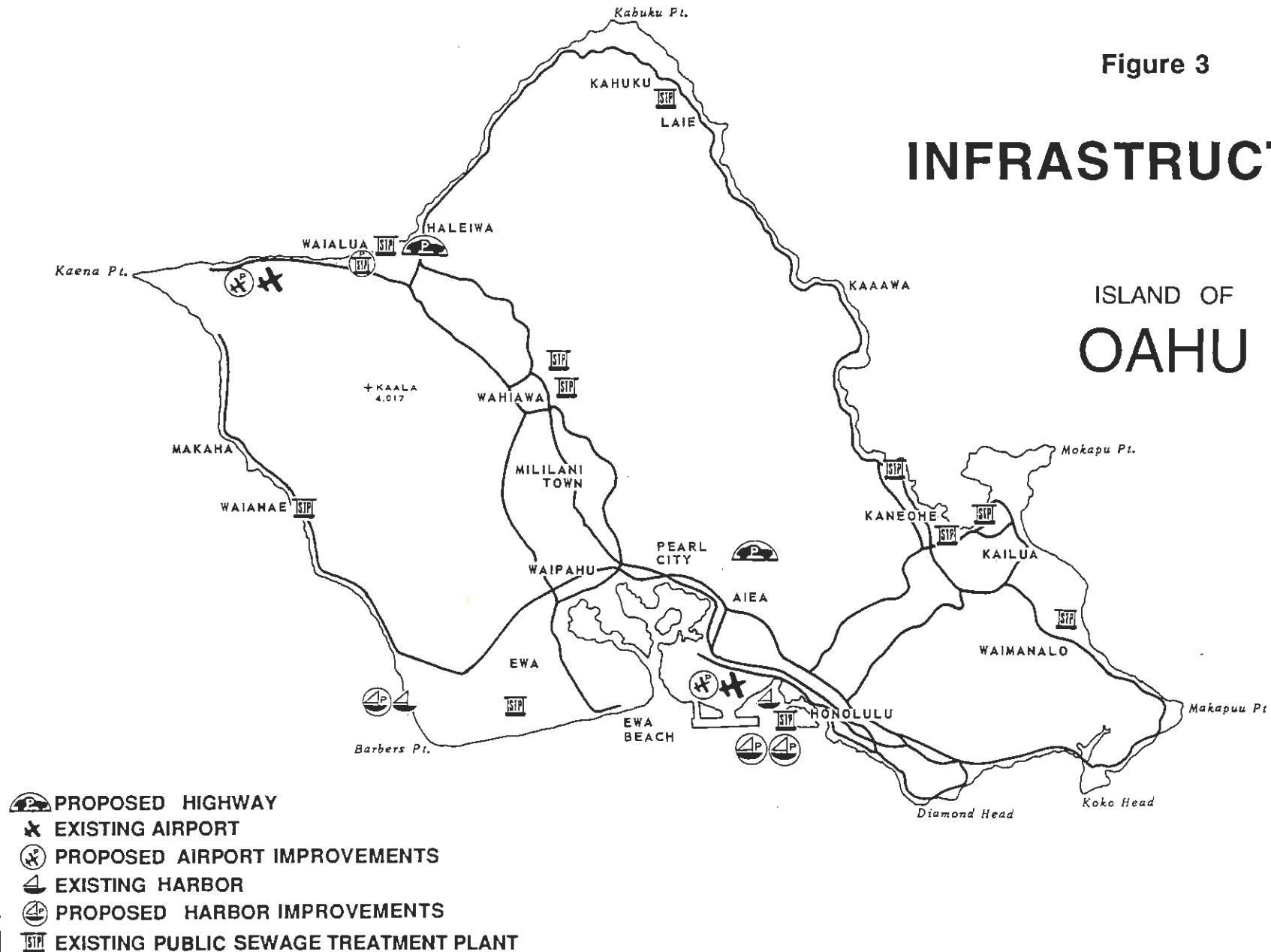
¹⁶ Major portions taken from the report, Integrated Solid Waste Management Plan for the State of Hawaii, Department of Health, State of Hawaii.

¹⁷ Department of Health, State of Hawaii, correspondence to OSP, July 10, 1992.

Figure 3

INFRASTRUCTURE

ISLAND OF OAHU



Because of Oahu's limited disposal capacity, it is recommended that the developers of proposed residential projects be required to meet Department of Health requirements for solid waste.

In addition to disposal, the City and County of Honolulu is trying to reduce the amount of waste generated through recycling programs.¹⁸ These programs include a pilot curbside recycling effort in Windward Oahu, an island-wide network of 20 school-based, drop-off points, and then development of incentives and support for commercial recycling efforts in downtown and resort areas.¹⁹ For 1991, it is projected that 133,100 tons of solid waste was recycled, or approximately 12 percent of the total waste.²⁰ Aggressive goals have been adopted to reduce solid waste by the City and County of Honolulu. They are targeting reduction of solid waste by 50 percent in 1995 and 75 percent in 2000.

At the State level, Act 324, Integrated Solid Waste Management Act, was passed to address the issue of solid waste. Act 324 sets up an Office of Solid Waste Management within the Department of Health to develop, along with the Counties, approaches to achieving State and County goals to reduce solid waste. In March of 1991, the Department of Health submitted to the Hawaii State Legislature the Integrated Solid Waste Management Plan for the State of Hawaii which examines current practices, special concerns of an island State, and proposes directions for solid waste management through the emphasis of source reduction, recycling, and bioconversion.

Water. The Commission on Water Resource Management, Department of Land and Natural Resources, has undertaken extensive studies of Hawaii's water resources. The following discussion is taken from the Hawaii Water Plan.²¹

Projected future water demand on Oahu is based primarily on the projections of municipal water demand which would be met by the Board of Water Supply. Although presently constituting about 43 percent of water use on the island, municipal demand is expected to steadily increase from the 1990 level of 156 mgd to 204 mgd by the year 2010.

¹⁸ Department of Health, State of Hawaii, Report to the Sixteenth Legislature, State of Hawaii, 1992, on Act No. 324-91, Requesting Review and Recommendations from the Director of Health on the Office of Solid Waste Management, 1991.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Department of Land and Natural Resources, Commission on Water Resource Management, Hawaii Water Plan, An Introduction, Draft, March 1992.

For the purpose of projecting future water demand, notwithstanding the uncertain outlook for sugar, it is assumed that the M-K series' projected decline in sugar exports will result in corresponding acreage reductions. A 28 percent decrease in sugar is anticipated by the year 2010. It is possible that "released" acreage will be subject to urbanization as well as replacement crops. Assuming that 50 percent of the released acreage will be urbanized and that 50 percent will be used for other crops (with average water demand three-quarters that of sugarcane), water demand for sugar is expected to decrease from 186 mgd in 1988 to 110 mgd by the year 2010.

Municipal water demand is driven primarily by population increases and associated land use allowances for increased residential and other urban activities. The overall impact on water resources, however, may not be significant if such increased demand is offset by a reduced demand for agricultural water use. Projected declines in sugar acreage would free up water for urban uses and lessen the need to develop new water sources. Sugar lands converted to residential use should transfer any water allocations particularly if potable supply was being used for sugar irrigation. However, any recharge resulting from sugar irrigation would be lost if residential use replaced sugarcane cultivation.

The basic directions for growth on Oahu established by the City's General Plan call for the full development of the Primary Urban Center and promotion of development within the secondary urban center at Kapolei, and the Ewa and Central Oahu urban fringe areas to relieve developmental pressures in other areas. Projected future water demand on Oahu has been based on the implementation of these primary land use directives. The DP areas requiring the greatest amounts of water by the year 2010 are Ewa, the Primary Urban Center and Central Oahu. Ewa will have a demand of 40.8 mgd for municipal water to meet the projected population and land use allocations for the area. This is a 285 percent increase over 1990's demand. The Primary Urban Center and Central Oahu follow with demands of 98.7 mgd (11 percent increase from 1990) and 18.8 mgd (25 percent increase over 1990), respectively. All other areas will have only slight increases over 1990 levels.

Ewa is already importing its potable water from the Pearl Harbor area, but withdrawals from the Pearl Harbor Water Management Area are rapidly approaching the maximum sustainable yield of the area.

Central Oahu may have ample supplies for its additional needs. To satisfy future additional water demand, it will be necessary for the Ewa area, as well as the Primary Urban Center, to rely on the development of new water sources in other areas of substantial undeveloped groundwater supply. Such areas include the above-mentioned Wahiawa aquifer and the Windward and North aquifer sectors which have potential yields of about 35 mgd and 91 mgd.

Using the Honolulu Board of Water Supply's island-wide integrated system with appropriate new pipeline connections, the development of these sources could provide the necessary additional supply for Ewa and the Primary Urban Center over the next 20 years. However, concerns have been expressed regarding the impacts that water diversion would have on windward streams.

Wastewater Facilities

Primary Urban Center - Sand Island Treatment Plant. The Sand Island Wastewater Treatment Plant has a primary treatment design capacity of 82 mgd and presently handles approximately 71 mgd. A study was recently initiated which will determine if expansion of this treatment plant is necessary.²²

Ewa - Honouliuli Treatment Plant. The Honouliuli WWTP services Ewa and Central Oahu and is operating near its design capacity of 25 mgd. An expansion of the plant's primary treatment capacity to 38 mgd is expected to be complete by the end of 1992. By early 1996, 13 mgd of secondary treatment capacity should be added, although the plant's total capacity will still be 38 mgd. The City Department of Public Works has stated that the capacity of the plant will have to be expanded beyond 38 mgd to service lands already in the Urban District as well as lands proposed for reclassification during the boundary review.²³

Also in Ewa is the Nanakai WWTP which has a secondary treatment design capacity of 0.125 mgd. The present average daily flow is 0.109 mgd. It is expected that flows to the Nanakai plant will be diverted to the Honouliuli WWTP.²⁴

Central Oahu - Wahiawa WWTP. The secondary treatment design capacity of the Wahiawa WWTP is 2.5 mgd and the daily average flow is presently 1.8 mgd. The Whitmore Village WWTP has a secondary treatment design capacity of 0.252 mgd and has an average daily flow of 0.25 mgd. The City is looking into diverting flows from these two plants to the Honouliuli WWTP.²⁵

East Honolulu - Hawaii Kai WWTP. The capacity of the private Hawaii Kai WWTP is 3.9 mgd and the average flow is 3 mgd.

²² Department of Public Works, City and County of Honolulu, letter to OSP, July 17, 1992.

²³ Ibid.

²⁴ Ibid.

²⁵ Ibid.

Projected waste flow in 2010 is 4.6 mgd. There are plans to increase capacity to 4.6 mgd which will accommodate the need for 2010.

Koolaupoko. This district includes Kailua and Kaneohe and is known as the Kaneohe-Kailua Sewerage District. The Kaneohe WWTP presently has a secondary treatment design capacity of 4.2 mgd and treats an average daily flow of 4.6 mgd. Because of this deficit, the City's Department of Public Works, Division of Wastewater Management, has issued a moratorium on sewer connections in the Kaneohe area.

In Waimanalo, the Waimanalo WWTP has an actual capacity of approximately 0.8 mgd. However, the average daily flow is 0.5 mgd, and because the Underground Injection Control (UIC) discharge limit for this system is 0.504 mgd, the Division of Wastewater Management has issued a moratorium on new sewer connections in the area. This moratorium will remain in effect until the State Department of Health approves a UIC limit of 0.8 mgd, the actual capacity of the plant.²⁶

The Ahuimanu and Kailua WWTPs have design capacities of 1.4 mgd and 7.0 mgd, respectively. These capacities are adequate for the present average flows of 0.7 mgd at Ahuimanu and 5.6 mgd at Kailua.

There are plans to upgrade the Kailua plant to a regional facility. The existing Ahuimanu and Kaneohe plants will be converted to pre-treatment and pumping of wastewater to the Kailua WWTP for secondary treatment.

About 15 percent of the population in the Kahaluu subdistrict use cesspools. No new cesspool permits are being issued by the Department of Health and new residents are required to build septic tanks and/or leaching fields for treatment of sewage in the absence of a municipal WWTP.²⁷

Koolauloa. This district includes Kaaawa, Hauula-Punaluu, Laie, Kahuku, Kuilima and Pupukea-Sunset Beach. Although there are ten treatment plants in the area, only one, the Kahuku WWTP, is publicly owned. This plant has a secondary treatment design capacity of 0.2 mgd and treats an average flow of 0.13 mgd. The capacity of the Kahuku WWTP will be doubled to 0.4 mgd with the soon-to-be completed expansion project. However, most of Koolauloa is serviced by cesspools and the area is not connected to major sewage lines. Most future residents will have to rely on septic tanks for treatment of their sewage or be serviced by privately operated treatment plants.

²⁶ Ibid.

²⁷ Ibid.

North Shore. Most households in this district are served by cesspools and private sewage treatment plants. Only 1,000 households are served by a municipal WWTP. The Paalaa Kai WWTP, constructed in 1980, was designed as a temporary plant and uses expensive injection well technology. This plant has a secondary design capacity of 0.144 mgd and treats an average daily flow of 0.096 mgd.²⁸ A central plant at Mokuleia and a future ocean outfall disposal system are proposed. The present system would require expansion if the area is to accommodate residential growth.

Waianae. The use of cesspools is the principal means of sewage disposal. The present capacity of the WWTP is 5.2 mgd with average daily flows of 2.9 mgd. The existing capacity is adequate to handle existing and projected flows to 2010.

Parks and Recreation

The desire for more parks, open space, and beach access is a continuing island-wide issue. Demand will continue to grow as the population increases.

The State Recreation Plan shows a high need for coastal, facility-based and trail system recreation facilities. There is a medium need for action for camping, picnicking and beach-related activities such as swimming, sunbathing, diving and surfing. A high need for action is projected for field games, playground equipment, pool swimming, tennis, picnicking, walking, jogging and bicycling.

Increased competition for beach recreational resources is evident on Oahu. In addition, as more areas become developed, there will be a growing need for beach access.

Schools

School facilities will need to be expanded in areas where there has been high residential growth. For example, for the 1990 school year at Mililani-Uka Elementary, nine classrooms have been added to accommodate growing enrollment in the general area and to handle students from Kipapa Elementary whose homes now fall in the Mililani-Uka attendance area. Eight classrooms were added at Ewa Elementary to accommodate growth from the West Loch area and Gentry subdivision. Eight classrooms were added at Kaleiopuu Elementary, Kamaile Elementary and Sunset Beach Elementary Schools to accommodate enrollment growth in Village Park, Waianae and Sunset Beach.²⁹

²⁸ Ibid.

²⁹ Sunday Star-Bulletin & Advertiser, "Public Schools Will Reopen Tuesday," September 2, 1990.

In the Central Oahu school district, enrollment is projected to increase by 1,951 students by 1995 due to the large number of students at the elementary grade levels and proposed residential developments. In anticipation of increased enrollment in the Mililani area, an elementary school is being planned to service the Mililani Mauka development.

Public school enrollment in the Leeward district is expected to increase by an average of 600 students per year for the next six years. The Department of Education estimates that a substantial increase in enrollment will become apparent in 1991 when the Kapolei Villages, Ewa Gentry and Royal Kunia developments will be delivering large numbers of units. In order to accommodate the increases, new schools are planned for the Kapolei and Ewa Gentry areas.

The enrollment outlook for the Windward District over the next six years shows slight enrollment increases. The Honolulu District is projected to continue losing students over the next six years.³⁰

Statewide, the Department of Education is currently facing a shortage of over 500 classrooms. Rapid enrollment growth and the continued approval of new residential developments make it difficult for the Department to get up to par. The Department will need to build approximately 19 new schools by 1997. Additional residential developments will severely tax its resources.

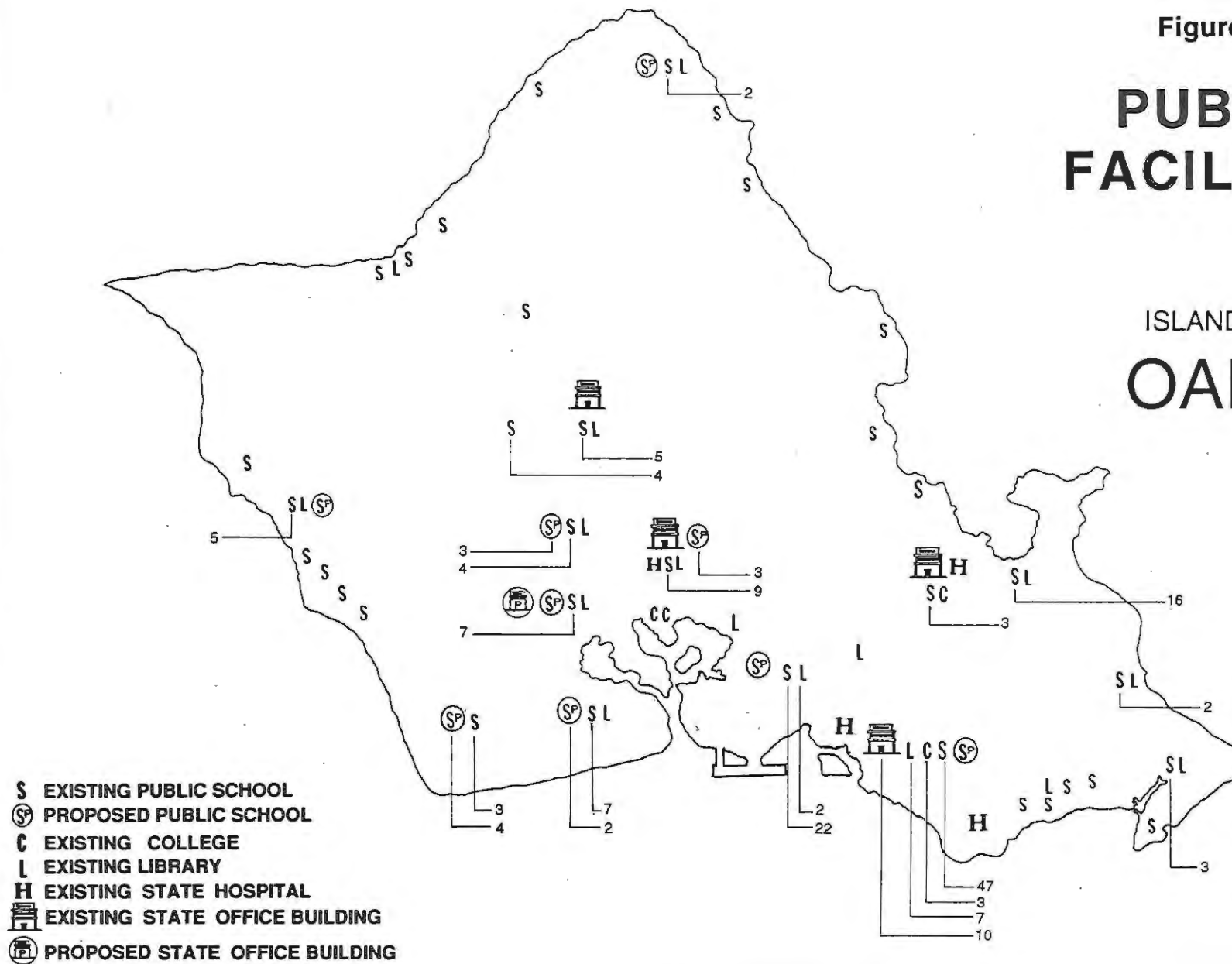
Civil Defense

According to civil defense agencies, more warning sirens, shelters and transportation network analyses are needed to accommodate new urban developments. Sheltering facilities in Leeward and Central Oahu are already at capacity. Additionally, the constraint of the adequacy and distribution of electrical power generation systems and back-up power generation systems for proposed urban developments is a concern for normal and disaster conditions.

Aside from the natural hazards of steep slopes, areas prone to tsunamis, erosion and flooding/flash flooding, earthquakes and subsidence, another item requiring consideration is the triple threat of storm waves, high winds and heavy rainfall associated with tropical cyclones/hurricanes. The island of Oahu with its steep terrain, short coastal plains, and deep valleys is at risk from winds being amplified by the sloping topography and deep valleys, flash flooding and debris/mud slides resulting from slope instability and soil movement problems.

³⁰ Department of Education, Enrollment Projections of the Public Schools in Hawaii, 1990-1995, May 1990.

PUBLIC FACILITIES

ISLAND OF
OAHU

Urban Land Use Issues

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

Infrastructure was covered in the section on Infrastructure Capacities and Constraints. However, traffic and sewerage facilities are major concerns on Oahu.

Urbanization will also impact Oahu's sugar and pineapple industries. Increasing urbanization in Ewa and Central Oahu has reduced Oahu Sugar Company's acreage and it is not able to compensate for lost fields by the planting of new fields. The sugar company leases all of the land it cultivates. These leases will expire in 1995 and 1996. Lease renewals will determine the continued existence of the sugar company. However, the State of Hawaii is now a major landowner in Ewa. Given the difficulties faced by the sugar industry, State ownership can allow the necessary use of portions of its land for agriculture to insure that Oahu Sugar Company is not faced with premature loss of lands used for cultivation. At the same time, State ownership provides the control necessary for landbanking to insure the provisions of more affordable housing.

Waialua Sugar Company potentially faces the same urbanization pressures as Oahu Sugar Company. Diversified agricultural operations are also affected by increasing demands for urban land. Diversified agriculture farmers may find land prices high and find it difficult to obtain long-term leases when land is being held in anticipation of future urban development.

Affordable housing continues to be a pressing problem. Statewide, it has been estimated that 64,000 units would be needed by low and moderate income families by 2000.³¹

There are also private developer proposals for developments in rural Oahu including Mokuleia, Haleiwa, Sunset Beach and Waianae. Infrastructure is not adequate to handle growth in these areas. Residents' concerns include whether such developments are consistent with policies that designate these areas as rural and the impact of the proposed developments on their communities and lifestyle.

³¹ Housing Finance and Development Corporation, State Housing Functional Plan, 1991.

Approximately 40 golf courses have been proposed, planned or are under construction on Oahu.³² Potential environmental impacts from golf courses may include: competition for water availability; ground and surface water contamination from fertilizer and pesticide runoff; erosion; impacts on groundwater recharge; loss of public access; and damage and loss of wildlife habitat. Cultural and social impacts may include: damage and loss of historic and archaeological sites; development of higher cost large lot estates; disruption of rural lifestyles; and effect on local property taxes. The needs and benefits of golf course development need to be weighed against environmental, cultural and social impacts.

Oahu's scenic, open space and coastal resources are also affected by urbanization pressures as evidenced by controversies over proposed developments at Sandy Beach, Queen's Beach and Mokuleia. In addition, Oahu residents have called for the protection of scenic areas, such as Olomana and the Kaiwa ridge line in Lanikai from residential and other uses.

Analysis of Urban Lands

Urban growth is directed to Ewa and Central Oahu. The State supports the concept of developing a second city in Ewa to direct growth in a comprehensive and coordinated manner. The Ewa Plain is a logical priority for a secondary urban center based on the qualities of proximity to urban Honolulu, major employment bases in the surrounding area, subterranean cap rock which prevents pure groundwater supplies from becoming contaminated and marginal agricultural lands in the westerly and makai areas.

Ewa's large areas of marginal agricultural lands to the west and in the makai direction also provide necessary lands for urbanization. However, some of the State-owned Ewa lands may be needed to support the viability of Oahu Sugar Company.

Lands east of Waikele Gulch toward H-2 Freeway excluding lands in the vicinity of Waikele Gulch and Waiahole Ditch are less valuable for agriculture and, therefore, provide opportunities for urbanization. In addition, several projects including Mililani, Mililani Mauka and Gentry Waiawa have already been permitted. Special conditions have been attached to protect groundwater resources and to ensure that existing infrastructure including roadway transportation and sewerage systems can accommodate expected demand.

While the logical first priority for directed growth should be the Ewa secondary urban center region, development of land east of Waikele Gulch toward the Koolau mountain range excluding lands in the vicinity

³² Office of State Planning, State of Hawaii, Golf Course Development in Hawaii: Impacts and Policy Recommendations, January 1992.

of Waikele Gulch and Waiahole Ditch should concurrently be allowed if the State concerns of affordable housing, agricultural and open space preservation and minimizing public infrastructure costs can be met.

Lands below Waiahole Ditch and on the Waianae side of Waikele Gulch should remain in Agriculture. In addition, the pineapple lands of Kunia and the fertile lands directly north of Wahiawa on the Mokuleia side of the North Shore district shall be maintained in Agriculture.

Urbanization shall first be directed to fallow lands adjacent to existing Urban District lands in Ewa and Central Oahu. Further urbanization is directed to the Ewa Plains to infill lands not already in the Urban District. Completion of the Mililani Mauka development is also recommended.

Specific areas recommended for Urban reclassification are Agricultural District lands in Ewa, Makaiwa Hills, an infill area in Makakilo and expansion of the Gentry Waiawa project.

While there is a need for urban land in Koolaupoko to meet population allocations for 2000, expansion of the Urban District is not recommended because of impacts on conservation and agricultural resources. Similarly, while small amounts of urban land appear to be needed in the Primary Urban Center, East Honolulu and Waianae, urbanization is not recommended for these areas and is directed to Ewa and Central Oahu. There does not appear to be a need for urban lands in Koolauloa, the North Shore and Waianae. These areas should remain predominately rural, low-density areas.

IX. AGRICULTURAL DISTRICT

Existing Land Uses

The major agricultural areas on Oahu are in the Central Oahu, Ewa, Koolauloa, North Shore and Waianae planning areas. Agriculture is also present in the East Honolulu and Koolaupoko areas.

Sugar and pineapple are the major crops. Oahu has less land in sugarcane than the other Counties (23,800 acres). The major plantations are Oahu Sugar Company, whose acreage is located in the Ewa and Central Oahu districts (11,750 acres cultivated) and Waialua Sugar Company, which has lands located in the North Shore district (12,050 acres cultivated).³³

There are 13,000 acres of land in pineapple. Dole Pineapple has approximately 7,300 acres in the Central Oahu, Ewa and North Shore districts and Del Monte has approximately 5,700 acres in Central Oahu.³⁴

Excluding beef, cattle and macadamia nuts, there are approximately 2,700 acres in diversified agriculture on Oahu, according to the Department of Agriculture. Other agricultural industries on Oahu include aquaculture (403 acres), beef and cattle (80 operators), orchids (2.0 million square feet which represents approximately 64 percent of the State's total land in orchids), and nursery products.³⁵

Agricultural Land Requirements

Lands rated A and B by the Land Study Bureau are located in the fertile central plain between the Waianae and Koolau mountain ranges; along the coastline and in valleys in the North Shore, Koolauloa and Koolaupoko planning areas; in Kaneohe and Waimanalo; in East Honolulu, in Lualualei and flatter areas along the coast at Makaha.

The Land Evaluation and Site Assessment Commission (LESAC) in 1986 developed a rating system to identify important agricultural land. This rating system was based upon a composite of five soil rating systems (LE) and site assessment (SA) factors which expressed the relative quality of a site or area based upon its non-physical characteristics or attributes. The LESAC further projected that approximately 60,077 acres (including a contingency figure of approximately 4.03 percent) will be required for Oahu to meet desired agricultural production goals.

³³ Deloitte and Touche, Agricultural Resources Study, 1991.

³⁴ Ibid.

³⁵ Ibid.

Table 11. AGRICULTURAL PRODUCTION ACREAGE REQUIREMENTS
FOR OAHU, 1983 (Actual) 1990 and 1995

	<u>1983</u>	<u>1990</u>	<u>1995</u>
Acreage required	63,200	55,900	57,600
w/ contingency		58,153	60,077

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

Agricultural Land Use Issues

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

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

The following is a summary of the survey results.

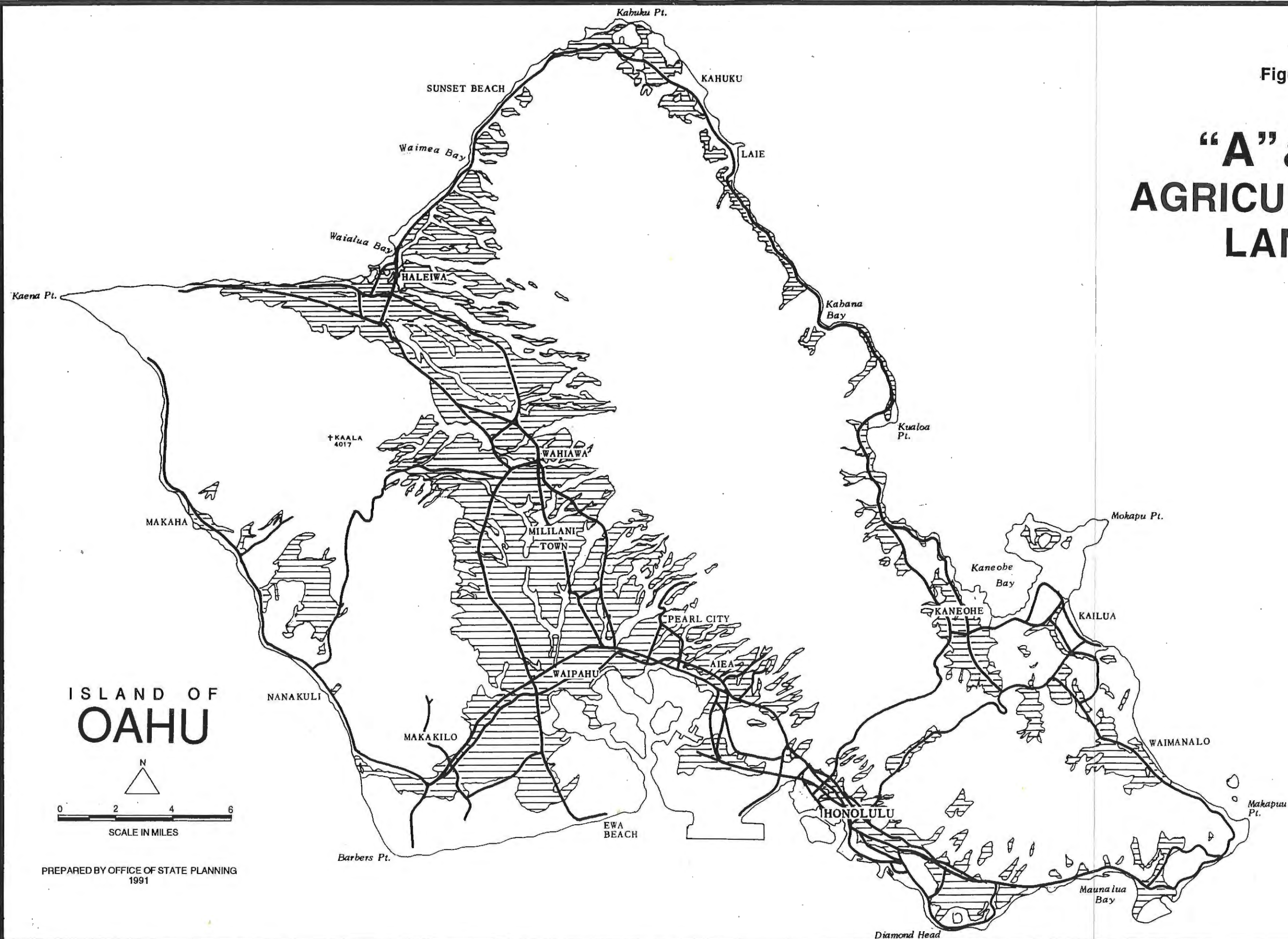
Factors limiting the success of agriculture on Oahu overall include the cost and availability of land, capital, and labor; obtaining long-term leases; and the cost of materials, supplies, and insurance. Despite the continuing urbanization of the island, neither conflicting adjacent land use nor the cost of leases is a major issue. In the future, these should become more of an issue due to the increasing urbanization.

Since the value of land has been increasing significantly in the past few years, many landowners do not want to give long-term leases. One nursery operator indicated that his lease was being terminated after 25 years of being subject to a month-to-month lease. The papaya growers report that farm lease costs are almost double that of Hawaii County and land clearing and replanting costs are almost three times as much.

The development of agricultural parks is an important issue that must be given consideration for the future of Oahu's diversified agriculture. The Kahuku (which is on former sugarcane land), Waianae, and Waimanalo (Phase II) agricultural parks were in various stages of completion at the end of 1989. However, development of agricultural parks has been hampered by excessive costs. One such cost arises from a regulation that requires an agricultural park to be subject to the same County standards used for residential subdivisions. The parks located in Kahuku and Waiahole have included papaya in their plans.

Figure 5

"A" & "B" AGRICULTURAL LANDS



Oahu Sugar Company. Oahu Sugar Company first milled sugar in 1899. It is a subsidiary of Amfac, located in Leeward Oahu and is the State's third largest sugar producer. In 1990, the company cultivated 11,750 acres, almost 18 percent lower than 1985.

Due to good agronomic practices, favorable growing conditions, and drip irrigation, sugar yields at Oahu Sugar Company are very high. The company holds the world record of sugar yield at 21.63 tons per acre set in April 1985. Despite its relatively high yields and efficiently run operations, Oahu Sugar Company is only marginally profitable. The principal problems are low sugar prices and relatively high lease rent.

Oahu Sugar Company leases all of the land it cultivates. Lands still under the control of a major estate and leased to Oahu Sugar Company include:

- Campbell Estate lands in Ewa and fields near Ewa Beach,
- Campbell Estate lands in Central Oahu, and
- Some northern fields on Robinson Estate lands.³⁶

The leases will be expiring in 1995 and 1996 requiring Oahu Sugar Company to potentially bid for these lands against developers and diversified agricultural growers. This future uncertainty has affected Oahu Sugar Company's long-term investments in operations.

Oahu Sugar Company also leases lands from the U.S. Navy (Waipio Peninsula and a portion of the eastern Ewa Plain). Navy regulations require that lands be leased according to competitive bidding. This is a crucial property for the plantation because it includes water.

The State of Hawaii recently acquired 1,100 acres in Ewa from Campbell Estate which are currently under cultivation by Oahu Sugar Company. The lease on these lands expires in 1995. The State intends to extend the lease.

Oahu Sugar Company has been reported to have identified 8,000 acres as the minimum acreage that the plantation needs to remain viable.³⁷

The viability of Oahu Sugar Company is of critical concern to the State of Hawaii. The demise of Oahu Sugar Company would have a domino effect on the rest of the sugar industry in Hawaii. It would critically affect the viability of Waialua Sugar since the two companies share some costs, e.g., wharfage fees.

³⁶ Deloitte and Touche, Agricultural Resources Study, 1991.

³⁷ Ibid.

Waialua Sugar Company. A subsidiary of Castle & Cooke, Inc., Waialua Sugar Company first milled sugar in 1883. Sugar yields have been relatively high for this plantation. In 1990, Waialua Sugar Company cultivated 12,050 acres, six percent lower than in 1985.

Although sugar will continue to be its main crop, Waialua Sugar Company has explored alternative uses for its acreage. They have investigated the potential of growing marine shrimp and have provided lands for a taro operation.

Waialua Sugar Company has indicated plans to install a drip irrigation system as their only major capital improvement in the near future.

There are currently 63 fee acres under cultivation. There are no idle fee or leased acres. The 11,987 leased acres under cultivation are leased from the following lessors:

- 6,123 acres from Castle & Cooke with no specified lease termination date,
- 5,593 acres leased from Bishop Estate with a year 2000 lease termination date, and
- 271 other acres with various lease termination dates.³⁸

The maximum acreage that could be economically cultivated was identified as 15,000 acres. The minimum acreage necessary for economic viability was identified as 12,000 acres.³⁹

The bypass highway that is being constructed in Haleiwa parallel to Kamehameha Highway is expected to remove some sugarcane acreage.

Pineapple Industry. Pineapple remains the State's second most important agricultural industry after sugar. Cultivation began on Oahu in 1900 and by 1940, the pineapple industry grew to become Hawaii's second largest cash crop supplying 80 percent of the world's market.

In the last two decades, pineapple's presence in Hawaii has diminished sharply. Statewide, there were 62,400 acres in pineapple production in 1969 compared to 30,900 acres in 1990. On Oahu, there are approximately 12,000 acres in pineapple production. Dole Pineapple has approximately 7,300 acres in the Central Oahu, Ewa, and North Shore areas and PPI Del Monte has approximately 7,480 acres of leased land in Central Oahu, 4,200 acres of which are used for actual planting.

³⁸ Deloitte and Touche, Agricultural Resources Study, 1991.

³⁹ Ibid.

One of the main issues facing Oahu's pineapple industry is development pressure, especially in the Central Oahu region. In Wahiawa, for example, PPI Del Monte is expected to withdraw fields from production to allow for residential uses on lands it leases from Galbraith Estate. The continued loss of cultivated lands to urbanization may soon adversely affect pineapple operations since current acreages are considered to be the minimum amount needed for economic viability.⁴⁰

The indirect effects of urbanization are also issues for pineapple growers and the agricultural industry in general. Residential developments near agricultural fields lead to complaints from residents about noise, odors, dust, etc., despite provisions of the Hawaii Right to Farm Act (Chapter 165, Hawaii Revised Statutes).⁴¹

Placing conditions on reclassifications from the Agricultural District to the Urban District is one means of maintaining the health of the pineapple industry while accommodating the need for urban lands. Condition 9 in the Mililani Town, Inc., Land Use Commission Decision and Order, for example, states that "Petitioner will ensure that there will be no loss of pineapple production as a result of the proposed development."⁴² Another condition imposed by the Land Use Commission limits the circumstances under which pre-existing farming activities may be deemed a nuisance. This condition, relating to the Hawaii Right to Farm Act, places the burden of mitigating actions on the owners of the neighboring property, not the farm business.

While it is true that urbanization pressures are less severe on the Neighbor Islands, there is a need to keep the pineapple industry viable on Oahu. For logistical reasons, there is a benefit in Oahu remaining the State's major supplier of fresh fruits since the Neighbor Islands have limited direct air freight and surface shipment capacity. If the fresh fruits originated on a Neighbor Island and required transshipment through Honolulu, the fruits' shelf life would be reduced.⁴³

Depending on the future of Oahu Sugar Company and Waialua Sugar Company, additional lands could become available for pineapple.

⁴⁰ Rohrbach, et al, Pineapple Industry Analysis, No. 6, May 29, 1991.

⁴¹ Department of Agriculture, letter to Councilmember Rene Mansho from Paul J. Schwind, Ph.D., March 14, 1991.

⁴² Land Use Commission Decision and Order, A87-609, Mililani Town, Inc., Increment 1, May 17, 1988.

⁴³ Rohrbach, et al, Pineapple Industry Analysis, No. 6, May 29, 1991.

Increased foreign competition is another major issue facing Hawaii's pineapple industry. The Philippines, Thailand and Central America give Hawaii its greatest competition. Presently, however, Hawaii dominates the West Coast fresh fruit market. In other parts of the country, there is major competition from Central America.

Foreign competition also hurts Hawaii's pineapple industry by eliminating jobs in this State. Dole recently announced that it will lay off 90 workers in October and November of 1992 and an additional 150 workers in April 1993 because of plans to move some of their operations to Thailand where labor costs are much lower.⁴⁴ Ratification of the North American Free Trade Agreement by the United States, Canada, and Mexico is seen as a further threat to both the pineapple and sugar industries in Hawaii. The Agreement would remove various trade barriers, leading to the possibility of American businesses migrating to Mexico.

Water availability is also a problem facing the pineapple industry on Oahu. For the foreseeable future at least, additional groundwater resources are not expected to be allocated to agricultural uses in the Central Oahu/North Shore area.

Other issues relating to pineapple include labor cost/availability and declining productivity.

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 viability of Oahu Sugar Company must be maintained. Land use changes to accommodate population growth and economic development should be directed away from those lands which are critical to the company's survival.

⁴⁴ Honolulu Star-Bulletin, "Union workers prepare for life after Dole," August 17, 1992.

The Department of Agriculture has indicated that its highest priority for retaining agricultural land is the area below Waiahole Ditch and on the Waianae side of Waikele Gulch because it has large, uninterrupted, continuous fields and inexpensive irrigation water available from Waiahole Ditch. This area also provides a significant open space area with good view planes from Kamehameha Highway west to the Waianae mountains.

Land east of Waikele Gulch toward H-2 Freeway excluding lands in the vicinity of Waikele Gulch and Waiahole Ditch are less valuable for agriculture and, therefore, provide opportunities for urbanization.

While the State supports urban development in Ewa, some of the State-owned lands in Ewa may be used to provide support to Oahu Sugar Company as well as for future urban uses.

The State supports maintaining the current acreage of Waialua Sugar Company in the Agricultural District. The fertile, irrigated lands directly north of Wahiawa on the Mokuleia side of the North Shore district should be protected in the Agricultural District. It also supports maintaining the Kunia pineapple lands in the Agricultural District. Agricultural land should also be maintained in the North Shore, Koolauloa, Koolaupoko and Waianae for truck farming, flower growing, aquaculture, livestock production and other types of diversified agriculture.

With 137,667 acres in the Agricultural District and only 60,077 acres required to meet agricultural production goals, it appears that there is more than enough land to meet agricultural production requirements. In the event that Oahu Sugar Company is no longer able to operate and its closing has an adverse impact on Waialua Sugar Company, large acreages of sugar land will become available for other uses--agricultural or urban. It does not seem likely that diversified agriculture would be able to utilize a substantial portion of the available acreage. However, only approximately 3,700 acres of additional urban land are required to accommodate urban uses to 2000 on Oahu. The remaining lands, those not needed to meet agricultural production goals or urban needs, have value as open space.

As long ago as 1972, the Overview Corporation which developed an open space plan for Hawaii noted:

"Open space provides 'psychic relief' from the congested, noise-ridden, intense living experience of heavily developed urban areas. Readily accessible open space is an essential element of a well balanced urban life style. It plays a vital function in creating a total environment which attempts to maximize quality of life. Yet the urban areas with the greatest need for open space are the ones most threatened by its loss through the urbanization of agricultural land."⁴⁵

⁴⁵ Overview Corporation, Washington, D.C., State of Hawaii Comprehensive Open Space Plan, 1972.

Important agricultural lands should remain in the Agricultural District unless overriding public interest dictates otherwise. These lands should be maintained to support the sugarcane and pineapple industries and diversified agriculture. They should also be protected as a resource in their own right. Finally, lands should be retained in the Agricultural District to provide open space, greenbelts and a buffer between urbanized communities.

X. CONSERVATION DISTRICT

Watersheds

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

The Koolau and Waianae mountain ranges are watershed or water recharge areas for the island of Oahu. The leeward side of the Koolau range is subject to increasing development pressures and was selected as a high priority area for review by the Department of Land and Natural Resources, Office of State Planning and University of Hawaii Water Resources Research Center. While the windward side of the Koolau range is also subject to development pressures, it is a much more complicated water and land resource system and a review of this area was not feasible within the time frame of this project.

A review and evaluation of the makai boundaries of the Conservation District on the leeward Koolaus was made with the objective of ascertaining whether an expansion of the boundaries would significantly benefit and protect the water resources of southern Oahu.

It is a common assumption that forested terrains in Hawaii are the most efficient converter of rainfall to groundwater infiltration, and this assumption has yet to be proven false. It is a matter of necessity, therefore, to retain as much of the high rainfall-forested area in its natural state as possible and to augment it with areas capable of being returned to a forested state.⁴⁶

The present route of the Conservation District through the leeward mountains of Oahu approximately parallels the trace of the Koolau crest, but in certain places sharp inland indentations eliminate appreciable areas from benefitting groundwater recharge and moderating direct surface runoff. These areas have been given special attention. Of particular importance, however, are valley sides and bottoms which are premier water catchments. Where possible and within reason, the boundary line in the valleys was pushed seaward to preserve the fragile terrain from disruption, thereby adding to the water retention potential of the Conservation District.

⁴⁶ University of Hawaii, Water Resources Research Center, Watershed and Water Recharge Area Study, Draft, 1991.

As a general statement, the mountain region inland of the existing Conservation District boundary in Leeward Oahu incorporates the most productive water production and retention terrain on the island. The current boundary roughly follows the 50 to 60 inch average annual isohyet and was drawn to isolate the high rainfall interior from the deprecations of agriculture and urbanization.

The boundary changes proposed for the leeward Koolau mountains are based solely on hydrological considerations. The study confirmed the overall hydrological validity of the existing Conservation District boundaries in the leeward Koolau mountains and recommends the seaward expansion of the lines in some areas to enhance opportunities for recharge.⁴⁷

In the region stretching from Red Hill (the western boundary of the Honolulu District) to Kawaihoa in Waialua, a total of 18 areas are proposed for expansion seaward of the existing conservation zone boundary. Most of the expansion consists of extension downstream of valley sides and bottoms. The proposals add approximately seven square miles to the conservation zone, all of it in undeveloped land. Areas of potential hydrologic value which are, or recently have been, or are likely to be used for agriculture or recreation were given little consideration. These areas normally are ridge facets between the valleys.⁴⁸

The largest new acreage proposed for conservation is in the Waiawa drainage basin between valley bottom elevations of 220 and 840 feet. A total of 2,135 acres of valley and ridge were identified. Average annual rainfall ranges from 50 to 100 inches.

Close by is the second largest proposed area, Kipapa, encompassing 833 acres. Both areas are in the groundwater recharge environment critical to the sustainable yield of southern Oahu.

Other areas proposed are mapped in the Recommendation section.

Forest Reserves

Oahu has approximately 28,626 acres within the State Forest Reserve System managed by the Department of Land and Natural Resources. These areas provide important benefits such as enhancing and protecting watersheds, providing habitats for rare and endangered species, protecting native forests, increasing recreational opportunities and allowing forestry uses. All of the forest reserves on Oahu are in the Conservation District.

⁴⁷ Ibid.

⁴⁸ Ibid.

Public and Private Protected Natural Areas

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

Natural Area Reserves and Marine Life Conservation Districts. Natural Area Reserve System (NARS) sites are areas which the Board of Land and Natural Resources designates as having unique natural resources and manages and regulates use to assure their protection. There are three Natural Area Reserves on Oahu. These are the Pahole NAR which contains rare, dry and mesic forests; the Mount Kaala NAR which contains eight natural communities that include many rare plants; and the Kaena Point NAR which contains three coastal native communities. All of the existing NAR sites are in the Conservation District.

Candidate NAR sites include: 1) Upper Makaha which contains the largest, most pristine and intact stand of a diverse mesic forest community unique to Oahu; 2) Kaena NAR extension which would greatly enhance the community diversity of this reserve and lend protection to rare coastal communities; 3) Kuaokala located in the drier sections of the northwest Waianae mountains and contains lowland, dry and mesic communities not yet present in the NARS; 4) Upper Makaleha which is similar to the adjacent Pahole NAR and provides an important duplicate site for rare and vulnerable dryland and mesic communities; 5) Central Koolau mountains which contain examples of several wet, lowland communities characteristic of the Koolau mountains and not protected elsewhere; and 6) Makua Kaau candidate NAR which contains a unique Waianae endemic loulu palm forest and intact surrounding ohia mesic forest.

The boundaries of the candidate NAR sites have not been delineated. However, the Upper Makaha, Makua Keaau and Upper Makaleha candidate NAR sites appear to be within the Conservation District since they are upper elevation areas surrounded by Conservation District land. The Kaena candidate NAR extension, the Kuaokala candidate NAR extension, and the Central Koolau candidate NAR appear to have some portions of the proposed sites in the Agricultural District. However, no recommendations have been made regarding these sites because of a lack of information regarding the candidate NAR boundaries.

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

U.S. Fish and Wildlife Refuges and Nature Conservancy Preserves.

There are four U.S. Fish and Wildlife Service Refuges on Oahu--the James Campbell National Wildlife Refuge (Kii and Punamano units) and the Pearl Harbor National Wildlife Refuge (Honouliuli and Waiawa units). All four provide habitat for endangered Hawaiian waterbirds. The James Campbell Wildlife Refuge is in the Agricultural District and is recommended for inclusion in the Conservation District. The Pearl Harbor National Wildlife Refuge, Waiawa unit, is in the Urban District and is recommended for inclusion in the Conservation District. The Honouliuli unit is already in the Conservation District.

The Nature Conservancy of Hawaii's Honouliuli Preserve is home to more than 45 rare plant and animal species and contains some of the last remaining habitat on Oahu for native forest birds.

The Ihihilauakea Preserve located above Hanauma Bay is a cooperative effort by The Nature Conservancy of Hawaii, the Hawaiian Botanical Society and the City and County of Honolulu to protect a one-of-a-kind vernal pool and rare fern.

Both of these preserves are in the Conservation District.

Native Ecosystems and Rare Species

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

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









Approximately 75 percent of species extinctions recorded in the United States has occurred in Hawaii. As of May 1991, 25 percent of all plants and birds on the endangered species list in the United States is 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 attached maps show the locations of rare species as identified by the Heritage Program of The Nature Conservancy of Hawaii. Information regarding the location of rare and endangered species has been provided by The Nature Conservancy's Hawaii Heritage Program (HHP). The data points on the workshop maps distinguish between older, often historical information (pre-1960), and more recent observations (1960-1990).

The HHP database 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,

Figure 6

FEDERAL, STATE AND PRIVATE RESERVES REFUGES AND PRESERVES

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

FOREST RESERVES

- | | |
|----------------------------------|----|
| Pupukea - Paumalu Forest Reserve | 1 |
| Kaipapau Forest Reserve | 2 |
| Kauokala Forest Reserve | 3 |
| Mokuleia Forest Reserve | 4 |
| Ewa Forest Reserve | 5 |
| Makua Keau Forest Reserve | 6 |
| Waianae Kai Forest Reserve | 7 |
| Waiahole Forest Reserve | 8 |
| Iolekaa Forest Reserve | 9 |
| Honolulu Forest Reserve | 10 |
| Kuliouou Forest Reserve | 11 |
| Waahila Ridge Forest Reserve | 12 |

NATURAL AREA RESERVES

- | | |
|----------------------------------|----|
| Kaena Point Natural Area Reserve | 13 |
| Pahole Natural Area Reserve | 14 |
| Mount Kaala Natural Area Reserve | 15 |

THE NATURE CONSERVANCY PRESERVES

- | | |
|-----------------------|------------|
| Honouliuli Preserve | 16 |
| Ihiihilaueka Preserve | Not Mapped |

WILDLIFE REFUGES

- | | |
|---------------------------------------|----|
| Punamano Wildlife Refuge | 17 |
| Kii Wildlife Refuge | 18 |
| Pearl Harbor National Wildlife Refuge | 19 |

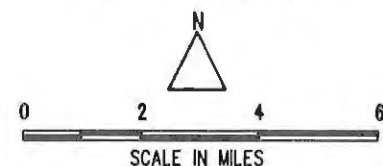
WILDLIFE SANCTUARIES

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|--|----|
| Kihewamoku Island State Seabird Sanctuary | 20 |
| Pulemoku Rock State Seabird Sanctuary | 21 |
| Kukuihoulua Island State Seabird Sanctuary | 22 |
| Mokualai Island State Seabird Sanctuary | 23 |
| Mokulua Island State Seabird Sanctuary | 24 |
| Manana Island State Seabird Sanctuary | 25 |
| Mokuauia Island State Seabird Sanctuary | 26 |
| Mokumanu Island State Seabird Sanctuary | 27 |
| Kekepa Island State Seabird Sanctuary | 28 |
| Mokolea Rock State Seabird Sanctuary | 29 |
| Poipoa Island State Seabird Sanctuary | 30 |
| Kaohikaipu Island State Seabird Sanctuary | 31 |
| Paiko Lagoon Wildlife Sanctuary | 32 |

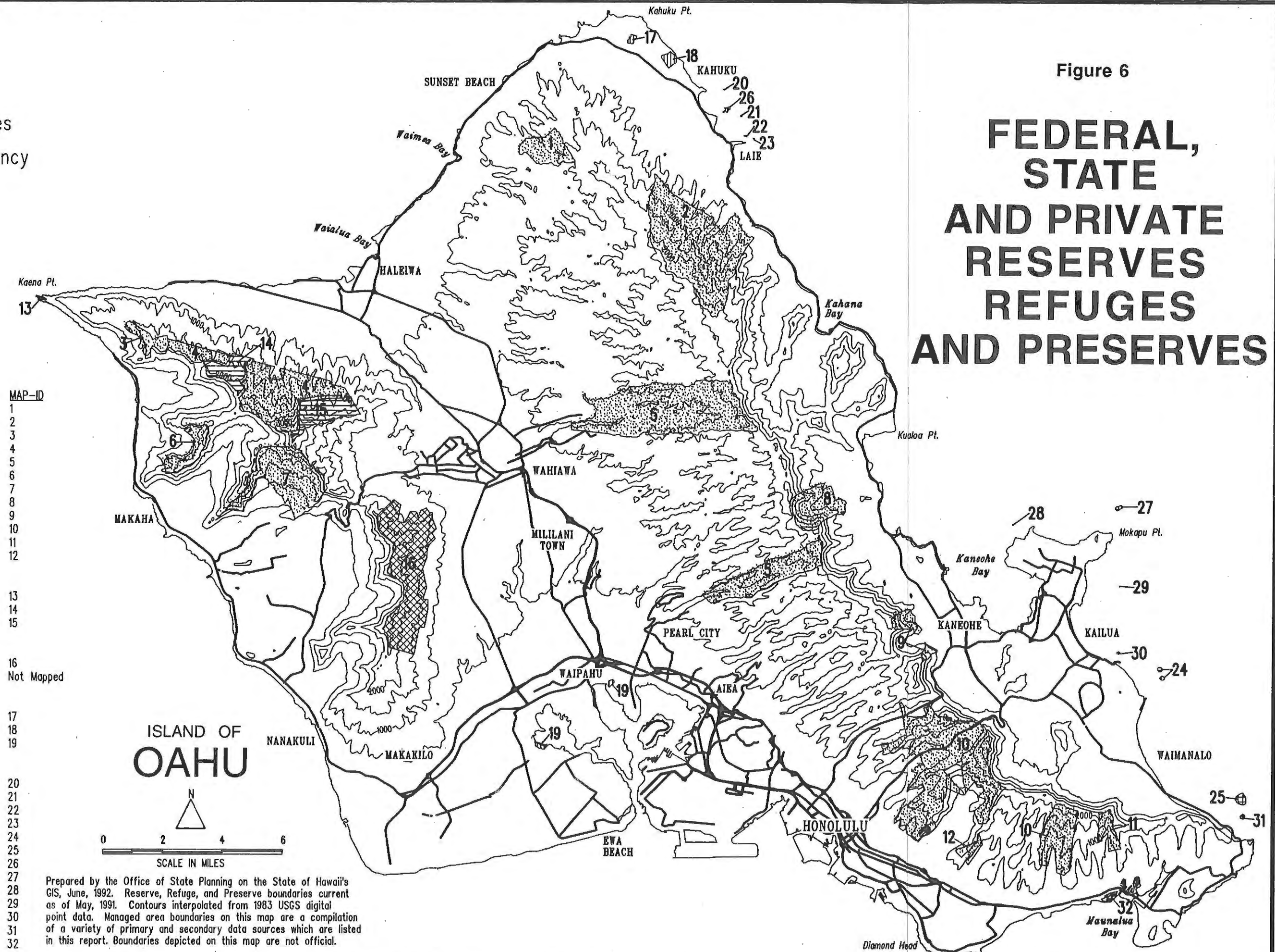
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ISLAND OF
OAHU



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.



and new plants and animals are still being discovered. Hence, the database information provided here should never be regarded as final statements about the resources present, or substituted for on-site surveys required for environmental assessments. Data provided by HHP do not represent a position taken by The Nature Conservancy of Hawaii.

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

The managed area boundaries, specifically those of the State FR's, NAR's, and MLCD's are still preliminary in nature. These boundaries were drafted from digital information from the USGS and a variety of base maps with varying scales. Assistance was provided by staff from the Division of Forestry and Wildlife (DOFAW) of the Department of Land and Natural Resources, on each island. Further consultation is needed before these boundaries can be finalized.

In addition, 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 these resources. The findings of these workshops are presented in the Proceedings of the Native Ecosystems and Rare Species Workshops, 1991.

In the Proceedings, 24 sites believed to contain significant biological resources were identified outside of the Conservation District on the island of Oahu. 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.

A majority of the sites identified on Oahu were in the lowlands. These include wetlands, the lower reaches of streams, and areas of coastal vegetation. Kaena Point has native coastal vegetation and some of the best dry forest and shrub lands left on Oahu. Wetlands in the area also provide habitat for endangered Hawaiian coots. The Mokuleia foothills, one of only five inland sites identified, has a high concentration of rare plants in native dry forest on the slopes and pockets of native vegetation in the gulches.

Three wetlands along the northwest coast, Crowbar Ranch, Haleiwa Lotus Fields, and Ukoa Marsh were identified as habitat for endangered Hawaiian waterbirds. Kawela Bay and the northeast coastline from Kuilima Bay to Kalani Point are foraging and resting sites for threatened green sea turtles. The northeast coastline also provides habitat for all four endangered Hawaiian waterbirds and migratory waterbirds and shorebirds at Kahuku, Laie, Hauula and Kualoa. There are a variety of native plants in the area and the Kahuku/Kalanai coast has one of the best examples of coastal strand in the State. There is also native coastal strand at Laniloa Beach on Laie Point and at Pounder's Bluff, south of Laie Beach Park.

Waikane and Waiahole Streams in the Waikane Valley on the eastern coast contain native gobies and shrimp, and there is native vegetation throughout the upper reaches of the valley. This area is also important because management of the valley affects Kaneohe Bay.

Four wetland areas around Kaneohe, at Kahaluu, Heeia, Kaneohe and Kawaiinui, were identified as habitat for endangered Hawaiian waterbirds, migratory and shorebirds, and/or native freshwater fishes and invertebrates.

Native plants and a rare natural community are found in the area around Makapuu that is outside of the current Conservation District boundary.

Waahila Ridge, east of the University of Hawaii (UH), provides easily accessible examples of native plants and is an important outdoor laboratory for UH classes of botany and zoology. Keehi Lagoon and the wetlands around Pearl Harbor provide habitat for endangered and migratory shorebirds and waterbirds.

There are a few population of endangered plants in the Barbers Point area on the southwest coast and scattered remnants of a unique raised coral ecosystem that once covered the entire region including two anchialine pools and sinkholes.

There are two small areas on the southwest slope of the Waianae mountains supporting extremely rare native species.

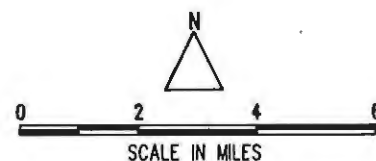
On the south slope of the Waianae mountains are three small areas supporting extremely rare native species. Lualualei contains a rare native fern in an area on Agricultural District land. Kauaopuu and Mauna Kuwale, outside of the Waianae Kai Forest Reserve, provide habitat for the only known occurrence of a rare akoko.

The sites identified in the Native Ecosystems and Rare Species Report were assessed by the Office of State Planning. In general, they fell into two categories--those that had been studied and/or surveyed or were known to contain significant biological resources and those that were suspected to contain significant biological resources but needed further work to verify these resources. Those that fell into the former category and met other criteria established for the Conservation District as discussed in this chapter, e.g., native forests, wetlands, special streams, etc., were recommended for inclusion into the Conservation District. The emphasis was on "communities" rather than individual species.

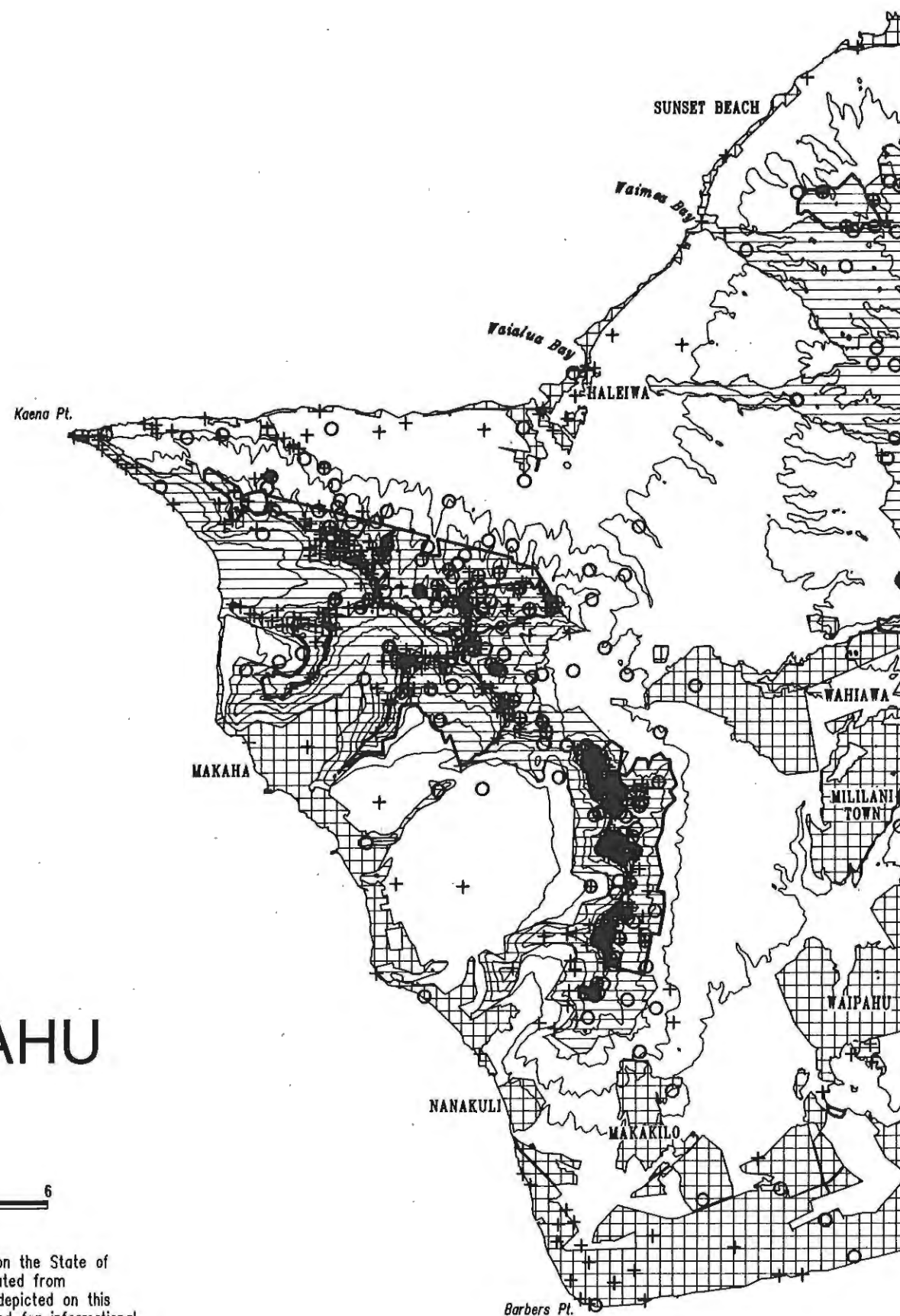
Figure 7

NATIVE ECOSYSTEMS AND RARE SPECIES

WEST OAHU











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.



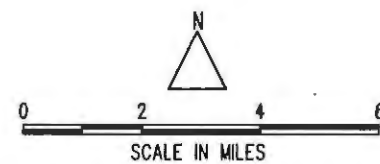
- Agricultural District
- ▨ Conservation District
- ⋯ Rural District
- ▦ Urban District
- 500 Ft. Contours
- Managed Areas
- Rare and Endangered Species (pre-1960) Hawaii Heritage Program
- + Rare and Endangered Species (post-1960) Hawaii Heritage Program

Figure 8

NATIVE ECOSYSTEMS AND RARE SPECIES

-  Agricultural District
-  Conservation District
-  Rural District
-  Urban District
-  500 Ft. Contours
-  Managed Areas
-  Rare and Endangered Species (pre-1960) Hawaii Heritage Program
-  Rare and Endangered Species (post-1960) Hawaii Heritage Program

EAST OAHU



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.

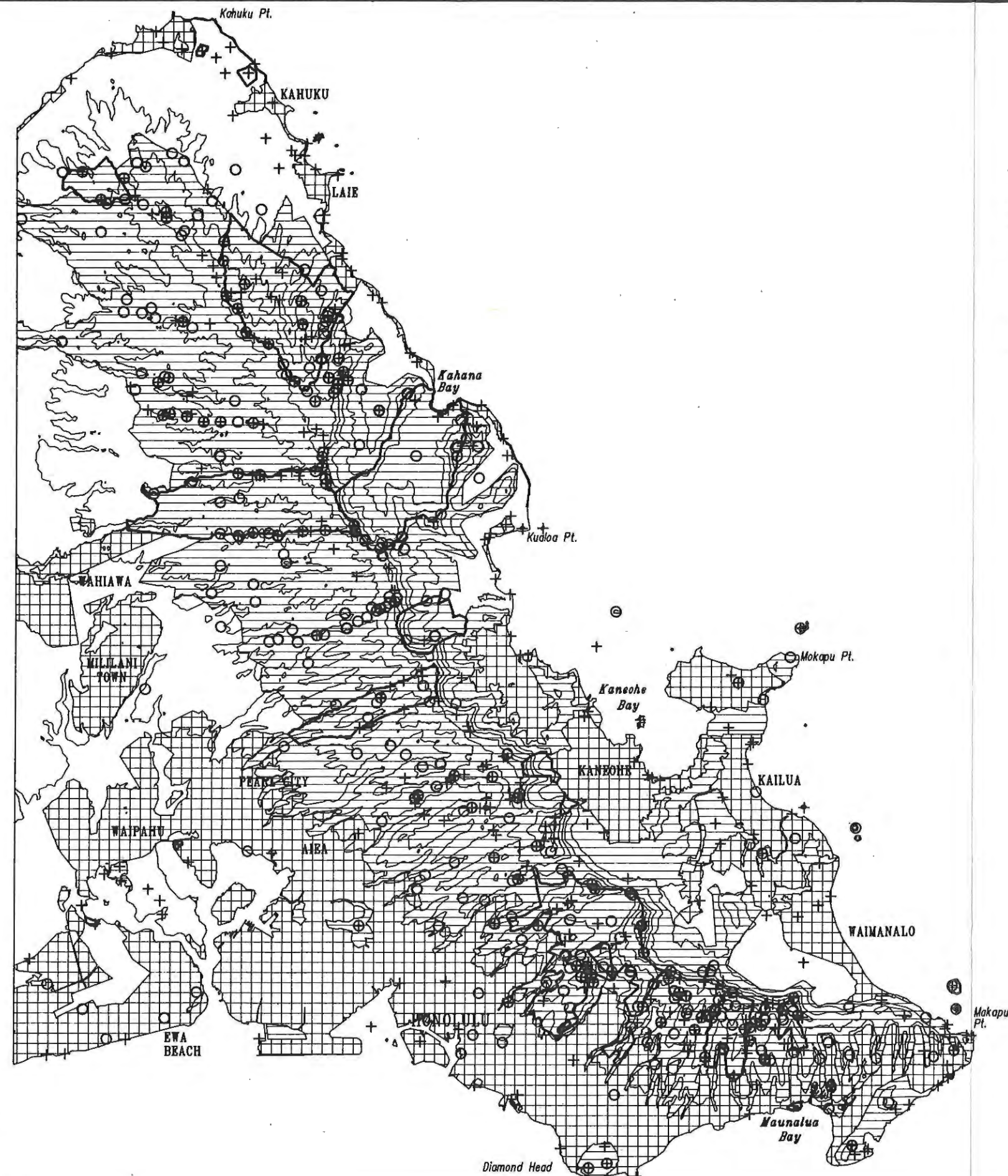


Table 12

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED
TO CONTAIN BIOLOGICAL RESOURCES
ISLAND OF OAHU

<u>Site</u>	<u>Assessment</u>	<u>Recommendation</u>
Kaena Coastline	One of the best examples of shrub lands on Oahu as well as native coastal vegetation with 11 rare plants.	Reclassify to Conservation.
Mokuleia Mauka Extension	Reported to contain dry forest which supports a high concentration of rare plants and pockets of native vegetation in gulches. Further survey work needed to verify resources but area meets other conservation criteria, e.g., steep slopes, scenic resources.	Reclassify to Conservation.
Crowbar Ranch and Wetlands	Wetland habitat for all four endangered Hawaiian waterbirds. ¹	Reclassify to Conservation.
Haleiwa Lotus Fields	Wetland habitat for endangered Hawaiian gallinules. ¹	Reclassify to Conservation.
Ukoa Marsh and Loko Ea Fishpond	Wetland habitat for all four endangered Hawaiian waterbirds. 1, 2, 3, 4	Reclassify to Conservation.
Kawela Bay	Significant foraging and resting site for threatened green sea turtle. However, area is currently surrounded by single-family dwelling units with a resort development scheduled for the eastern portion of the bay. The shoreline is already in the Conservation District. Further information needed on buffer areas to protect marine species.	No action at this time.

¹ U.S. Fish and Wildlife Service and the Department of Land and Natural Resources, State of Hawaii, Hawaiian Waterbirds Recovery Plan, 1985.

² Department of Land and Natural Resources, State of Hawaii, State Conservation Lands Functional Plan, 1991.

³ U.S. Fish and Wildlife Service, Region 1, Regional Wetlands Concept Plan: Emergency Wetlands Resource Act, August 1990.

⁴ Department of Land and Natural Resources, State of Hawaii, State Recreation Functional Plan and Technical Reference Document, 1991.

Table 12 (cont.)

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED
TO CONTAIN BIOLOGICAL RESOURCES
ISLAND OF OAHU

<u>Site</u>	<u>Assessment</u>	<u>Recommendation</u>
Kahuku/Kuilima Northeast Coastline	Wetland habitat for all four endangered Hawaiian waterbirds as well as migratory waterbirds. ¹ One of the best example of coastal strand in the State from Kahuku Point. Kalani Point portion of coastline is already in Conservation.	Reclassify wetlands to Conservation.
Laniloa Beach	Contains native coastal strand and the rare 'anaunau. Area is less than 15 acres.	No action at this time.
Laie Wetlands	Provides habitat for endangered Hawaiian coots, stilts and gallinules. Additional information is needed.	No action at this time.
Pounder's Bluff	Lithified dune area which contains native coastal strand, the rare 'anaunau, and the rare pua-pilo. Area is less than 15 acres.	No action at this time.
Wetlands North of Hauula	A nesting site for the endangered Hawaiian gallinule and, when seasonally flooded, habitat for the endangered Hawaiian coots and stilts. Area is less than 15 acres. ¹	No action at this time.
Kualoa Wetlands	Provides habitat for waterbirds. The boundaries consist of Kualoa Regional Park and single-family dwelling units. Majority of the area is in use consistent with conservation objectives. Kualoa and Molii Ponds are already in the Conservation District.	No action at this time.
Waikane/Waiahole Streams and Waikane Valley	Streams provide habitat for native aquatic species while higher elevations of the valley contain native vegetation.	Reclassify portions to Conservation.

¹ U.S. Fish and Wildlife Service and the Department of Land and Natural Resources, State of Hawaii, Hawaiian Waterbirds Recovery Plan, 1985.

Table 12 (cont.)

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED
TO CONTAIN BIOLOGICAL RESOURCES
ISLAND OF OAHU

<u>Site</u>	<u>Assessment</u>	<u>Recommendation</u>
Kahaluu Wetland	Provides habitat for endangered Hawaiian gallinule and migratory shorebirds; also known as Waihee Wetland. ³	Reclassify to Conservation.
Heeia Marsh and Meadowland	Provides habitat for all four endangered Hawaiian waterbirds, second largest existing wetland on Windward Oahu, habitat for native aquatic species. ^{1, 2, 3, 4}	Reclassify to Conservation.
Kaneohe Estuary	Provides habitat for terrestrial, marine, and aquatic species. Estuary is already in Conservation District.	No action at this time.
Kawainui Complex	Provides habitat for all four endangered Hawaiian waterbirds, migratory waterbirds, and the indigenous black-crowned night heron. Part of the largest natural wetland in the State. ^{1, 2, 4}	Reclassify portions to Conservation.
Makapuu and Queen's Beach	Reported to contain native coastal strand, including native cotton. Further survey work is needed to verify biological resources. However, reclassification is recommended based on other factors, including County plan.	Reclassify portions to Conservation.

¹ U.S. Fish and Wildlife Service and the Department of Land and Natural Resources, State of Hawaii, Hawaiian Waterbirds Recovery Plan, 1985.

² Department of Land and Natural Resources, State of Hawaii, State Conservation Lands Functional Plan, 1991.

³ U.S. Fish and Wildlife Service, Region 1, Regional Wetlands Concept Plan: Emergency Wetlands Resource Act, August 1990.

⁴ Department of Land and Natural Resources, State of Hawaii, State Recreation Functional Plan and Technical Reference Document, 1991.

Table 12 (cont.)

ASSESSMENT OF AREAS IDENTIFIED AS KNOWN OR SUSPECTED
TO CONTAIN BIOLOGICAL RESOURCES
ISLAND OF OAHU

<u>Site</u>	<u>Assessment</u>	<u>Recommendation</u>
Waahila Ridge	Provides habitat for native plants, however, their significance is not known. Area is on steep slope with no known development pressure.	No action at this time.
Keehi Lagoon	Estuarine areas provide habitat for waterbirds and are surrounded by urban use. Already in the Conservation District. ¹	No action at this time.
Pearl Harbor Wetlands	Provides habitat for endangered Hawaiian stilt and migratory waterbirds. ¹	Reclassify portions to Conservation.
Barbers Point Region	There are resources in this area; however, they are scattered. Some may be less than 15 acres. Further information is needed.	No action at this time.
Lualualei Valley	Provides habitat for rare native fern. Area is less than 15 acres.	No action at this time.
Kauaopuu and Mauna Kuwale	Provides habitat for only known occurrence of a rare akoko and is an area of steep slope.	Reclassify to Conservation.

¹ U.S. Fish and Wildlife Service and the Department of Land and Natural Resources, State of Hawaii, Hawaiian Waterbirds Recovery Plan, 1985.

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 seabirds, 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.⁴⁹ 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.⁵⁰ 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, Hawaiian Wetlands National Wildlife Refuge Complex Master Plan, the Regional Wetlands Concept Plan, Ecologically Sensitive Wetlands on Oahu: Groundwater Protection Strategy for Hawaii, and Proceedings of the Native Ecosystems and Rare Species Workshops (see Figure 9).

AmOrient Prawn Farm
Apokaa Ponds
Baskerville Spring

⁴⁹ Klein, Richard D., Community and Environmental Defense Associates, "Protecting the Aquatic Environment from the Effects of Golf Courses," May 1990.

⁵⁰ U.S. Environmental Protection Agency, "Vegetative Filter Strips," in brochure prepared by the Soil and Water Conservation Service.

Bellows AFB Wetlands
 Coconut Grove
 Crowbar Ranch Pond
 Dillingham Ponds
 Haleiwa Lotus Fields
 Hauula Wetland
 Heeia Marsh and Meadowlands
 Hoomaluhia Park
 James Campbell National Wildlife Refuge-Kii Unit
 James Campbell National Wildlife Refuge-Punamano Unit
 Kaelepulu Pond
 Kahana Marsh
 Kahuku Prawn Farm
 Kalou Marsh
 Kawainui Marsh
 Keehi Lagoon
 Kualoa Pond
 Laie Prawn Farm
 Loko Ea Fishpond
 Lualualei Reservoir
 Mokuleia Quarry
 Molii Pond
 Mount Kaala
 Nuuanu Reservoirs
 Nuupia Ponds
 Paiko Lagoon
 Pearl Harbor National Wildlife Refuge-Honouliuli Unit
 Pearl Harbor National Wildlife Refuge-Waiawa Unit
 Pearl Harbor Ponds and Shorelines
 Puohala Marsh
 Punahoolapa Marsh
 Punaluu Prawn Farm
 Salt Lake
 Ukoa Marsh
 Waihee Wetland
 Waikele Wetland
 Waimea Falls Park
 Waipahu Landfill
 Waipio Peninsula Ponds

Some of these wetlands are already in the Conservation District and should remain in that district. Those that are not in the Conservation District have been proposed for inclusion in the Conservation District except where current agricultural use is appropriate, e.g., AmOrient Prawn Farm and Laie Prawn Farm. Wetlands on Oahu are subject to development pressures. Therefore, in general, wetlands have been proposed for reclassification to the Conservation District except in certain specific cases where there is active aquaculture use.

There may be other wetlands on Oahu but it was not possible to identify and assess all of these wetlands given the resource 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.

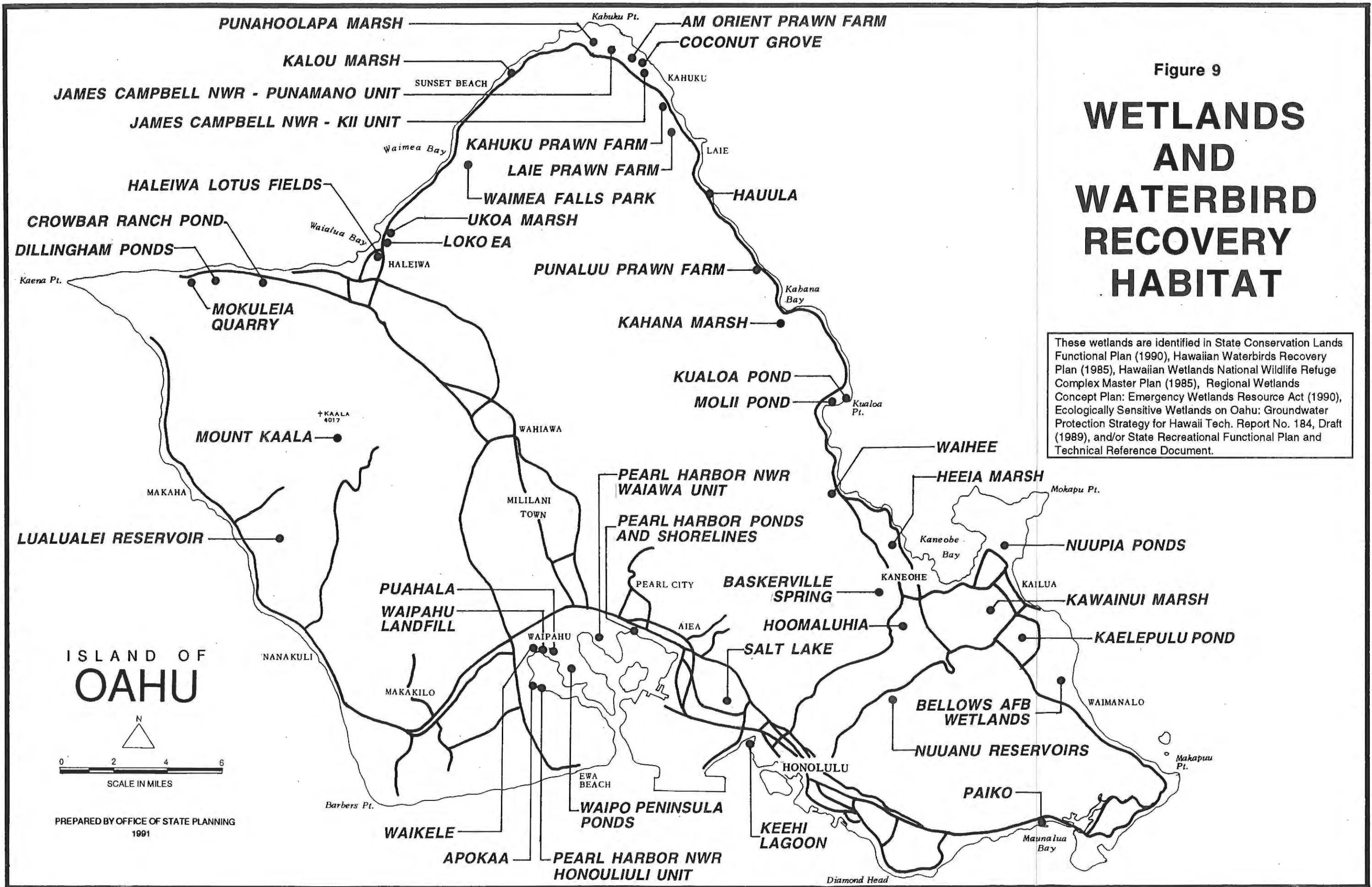


Figure 9

WETLANDS AND WATERBIRD RECOVERY HABITAT

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
AmOrient Prawn Farm	Agricultural	Aquaculture	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Compatible use. No action.
Apokaa Ponds	Agricultural	Proposed Park	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Baskerville Spring	Urban	Residential	No	Water source for Haiku Pond	Less than 15 acres. No action.
Bellows AFB Wetlands	Urban	Military Base	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Coconut Grove	Agricultural	Unknown	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Less than 15 acres. No action.
Crowbar Ranch Ponds	Agricultural	Pasture	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Dillingham Field Ponds	Agricultural	Aviation	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Haleiwa Lotus Fields	Agricultural	Lotus Cultivation	Unknown	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Hauula Wetland	Urban	Vacant	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Less than 15 acres. No change.
Heeia Marsh and Meadowlands	Urban	Pasture	Land exchange for State acquisition in process.	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	Reclassify to Conservation.
Hoomaluhia Park	Conservation/Urban	Park	No	Provides habitat for rare and endangered Hawaiian waterbirds.	No action.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
James Campbell NWR: Kii	Agricultural	USFWS Refuge	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	Reclassify to Conservation.
James Campbell NWR: Punamano	Agricultural	USFWS Refuge	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	Reclassify to Conservation.
Kaelepulu Pond	Conservation	None	No	Designated Preservation.	No change needed.
Kahana Marsh	Conservation	State Park	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	No change needed.
Kahuku Prawn Farm	Agricultural	Aquaculture	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Compatible use. No action.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Kalou Marsh	Agricultural	UH Ag Research	No	Endangered Hawaiian waterbirds have been seen in area.	Less than 15 acres. No action.
Kawainui Marsh	Conservation/Urban	Surrounded by urban uses	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify portions to Conservation.
Keehi Lagoon	Conservation	Surrounded by industrial use	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	No change needed.
Kualoa Pond	Conservation	None, located in park	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	No change needed.
Laie Wetlands	Agricultural	Unknown	Unknown	Provides habitat for endangered Hawaiian waterbirds.	Additional information needed. No action at this time.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Loko Ea Pond	Agricultural	Active fishpond	Yes	Provides habitat for rare and endangered Hawaiian waterbirds	Reclassify to Conservation.
Lualualei Reservoir	Agricultural	Within military base	No	Provides habitat for rare and endangered Hawaiian waterbirds	No action.
Makaleha Wetland	Agricultural	Pasture	No	Provides habitat for rare and endangered Hawaiian waterbirds. Associated with Special Stream.	Reclassify to Conservation.
Mokuleia Quarry	Conservation	Former quarry	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	No change needed.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Molii Pond	Conservation	Active fishpond	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	No change needed.
Mount Kaala	Conservation	NARS	No	Provides habitat for native shrubs and grasses.	No change needed.
Nuuanu Reservoirs	Conservation	Reservoir	No		No change needed.
Nuupia Ponds	Conservation	Military base	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	No change needed.
Paiko Lagoon	Conservation		No	Provides habitat for rare and endangered Hawaiian waterbirds.	No change needed.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Pearl Harbor NWR: Honouliuli	Agricultural	USFW Refuge	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Pearl Harbor NWR: Waiawa	Urban	USFW Refuge	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Pearl Harbor Ponds, Wetlands, and Shoreline	Conservation/Agricultural	Various	No	Provides habitat for rare and endangered Hawaiian waterbirds.	No action.
Puohala Marsh	Conservation	None	No	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	No change needed.
Punahoolapa Marsh	Agricultural	Adjacent to resort	Yes	Provides habitat for rare and endangered Hawaiian waterbirds. Designated Preservation.	Reclassify to Conservation.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Punaluu Prawn Farm	Agricultural	Aquaculture	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Compatible use. No action.
Salt Lake	Conservation	Golf Course	No	Provides habitat for rare and endangered Hawaiian waterbirds.	No change needed.
Ukoa Marsh	Agricultural	Pasture	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Waihee Marsh	Urban	Pasture	Yes	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Waikele Wetland	Urban	None	No	Provides habitat for rare and endangered Hawaiian waterbirds.	Reclassify to Conservation.
Waimea Falls	Conservation	Park	No		No change needed.

Table 13. ASSESSMENT OF WETLANDS
ISLAND OF OAHU (cont.)

Site	Existing SLU District	Use	Development Pressure	Associated with Special Streams, in County Preservation District, provides habitat for rare and endangered Hawaiian waterbirds	Recommendation
Waipahu Landfill	Conservation	Former landfill	No	Provides habitat for rare and endangered Hawaiian waterbirds.	No change needed.
Waipio Peninsula Ponds	Conservation Agricultural		Unknown	Provides habitat for rare and endangered Hawaiian waterbirds.	Less than 15 acres. No action.
Wetlands in Kahuku	Agricultural	Various	Yes	Provides habitat for rare and endangered Hawaiian waterbirds. No specific boundaries at this time.	Reclassify to Conservation.

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.

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.

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 scoured portion of 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.⁵¹ 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.⁵² 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 floodwaters. 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 or associated with waterbird recovery habitat. These are streams with known and documented outstanding resources. However, this does not mean that these are the only streams in need of protection. As field studies continue, undoubtedly additional streams with similar resources will be identified.

"With only five species comprising the native stream fish fauna, the loss of a single one would result in a dramatic reduction of diversity in Hawaiian freshwaters".⁵³ 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.

51 Klein, Richard D., "Protecting the Aquatic Environment from the Effects of Golf Courses," May 1990.

52 U.S. Environmental Protection Agency, "Vegetative Filter Strips," in brochure prepared by the U.S. Soil Conservation Service.

53 William S. Devick, et al, "Conservation of Hawaiian Freshwater Fishes," April 1992.

Table 14

**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 on each side of the stream or a corridor that follows the flood delineation boundary or if associated with a wetland, a boundary encompassing the wetland and a buffer was recommended.
4. If a stream had no definable ridgeline or other identifiable boundary or there were numerous nearby residences, then a 100 foot corridor on each side of the stream or a corridor that follows the flood delineation boundary was recommended.
5. One hundred foot corridors were delineated for streams that only met the criteria for outstanding riparian values, determined in part by the presence of waterbird recovery habitat.
6. If a stream met the criteria necessary to warrant ridge-to-ridge conservation district protection, and the land was currently under the management of DLNR's State Parks Division, the final recommendation for land use districting and corridor determination was made by that agency.

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

Table 15

Special Streams: Oahu

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

Stream Name	Special Stream Criteria	Values	Land Use Districts	Land Uses	Recommendation
Koloa Gulch	1	Abundance of native aquatic species.	Conservation Agriculture Urban	Trees, grasses, little or no residential use	We recommend that a 100 foot setback be used because there is no clear ridge to ridge boundary and the land in the agricultural district is relatively flat.
Kaluanui	1	Abundance of native aquatic species.	Conservation Agriculture Urban	Grasses, bananas, few residential uses	We recommend that the conservation district boundary be delineated such that the entire valley from ridge to ridge be included.
Punaluu	1	Abundance and spawning of native aquatic species.	Conservation Agriculture Urban	Cattle, nurseries, bananas, ti-leaf, taro, fruit trees	Due to the large number of dwelling units in the valley, we recommend only a 100 foot corridor.
Kahana	*		Conservation		
Kaaawa	1	Abundance of native aquatic species.	Conservation Agriculture Urban	Cattle, bananas, few houses	We recommend that the conservation district boundary be delineated such that the entire valley from ridge to ridge be included.
Makana	1	Abundance of native aquatic species.	Conservation Urban		Conservation District corridors are not being proposed for land currently in the Urban District.
Heeia	2	Values include the presence of endangered waterbirds and stream associated waterbird recovery habitat.	Conservation Urban		Conservation District corridors are not being proposed for land currently in the Urban District. The recovery habitat is already proposed for protection.

Kawainui/ Maunawili	2	Values include the presence of endangered waterbirds and stream associated waterbird recovery habitat (Kawainui marsh).	Conservation, Agricultural Urban Conservation Urban.		Due to the very limited area of land in the agricultural district, a corridor larger than 100 feet can not be justified.
Waikele	2	Values include the presence of endangered waterbirds and stream associated waterbird recovery habitat.	Conservation Agriculture Urban Agriculture Urban	Military, pineapple, urban/ industrial	Channelized stream. No corridor recommended. The recovery habitat is already proposed for protection.
Makaleha	2	Values include the presence of endangered waterbirds and stream associated waterbird recovery habitat.	Conservation Agriculture	Polo, sugar	Much of the reason for the special stream classification is related to the recovery habitat which is also being proposed for protection. Therefore a 100 ft corridor is recommended.
Paukauila (Helemanu, Opaeula)	1	Abundance of native aquatic species.	Conservation Agriculture Urban Agriculture		We recommend that both tributaries of the Paukauila receive a corridor that encompasses the entire stream gulch narrowing to a 100 foot corridor down to the Urban district.
Anahulu	4	Diversity of native aquatic species including presence of <i>Lentipes concolor</i> ('o'opu alamoo)	Conservation Agriculture Urban		We recommend a 100 foot Conservation district corridor extension down to the Urban district.
Waimea	*		Conservation		

Figure 10

PERENNIAL STREAMS

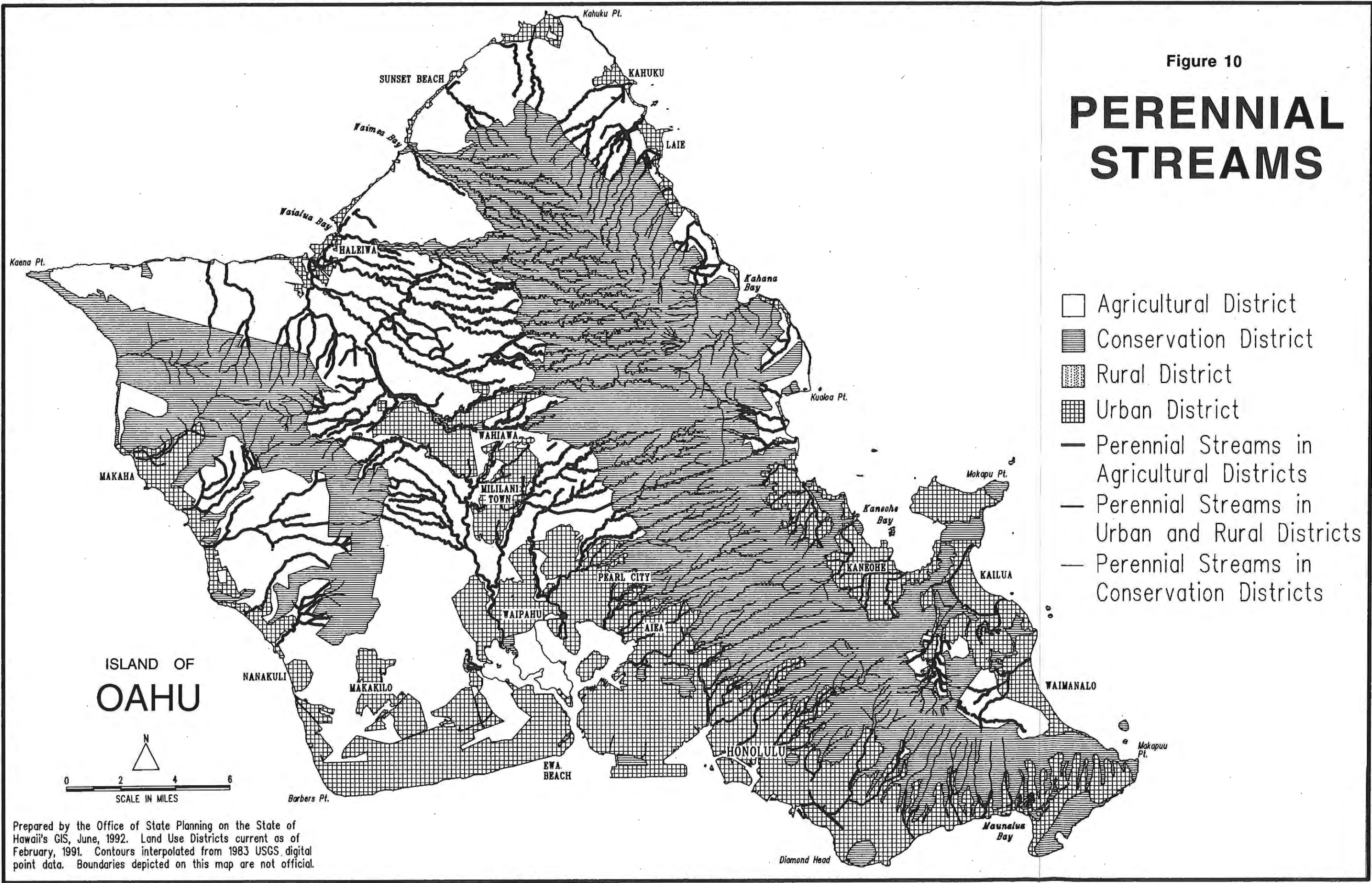
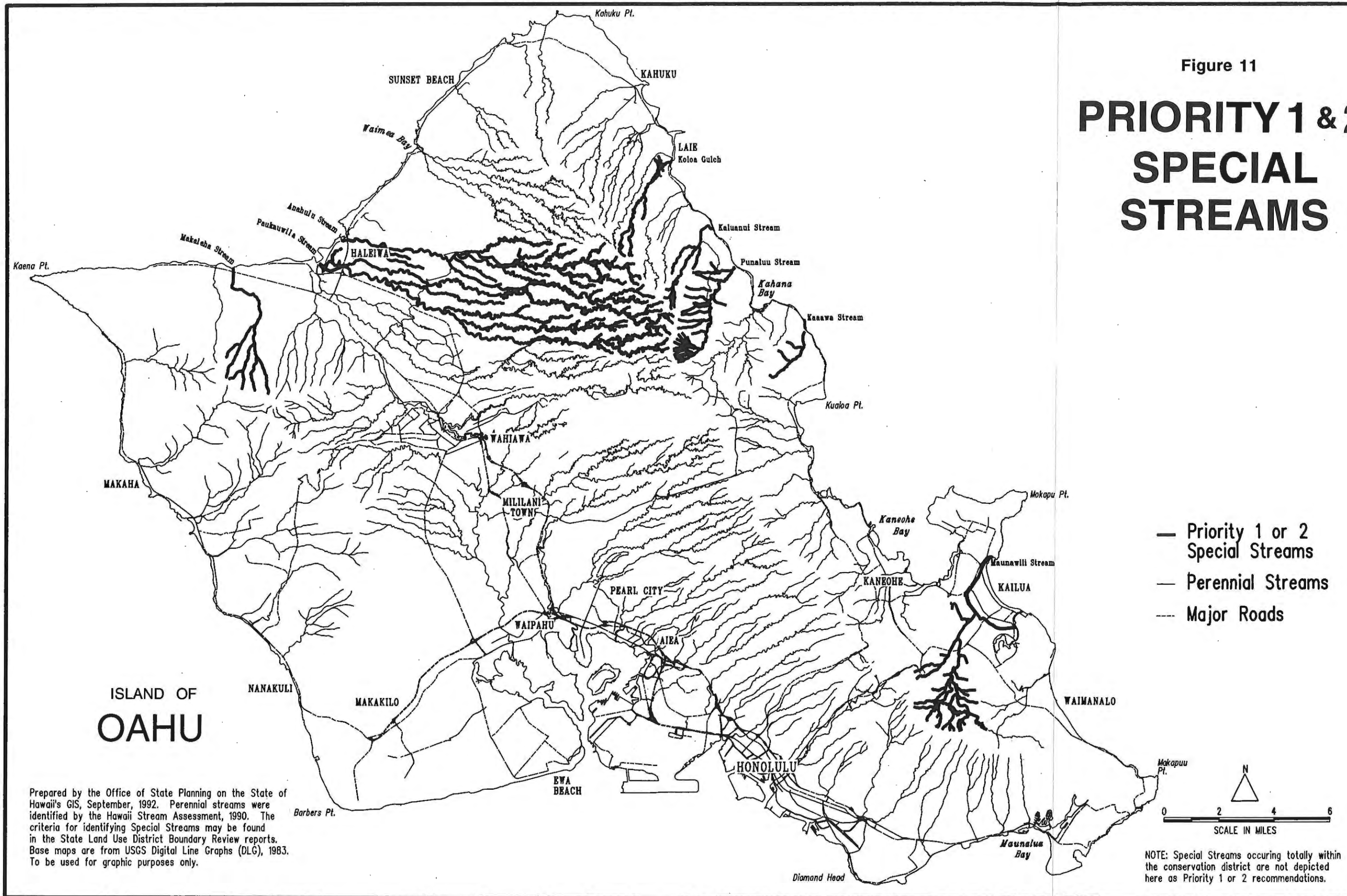


Figure 11

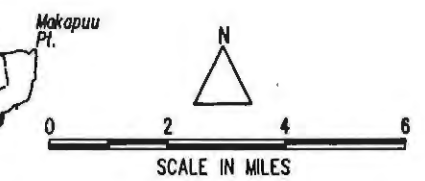
PRIORITY 1 & 2 SPECIAL STREAMS



ISLAND OF
OAHU

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 depicted here as Priority 1 or 2 recommendations.

Beaches and Coastal Areas

Swimming beaches which have been rated as having high statewide or island-wide significance are presented in the following table.

Table 16. BEACHES WITH STATEWIDE OR ISLAND-WIDE SIGNIFICANCE FOR SWIMMING

Camp Erdman	High island-wide significance
Mokuleia Army Beach	" " "
Mokuleia Beach	" " "
Haleiwa Bay	" " "
Waimea Bay	High statewide significance
Ehukai Beach	" " "
Sunset Beach	High island-wide significance
Kawela Bay	High statewide significance
Malaekahana Bay	" " "
Mokuauia Beach	High island-wide significance
Laniloa Beach	" " "
Pounders Beach	" " "
Kualoa Beach	" " "
North Beach	High statewide significance
Kailua Bay	" " "
Lanikai Beach	" " "
Waimanalo Bay	" " "
Makapuu Beach	" " "
Hanauma Bay	" " "
Waikiki Beach	" " "
Aina Moana Lagoon	" " "
Ala Moana Beach	" " "
Nimitz Officers Beach	High island-wide significance
West Beach	" " "
Kahe Beach	" " "
Nanakuli Beach	" " "
Ulehawa Beach	" " "
Maili Beach	" " "
Pokai Bay	" " "
Papaoneone Bay	" " "
Makaha Beach	" " "
Makua Beach	" " "

Source: Division of State Parks, Department of Land and Natural Resources, Statewide Recreation Resources Inventory, Principal Swimming Areas, 1987.

Many of these beaches are in the Urban District except for the area seaward of the high water mark. For beaches in the Agricultural District, it is recommended that any proposed land use classification change which may affect recreational use of these beaches be carefully evaluated and that an adequate Conservation District buffer be provided. Beaches and coastal areas in the Conservation District should remain in that district and are not recommended for reclassification to the Urban or Agricultural District during the boundary review.

Significant Scenic and Open Space Resources

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

Important scenic and open space resources on Oahu which should be reclassified from the Urban or Agricultural Districts to the Conservation District include Queen's Beach, Sandy Beach, the Ka Iwi Shoreline, portions of Koko Crater, the lower slopes of Mount Olomana, the lower northern slopes of Diamond Head, Kaena Point to Dillingham Airfield, and the lower slopes of the leeward Waianae range.

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.

Conservation District status may better protect certain specific historic sites, particularly those which are significant, meet multiple criteria for historic preservation and when the lands contain other conservation resources as well.

State Parks

State parks include Hanauma Bay State Underwater Park, Heeia State Park, Kahana Valley State Park, Keaiwa Heiau State Recreation Area, Malaekahana State Recreation Area, Sacred Falls State Park, Ulu Po Heiau State Monument, and Wahiawa Freshwater State Recreation Area.

State parks have different uses either more intensive urban recreational uses, e.g., Sand Island State Recreation Area, which are compatible with the Urban District, or more passive recreation uses which are compatible with the Conservation District.

Pursuant to Act 1311, S.D. 1, H.D. 1 (Act 312), the titles to several State parks have been or are in the process of being transferred to the City and County of Honolulu. Aina Moana State Recreation Area and Waimanalo Bay State Recreation Area are two former State parks included in the park transfer.

It was not feasible within the scope of the review to assess whether these lands should remain in the Conservation District or be reclassified to another district. However, some of these areas appear to have conservation values which warrant their retention in the Conservation District, e.g., Tantalus (watershed and scenic qualities). In general, Conservation

District boundaries should be maintained. The focus during the review was to assure that lands with conservation values, particularly within the Agricultural District, were reclassified to Conservation.

The State Parks Division, Department of Land and Natural Resources, recommended the reclassification of lands affecting several State parks. The Office of State Planning assessed these recommendations and incorporated a number of them.

Steep Slopes

Nearly one-half of the land area on Oahu lies above a slope of 20 percent and is considered unsuitable for intensive use. The slope of land was a significant criterion in the initial delineation of the Urban District on Oahu in 1964. With some exceptions, the original proposed Urban District boundaries did not exceed slopes of 20 percent.⁵⁴

The consultant for the first Five-Year Boundary Review conducted in 1969 recommended adjustment of the 20 percent slope limitation, particularly as it pertained to Oahu, to take into account the existence of adequate County controls so that where they exist and where open space amenities are not violated, the Commission may zone areas to Urban. The consultant indicated that public safety and publicly important views should be taken into account whatever the slope.⁵⁵ The Land Use Commission rules now reflect this change.

However, numerous hillside areas on Oahu have experienced slope instability and soil movement problems. Some areas have suffered extensive property damage resulting from landslides and debris flows. The most severe and significant incidents in recent years have occurred in the Manoa, Palolo, Aiea, Hahaione, Moanalua Valley and Kuliouou areas. In addition, an inordinate amount of movement of soil and land under hillside residences is beginning to make homes in some of these valleys unsafe for habitation and is destroying public utilities and roadways. Areas within East Manoa Valley, Wailupe Valley, Kuliouou Valley and Moanalua Valley have experienced or are presently experiencing: 1) uprooted home foundations, garages and driveways; 2) broken underground water mains and seepage of groundwater; 3) collapsing streets and sidewalks; 4) fractured dwelling structures; and 5) other serious problems.⁵⁶

Significant amounts of public funds have also been expended to help alleviate this problem.

⁵⁴ Harland Bartholomew & Associates, Land Use Districts for the State of Hawaii, Recommendations for Implementation of the State Land Use Law, Act 187, SLH 1961, 1963.

⁵⁵ Eckbo, Dean, Austin and Williams, State of Hawaii Land Use Districts and Regulations Review, August 15, 1969.

⁵⁶ Bill No. 127/CD-2 (1989), A Bill for an Ordinance Regulating for an Interim Period Urban Development with Oahu Hillsides in the City and County of Honolulu.

So as not to further compound this problem and protect the safety and well-being of residents, reclassification of lands above 20 percent slope to the Urban District during the State Land Use District Boundary Review is not recommended.

AICUZ

Air Installations Compatible Use Zones (AICUZ) are designated in the vicinity of air installations to safeguard the safety, health and welfare of the public from noise exposure and accident potential. It is generally recommended that no residential developments be built in an area with noise contours of 60 Ldn or greater. It is also recommended that the petitioner grant to the State of Hawaii an avigation (right of flight) and noise easement on any portion of the property subject to noise levels in excess of 55 Ldn.

AICUZ noise contours are a consideration in developments near the Honolulu International Airport, Barbers Point Naval Air Station, Hickam Air Force Base, Dillingham Military Reservation, Wheeler Air Force Base and Helemano Military Reservation as these installations have off-site noise impacts. The Marine Corps Air Station Kaneohe Bay AICUZ covers all of Coconut Island and Kealahi Point. However, flight patterns have been adjusted optimally so that most of the AICUZ is restricted to the waters of Kaneohe Bay. The AICUZ at Bellows Air Force Station appears to only impact the installation itself and the ocean.⁵⁷

Other Uses

There are three golf courses in the Conservation District--the Honolulu International Country Club, the Pali Golf Course and the Minami Golf Course. Residential uses on Oahu in the Conservation District are found at Tantalus and Mokuleia.

There are five subzones within the Conservation District: Protective; Limited; Resource; General; and Special. The Protective Subzone is the most restrictive in terms of permitted uses, followed by the Limited, Resource and General subzones. The Special Subzone comprises areas containing unique developmental qualities which complement the area's natural resources.

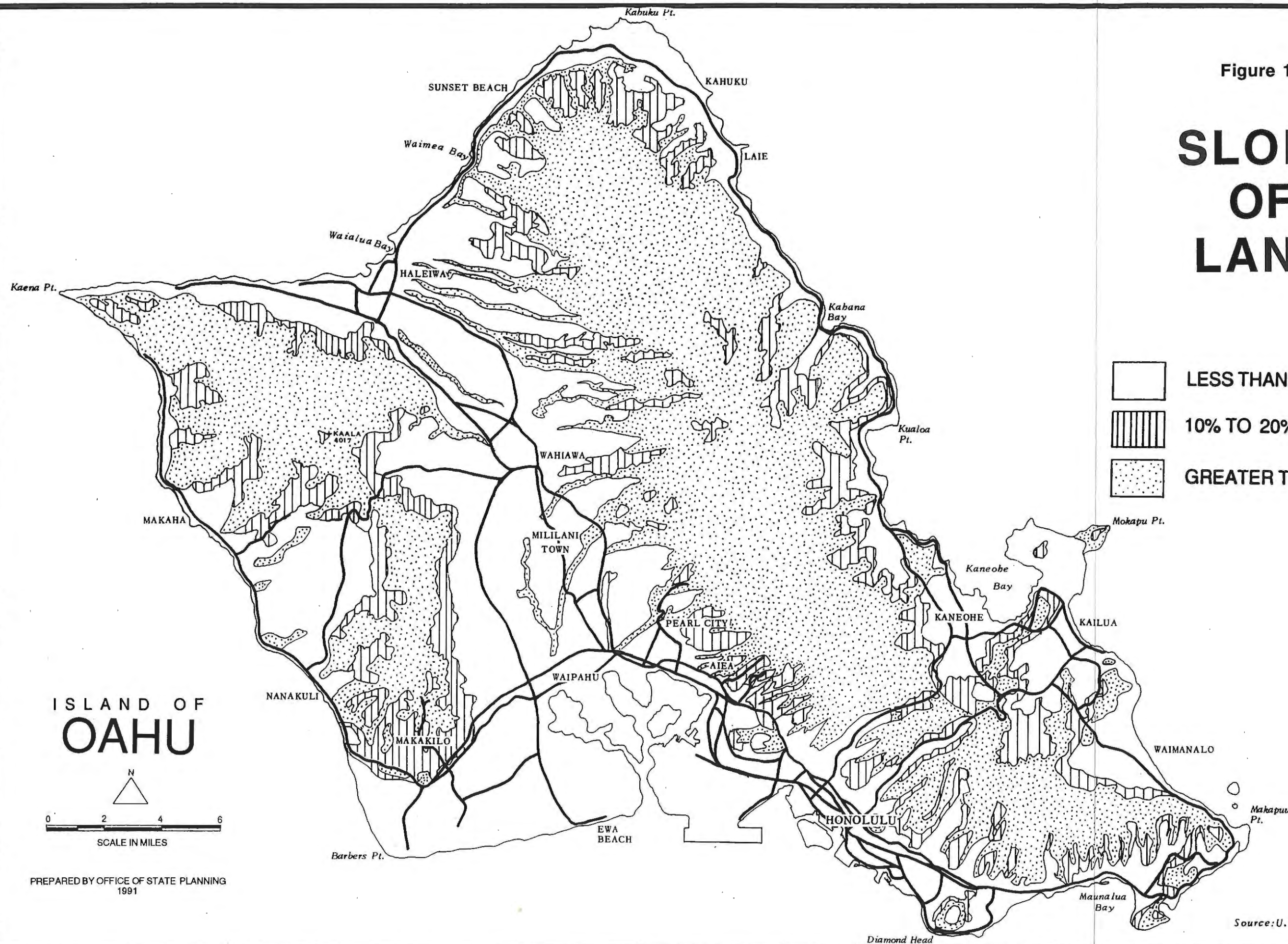
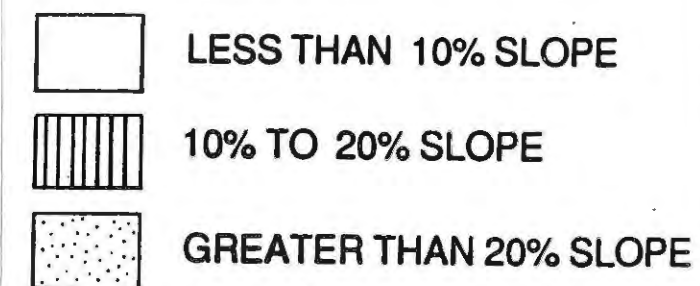
There are four Special Subzones on Oahu: 1) Hawaii Loa College special subzone for educational purposes, 2) Haka site special subzone for cemetery purposes in Kaneohe, 3) Kapakahi ridge special subzone for nursing or convalescent home purposes in Honolulu and 4) Sea Life Park special subzone for recreational, educational and commercial purposes.

The Board of Land and Natural Resources designates subzones within the Conservation District.

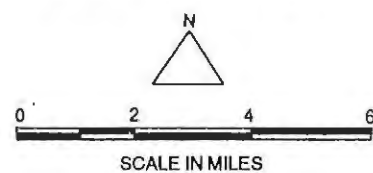
⁵⁷ Naval Facilities Engineering Command, Pacific Division, Department of the Navy, Military Property Requirements in Hawaii, April 1979.

Figure 12

SLOPE OF LAND



ISLAND OF
OAHU



PREPARED BY OFFICE OF STATE PLANNING
1991

Source: U.S. Geological Survey map.

Conservation District Issues

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

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

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

Shoreline

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

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

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.

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

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 resources or riparian values associated with waterbird recovery habitat 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's 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 as Priority #1 areas because to do so statewide would have potentially meant including a number of buildings in the Conservation District. However, protective corridors are recommended for urban areas along Priority #1 Special Streams.

Protection can be achieved through Conservation District designation established by the Legislature, through Special Management Area designations by the Counties, or through conditions or easements negotiated during the reclassification process. Corridors of at least 100 feet extending from either side of the stream bank in the Agricultural District and at least 10 feet in the Urban 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.

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

Analysis of Conservation Lands

The focus of 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 Oahu were used to identify and recommend lands appropriate for reclassification to the Conservation District during the Five-Year Boundary Review. These lands include:

1. Watershed and water recharge areas identified in the Watershed Protection Study (University of Hawaii Water Resources Research Center, 1991). Watershed areas in the leeward Koolaus are recommended for Conservation designation pursuant to the watershed study.
2. Public and private natural areas including U.S. Fish and Wildlife Refuges (the James Campbell NWR's and Pearl Harbor NWR's).
3. 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, the Hawaiian Wetlands National Wildlife Refuge Complex Master Plan, or identified in Sensitive Wetlands on Oahu as endangered wildlife habitat, or as recommended by the Division of Forestry and Wildlife, DLNR, or the U.S. Fish and Wildlife Service. These include: Crowbar Ranch and Dillingham Field Ponds, Ukoa Marsh and Loko Ea Fishpond, Punahoolapa Marsh, Kahuku Wetlands, Waihee Wetlands, Heeia Marsh and Meadowlands, Kawainui Complex and Maunawili Stream, Waikele Wetlands and Bellows AFB Wetlands.
4. Special Streams which are streams containing outstanding aquatic or riparian values (associated with waterbird recovery habitat) according to the Hawaii Stream Assessment, or based on new information provided by stream experts.
5. Coastal areas recommended by DLNR and/or designated "Preservation" on the Development Plan.
6. Significant scenic resources identified primarily through public input or by State agencies and assessed by staff (Olomana, Diamond Head State Monument, Koko Crater).
7. Historic sites identified through public input and confirmed by DLNR (Ahuimanu Taro Loi System).
8. Areas with a combination of resources, specifically, steep slopes, scenic and open space resources (Northern Waianae Range, Leeward Waianae Foothills).
9. Areas with steep slopes, scenic/open space and/or water recharge value and needed for the protection of Kaneohe Bay water quality (Waikane Watershed, Waihee Valley Mauka, Hakipuu 200' Elevation).

10. Areas reported to contain rare plants which also contain other Conservation values, e.g., scenic resources, steep slopes, County "Preservation" designation, etc. (Kauaopuu and Kaena Coastline).
11. Areas needed to protect the water quality of the Waiawa Shaft (Hydrologic Zone of Contribution).

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

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

1. Approximately 3,685 acres of additional urban land is required to meet urban requirements to 2000. Urban growth during the State Land Use District Boundary Review is directed to areas adjacent to existing urban areas in Ewa and Central Oahu.
2. No reclassification of lands for hotel purposes is recommended during the boundary review. However, for future growth, the following are designated as resort destination areas: Waikiki, Ko Olina and Kawela Bay to Kahuku Point. Future resort expansion should be directed to Ko Olina and the existing Urban District at Kawela Bay to Kahuku Point since Waikiki is already heavily developed and the focus there would be on redevelopment.
3. Future residential, commercial and industrial growth shall be guided by the following policies: Maintain Urban District designation in the Primary Urban Center and East Honolulu. Direct growth to Ewa to develop a secondary urban center. Retain the rural character of Koolauloa, North Shore and Waianae.
4. Provide sufficient agricultural land in Ewa, Central Oahu and the North Shore to encourage the continuation of sugar and pineapple as viable industries.
5. Maintain important agricultural land in the Agricultural District unless overriding public interest exists to reclassify these lands. In particular, Kunia, the area below Waiahole Ditch and on the Waianae side of Waikele Gulch, and the area directly north of Wahiawa on the Mokuleia side of the North Shore district shall be maintained in the Agricultural District.
6. Maintain lands in the Agricultural District if not needed for urban expansion to provide open space.
7. Maintain agricultural land along the Windward, North Shore, and Waianae coasts for truck farming, flower growing, aquaculture, livestock production and other types of diversified agriculture.
8. The Conservation District shall be amended to include additional protection for the Leeward Koolau watershed. The existing boundaries of the Windward Koolau and Waianae ranges should be maintained or expanded to protect watershed areas.
9. Important heritage resources which have natural, scenic and cultural significance, including but not limited to the following, shall remain in or be reclassified to the Conservation District:
 - the Waianae and Koolau Mountains
 - Olomana
 - Kaena Point
 - Diamond Head
 - Queen's Beach and Sandy Beach
 - Koko Crater
 - the Pali

10. Significant native ecosystems and habitats of rare and endangered species, wetlands, special streams, beach and coastal resources, historic sites, and scenic, open space and natural areas shall be reclassified to the Conservation District.

XII. FINDINGS

North Shore

Urban District. This area should remain rural and agricultural in character. There is a modest surplus of urban land available to meet urban growth needs to 2000. There are infrastructure constraints to further development specifically transportation, sewerage and water systems. However, the traffic situation should be alleviated with the completion of the Haleiwa Bypass Road. The County General Plan designates this area as rural and recognizes its value to the agricultural industry and its open space character.

The existing Urban District areas in Waialua, Haleiwa and along both sides of Kamehameha Highway from Haleiwa to the University of Hawaii Experimental Station appear appropriate, given existing urban use of these areas and are sufficient to accommodate growth to 2000. No reclassifications to the Urban District are proposed.

By 2010, there may be need for additional urban expansion since by then, the area will show only a slight surplus of urban lands. Modest residential growth should be allowed adjacent to the existing Urban District at Waialua and Haleiwa so long as such development does not adversely impact Waialua Sugar Company.

Agricultural District. The North Shore has some of Oahu's most productive lands rated A and B by the Land Study Bureau. These lands are used for sugar and pineapple. Lands necessary for the viability of Mokuleia Sugar Company shall be retained in the Agricultural District. Pineapple lands in the upper plain shall also remain in the Agricultural District as well as areas utilized for diversified agriculture.

Three areas in the Agricultural District which have scenic, open space, recreation and ecological value and six wetlands are being proposed for reclassification to the Conservation District and are discussed in the following section.

Conservation District. The North Shore area contains numerous significant conservation resources. With its world renown beaches, it is a major recreational focal point for the rest of Oahu. Most of the coastal area is already in the Urban District and has been developed offering few opportunities for redesignation to Conservation. Exceptions are portions of Mokuleia Beach and Waimea Bay which are in Conservation and portions of the Kaena coastline which are in the Agricultural District. Recommendations for this area include extending the Conservation District from the tip of Kaena Point to Dillingham Air Force Base to protect its scenic, open space, recreational and biological resources. Extension of the Conservation District boundary in the northern Waianae mountains is also recommended to protect native plants and because of steep slopes. Makaleha Stream and Crowbar Ranch Wetland, Dillingham Field Ponds,

Ukoa Marsh, Loko Ea Fishpond, Haleiwa Lotus Fields, and Paukauila Stream are also recommended for inclusion in the Conservation District. Also, the Conservation District will be extended in various areas along the leeward Koolau range to provide for watershed protection.

Koolauloa

Urban District. Koolauloa should remain predominantly rural except for resort use at Kuilima. Kuilima is designated a resort destination area. There is sufficient urban designated land (approximately 700 acres) in the area between Kawela Bay and Kahuku Point to accommodate the development of the resort. Other major urban areas in Koolauloa are Kahuku, Laie, Punaluu and Kaaawa. A coastal strip from Kahuku to Kaaawa but excluding Kahana Bay is in the Urban District. There are residences along much of this coastal strip. Koolauloa has a modest surplus of urban lands available to accommodate urban needs to 2000. Further, there are infrastructure constraints, specifically roads and sewerage. The County General Plan designates this area as rural and confines further tourist-oriented development to the Kahuku Point-Kawela Bay area.

By 2010, the area shows a modest surplus of urban lands. It is recommended that growth be directed away from the existing Agricultural District lands between the Urban Districts at Kahuku Point and Kahuku. This area contains extensive wetlands including the Kii and Punamano Wetlands. Coastal strand vegetation including native plants are located along the beach from Kahuku Point to Kalani Point.

Agricultural District. Several changes to the Agricultural District are recommended and discussed more fully under the next section.

Conservation District. The Koolauloa coastline has recreational, scenic and open space value. The coastline in the Koolauloa district is largely in the Urban District except for 1) a strip approximately from Kahuku Point to Kahuku, 2) Kahana Bay, and 3) a strip from Kaaawa Beach Park to Kaoio Point.

Much of the remaining coastal urban area contains residences and offers few opportunities for conservation designation.

The Punahoolapa Marsh and James Campbell National Wildlife Refuge--Punamano and Kii units--are proposed for reclassification from the Agricultural to Conservation District. Additional wetlands in Kahuku will also be proposed for reclassification from the Agricultural to the Conservation District.

The Koloa Gulch, Punaluu, Kaluanui, and Kaaawa Streams have been designated special streams. A 100-ft. conservation corridor is recommended for Koloa Gulch and Punaluu Stream. For Kaluanui and Kaaawa, lands in the Agricultural District should be reclassified to Conservation such that Conservation designation extends from ridge to ridge and narrows at the lower reaches of the stream.

The Conservation District boundary along the Koolau Mountains should be maintained to protect watershed and water recharge areas.

Koolaupoko

Urban District. Kailua, Kaneohe and Ahuimanu will remain the primary residential and commercial areas in Koolaupoko. Kualoa, Waiahole-Waikane, Kahaluu and Waimanalo are to remain rural and agricultural in character. Kailua and Kaneohe contain substantial acreages of urban lands. In addition, the area from Ahuimanu to Puu Kiolea including Kahaluu is classified Urban as are Heeia Kea, a small area in Waiahole and coastal areas in Waikane. Waimanalo also contains urban lands at Bellows Air Force Base and along Kalaniana'ole Highway.

Although Kahaluu is intended to be primarily rural in character, it is currently within the Urban District. Approximately, 1,428 acres in Kahaluu are designated Agriculture on the County Development Plan but are designated Urban. While reclassification of this area to the Agricultural District has been proposed, it has not been recommended because of the numerous residential uses which exist in the area.

The Koolaupoko area will need an additional 1,129 acres to accommodate urban needs to 2000. By 2010, 1,434 acres will be needed.

Much of Kailua and Kaneohe are already in the Urban District. Further, there are few Agricultural District lands in Kailua and Kaneohe towns. Maunawili has some Agricultural District lands and the lower slopes of Mount Olomana are in the Agricultural District. Expansion of the Urban District may lead to reductions in Conservation District lands such as the Koolaus, Puu O Ehu, Kaiwa Ridge and Kawainui Marsh and is not recommended.

There are Agricultural District lands in Waimanalo and Waiahole-Waikane. However, residents of these areas have generally expressed the desire to remain rural and agricultural. Therefore, no recommendation for expansion of the Urban District at Koolaupoko is proposed at this time.

Agricultural District. Diversified agricultural activities in Kualoa, Waiahole-Waikane, portions of Maunawili and Waimanalo are supported.

These areas should remain in the Agricultural District. Several areas in the Agricultural District are proposed for reclassification to the Conservation District.

Conservation District. The Conservation District line which protects the watershed of the Koolau mountain range should be maintained. Ridges such as but not limited to Puu Maelieli, Puu O Ehua and Kaiwa Ridge should be kept in the Conservation District. Olomana should be reclassified to the Conservation District. Existing wetlands including but not limited to Nuupia Pond, Halekou Pond, Kawainui Marsh and Kaelepulu Pond should be retained in the Conservation District.

The Waihee Wetlands, Heeia Marsh and Meadowlands, Bellows Air Force Base Wetlands, and an expansion of Kawainui Marsh are recommended for inclusion into the Conservation District. Additional reclassifications to the Conservation District are certain lands in Hakipuu above the 200-foot elevation level with slope greater than 20 percent, Waikane Watershed, Waihee Valley Mauka, and the Ahuimanu (Kahaluu) Taro Loi system. A 100-foot Conservation corridor is recommended for portions of Maunawili Stream which are currently in the Agricultural District.

East Honolulu

Urban District. There will be a slight need for additional urban lands in East Honolulu by 2000 (166 acres). There are no Agricultural District lands in East Honolulu. All of the valleys are currently in the Urban District. Any expansion of the Urban District would have to occur in the backs of the valleys or on the ridges now designated Conservation which is not desirable. No reclassifications to Urban are recommended at this time.

Conservation District. Major Conservation District lands are located at Hanauma Bay, Koko Crater and Makapuu Head. The ridges along and in back of the valleys are also in the Conservation District. It is recommended that the Conservation District boundaries at Hanauma Bay, Koko Crater and Makapuu Head be maintained. It is recommended that to the extent possible, areas of steep slopes be maintained in the Conservation District.

Queen's Beach and Sandy Beach are recommended for inclusion into the Conservation District for their recreational, scenic, open space and ecological value. Portions of Koko Crater which are not currently in the Conservation District are also recommended for inclusion into the Conservation District due to steep slope, scenic, and open space value.

Primary Urban Center

Urban District. The Primary Urban Center is largely in the Urban District. There will be a need for approximately 277 acres of additional urban lands by 2000. Opportunities for urban expansion are limited and would have to occur in the backs of valleys or on ridges. This is not recommended. Instead, growth should be directed to Ewa and Central Oahu.

Agricultural District. Agricultural District lands occur in the back of Palolo Valley, small areas in Waimalu Gulch and at Kalauao Springs. It is recommended that these areas be retained in the Agricultural District.

Conservation District. Conservation District boundaries should be maintained to protect watersheds, avoid steep slopes and protect natural features such as Punchbowl and Diamond Head.

Several parcels on the lower slopes of Diamond Head which are not in the Conservation District are proposed for inclusion to that district.

The Pearl Harbor National Wildlife Refuge-Waiawa unit, is also recommended for inclusion in the Conservation District. An expansion of the Conservation District in Aiea is recommended to protect watershed areas in the Leeward Koolaus.

Central Oahu and Ewa

Urban and Agricultural Districts. The State supports directing growth to Ewa and Central Oahu while protecting important agricultural lands, assuring adequate infrastructure and maintaining open space resources. A second city is being developed in Ewa to accommodate future urban growth. The Ewa Plain is a logical priority for a secondary urban center based on the qualities of proximity to urban Honolulu, major employment bases in the surrounding area, subterranean caprock which prevents pure groundwater supplies from becoming contaminated and marginal agricultural lands in the westerly and makai areas.

Development of lands east of Waikele Gulch toward the Koolau mountain range excluding lands in the vicinity of Waikele Gulch and Waiahole Ditch should be allowed if State concerns of agricultural and open space preservation and minimizing public infrastructure costs can be met.

The Department of Agriculture has indicated that its highest priority for retaining agricultural lands is the area below Waiahole Ditch and on the Waianae side of Waikele Gulch because it has large, uninterrupted, continuous fields and inexpensive irrigation water available from Waiahole Ditch. This area also provides a significant open space area with good view planes from Kamehameha Highway west to the Waianae Mountains.

In addition, the pineapple lands of Kunia and the fertile lands directly north of Wahiawa on the Mokuleia side of the North Shore districts shall be maintained in Agriculture. Sufficient lands shall be provided for the economic viability of Oahu Sugar Company. The minimum acreage required is currently estimated by the plantation to be 8,000 acres.

There is a surplus of urban land available in Ewa to meet needs to 2000 and a need for 276 acres of additional urban land in Central Oahu by 2000. However, it is recommended that Oahu's urban land requirements to 2000 be met by directing urban growth to Ewa and Central Oahu. Therefore, 4,972.5 acres are proposed for reclassification to Urban in Ewa and Central Oahu.

Areas adjacent to existing urban areas in Ewa and Central Oahu are recommended for urbanization. Reclassification from Agricultural to Urban is also recommended for Barbers Point Harbor expansion and Hawaii Raceway Park.

The remaining areas in the Agricultural District shall be protected for agricultural and open space purposes.

Conservation District. Expansion of the Conservation District on the leeward Koolaus is recommended to protect the watershed. Also, the hydrologic zone of contribution on the Navy's Waiawa Shaft is recommended to the Conservation District. Extension of the Conservation District boundaries along the windward Waianae range is proposed to protect scenic views. The Pearl Harbor National Wildlife Refuge-Honouliuli unit, Apokaa and Waikele Wetlands are recommended for inclusion into the Conservation District.

Waianae

Urban District. Waianae shall remain a predominately rural and agricultural area. Infrastructure constraints include transportation and sewerage. Waianae will need an additional 62 acres by 2000 to meet urban requirements. Reclassification of 48 acres from Agriculture to Urban is recommended for the Nanakuli Residence Lots being developed by the Department of Hawaiian Home Lands.

Agricultural District. Diversified agricultural activities in agriculturally designated Okiholo, Waianae and Lualualei areas is supported.

Conservation District. The Conservation District includes Kaena Point, Makua Valley, the windward Waianae range and its ridges, Puu Pahoe, Puu Mailiilii, Puu O Hulu Kai and Puu Hulu Uka and Lahilahi Point. A strip of coastline area extending from Kaneana Cave to Kapuhi Beach Park is also in the Conservation District. Conservation District boundaries should be maintained. In addition, an expansion of the Conservation District at Kauaopuu is recommended to protect the habitat of a rare plant.

XIII. PRIORITY LISTING

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

Reclassifications to the Conservation or Agricultural District

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

Priority #2. These are areas that are recommended as lower priority. They include, for example, conservation resources:

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

Reclassifications to the Urban and Rural Districts

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

Department of Hawaiian Home Lands (DHHL)

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

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #1

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>North Shore</u>			
1. Kaena Coastline	A to C	969	Significant biological, recreational and scenic resources.
2. Makaleha Stream- 100-ft. Corridor, Crowbar Ranch & Dillingham Field Ponds	A to C	114	Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa. Outstanding riparian resources.
3. Paukauila Stream (incl. Opaepala and Helemano) (#4)	A to C	3,406	Outstanding aquatic resources.
4. Anahulu Stream	A to C	42	Outstanding aquatic resources.
5. Ukoa Marsh and Loko Ea Fishpond	A to C	110	Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa.
<u>Koolauloa</u>			
6. Punahoolapa Marsh	A to C	51	Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa.
7. Kahuku Wetlands	A to C	208	Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa.
8. Punaluu Stream	A to C	31	Outstanding aquatic resources.
9. Kaaawa Stream* (100-ft. corridor)	A to C	63.3	Outstanding aquatic resources.

*A perpetual conservation easement and/or special subzone are being discussed with the landowner for this property.

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

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>Koolaupoko</u>			
10. Waihee Wetlands	U to C	22	Provides habitat for the endangered Hawaiian coot, stilt, gallinule and koloa.
11. Waihee Valley Mauka	U to C	148	Steep slope and water recharge.
12. Heeia Marsh and Meadowlands	U to C	295	Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa.
13. Ahuimanu (Kahaluu) Taro Loi System	U to C	40	Significant archaeological site; best example of ancient Hawaiian expertise in engineering. Consistent with County "Preservation" designation.
14. Olomana	A to C	503	Unique physiographic features.
15. Kawainui Complex & Maunawili Stream	U to C A to C	155 92	Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa. Outstanding riparian values. The Maunawili Stream and corridor recommendation is Priority #2.
<u>Primary Urban Center</u>			
16. Diamond Head State Monument	U to C	24	Unique physiographic feature; only portion of monument not in Conservation District.
17. Kalihi Valley Water Recharge Area	U to C	112	Valuable watershed lands. Steep slopes.
<u>Central Oahu</u>			
18. Leeward Koolau Watershed (Partial PUC)	A to C U to C	3,862 47	Additional lands for watershed.

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

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>Central Oahu (cont.)</u>			
19. Hydrologic Zone of	U to C	410	Protection of aquifer
Contribution: U.S.	A to C	1,463	and drinking water
Navy Waiawa Shaft			source.

RECLASSIFICATIONS TO THE CONSERVATION DISTRICT--PRIORITY #2

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>North Shore</u>			
1. Northern Waianae Range	A to C	5,599	Protection of native plants, scenic resources. Consistent with County "Preservation" designation for a portion of the area. *(A)
2. Haleiwa Lotus Fields	A to C	32	Provides habitat for endangered Hawaiian waterbirds. *(B)
<u>Koolauloa</u>			
3. Koloa Gulch	A to C	4	Outstanding aquatic resources. *(D)
4. Kaluanui Stream	A to C	789	Abundance of native aquatic species. Lands used for State park. *(B/C)
5. James Campbell NWR: Kii and Punamano	A to C	142	Part of National Wildlife Refuge System. Primary habitat for endangered Hawaiian coot, stilt, gallinule and koloa. *(C)
6. Kaaawa Valley	A to C	504.7	Outstanding aquatic resources.**
7. Hakipuu 200' Elevation Area	A to C	119	Conformance with County "Preservation" designation and contiguous to State Conservation District. Slope is greater than 20 percent. *(B)

*(A) - Further information needed

*(B) - Manpower/funding constraints

*(C) - Government ownership or management with conservation objectives

*(D) - Area is less than 15 acres

**A conservation easement and/or special subzone are being discussed with the landowner for this property.

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

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>Koolaupoko (cont.)</u>			
8. Bellows AFB Wetlands	U to C	20	Provides habitat for endangered Hawaiian waterbirds. *(B)
9. Waikane Watershed	A to C	281	Steep slopes, scenic, open space resources. Protection of Kaneohe Bay water quality. *(A)
<u>East Honolulu</u>			
10. Queen's Beach & Sandy Beach	U to C	418	Significant scenic and recreational resources. Consistent with County "Preservation" designation. *(A)
11. Koko Crater	U to C	25	Unique physiographic feature. Slope greater than 20 percent. *(A)
<u>Primary Urban Center</u>			
12. Pearl Harbor NWR: Waiawa Unit	U to C	25	Provides habitat for endangered waterbirds. *(C)
<u>Central Oahu</u>			
13. Windward Waianae Foothills	A to C	2,736	Steep slope and scenic resource.
14. Waikele Wetlands	U to C	26	Provides habitat for endangered Hawaiian water birds.

*(A) - Further information needed

*(B) - Manpower/funding constraints

*(C) - Government ownership or management with conservation objectives

*(D) - Area is less than 15 acres

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

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>Ewa</u>			
15. Pearl Harbor NWR: Honouliuli and Apokaa Ponds	A to C	42	Provides habitat for endangered waterbirds. *(C)
<u>Waianae</u>			
16. Kauaopuu (non- DHHL portion)	A to C	9	Protection of rare plant. Steep slopes. *(B)

*(A) - Further information needed

*(B) - Manpower/funding constraints

*(C) - Government ownership or management with conservation objectives

*(D) - Area is less than 15 acres

RECLASSIFICATIONS TO THE URBAN DISTRICT

	<u>REC.</u>	<u>ACREAGE</u>	<u>REASONS</u>
<u>Ewa</u>			
1. Hawaii Raceway Park	A to U	59	Currently in urban use. Urban District lands on two sides of parcel.
2. State & County Building Complex	A to U	50	Development of State and County facilities.
3. Barbers Point Harbor Expansion	A to U	141	Expansion of harbor facilities.
4. Makaiwa Hills	A to U	1,356	To meet urban land requirements to 2000. Proximity to existing Urban District.
5. Additional Urban Lands in Ewa	A to U	1,823	To meet urban land requirements. Proximity to existing Urban District.
6. Makakilo Expansion	A to U	87	To meet urban land requirements. Proximity to existing Urban District.

Central Oahu

1. Gentry Waiawa Expansion	A to U	1,067	To meet urban land requirements to 2000. Proximity to existing Urban District.
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RECOMMENDATIONS AFFECTING DEPARTMENT OF HAWAIIAN HOME LANDS

Waianae

1. Kauaopuu		9	Protection of rare plant. Steep slopes.
2. Nanakuli Residence Lots		48	To meet urban land requirements to 2000. Proximity to existing Urban District.

Petitions will not be initiated for DHHL lands.

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

XIV. RECOMMENDATIONS FOR STATE LAND USE DISTRICT BOUNDARY AMENDMENTS

NORTH SHORE

1. Kaena Coastline, 969 acres (A to C)

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

The proposed reclassification area is located between Kaena Point and Mokuleia roughly bounded by Puu Pueo on the west, following the 800-foot contour along the south, the existing shoreline on the north with the exception of Camp Erdman and a dwelling unit adjacent to Camp Erdman, and Keekee Gulch up to the 800-foot contour on the east.

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

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

Section 15-15-20(5) It shall include lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish, and, wildlife . . .

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

The Kaena Coastline is being proposed for reclassification to protect rare and endemic plants as well as scenic and recreational resources. This area is noted as having one of the best examples of shrub lands on Oahu as well as native coastal vegetation with rare plants. A substantial portion of the area is designated "Preservation" on the City and County of Honolulu North Shore Development Plan map with smaller portions designated as "Parks and Recreation" and "Public and Quasi-Public."

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

A to C

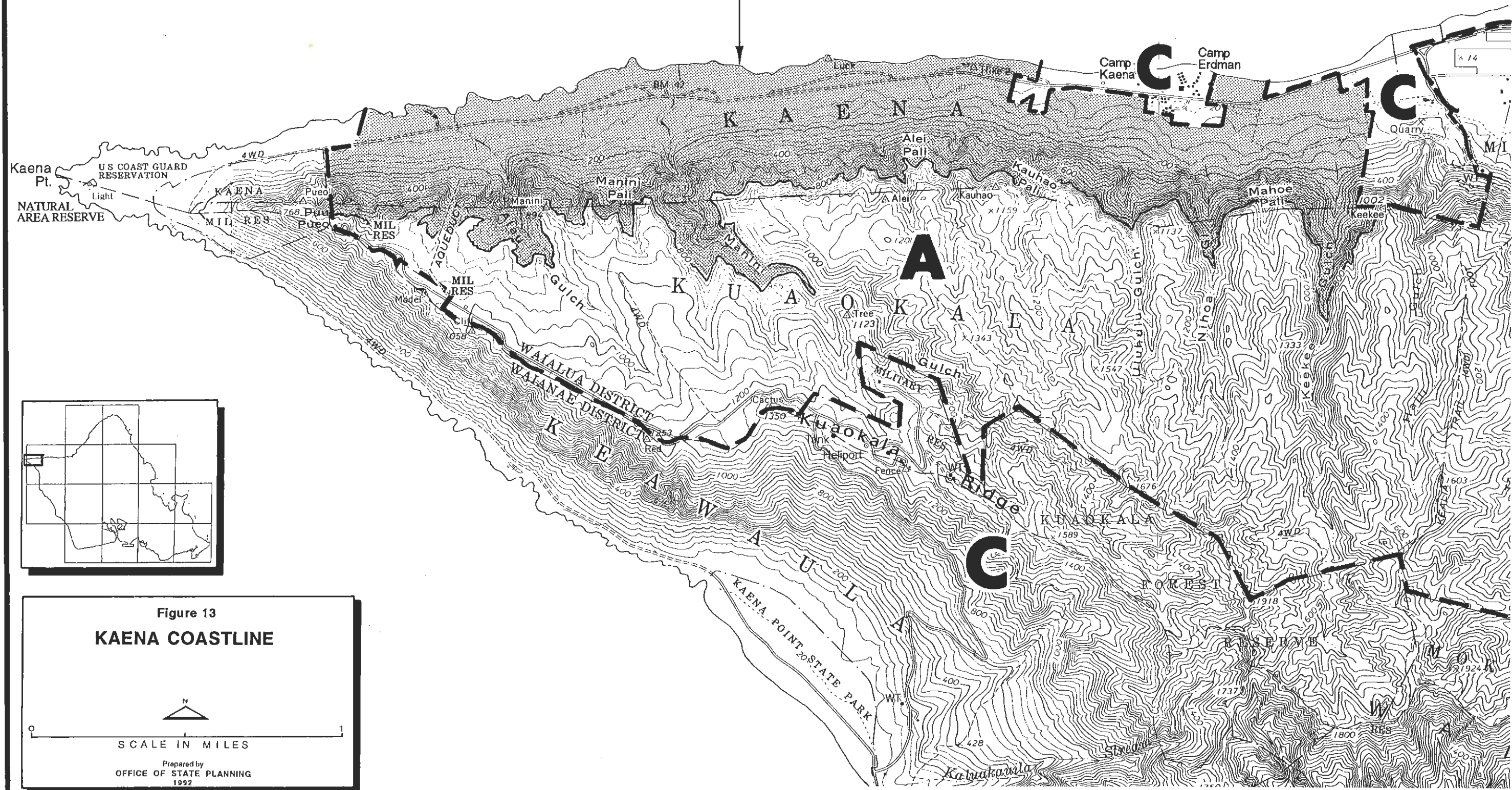
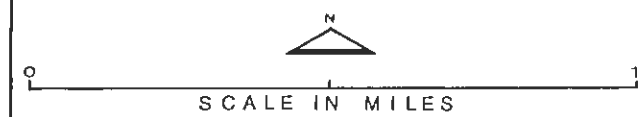


Figure 13
KAENA COASTLINE



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2. Northern Waianae Range, 5,599 acres (A to C)

The proposed reclassification of the Northern Waianae Range from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered; . . . open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources . . .

The proposed reclassification area is located between Kaena Point and Schofield Barracks roughly bounded by Puu Pueo on the west, following the existing Conservation District boundary along the south, following the 800-foot contour to the north, and the existing Conservation District at Puu Pane to the lower portion of Haleanu Gulch on the east.

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

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

Section 15-15-20(5) It shall include lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish, and, wildlife . . .

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

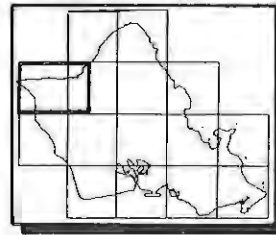
The Northern Waianae Range is being proposed for reclassification to protect rare and endemic plants as well as scenic resources. A dry forest on the slopes contains native plants. Native plants are also found in greater concentrations in the gulches. Much of the area consists of land with a slope greater than 30 percent. The City and County of Honolulu North Shore Development Plan map currently has the area designated both "Preservation" and "Agricultural."

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii and protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

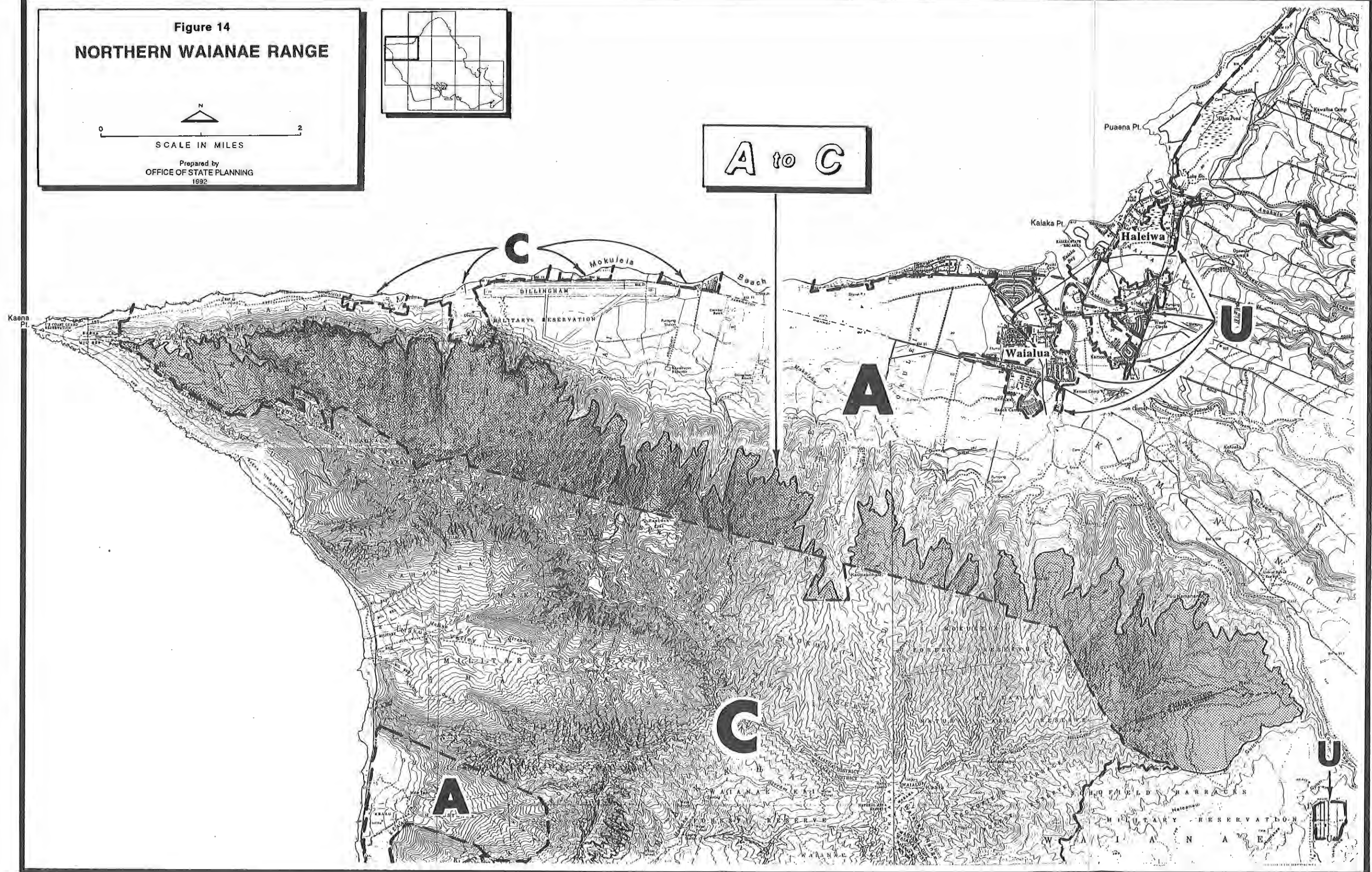
Figure 14
NORTHERN WAIANAE RANGE



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A to C



3. Makaleha Stream, 100-foot Corridor, Crowbar Ranch and Dillingham Field Ponds, 114.2 acres (A to C)

The proposed reclassification of Makaleha Stream, Crowbar Ranch and Dillingham Field Ponds from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . .

The proposed reclassification areas are located in Mokuleia. Makaleha Stream and 100-foot corridor are bounded by the existing Conservation District boundary adjacent to Kaupakuhale on the south, a 100-foot corridor from the stream bank on the west, a 100-foot corridor from the stream bank on the east, and the shoreline to the north. Crowbar Ranch Ponds are located to the west of Makaleha Stream makai of Farrington Highway and on the mauka side of Farrington Highway across Mokuleia Polo Farm. Dillingham Field Pond is located on Dillingham Airfield.

The proposed reclassification of Makaleha Stream, Crowbar Ranch and Dillingham Field Ponds from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

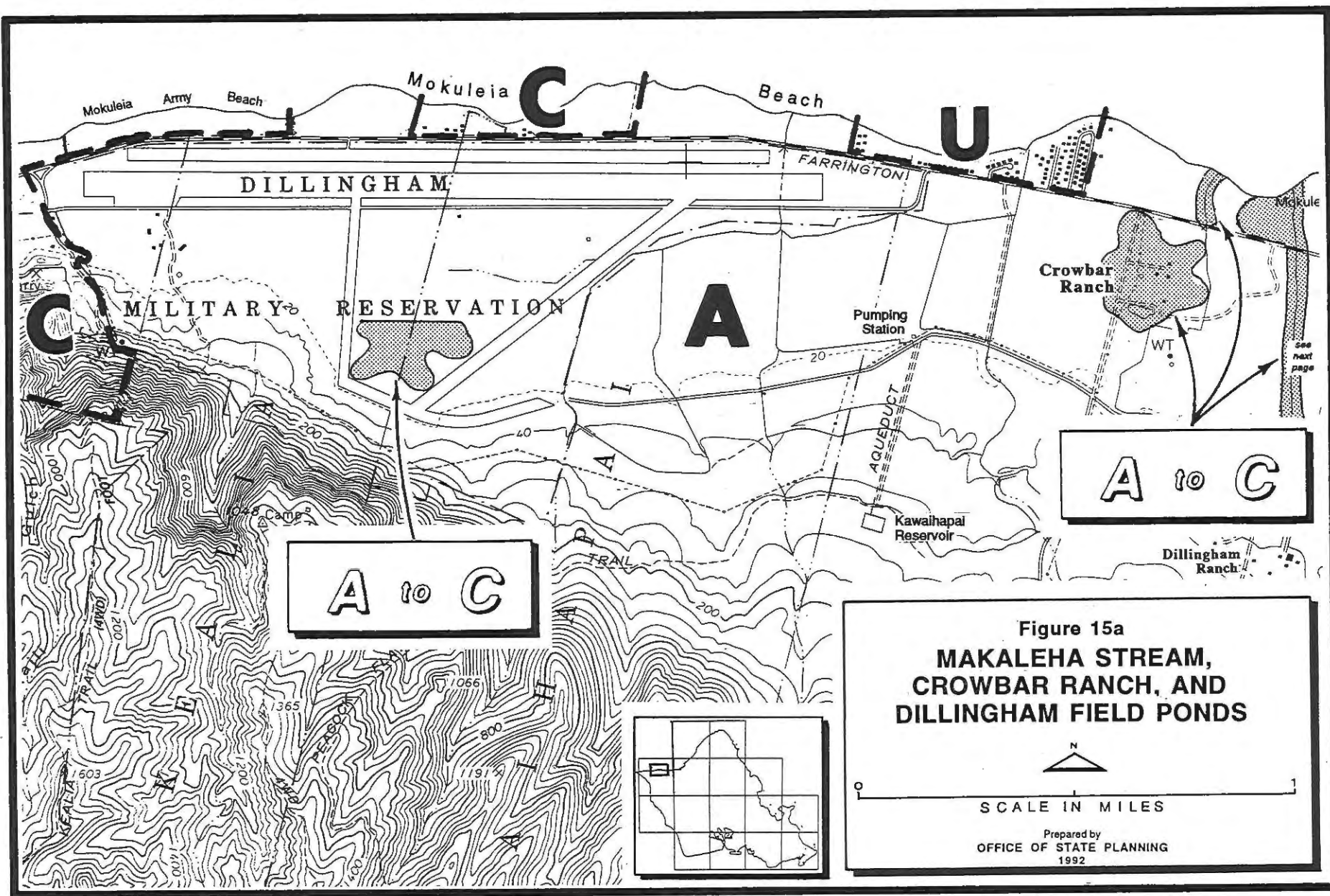
The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Land Use Commission Rules:

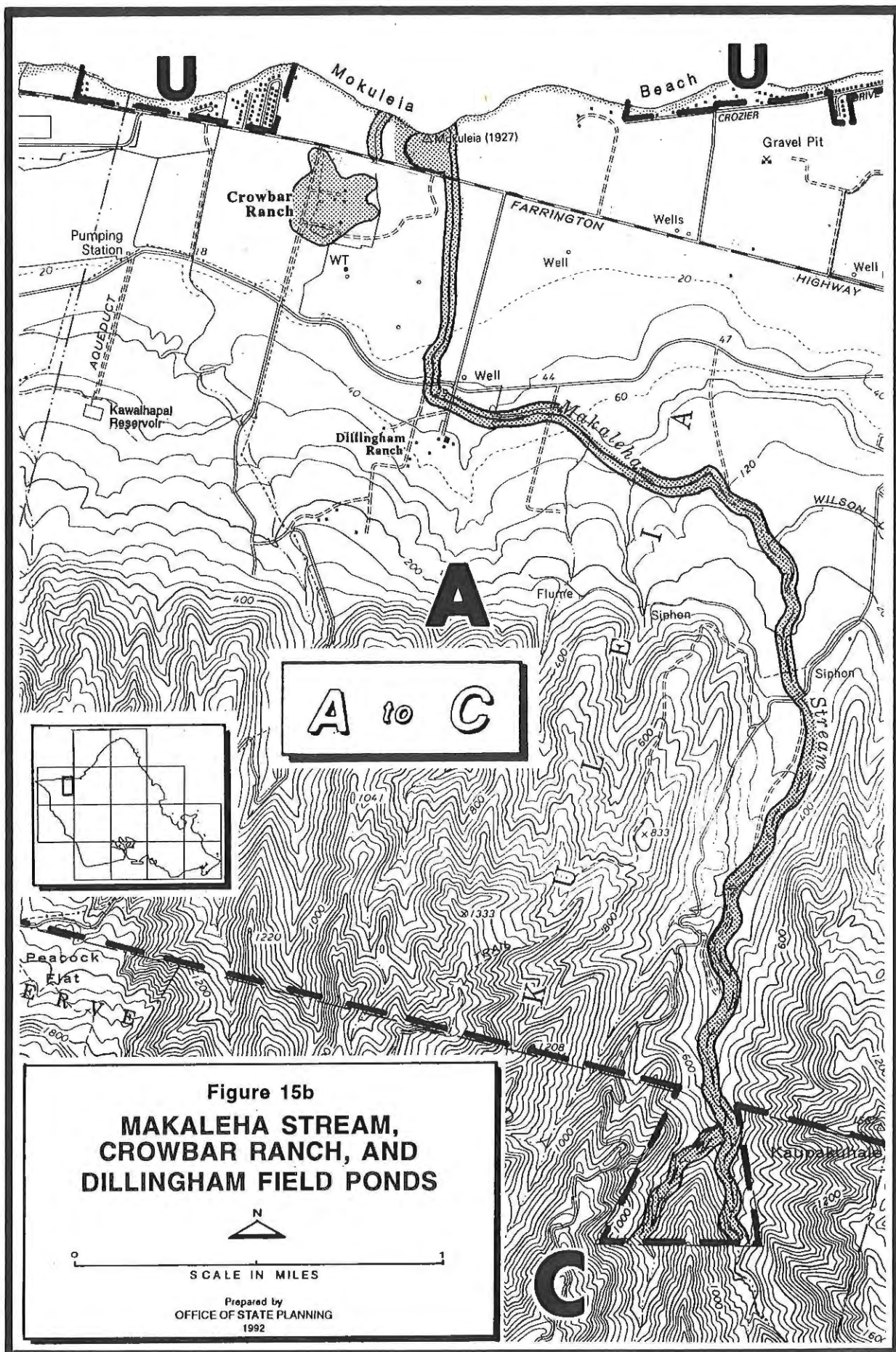
Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

Makaleha Stream, Crowbar Ranch and Dillingham Field Ponds are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. Makaleha Stream is noted for outstanding riparian resources in the Hawaii Stream Assessment as it is associated with the Crowbar Ranch Ponds. Both wetland areas have been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule. Additionally, they provide habitat for migratory waterbirds. A buffer around the wetlands, approximately 300 feet, is also desirable.

A minimum 100-foot buffer extending from the sides of the stream bank is recommended for reclassification from the Agricultural District to the Conservation District. Studies have shown that buffers are effective in reducing the amount of pollution entering a waterway (for example, Klein, 1990).

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.





4. Paukauila Stream and Corridor (including Opaepala and Helemano tributaries)
3,406 acres (A to C)

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

The proposed reclassification areas are located east of Haleiwa Town. Helemano Stream is north of Helemano Radio Station and is bounded by the existing Conservation District boundary adjacent to Kawaihoa Forest Reserve on the east, the ridge of the gulch down to the 200-foot elevation and then a 100-foot corridor on the north, the ridge of the gulch down to the 200-foot elevation and then a 100-foot corridor on the south, and the existing Urban District boundary north of Weed Circle on the west. Opaepala Stream is north of Helemano Stream and is bounded by the existing Conservation District boundary adjacent to Kawaihoa Forest Reserve on the east, the ridge of the gulch down to the 200-foot elevation and then a 100-foot corridor on the north, the ridge of the gulch down to the 200-foot elevation and then a 100-foot corridor on the south, and the existing Urban District boundary north of Weed Circle on the west.

The proposed reclassification of Paukauila Stream and its tributaries, Opaepala and Helemano, from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and, wildlife
. . . .

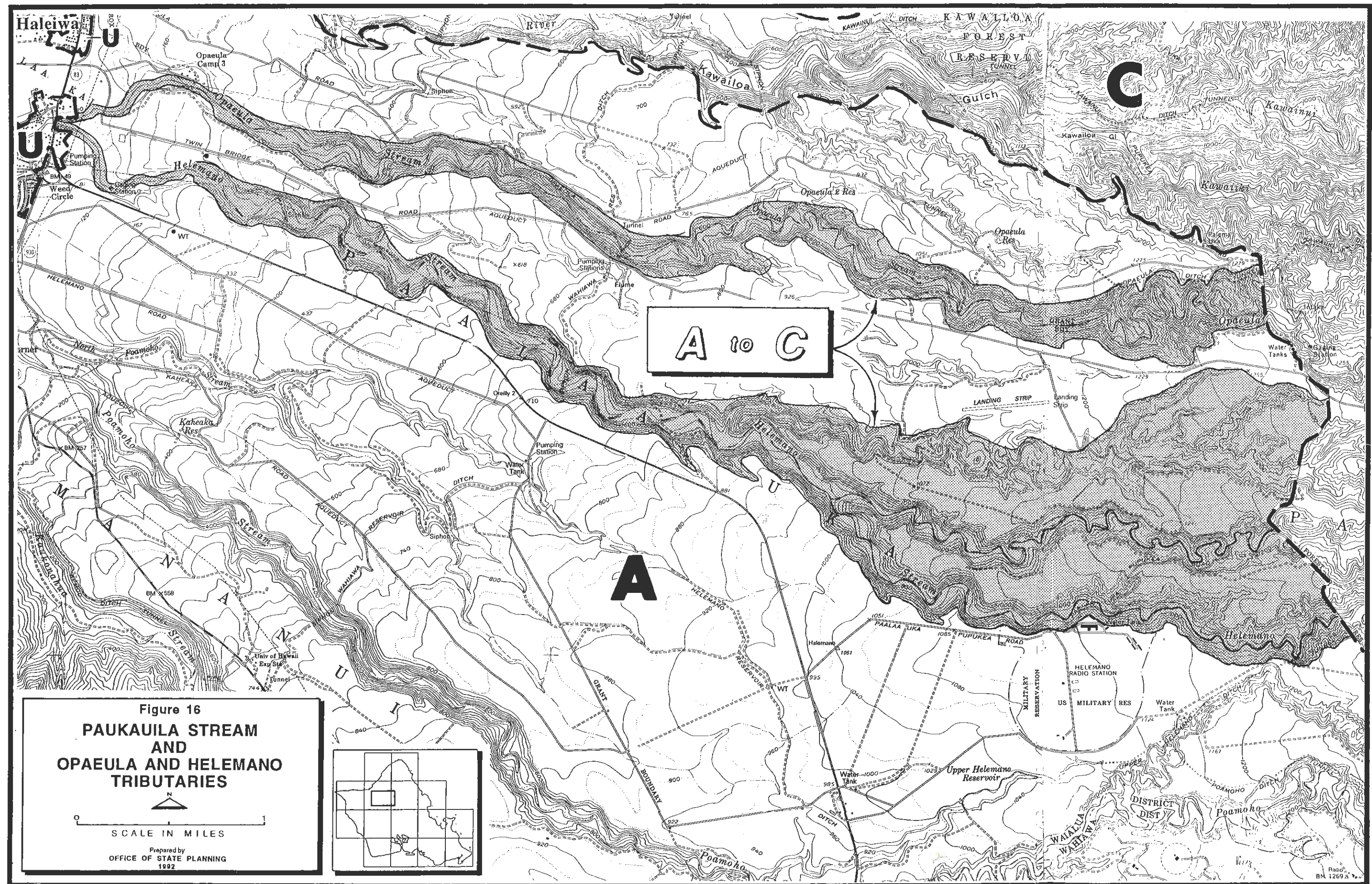
Paukauila Stream and its tributaries, Opaepala and Helemano, are being proposed for reclassification to protect native and candidate endangered species. It is noted for outstanding aquatic resources in the Hawaii Stream Assessment as there is an abundance of native aquatic species throughout the stream and its tributaries.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

For Heleman and Opauala tributaries of Paukauila Stream, this area would be "Urban" land from the makai border of the Agricultural District above Weed Circle to Kaiaka Bay.

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 resources should be thoroughly and critically reviewed.



5. Haleiwa Lotus Fields, 32.4 acres (A to C)

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

The proposed reclassification area is in Haleiwa Town roughly bounded by urban uses between Haleiwa Road on the north and west, Kamehameha Highway on the east, and Achiu Lane on the south.

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

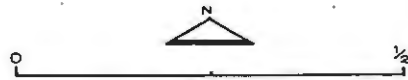
The proposed land use district boundary amendment meets the following standards for determining Conservation District boundaries contained in the Hawaii Land Use Commission Rules:

Section 15-15-20(5) It shall include lands necessary for providing and preserving parklands, wilderness and beach reserves, and for conserving natural ecosystems of endemic plants, fish, and wildlife . . .

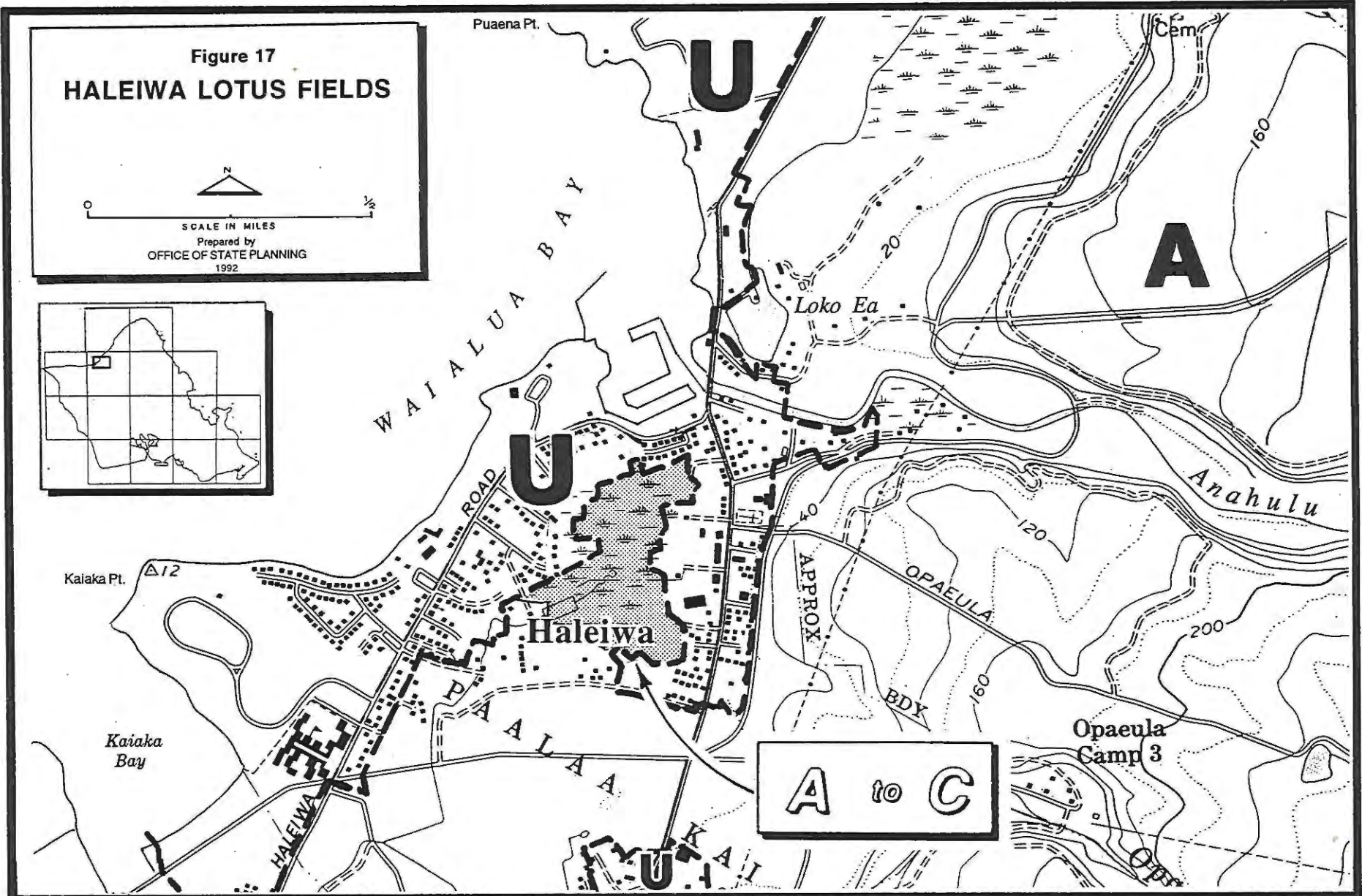
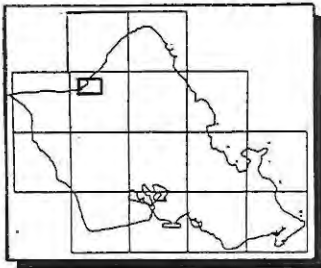
Haleiwa Lotus Fields are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. These wetland areas have been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule. A buffer area around the wetlands is desirable but may not be feasible given existing uses.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

Figure 17
HALEIWA LOTUS FIELDS



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6. Anahulu Stream and 100-Foot Corridor, 41.6 acres (A to C)

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

The proposed reclassification area is in the northern portion of Haleiwa Town bounded by the existing Conservation District boundary on the east, a 100-foot corridor from the stream bank on the north and south, and the existing Urban District boundary on the west.

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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Anahulu Stream is being proposed for reclassification to protect native and candidate endangered species. It meets the criteria for outstanding aquatic resources used in the Hawaii Stream Assessment based upon new information provided by the Department of Land and Natural Resources. There is an abundance of native aquatic species throughout Anahulu Stream.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

For Anahulu Stream, this area would be "Urban" land from the makai border of the Agricultural District just north of Haleiwa Town to Waialua Bay.

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 resources should be thoroughly and critically reviewed.

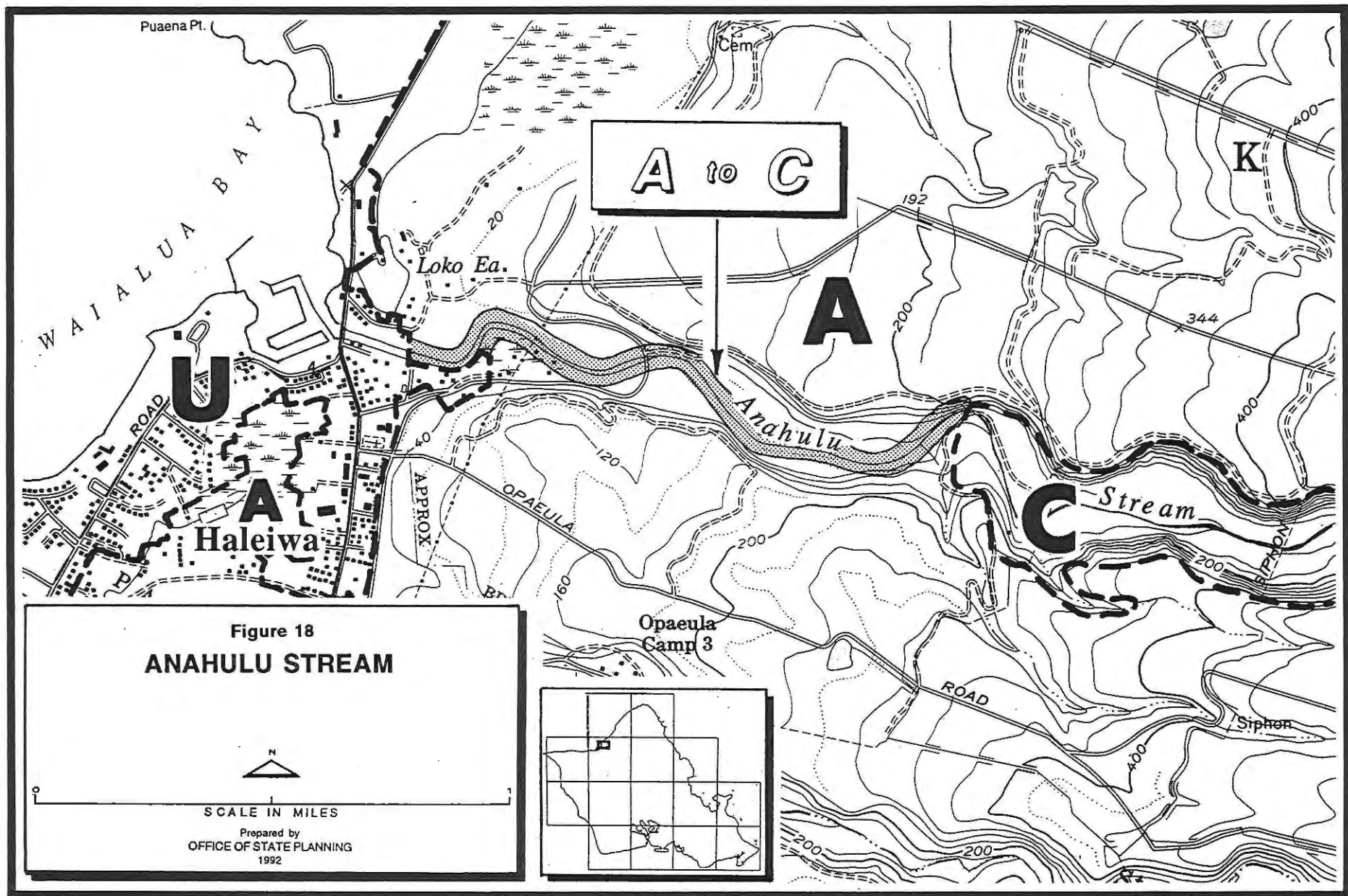


Figure 18
ANAHULU STREAM



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7. Ukoa Marsh and Loko Ea Fishpond, 110 acres (A to C)

The proposed reclassification of Ukoa Marsh and Loko Ea Fishpond from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants and wildlife, including those which are threatened or endangered . . .

The proposed reclassification area is north of Haleiwa Town roughly bounded by Kamehameha Highway on the west, Lokoea Place on the south, Cane Haul Road on the east, and Kawailoa Drive on the north.

The proposed reclassification of Ukoa Marsh and Loko Ea Fishpond from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

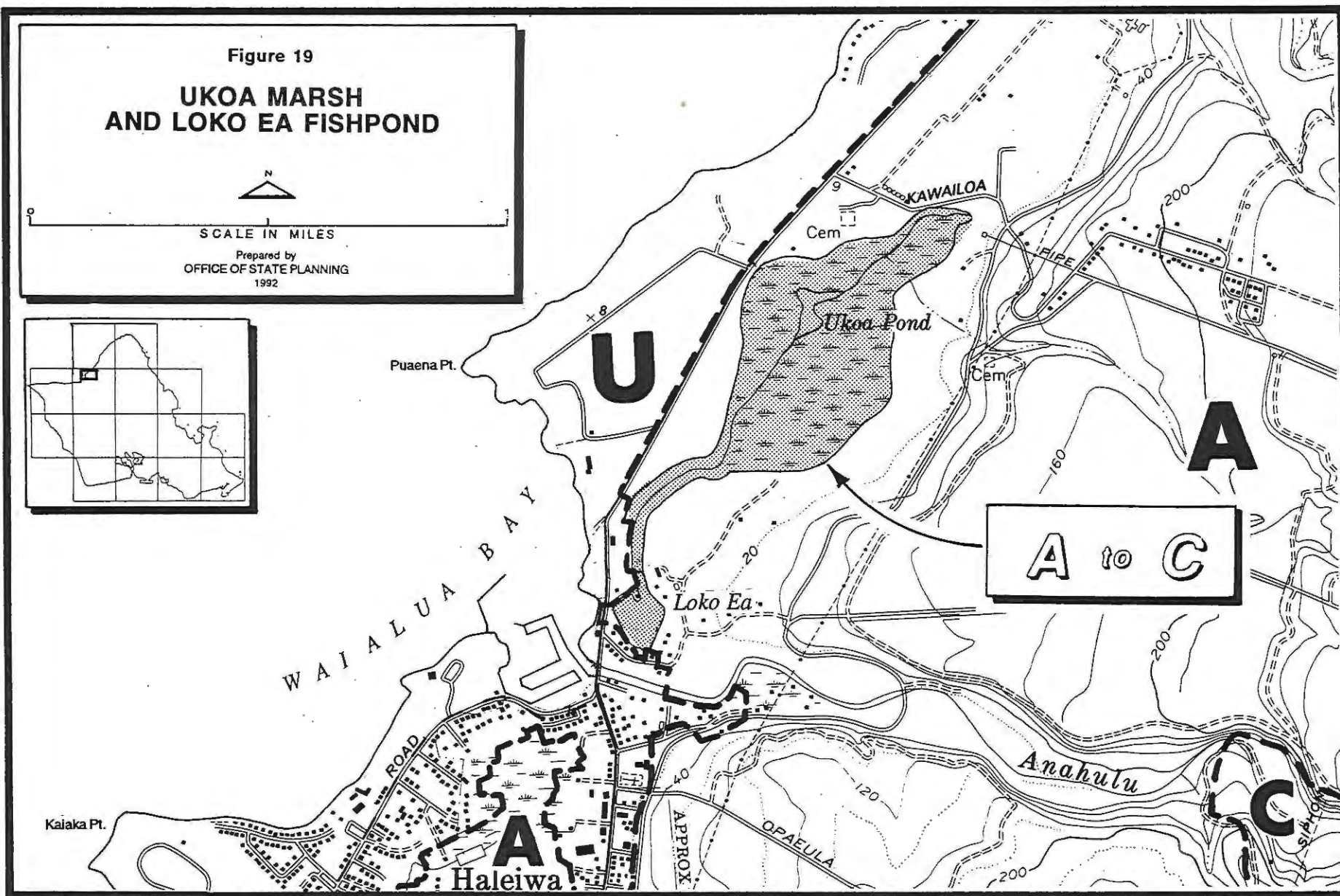
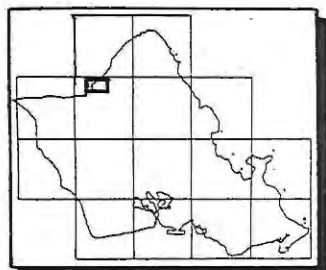
Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

Ukoa Marsh and Loko Ea Fishpond are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. The wetland has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule. In the Regional Wetlands Concept Plan: Emergency Wetlands Resource Act, Ukoa Marsh is noted as an important site. Ukoa Marsh is also listed as a top priority wetland for protection in the State Recreation Functional Plan, State Recreation Functional Plan Technical Reference Document, and the State Conservation Lands Functional Plan. Additionally, the wetland provides habitat for migratory waterbirds and shorebirds. A buffer area around the wetland is desirable but may not be feasible given existing uses.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

Figure 19

UKOA MARSH AND LOKO EA FISHPOND



KOOLAULOA

8. Punahoolapa Marsh, 50.5 acres (A to C)

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

The proposed reclassification area is south of Kahuku Point roughly bounded by Kamehameha Highway on the south, the Turtle Bay Hilton and Country Club on the west, Kahuku Airport on the north, and Kahuku Airport Road on the east.

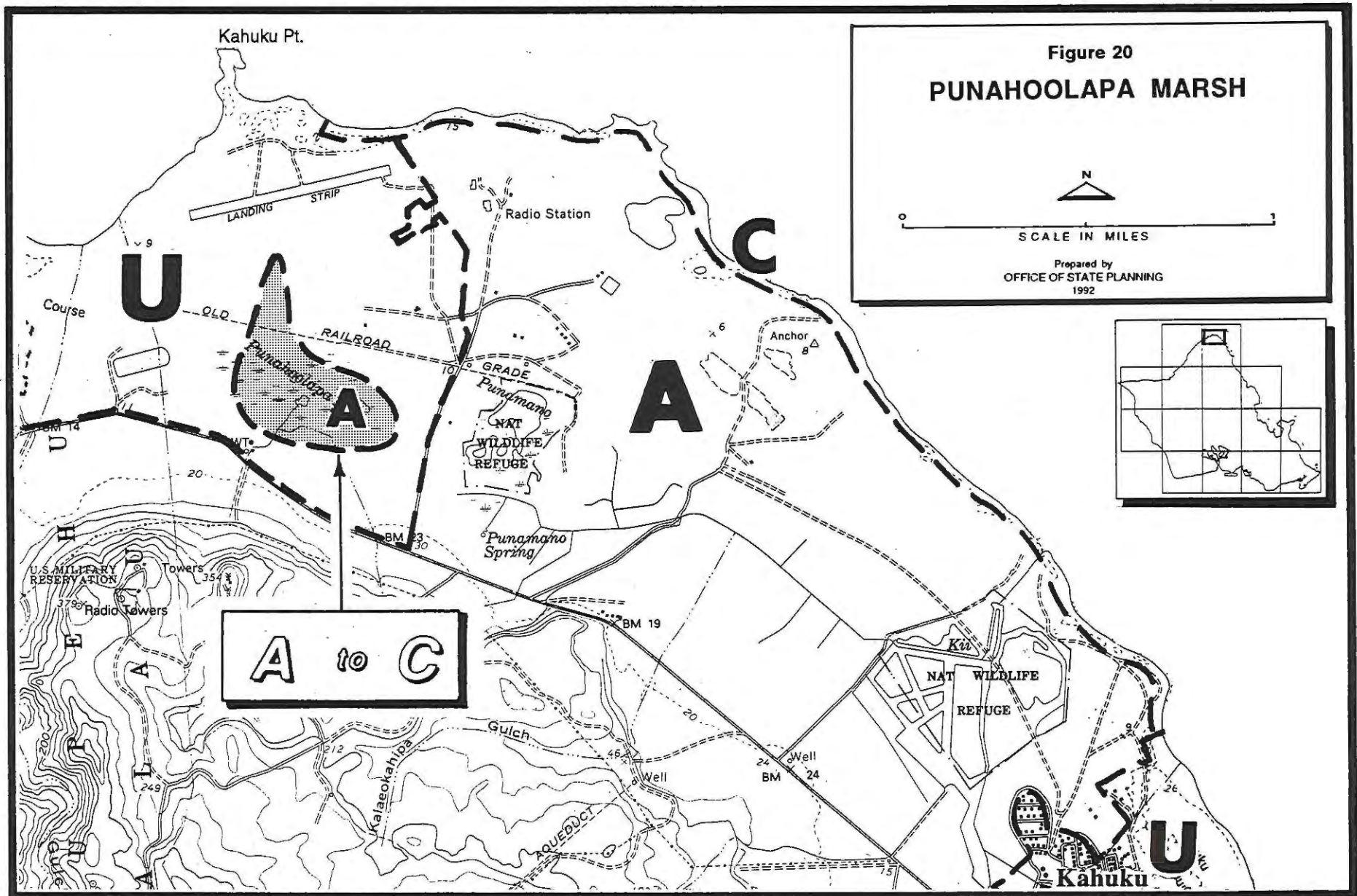
The proposed reclassification of Punahoolapa Marsh from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Punahoolapa Marsh is being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. It is a portion of a larger complex of wetlands in the area which support endangered Hawaiian coot, stilt, koloa, and gallinule, migratory waterbirds and shorebirds, as well as being a nesting area for the Laysan Albatross. Punahoolapa Marsh has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian waterbird. In the Regional Wetlands Concept Plan: Emergency Wetlands Resource Act, Punahoolapa Marsh is noted as a potential site for wetland acquisition. Enhancement of Punahoolapa Marsh as a waterbird habitat will be undertaken by landowner Asahi Jyukun as an amenity to the expansion of the Turtle Bay Resort. Punahoolapa Marsh is designated "Preservation" on the City and County of Honolulu Koolauloa Development Plan Map.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.



9. James Campbell National Wildlife Refuges: Punamano and Kii Units,
142 acres (A to C)

The proposed reclassification of the James Campbell National Wildlife Refuges, Punamano and Kii Units, from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . . .

The proposed reclassification areas are northwest of Kahuku Town. Punamano is roughly bounded by Kahuku Airport Road on the west, a plantation road on the north, an unnamed private road on the east, and a ditch on the south. Kii is generally bounded by Kahuku Town on the east, a ditch on the south, a plantation road on the west, and going towards the coast on the north.

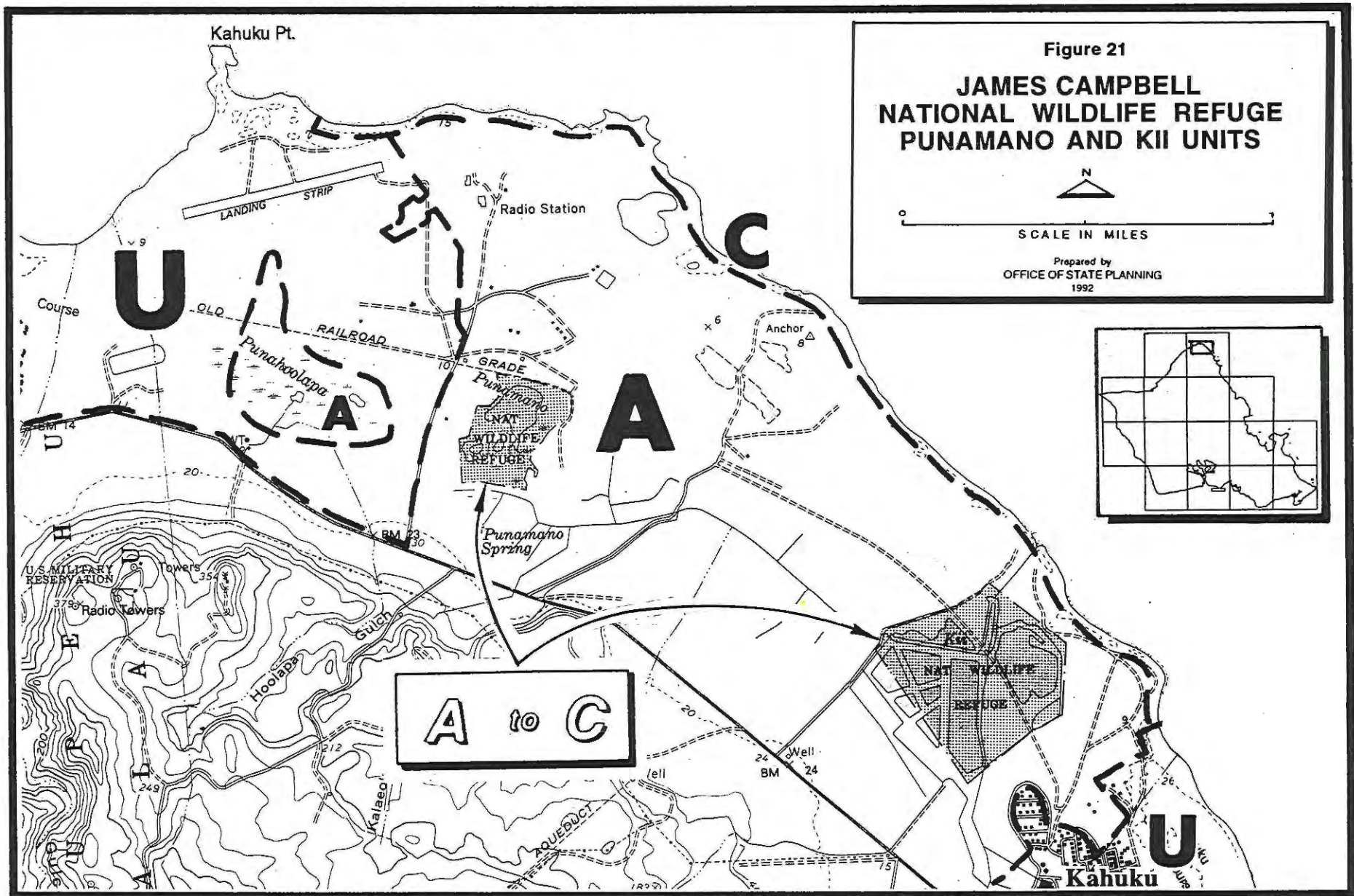
The proposed reclassification of the James Campbell National Wildlife Refuges, Punamano and Kii Units, from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

James Campbell National Wildlife Refuge, Punamano and Kii Units, are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. It is a portion of a larger complex of wetlands in the area which support endangered Hawaiian coot, stilt, koloea, and gallinule, migratory waterbirds and shorebirds, as well as being a nesting area for the Laysan Albatross. James Campbell National Wildlife Refuge, Punamano and Kii Units, have been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian waterbird. These two areas are currently managed by the U.S. Fish and Wildlife Service to protect endangered Hawaiian waterbird habitat. James Campbell National Wildlife Refuge, Punamano and Kii Units, are designated "Preservation" on the City and County of Honolulu Koolauloa Development Plan Map.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.



10. Kahuku Wetlands, 207.8 acres (A to C)

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

The proposed reclassification area is northwest of Kahuku Town and is roughly bounded by Kahuku Airport Road on the west, a ditch on the south, Kahuku Town on the east, and the old railroad line on the north.

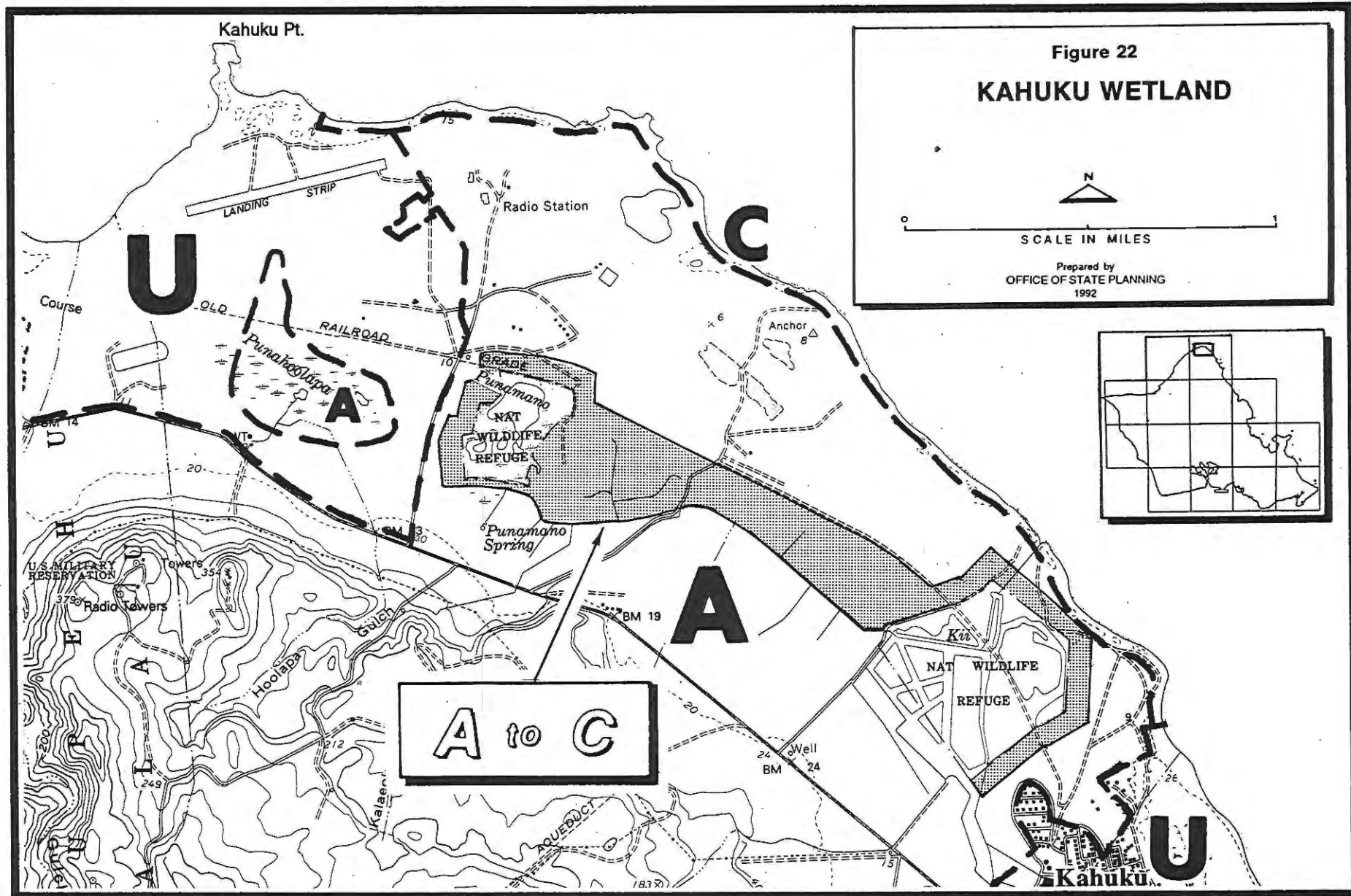
The proposed reclassification of Kahuku Wetlands from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Kahuku Wetlands are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. They are a portion of a larger complex of wetlands in the Kahuku area which support endangered Hawaiian coot, stilt, koloa, and gallinule, migratory waterbirds and shorebirds, as well as being a nesting area for the Laysan Albatross. Kahuku Wetlands have been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian waterbird. In the Regional Wetlands Concept Plan: Emergency Wetlands Resource Act, it is noted as important wetland sites.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.



11. Koloa Gulch and 100-Foot Corridor, 3.7 acres (A to C)

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

The proposed reclassification area is south of Laie Town in Koloa Gulch bounded by the existing Conservation District boundary on the west, a 100-foot corridor from the stream bank on the north and south, and the existing Urban District boundary on the east.

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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

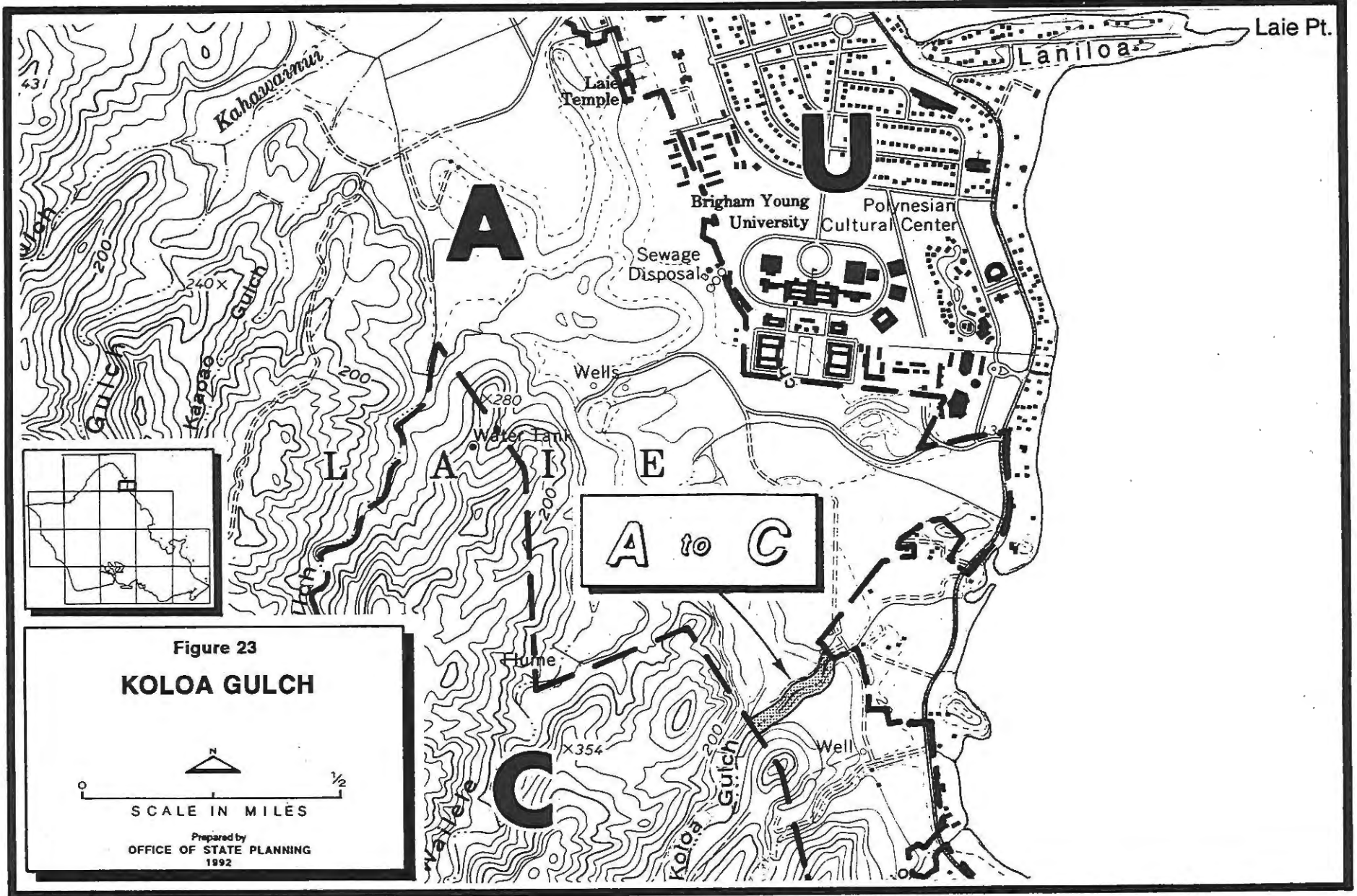
Koloa Gulch is being proposed for reclassification to protect outstanding aquatic resources. The Hawaii Stream Assessment notes an abundance of native aquatic species throughout the stream. Koloa Gulch is noted in the Hawaii Stream Assessment for its outstanding recreational and substantial riparian resources.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12, and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

For Koloa Gulch, this area would be "Urban" land from the makai border of the Agricultural District to the ocean, 100 feet wide from the stream banks on each side.

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 resources should be thoroughly and critically reviewed.



12. Kaluanui Stream and Valley, 789 acres (A to C)

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

The proposed reclassification is south of Hauula roughly bounded by the existing Conservation District boundary on the north, west and south, narrowing towards the existing Urban District boundary on the east.

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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Kaluanui Stream and Valley is being proposed for reclassification to protect native and candidate endangered species. Kaluanui Stream is noted for outstanding aquatic resources in the Hawaii Stream Assessment, as there is an abundance of native aquatic species throughout the stream. It is also noted in the Hawaii Stream Assessment for its outstanding recreational resources as well as its substantial riparian and cultural resources.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

For Kaluanui Stream, this area would be "Urban" land from the makai border of the Agricultural District to the ocean.

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 resources should be thoroughly and critically reviewed.

13. Punaluu Stream and 100-Foot Corridor, 31 acres (A to C)

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

The proposed reclassification area is located in Punaluu bounded by the existing Conservation District boundary on the west, a 100-foot corridor from the stream bank from the north and south, and the shoreline at Punaluu Beach Park on the east.

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

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

Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

Punaluu Stream is being proposed for reclassification to protect outstanding aquatic resources. The Hawaii Stream Assessment notes an abundance of native aquatic species throughout the stream. Punaluu Stream is also noted in the Hawaii Stream Assessment for its substantial riparian, cultural, and recreational resources.

A minimum 100-foot buffer extending from the sides of the stream bank is recommended for reclassification from the Agricultural District to the Conservation District. Studies have shown that buffers are effective in reducing the amount of pollution entering a waterway (for example, Klein, 1990).

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

For Punaluu Stream, this area would be "Urban" land from the mauka border of the Agricultural District to the ocean, 100 feet wide on the Makalii Point side of the stream bank.

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 resources should be thoroughly and critically reviewed.

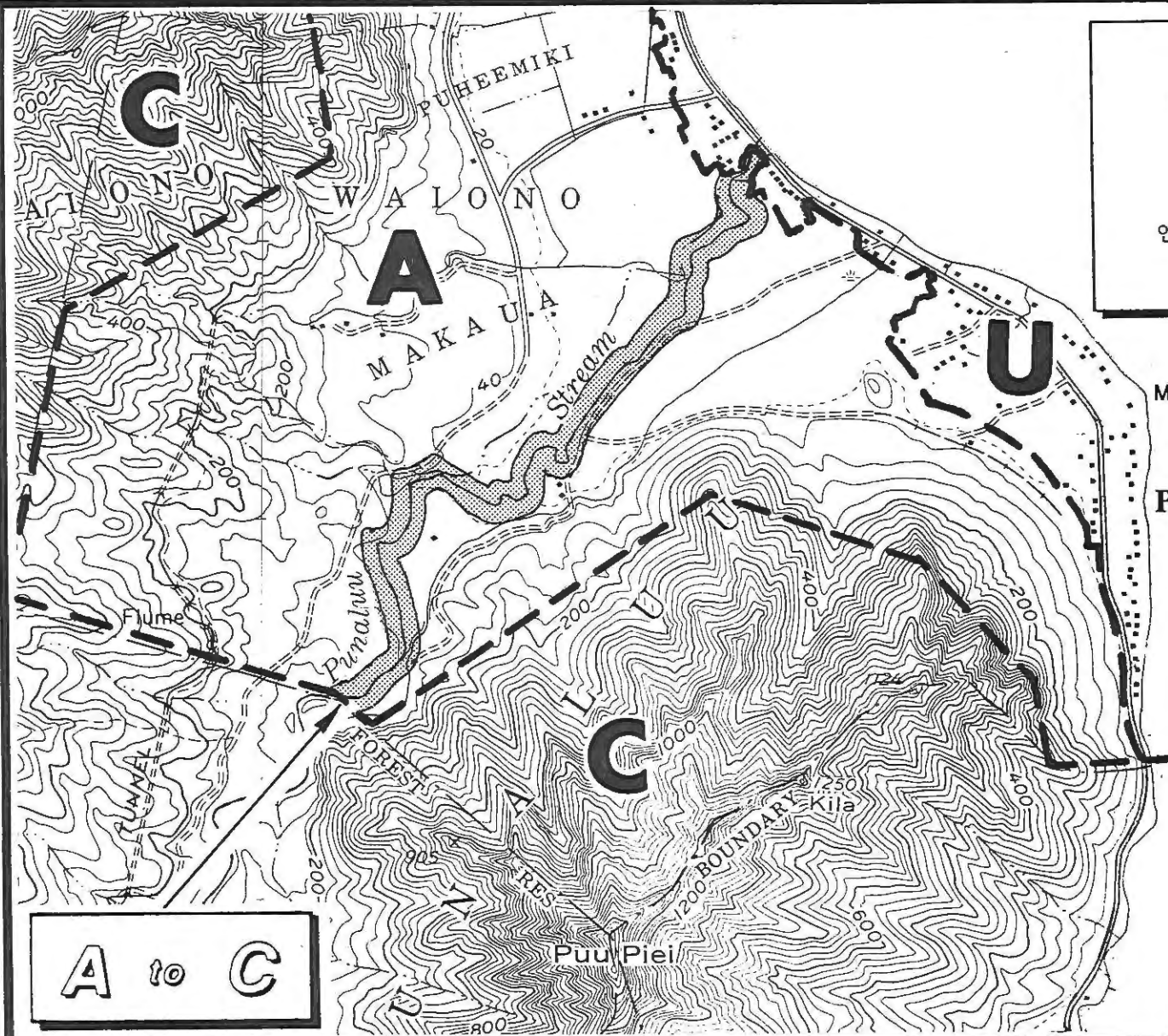
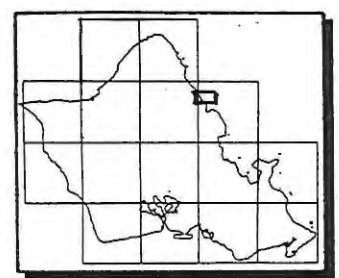


Figure 25
PUNALUU STREAM



Makalii Pt.
Punaluu



14. Kaaawa Stream and Valley, 63.3 acres (Priority #1); 504.7 acres (Priority #2) (A to C)

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

The proposed reclassification area is located in Kaaawa roughly bounded by the existing Conservation District boundary on the north, west, and south, and Kaaawa Stream on the east with a 100-foot corridor extending along the stream bank.

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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic values . . .

Kaaawa Stream and Valley is being proposed for reclassification to protect outstanding aquatic resources. The Hawaii Stream Assessment notes an abundance of native aquatic species within the stream system. It is also noted in the Hawaii Stream Assessment for its substantial recreational resources. A portion of the proposed reclassification area also contains lands with slopes greater than 20 percent.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

Discussions with the landowner indicate that an alternate approach to stream protection such as a conservation easement and/or special subzone may be pursued for much of the proposed reclassification area. These discussions relate to providing the greatest protection to the 100-foot corridor area on both sides of the stream and controlling activities in the remainder of the valley such that they do not harm the stream resources.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

For Kaaawa Stream, this area would be "Urban" land from the mauka border of the Agricultural District to the ocean.

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 resources should be thoroughly and critically reviewed.

KOOLAUPOKO

15. Hakipuu 200-Foot Elevation Area, 119 acres (A to C)

The proposed reclassification of the Hakipuu 200-foot Elevation Area from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preventing floods and soil erosion . . . open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources . . .

The proposed reclassification area is along the Koolau mountains above Kuuloa Park bounded by the existing Conservation District boundary on the north, and following the 200-foot contour on the west, south and east.

The proposed reclassification of the Hakipuu 200-foot Elevation Area from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Maintenance of valued cultural, historical, or natural resources.

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

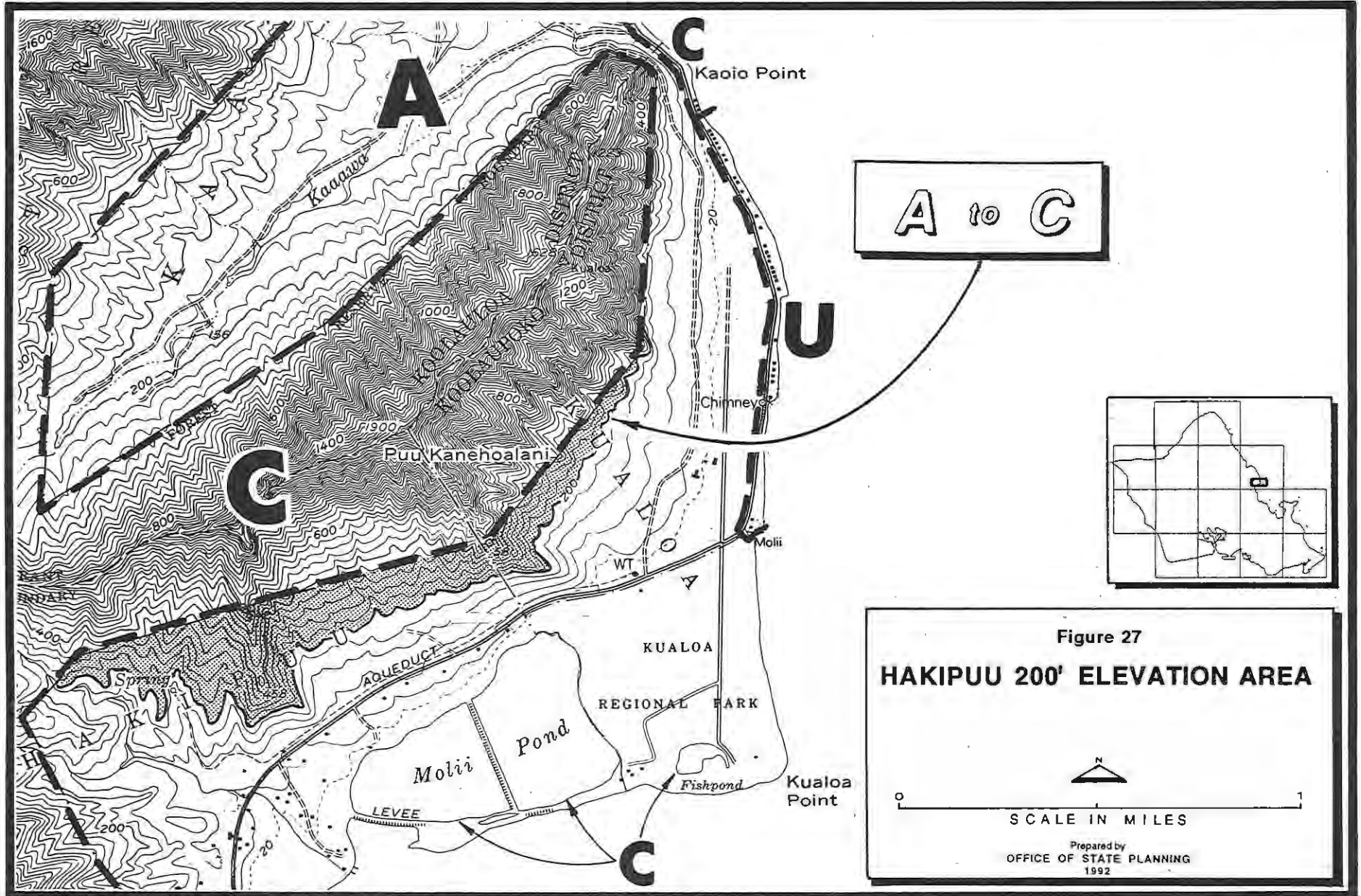
Section 15-15-20(2) It may include lands susceptible to floods and soil erosion . . .

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

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic values . . .

Various places in the Hakipuu Ahupuaa above 200-foot elevation with slope greater than 20 percent are being proposed for reclassification to prevent further soil erosion and preserve scenic resources. These areas consist of lands with a slope greater than 20 percent, are an extension of the Conservation District, and are designated "Preservation" on the City and County of Honolulu Koolaupoko Development Plan map. In addition, impacts on the water quality of Kaneohe Bay were a key consideration. This is a steep area which, if developed, may impact the quality of Kaneohe Bay.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, reducing the threat to life and property from erosion and other natural or man-induced hazards, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.



16. Waikane Watershed, 281 acres (A to C)

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

The proposed reclassification area is located in Waikane Valley roughly bounded by the existing Conservation District boundary on the north and west, Kamehameha Highway on the east, and Waikane Valley Road on the south.

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

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

Section 15-15-20(2) It may include lands susceptible to floods and soil erosion . . .

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

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

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic values . . .

The proposed reclassification of Waikane Watershed is an extension of the Conservation District to protect endemic plants and animals, scenic resources, and minimize soil erosion which impacts water quality in Kaneohe Bay. Much of the area consists of slope greater than 30 percent with a mean annual rainfall ranging from 65 inches in the lower portion of the valley to 110 inches in the upper portion of the valley. Waikane Stream runs through the watershed and is noted for its native aquatic resources. It is noted in the Hawaii Stream Assessment for its substantial recreational and cultural resources as well as its moderate

aquatic resources. This area was proposed for reclassification by the Kaneohe Bay Master Plan Task Force. The watershed meets criteria for reclassification utilized for the boundary review.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii and reducing the threat to life and property from erosion and other natural or man-induced hazards, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii and, protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

17. Waihee Wetland, 22.1 acres (U to C)

The proposed reclassification of Waihee Wetland from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . . .

The proposed reclassification area is located in Kahaluu roughly bounded by Waihee Road on the south, residential units on the west, Wailehua Road on the north, and the coastline on the east.

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

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

Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

Waihee Wetland, also known as Waihee Marsh and Kahaluu Wetland, is being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. The wetland provides primary habitat for endangered Hawaiian gallinules. Waihee Wetland is identified as important in the Regional Wetlands Concept Plan: Emergency Wetlands Resource Act. This area was proposed for reclassification by the Kaneohe Bay Master Plan Task Force and meets the criteria for reclassification utilized for the boundary review.

A buffer area around the wetland (300 feet) is desirable but may not be feasible given existing land uses.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

18. Waihee Valley Mauka, 147.6 acres (U to C)

The proposed reclassification of Waihee Valley Mauka from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watershed and water sources . . . preventing floods and soil erosion; open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, and would maintain or enhance the conservation of natural or scenic resources . . .

The proposed reclassification area is located in Waihee Valley roughly bounded by the existing Conservation District on the north, west and south and the end of the paved portion of Waihee Road on the west.

The proposed reclassification of Waihee Valley from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(1) It shall include lands necessary for protecting watersheds, water resources, and water supplies . . .

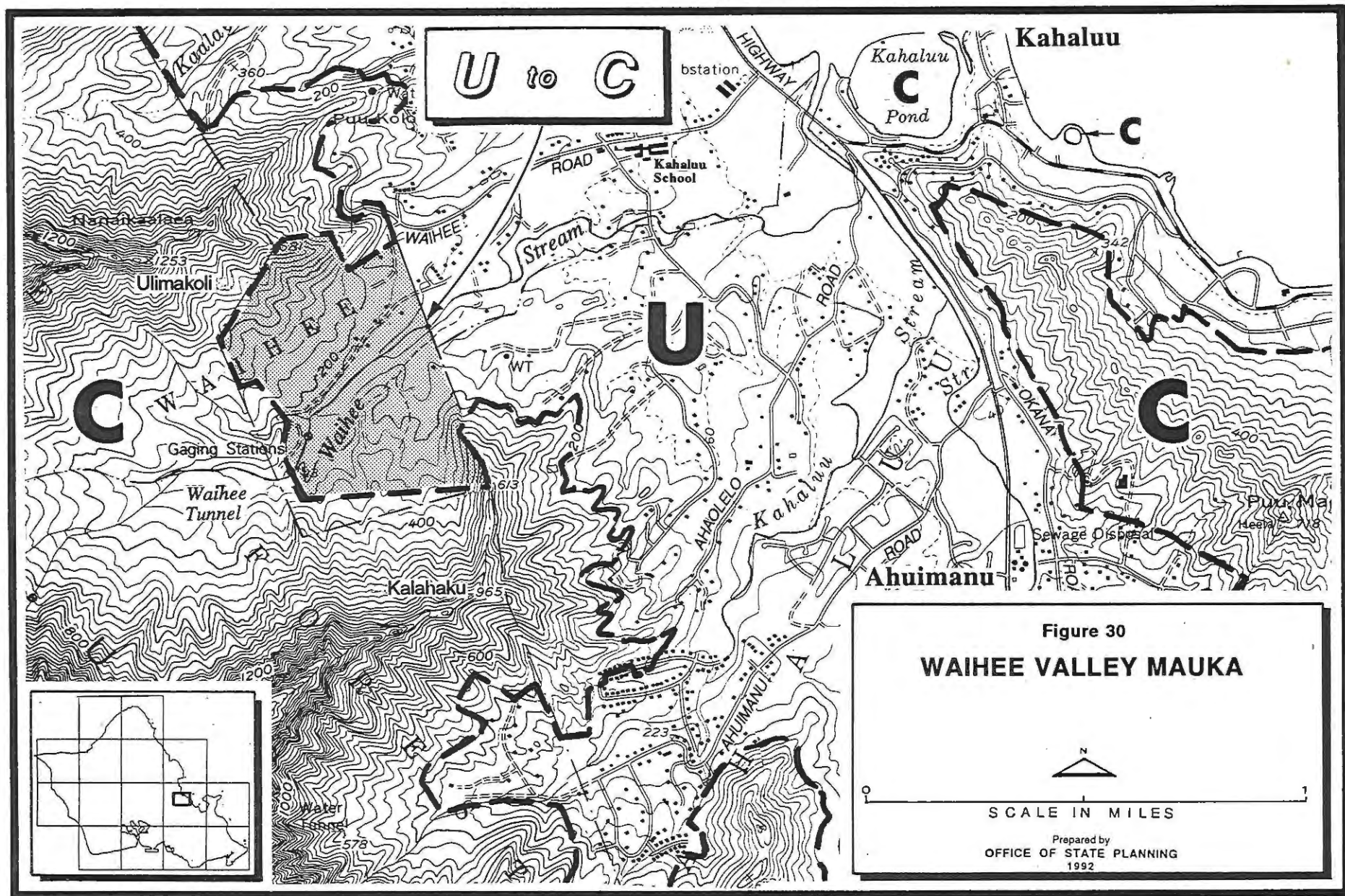
Section 15-15-20(2) It may include lands susceptible to floods and soil erosion . . .

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

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic values . . .

The proposed reclassification of Waihee Valley Mauka is an extension of the Conservation District to protect watershed, open space resources, and minimize soil erosion which impacts water quality in Kaneohe Bay. Much of the area consists of slope greater than 20 percent with a mean annual rainfall of approximately 75 inches. This area was proposed for reclassification by the Kaneohe Bay Master Plan Task Force and meets the criteria for reclassification utilized for the boundary review.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii and reducing the threat to life and property from erosion and other natural or man-induced hazards, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii and, protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.



19. Ahuimanu (Kahaluu) Taro Loi System, 40 acres (U to C)

The proposed reclassification of Ahuimanu (Kahaluu) Taro Loi System from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preserving scenic and historic areas . . .

The proposed reclassification area is located in Ahuimanu and is roughly bounded by the existing Conservation District boundary on the north, west and south and residential units on the east.

The proposed reclassification of Ahuimanu (Kahaluu) Taro Loi System from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(4) It shall include lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic or archaeologic sites . . .

The proposed reclassification of Ahuimanu (Kahaluu) Taro Loi System is to further protect significant archaeological features. Ahuimanu (Kahaluu) Taro Loi System is a significant cultural resource which is listed on the National Register of Historic Places. It is one of the largest examples of intact taro loi on Oahu, the most complex, and the best example of ancient Hawaiian expertise in engineering. The Ahuimanu (Kahaluu) Taro Loi System is currently designated "Preservation" on the City and County of Honolulu Koolaupoko Development Plan map. This area was proposed for reclassification by the Kahaluu Neighborhood Board and meets the criteria for reclassification utilized for the boundary review.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-12, HRS, including but not limited to, promoting the preservation and restoration of significant natural and historic resources, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii including historic and cultural sites.

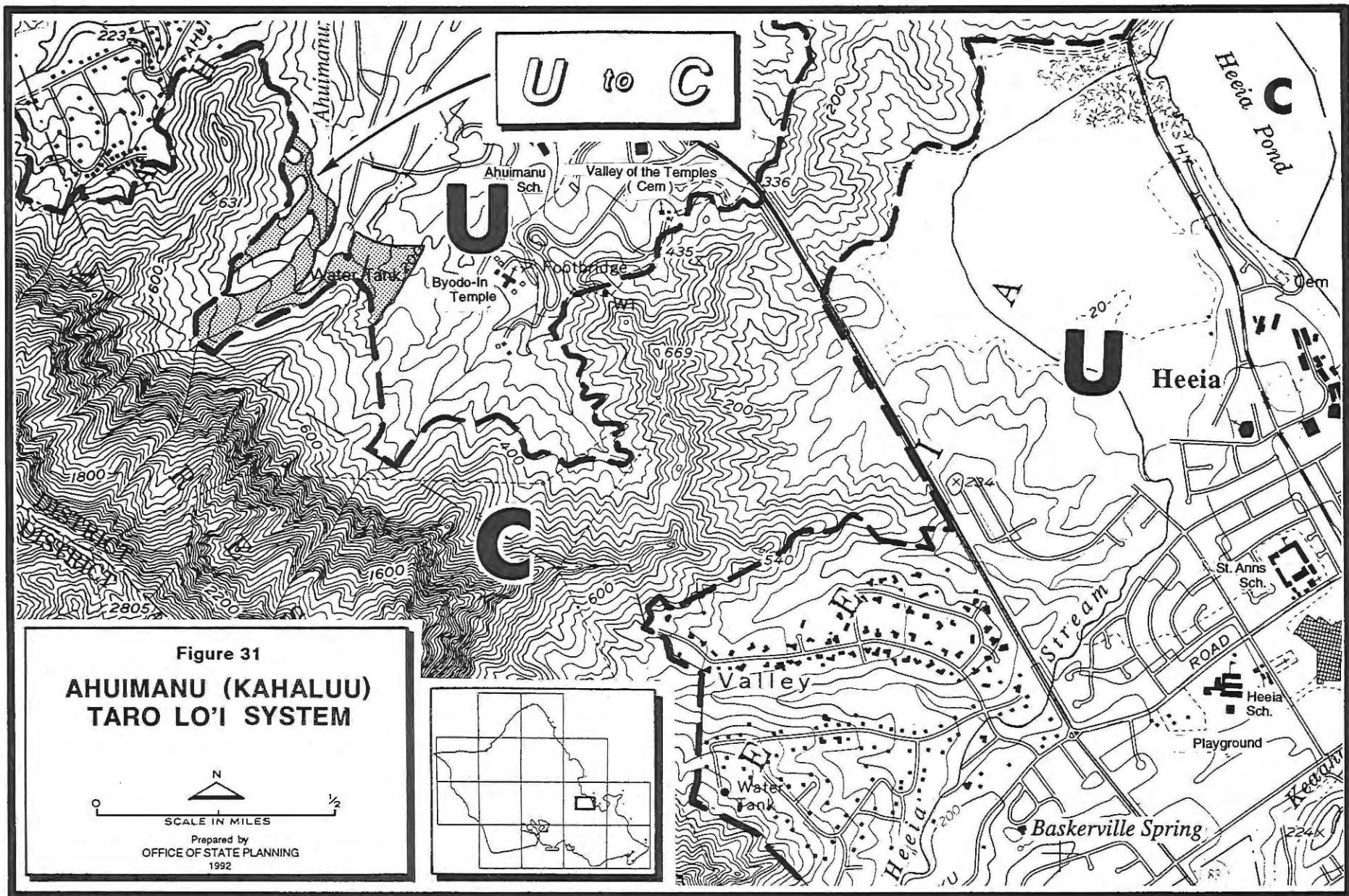


Figure 31
**AHUIMANU (KAHALUU)
TARO LO'I SYSTEM**

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0 1/2
SCALE IN MILES
Prepared by
OFFICE OF STATE PLANNING
1992

20. Heeia Marsh and Meadowlands, 295 acres (U to C)

The proposed reclassification of Heeia Marsh and Meadowlands from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . . .

The proposed reclassification area is located north of Kaneohe roughly bounded by the existing Conservation District on the north, Kahekili Highway on the west, Kamehameha Highway on the east and the 40-foot contour on the south.

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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Heeia Marsh and Meadowlands are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. The wetland has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule. In the Regional Wetlands Concept Plan: Emergency Wetlands Resource Act, Heeia Marsh is noted as a priority acquisition site. Heeia Marsh is also listed as a top priority wetland for protection in the State Recreation Functional Plan, State Recreation Functional Plan Technical Reference Document, and the State Conservation Lands Functional Plan. Additionally the wetland provides habitat for migratory waterbirds and is designated "Preservation" on the City and County of Honolulu Koolau-poko Development Plan map.

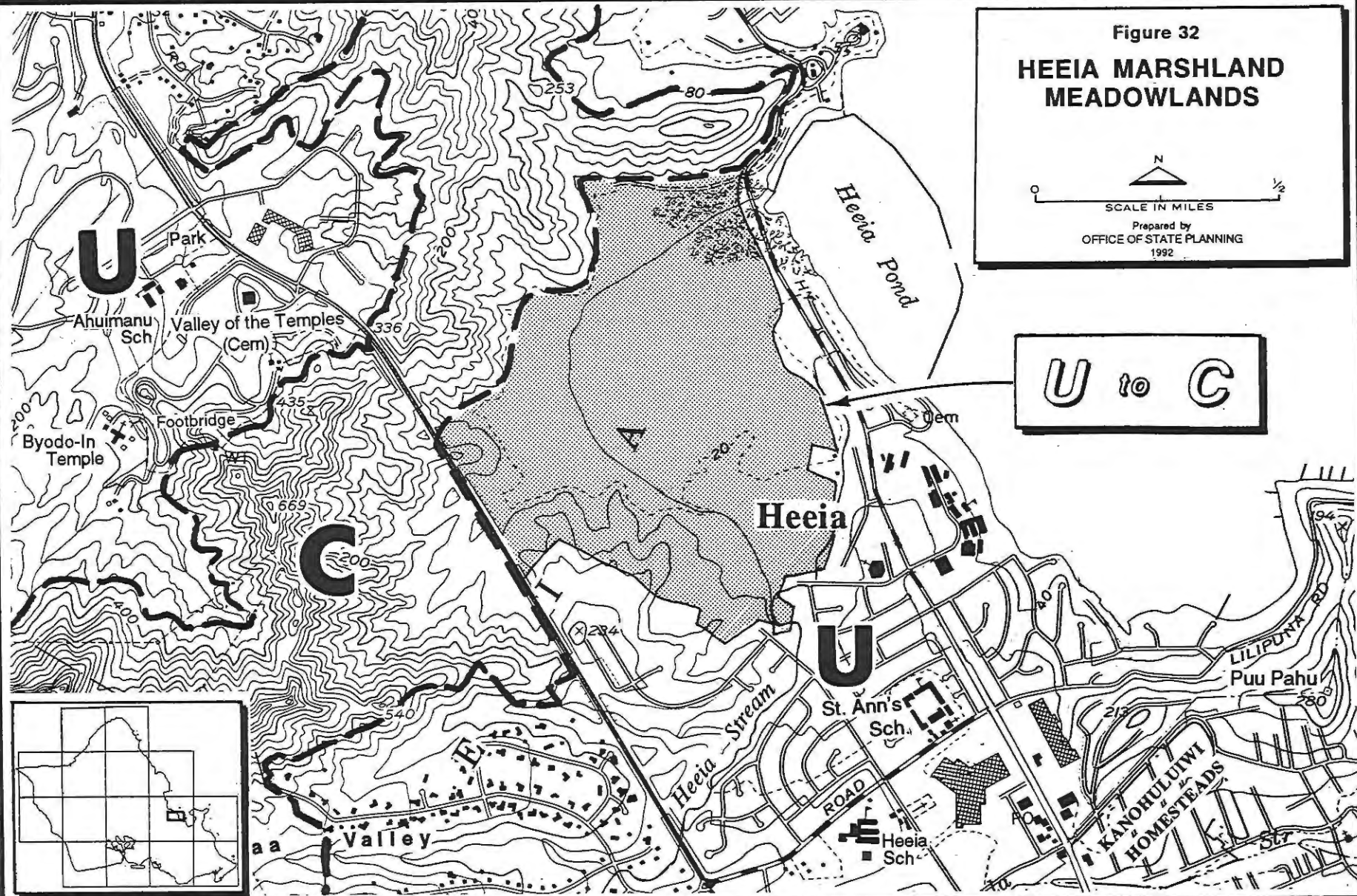
The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

Figure 32
**HEEIA MARSHLAND
MEADOWLANDS**



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1992

U to C



21. Olomana, 503 acres (A to C)

The proposed reclassification of Olomana from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preserving scenic and historic areas . . . open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, and would maintain or enhance the conservation of natural or scenic resources

The proposed reclassification areas are located south of Kailua and north of Waimanalo. The Kailua area is bounded by the existing Conservation District boundary on the south and west and the existing Urban District boundary on the east. Above the northern boundary, the proposed reclassification follows the 200-foot contour and then moves up to the 300-foot contour to exclude all but one of the existing Women's Community Correctional Center buildings. The boundary line drops back to 200 feet near the Hilltop Cottage. The Waimanalo area is bounded by the existing Conservation District boundary on the west, and the 200-foot contour on the north, east and south.

The proposed reclassification of Olomana from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(4) It shall include lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic, or archaeologic sites and sites of unique physiographic or ecologic significance

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic values

The proposed reclassification of Olomana is an extension of the Conservation District to protect scenic resources. Olomana is a significant scenic resource and a unique physiographic feature of Windward Oahu.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, oceans, scenic landscapes and other natural features, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii and, protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

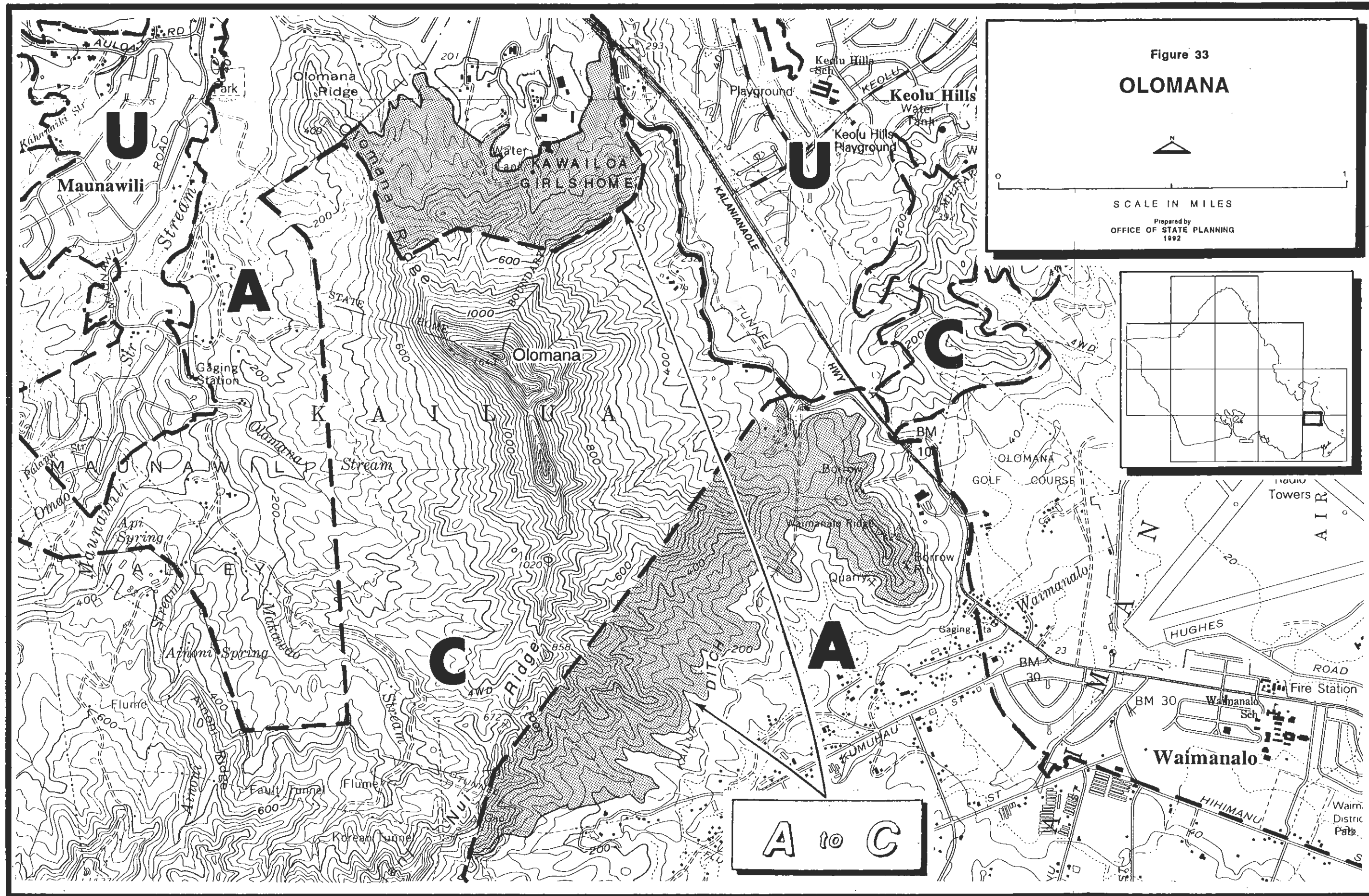
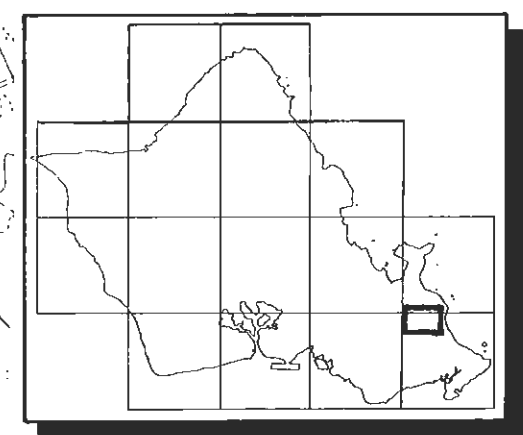
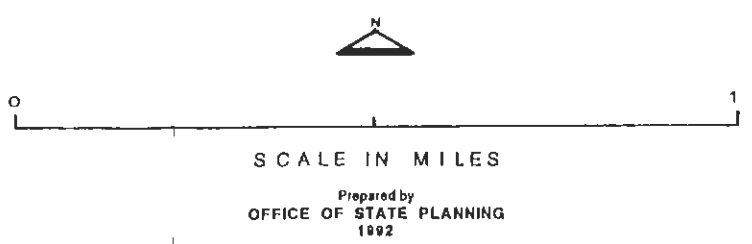


Figure 33
OLOMANA



A to C

22. Kawainui Complex, Maunawili Stream and Tributaries, 100-Foot Corridor, 251.1 acres (U to C and A to C)

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

The proposed reclassification area comprises the largest wetland complex on Oahu which is located in Kailua, and Maunawili Stream which flows into Kawainui. Kawainui Complex, which is comprised of Kawainui Marsh and the Hamakua Wetlands, is roughly bounded by Kapaa Quarry Road on the west, the existing Conservation District boundary on the north, Hamakua Canal Drive on the east, and Pohakapu subdivision on the south. Maunawili Stream, tributaries, and 100-foot corridor areas are located in Maunawili Valley roughly bounded by the existing Conservation District boundary on the south, a 100-foot corridor from the stream banks on the east and west, and the existing Urban District boundary on the north.

The proposed reclassification of Kawainui Complex and Maunawili Stream from the Urban and Agricultural Districts to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Kawainui Complex and Maunawili Stream are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. Kawainui Complex is the largest natural wetland in the State. The State of Hawaii is currently purchasing land to provide a buffer for Kawainui to protect the wetland and associated wildlife from impacts of urban uses which surround it. The wetland has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule. Kawainui Marsh is noted as an important site in the Regional Wetlands Concept Plan: Emergency Wetlands Resource Act. Kawainui Marsh is also listed as a top priority wetland for protection in the State Recreation Functional Plan, State Recreation Functional Plan Technical Reference Document, and the State Conservation Lands Functional Plan. The Kawainui Resource Management Plan provides the blueprint for current and future actions relating to the marsh. Most of the area is currently designated "Preservation" on the City and County of Honolulu Koolau-poko Development Plan map.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

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 streams, we are also recommending that the portions of these streams and associated corridors which pass through Urban or Rural Districts be considered Priority #2 areas.

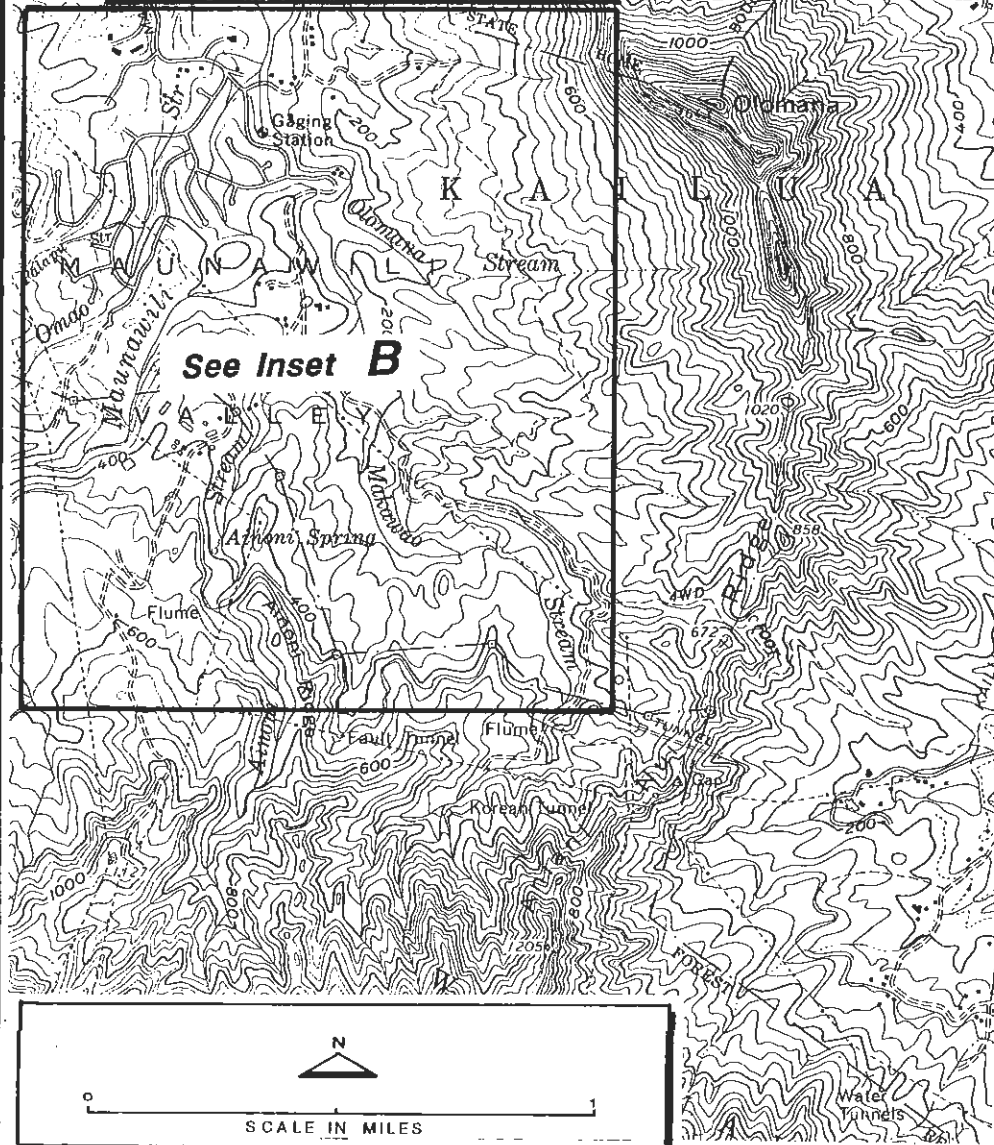
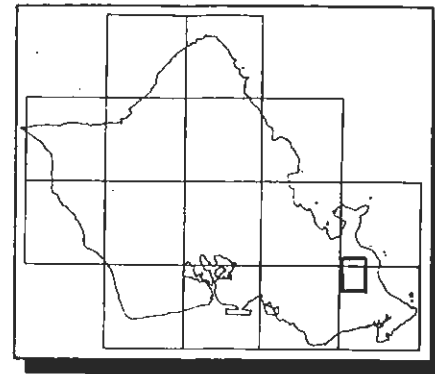
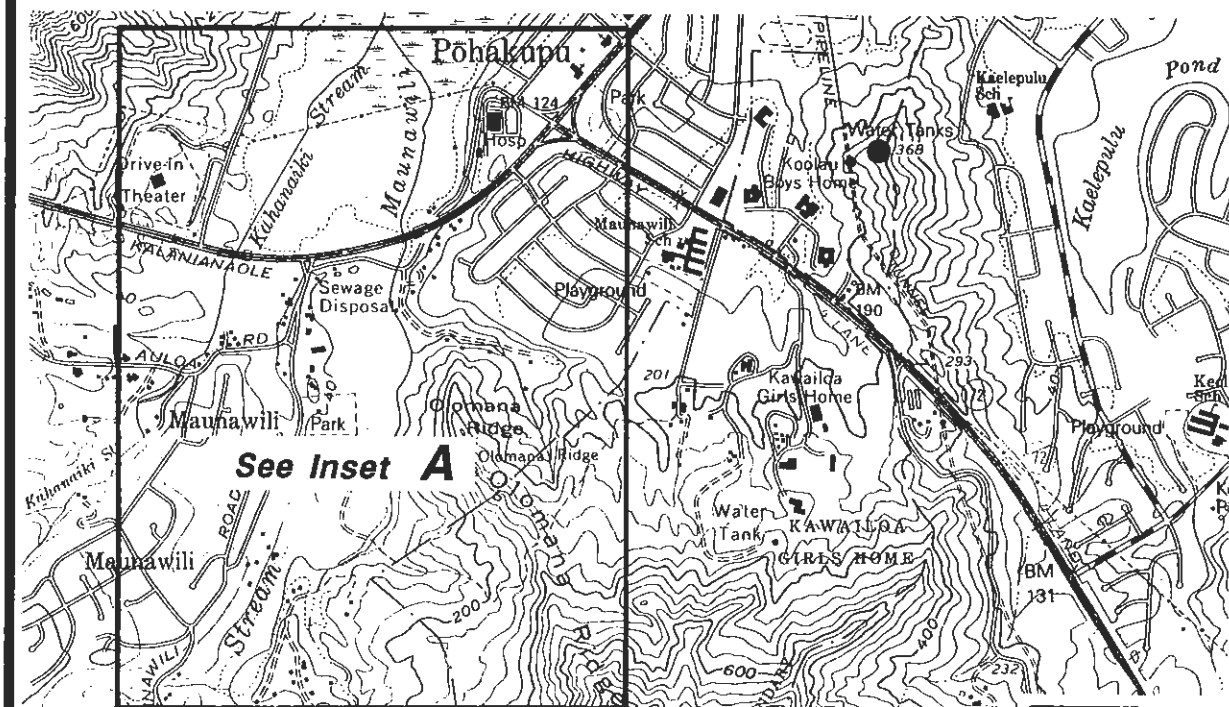
For Maunawili Stream, this area would be "Urban" land from the makai border of the Agricultural District through the subdivision, 100 feet wide from the stream banks on each side.

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 resources should be thoroughly and critically reviewed.

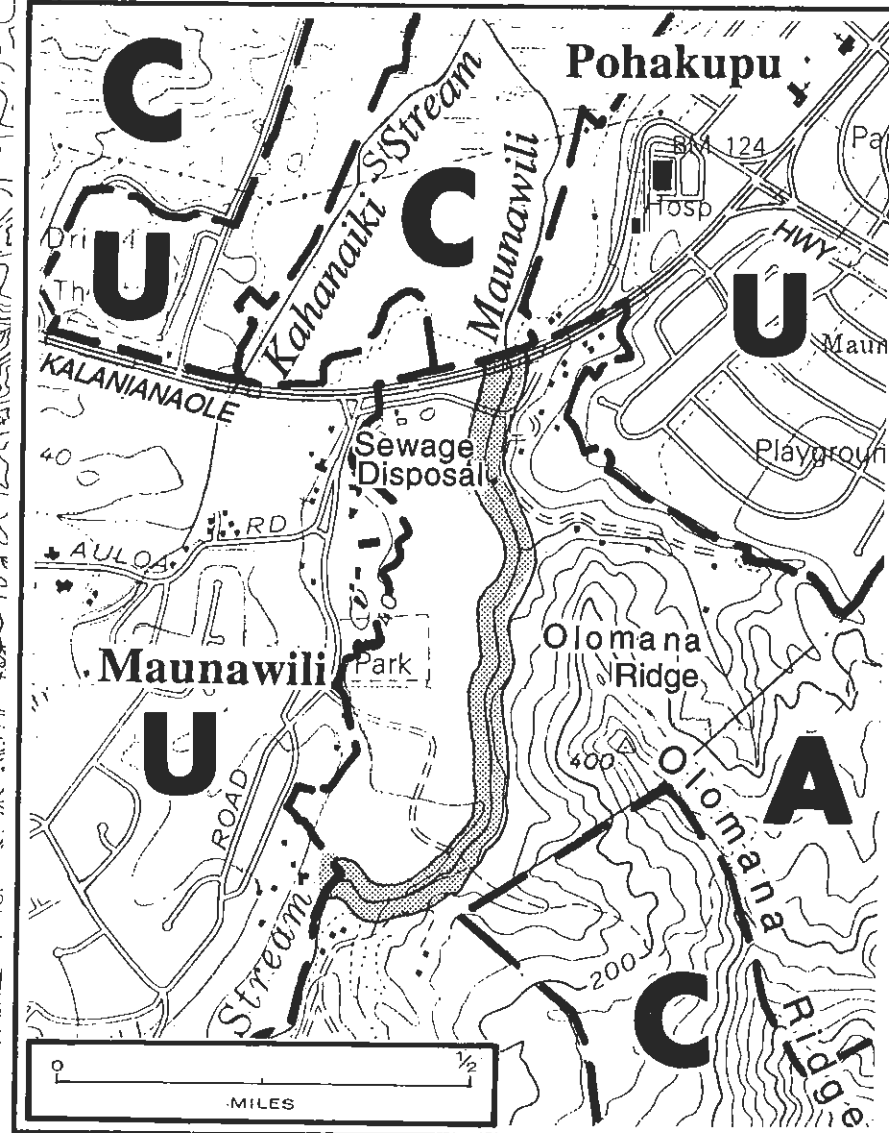
Figure 34b

KAWAINUI COMPLEX, MAUNAWILI STREAM AND TRIBUTARIES

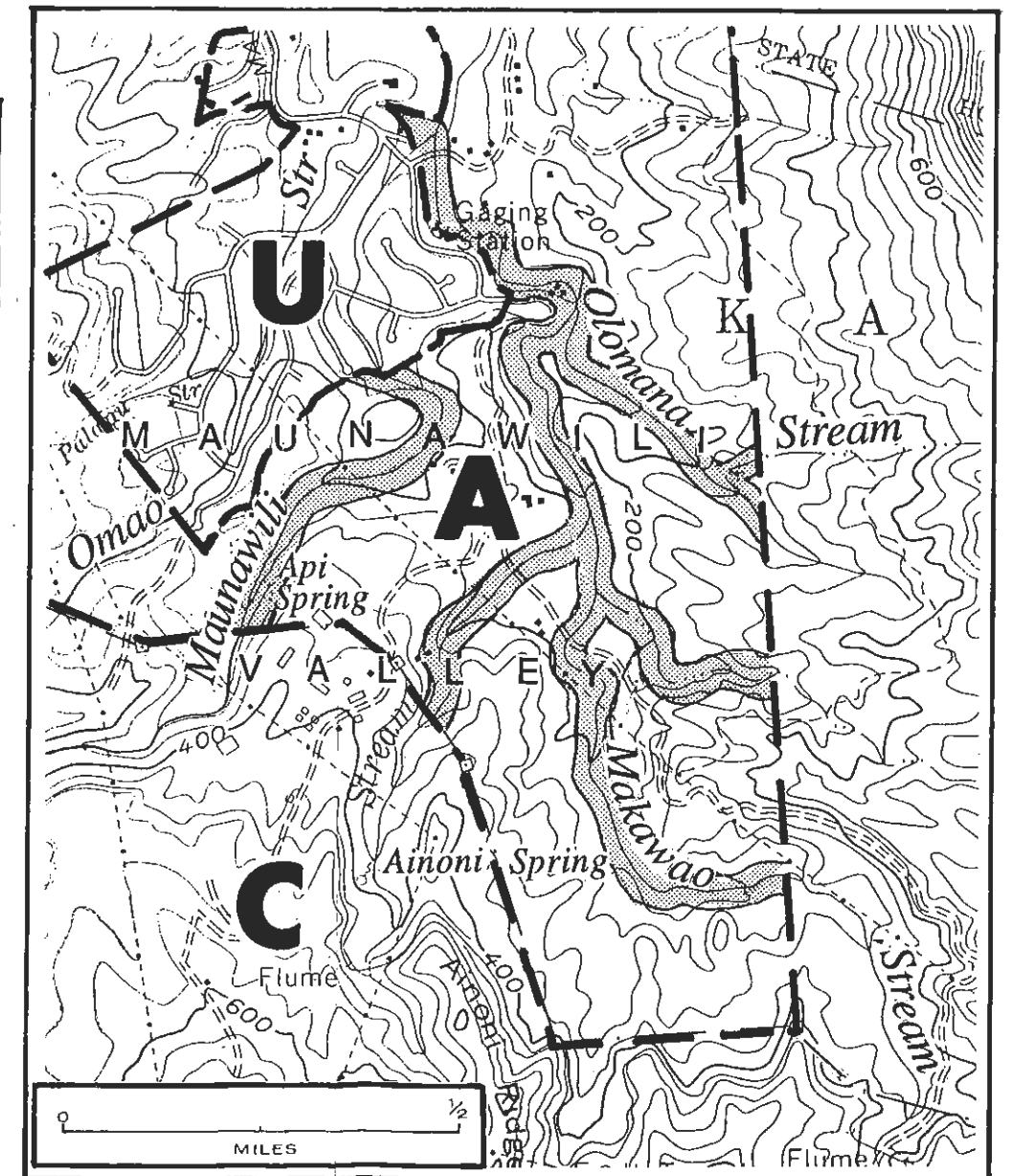
A to C



Inset A



Inset B



23. Bellows Air Force Base Wetlands, 20 acres (U to C)

The proposed reclassification of Bellows Air Force Base Wetlands from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered.

The proposed reclassification areas are located on Bellows Air Force Base and Olomana Golf Course. The area on Bellows is along the Waimanalo Stream going to the ocean. The area on Olomana Golf Course is near the middle of the course.

The proposed reclassification of Bellows Air Force Base Wetlands from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

Bellows Air Force Base Wetlands are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. The wetland has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

EAST HONOLULU

24. Queen's Beach and Sandy Beach, 418 acres (U to C)

Queen's Beach and Sandy Beach are significant scenic, recreational, and open space resources in East Honolulu. They are currently designated "Preservation" on the City and County of Honolulu Development Plan map.

The proposed reclassification area is east of Hawaii Kai roughly bounded by the existing Conservation District boundary on the north and east, the shoreline on the south, and the sewage disposal plant on the west.

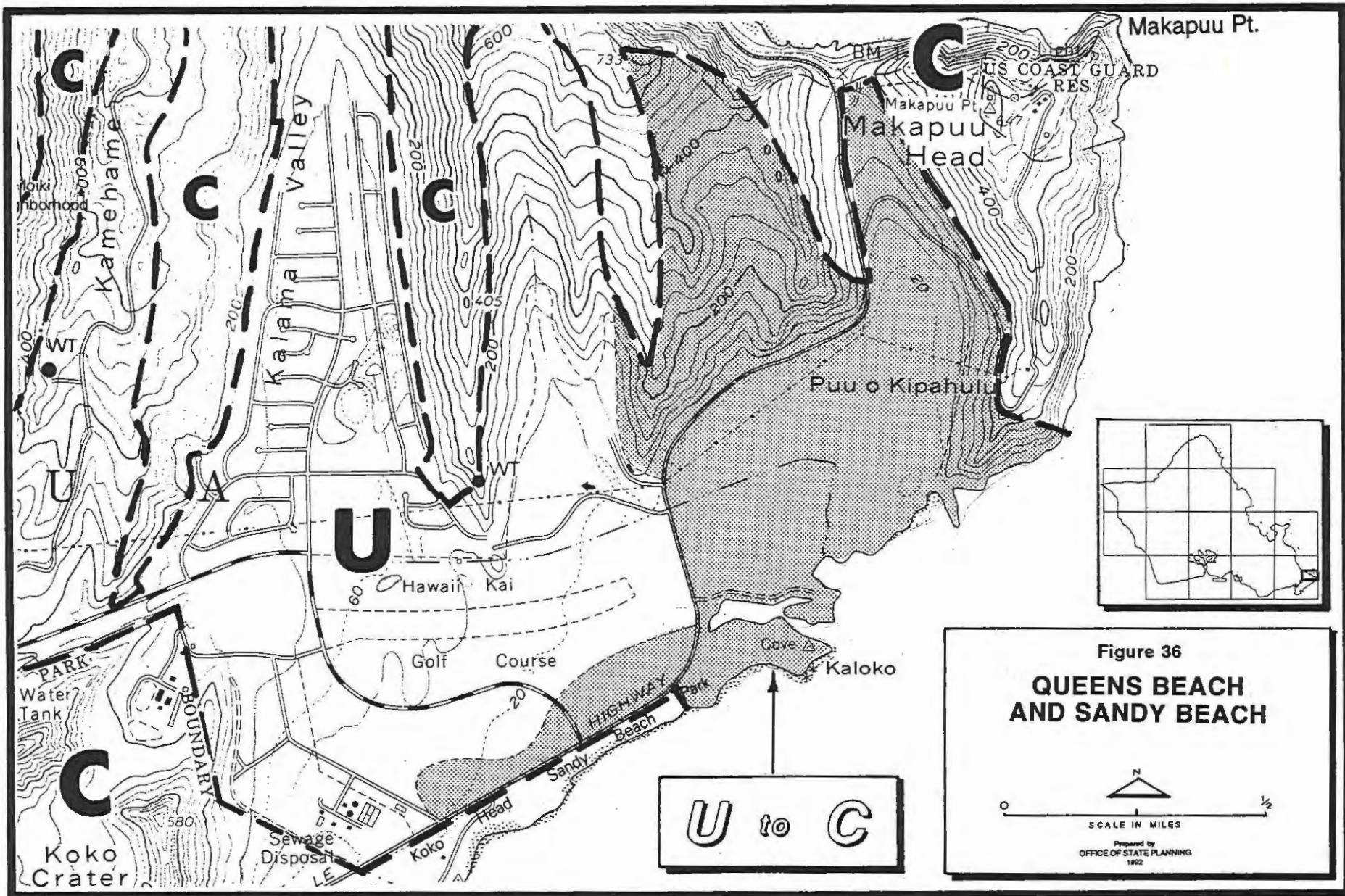
The proposed reclassification of Queen's Beach and Sandy Beach from the Urban District to the Conservation District meets the following Conservation District standards contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preserving scenic and historic areas; providing park lands, wilderness, and beach reserves; areas whose existing openness, natural condition, or present state of use, if retained, would maintain or enhance the conservation of natural or scenic resources; areas of value for recreational purposes . . .

The proposed reclassification of Queens Beach and Sandy Beach from the Urban District to the Conservation District will impact favorably the following area of statewide concern set forth in Section 205-17, HRS: Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(4): It shall include lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic or archaeologic sites and sites of unique physiographic significance . . .

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-12, HRS, including but not limited to promoting the preservation and restoration of significant natural and historic resources, views and vistas to enhance the visual and aesthetic enjoyment of mountains, oceans, scenic landscapes, and other natural features, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii; utilizing Hawaii's limited land resources wisely; and protecting Hawaii's shoreline, open spaces, and scenic resources.



25. Koko Crater, 25 acres (U to C)

The proposed reclassification of Koko Crater from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preserving scenic and historic areas . . . open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, and would maintain or enhance the conservation of natural or scenic resources . . .

The proposed reclassification area is located on the northeastern slope of Koko Crater roughly bounded by the existing Conservation District boundary on the south, Hawaii Kai Drive on the east and north, and Mokuhano Road on the east.

The proposed reclassification of Koko Crater from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(4) It shall include lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic, or archaeological sites and sites of unique physiographic or ecologic significance . . .

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic values . . .

The proposed reclassification of Koko Crater is an extension of the Conservation District to protect scenic resources. Koko Crater is a significant scenic resource and a unique physiographic feature in southeast Oahu.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, oceans, scenic landscapes and other natural features, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii and, protecting and enhancing Hawaii's shoreline, open spaces, and scenic resources.

PRIMARY URBAN CENTER

26. Diamond Head State Monument, 23 acres (U to C)

The proposed reclassification of the Diamond Head State Monument from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preserving scenic and historic areas; providing park lands; and areas of value for recreational purposes . . .

The proposed reclassification area is on the northeast slope of Diamond Head roughly bounded by the existing Conservation District boundary on the west, Monsarrat Avenue on the north and west, and 22nd Avenue on the south.

The proposed reclassification of the Diamond Head State Monument from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(3) It may include lands used for . . . state parks . . .

Section 15-15-20(4) It shall include lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic, or archaeologic sites and sites of unique physiographic significance . . .

The Diamond Head State Monument reclassification is an expansion of the Conservation District on State-owned lands which are part of the Diamond Head State Monument. Diamond Head Crater is a statewide, significant scenic resource.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-12, HRS, including but not limited to, promoting the preservation of significant natural and historic resources as well as protecting those special areas and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

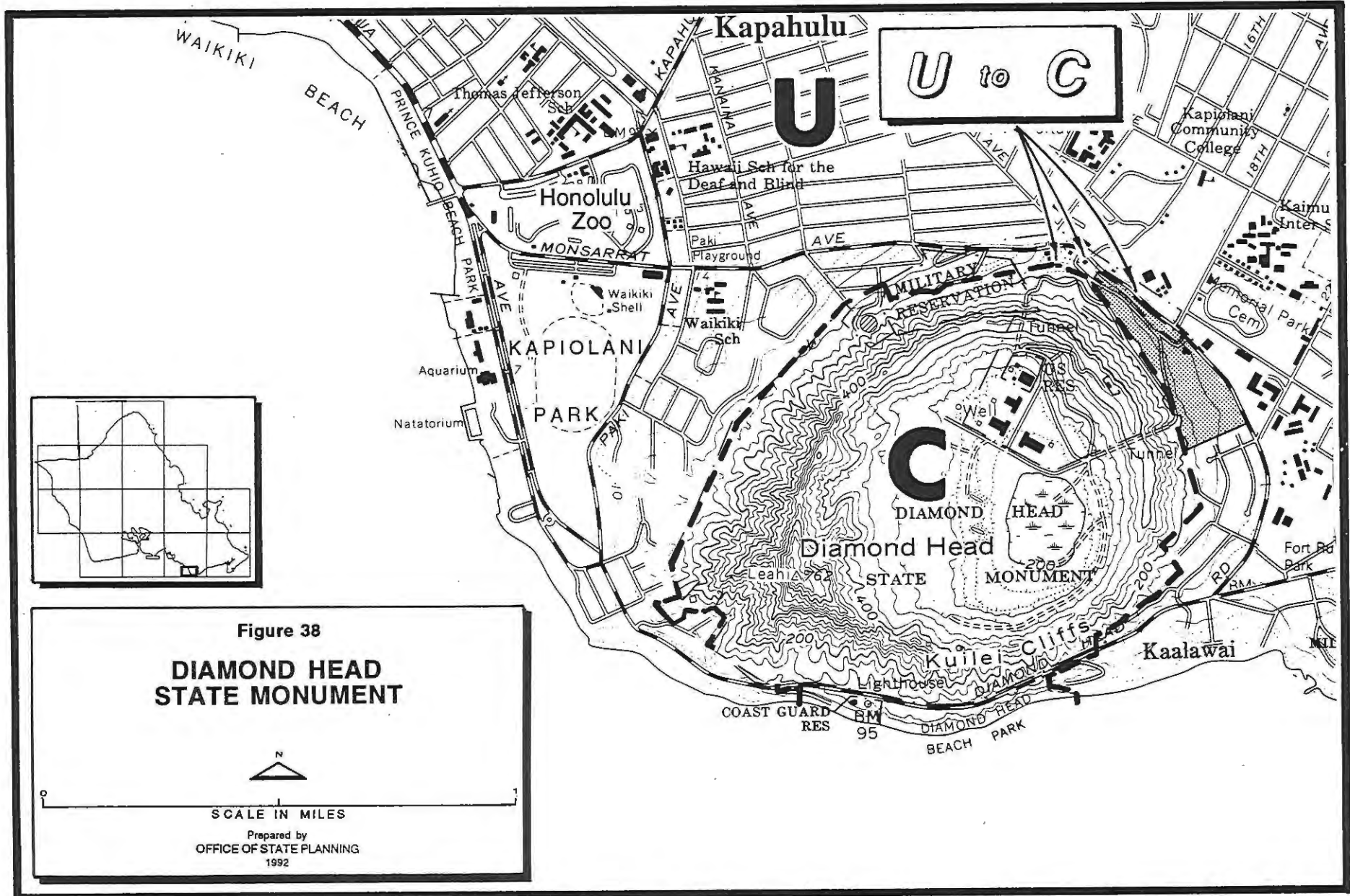


Figure 38
**DIAMOND HEAD
STATE MONUMENT**



SCALE IN MILES

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27. Kalihi Valley, Water Recharge Area, 112 acres (U to C)

The proposed reclassification of portions of Kalihi Valley from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watershed and water resources . . .

The proposed reclassification areas are located in Kalihi Valley. The Ewa portion is roughly bordered by Kalihi Elementary School on the south, Likelike Highway on the east, and the existing Conservation District boundaries on the north and west. The Diamond Head portion is roughly bordered by the existing Conservation District on the north, east, and south, and the existing housing development on the west.

The proposed reclassification of portions of Kalihi Valley from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(1) It shall include lands necessary for protecting watersheds, water resources, and water supplies . . .

Section 15-15-20(2) It may include lands susceptible to floods, and soil erosion . . .

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

The Kalihi Valley reclassification is an expansion of the Conservation District on both the Ewa and Diamond Head sides of the valley to protect watershed as both areas are part of the Kalihi shaft. Water pumped from this shaft through the Kalihi Uka wells provide approximately 8-10 percent of the potable water supplied by the Board of Water Supply for the City and County of Honolulu. Any degradation of the water supplied by the shaft will impact the Board of Water Supply's ability to meet existing potable water demand. The State Water Commission concurs that these lands are valuable watershed lands and that the watershed characteristics should be retained. An Interim Development Control Moratorium was placed on the Ewa side of Kalihi Valley from Kalihi Elementary School up to Wilson Tunnel by the City Council and expired June 30, 1992. Slopes on both the Diamond Head and Ewa sides of Kalihi Valley range from 10 to 70 percent. Soils are from the Lolekaa Series which is a silty clay and the Kaena Series which is a very stony clay. Runoff is medium to rapid; erosion is moderate to severe; and shrink-swell is moderate to high. Expansion of the Conservation District for watershed protection will reduce contamination and reduction of recharge into the Kalihi Shaft.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-13, HRS, including but not limited to maintaining and pursuing improved quality in Hawaii's land, air and water resources, Section 226-13(a)(1), HRS; promoting the proper management of Hawaii's land and water resources, Section 226-13(b)(2), HRS; promoting effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters, Section 226-13(b)(3); reducing the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions and other natural or man-induced hazards or disasters, Section 226-13(b)(5), HRS; and objectives and policies for facility systems-water, including but not limited to: assisting in improving the quality, efficiency, service and storage capacities of water systems for domestic and agricultural uses, Section 226-16(b)(4), HRS; and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to directing future development away from critical environmental areas or imposing mitigating measures so that negative impacts on the environment would be minimized, Section 226-104(b)(9); and identifying critical environmental areas in Hawaii including but not limited to . . . watershed and water recharge areas . . ., Section 226-104(b)(10), HRS.

28. Pearl Harbor National Wildlife Refuge: Waiawa Unit, 24.5 acres (U to C)

The proposed reclassification of Pearl Harbor National Wildlife Refuge: Waiawa Unit, from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . . .

The proposed reclassification area is located south of Pearl City on the Pearl City Peninsula roughly bounded by Middle Loch on the west and south, Leeward Community College on the north, and Waiawa Stream on the east.

The proposed reclassification of Pearl Harbor National Wildlife Refuge: Waiawa Unit, from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

The Pearl Harbor National Wildlife Refuge: Waiawa Unit, is being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. It is a portion of a larger complex of wetlands scattered along the Pearl Harbor area which support endangered Hawaiian waterbirds as well as migratory waterbirds. The wetland has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule and is managed by the Federal government for this purpose. As stilt habitat along the reef runway is lost, the Pearl Harbor area increases in importance to the stilts on Leeward Oahu.

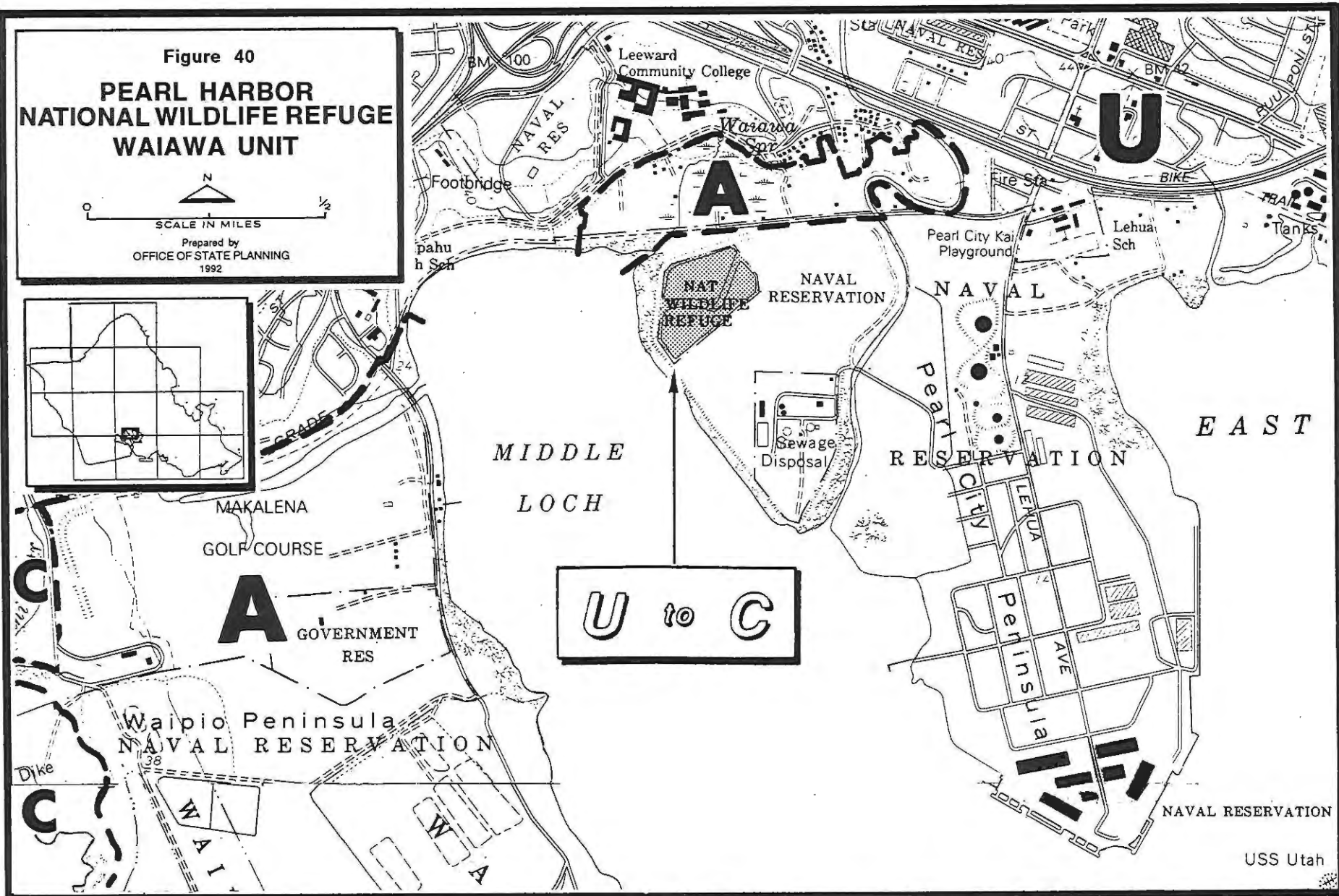
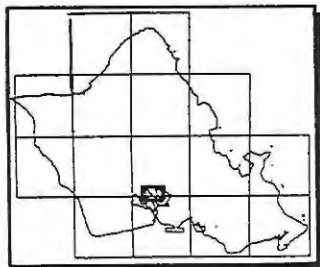
The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

Figure 40

**PEARL HARBOR
NATIONAL WILDLIFE REFUGE
WAIAWA UNIT**



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CENTRAL OAHU

29. Leeward Koolau Watershed, 3,909 acres (A to C)

The proposed reclassification of the Leeward Koolau Watershed from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watershed and water sources . . .

The proposed reclassification area spans the Leeward Koolau Range from Aiea to Kawaihoa and is clustered in five areas. Area 1 is a gulch located in Aiea roughly bounded by Keaiwa Heiau State Park on the north and east, Aiea Heights on the west, and Halawa Heights on the south. Area 2 is north of Pacific Palisades roughly bounded by the existing Conservation District boundary on the east, Pacific Palisades on the south, Panakauahi Gulch on the north and fallow lands on the west ranging from the 400-foot elevation to the 800-foot elevation. Area 3 is northeast of Mililani and is roughly bounded by the existing Conservation District boundary on the east and north, fallow lands on the south ranging from the 1,000-foot elevation to the 800-foot elevation, and upper Kipapa Gulch on the west. Area 4 is a series of five gulches north of Wahiawa which are extensions of the existing Conservation District boundaries beginning with the North Fork of Kaukonahua Stream, Poamoho Stream gulch, an unnamed gulch, Helemanu Stream gulch, and an unnamed gulch. Area 5 is north of Helemanu Radio Station and is in Opaepa Stream gulch.

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

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

Section 15-15-20(1) It shall include lands necessary for protecting watersheds, water resources, and water supplies . . .

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

The Leeward Koolau Watershed is an expansion of the existing Conservation District, from Aiea to Kawaihoa, in order to provide for watershed protection. These areas have been recommended for inclusion into the Conservation District in the Watershed Protection Study for the Five Year Boundary Review, Conservation District Adjustments, Water Resources Research Center, University of Hawaii.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment and facility systems, Sections 226-12 and 16, HRS, including but not limited to, promoting the proper management of Hawaii's land and water resources and effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters; fostering recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures, and visitors; assisting in improving the quality of water systems for domestic and agricultural use, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, directing future development away from critical environmental areas so that negative impacts on the environment would be minimized, and identifying critical environmental areas in Hawaii.

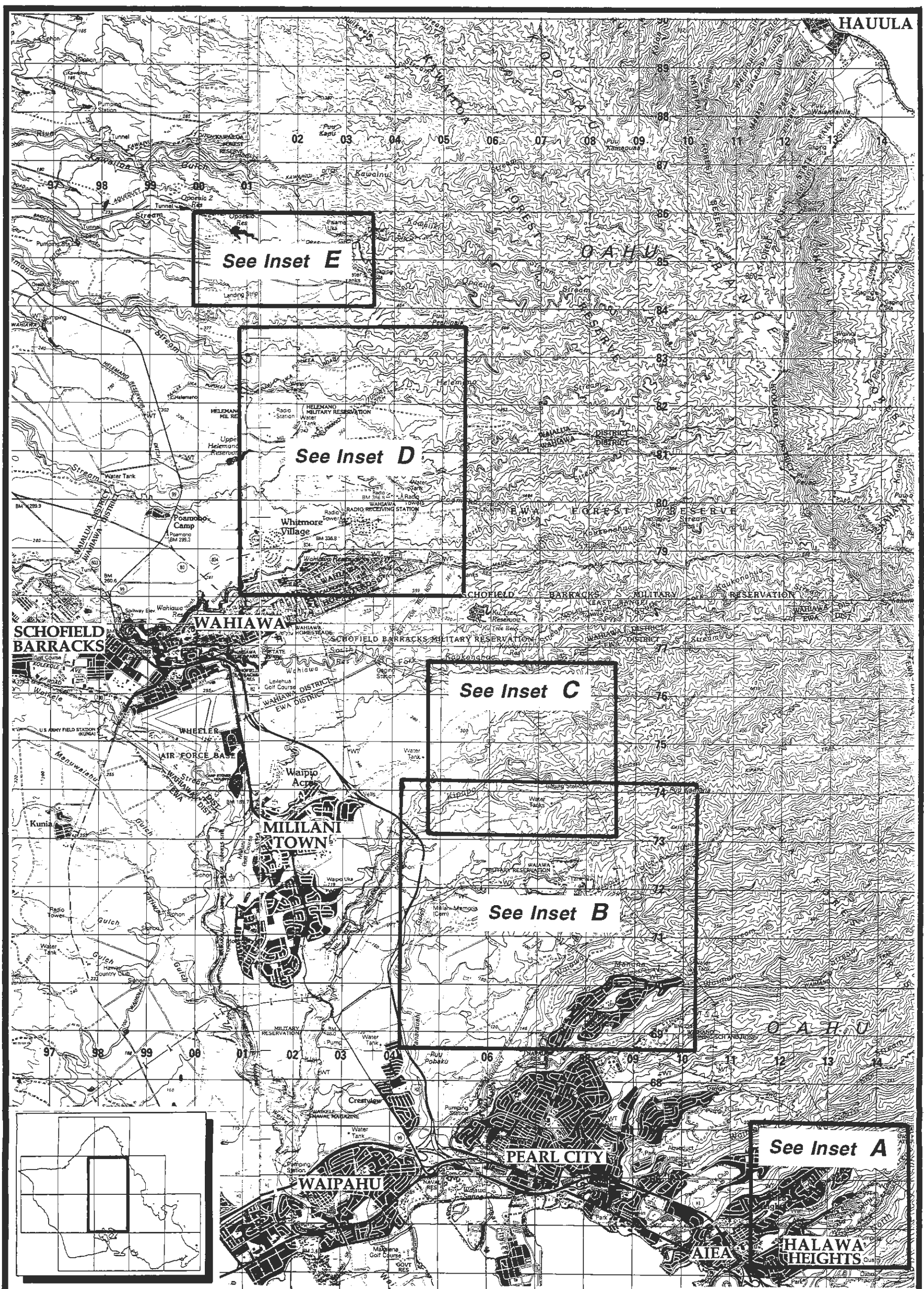


Figure 41

LEEWARD KOOLAU WATERSHED

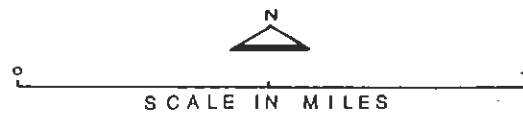
SCALE IN MILES

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A to C

Figure 41

LEEWARD KOOLAU WATERSHED



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(All insets are drawn at same scale)

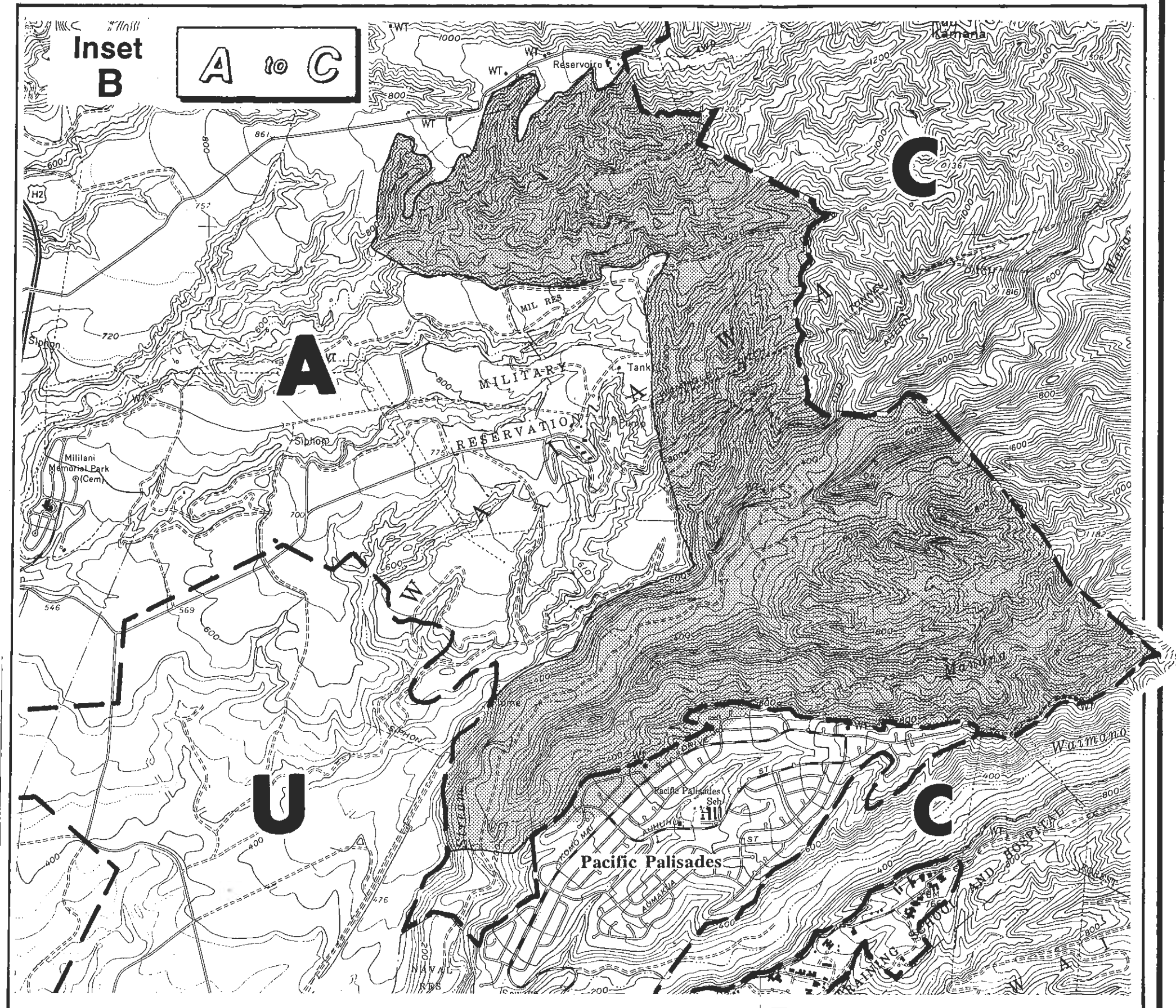
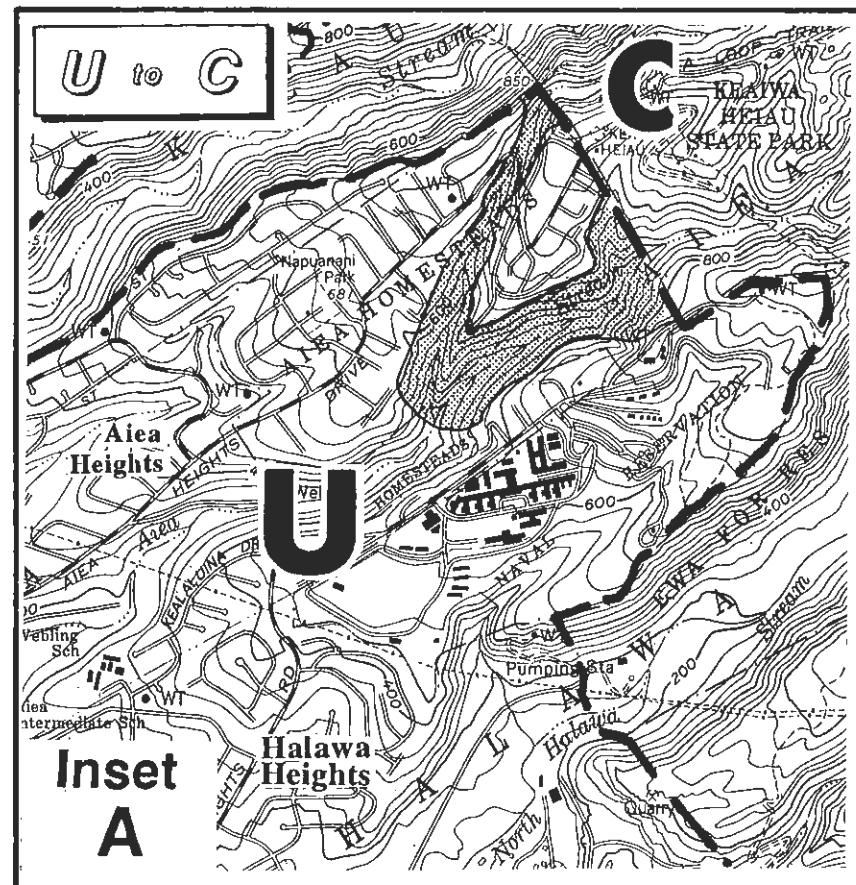
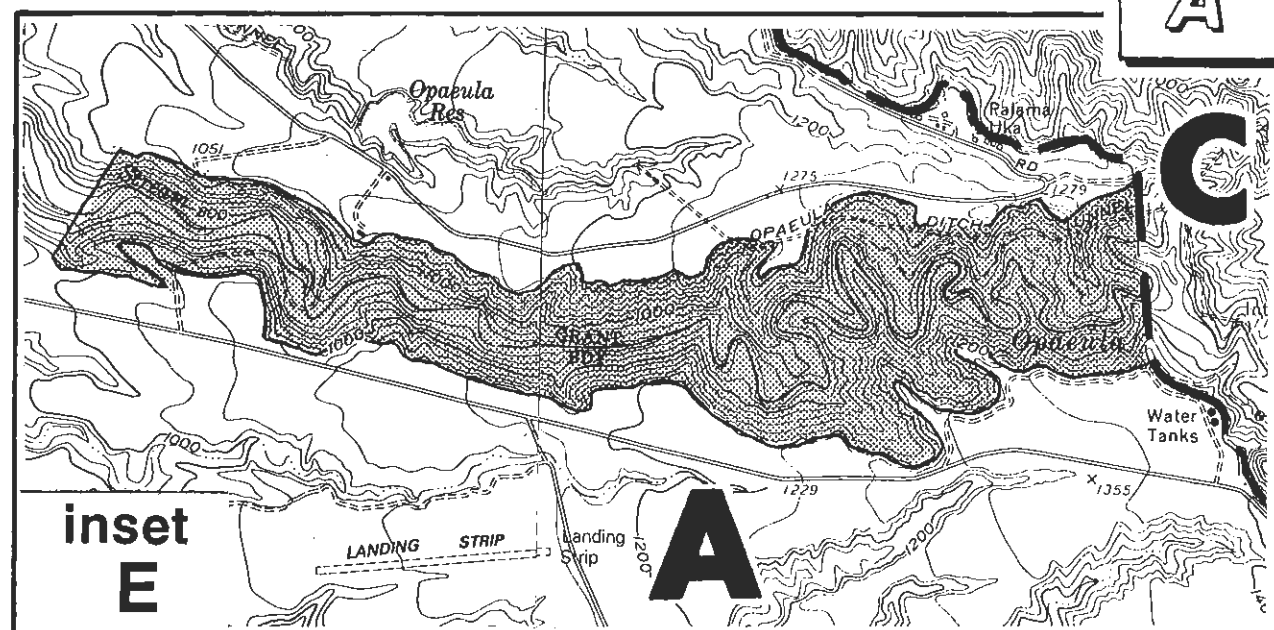
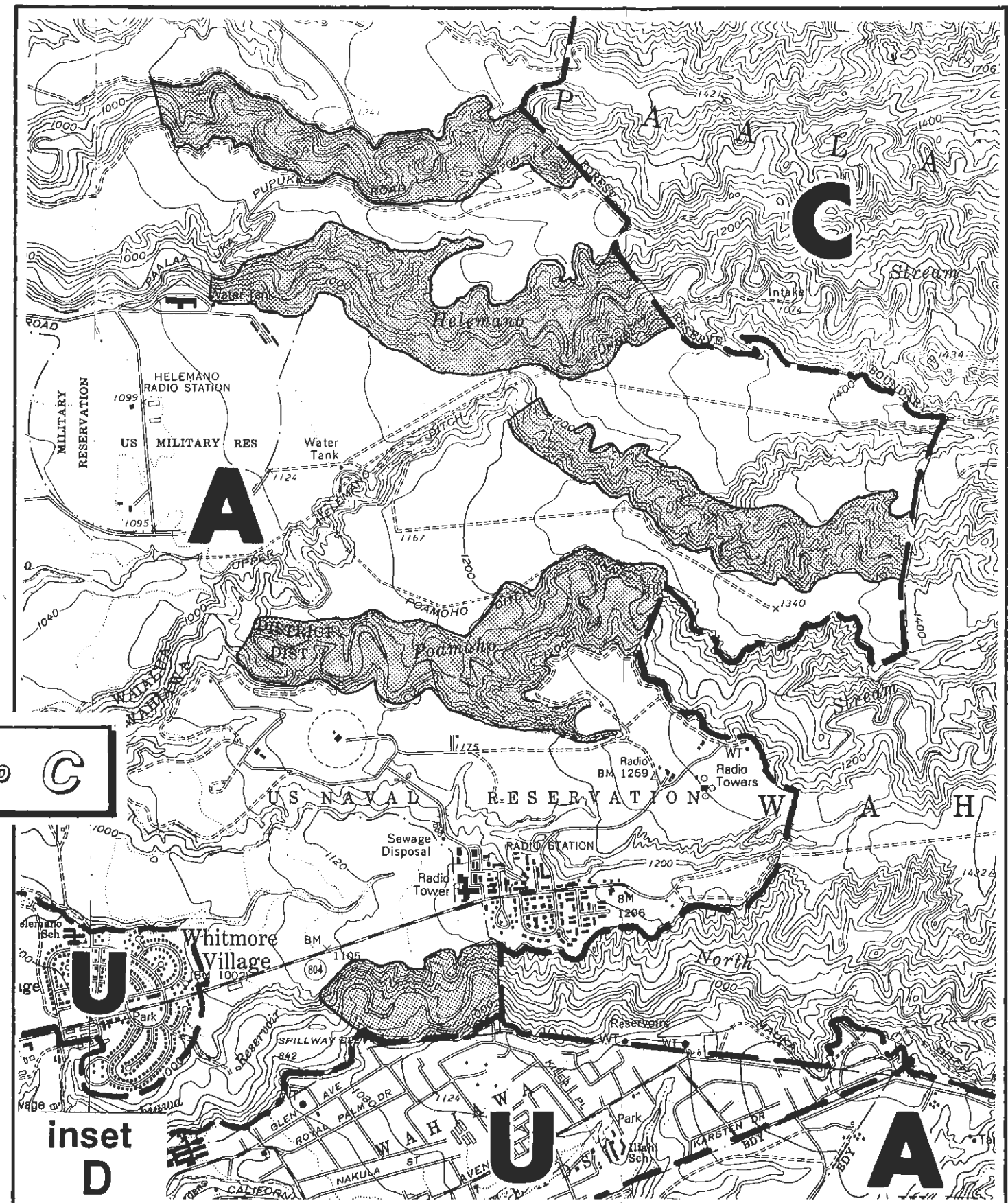
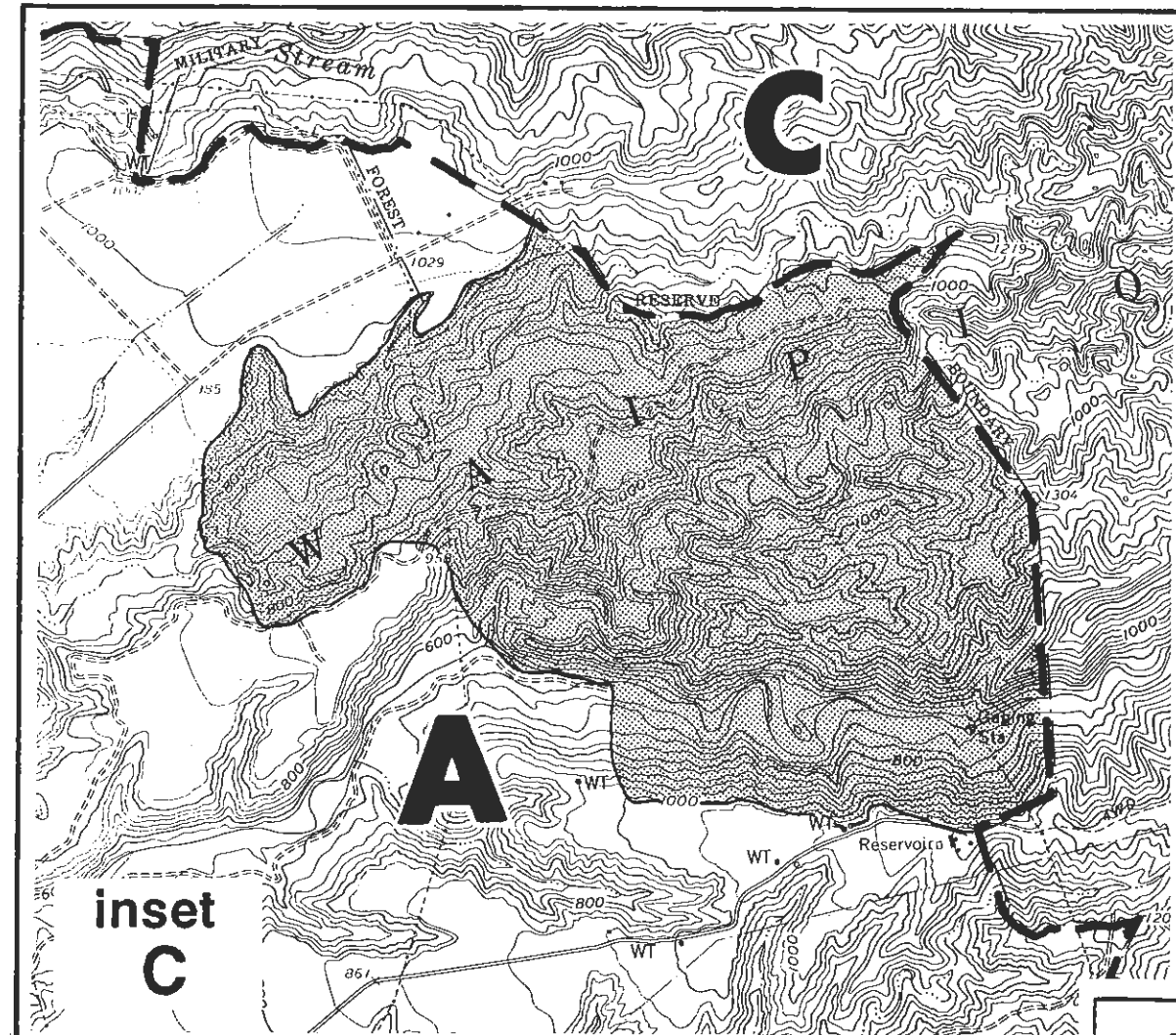


Figure 41
LEEWARD KOOLAU WATERSHED



A to C

30. Hydrologic Zone of Contribution, 1,873.16 acres (1,463 acres A to C and 410.16 acres U to C)

The proposed reclassification of the Hydrologic Zone of Contribution from the Agricultural and Urban Districts to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for protecting watershed and water supplies . . .

The proposed reclassification area is north of Pacific Palisades roughly bounded by the existing Conservation District boundary on the north, fallow lands on the east and west, and a naval reservation on the south.

The proposed reclassification of the Hydrologic Zone of Contribution from the Agricultural and Urban Districts to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems and habitats.

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

Section 15-15-20(1) It shall include lands necessary for protecting watersheds, water resources, and water supplies . . .

The reclassification of the Hydrologic Zone of Contribution of the Waiawa Shaft is recommended to protect groundwater resources. The U.S. Navy Waiawa Shaft provides drinking water to Pearl Harbor Shipyard, Hickam Air Force Base, the Moanalua Shopping Center, and various military housing areas. The Waiawa Shaft is vulnerable to groundwater contamination by various types of uses within the Zone of Contribution. The Hydrologic Zone of Contribution has been delineated in the Study to Delineate the Zone of Contribution of the Waiawa Shaft by the Department of Health (DOH). The DOH discovered traces of dibromochloropropane (DBCP) and trichloropropane (TCP) in the shaft. While the levels found do not appear to pose a significant health threat, the presence of these contaminants demonstrates the shaft's vulnerability to contamination. Areas which fall into the Zone of Contribution and are not developed at this time are recommended for inclusion into the Conservation District for protection of groundwater resources.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment and facility systems, Sections 226-12 and 16, HRS, including but not limited to, promoting the proper management of Hawaii's land and water resources and effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters; fostering recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures, and visitors; assisting in improving the quality of water systems for domestic and agricultural use, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, directing future development away from critical environmental areas so that negative impacts on the environment would be minimized, and identifying critical environmental areas in Hawaii.

31. Waikele Wetland, 25.9 acres (U to C)

The proposed reclassification of Waikele Wetlands from the Urban District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . . .

The proposed reclassification area is located south of Waipahu on the northwest corner of Waipio Peninsula bounded by the railroad right-of-way on the north, Waikele Stream on the east, and West Loch on the west and south.

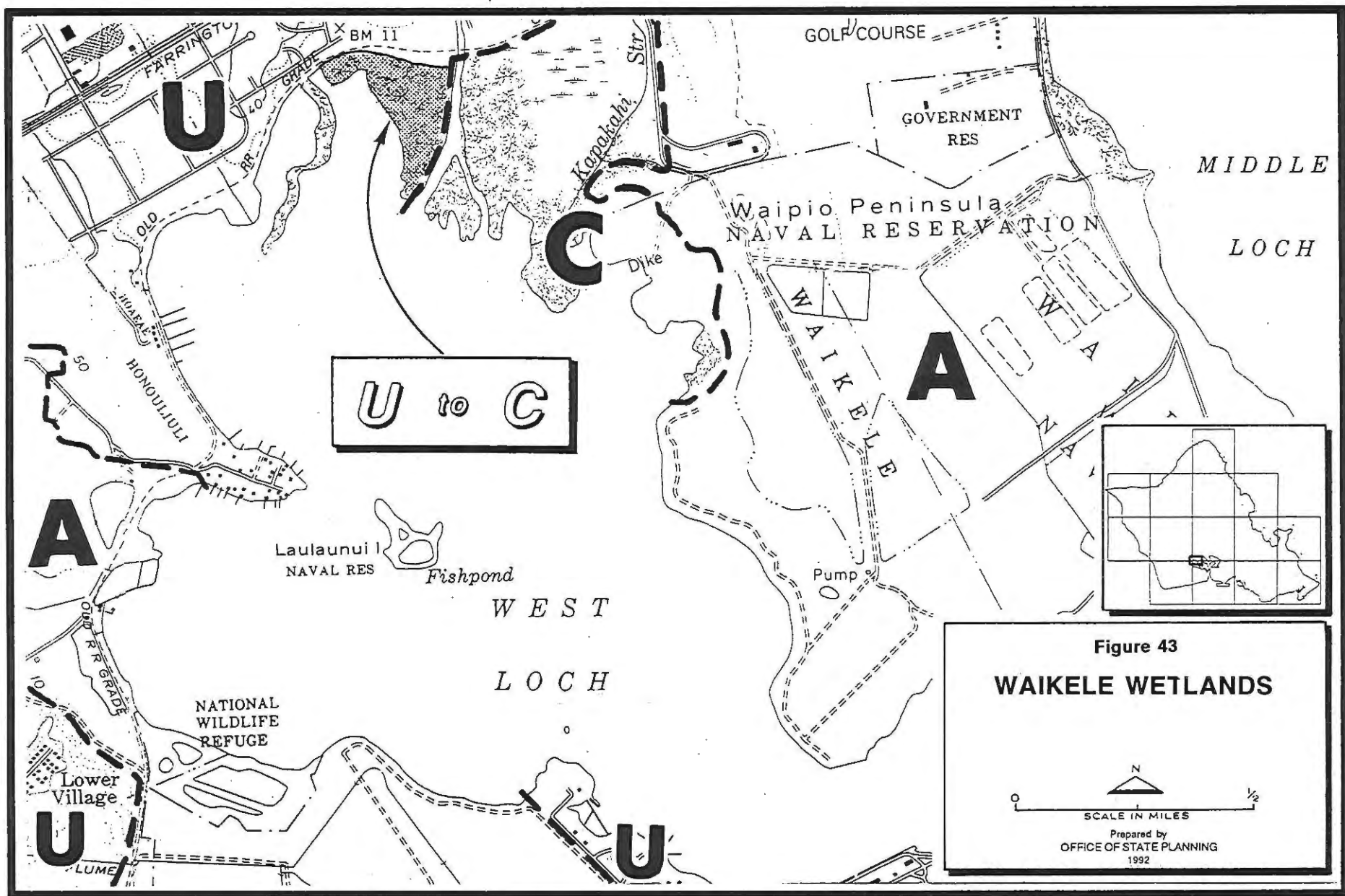
The proposed reclassification of Waikele Wetlands from the Urban District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural,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

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

Section 15-15-20(5) It shall include lands necessary for . . .
conserving natural ecosystems of endemic plants, fish, and wildlife
. . .

Waikele Wetlands are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. It is a portion of a larger complex of wetlands scattered along the Pearl Harbor area which support endangered Hawaiian waterbirds as well as migratory waterbirds. These wetlands have been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule. As stilt habitat along the reef runway is lost, the Pearl Harbor area increases in importance to the stilts on Leeward Oahu.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.



32. Windward Waianae Foothills, 2,736 acres (A to C)

The proposed reclassification of the Windward Waianae Foothills from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . preventing floods and soil erosion; . . . preserving scenic and historic areas . . .

The proposed reclassification area spans the Waianae range roughly bounded by the existing Conservation District boundary on the west, areas identified with slope greater than 20 percent from Maunauna on the north and east, and the existing Urban District boundary at Makakilo on the south.

The proposed reclassification of the Windward Waianae Foothills from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(2) It may include lands susceptible to floods, and soil erosion . . .

Section 15-15-20(7) It shall include lands with topography, soils, climate or other environmental factors that may not be normally or presently needed for urban, rural, or agricultural use . . .

Section 15-15-20(8) It shall include lands with a general slope of twenty percent or more which provide for open space amenities or scenic views . . .

The Windward Waianae Foothills proposal is an expansion of the existing Conservation District boundary to incorporate areas with a slope greater than 20 percent. Additionally, the area is also an open space and scenic resource.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Section 226-12, HRS, including but not limited to, promoting the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii; protecting and enhancing Hawaii's shoreline, open space, and scenic resources.

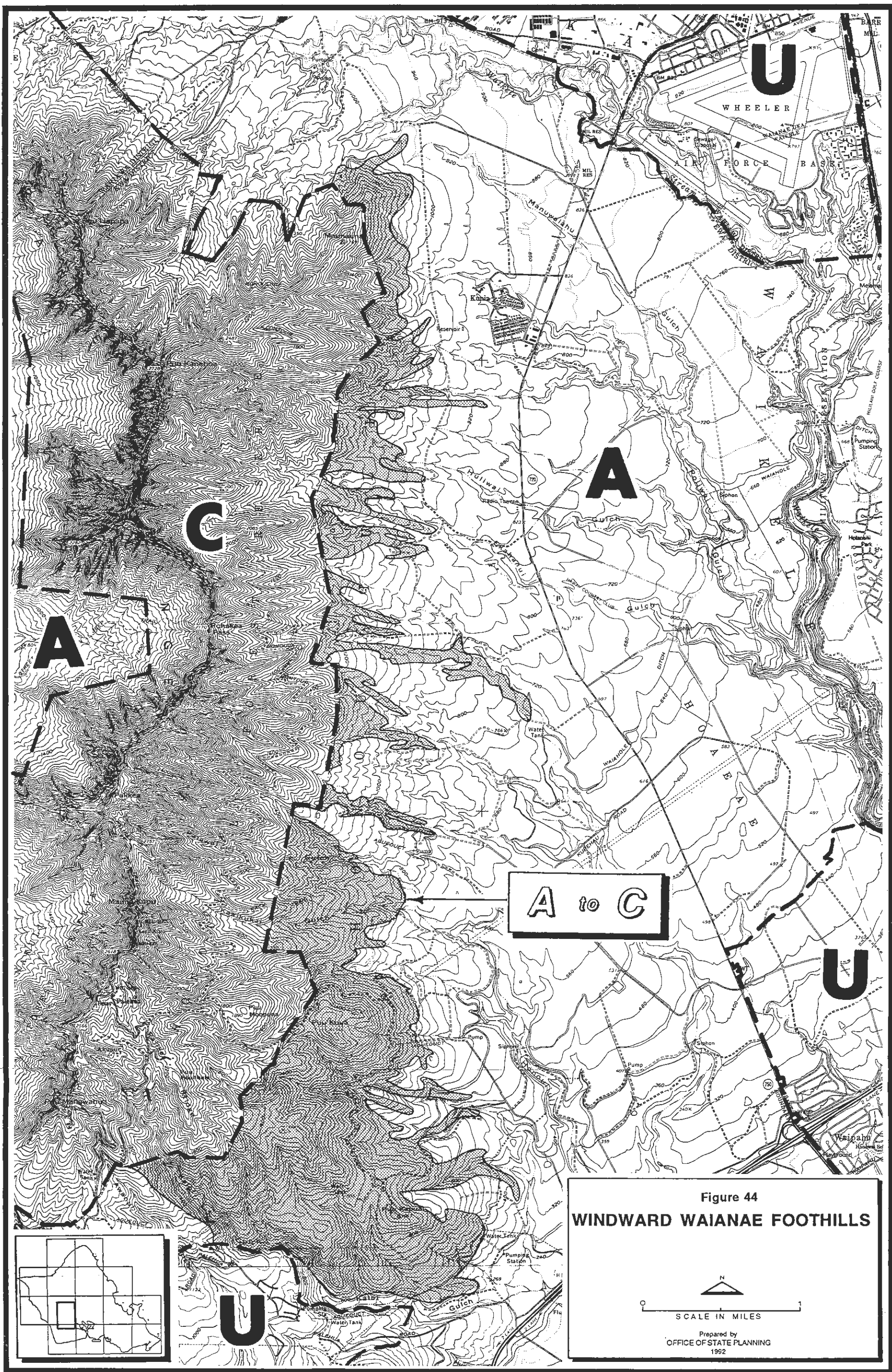


Figure 44
WINDWARD WAIANAE FOOTHILLS

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SCALE IN MILES

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1992

33. Gentry Waiawa Expansion, 1,067 acres (A to U)

The proposed reclassification from the Agricultural District to the Urban District is intended to allow for expansion of the proposed Gentry Waiawa master planned community in which the first phase is already in the Urban District but not yet developed. The project will be a mix of single-family, low density apartment, medium density apartment, commercial/industrial, golf course, park, and open space uses.

The proposed reclassification area is located north of Pearl City roughly bounded by the H-2 Freeway on the west and south, the existing Conservation District boundary on the east, and fallow lands on the north.

Conformance with Chapter 205, HRS

Section 205-2, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., 1991, Oahu will have a deficit of approximately 3,685 acres of urban lands in the year 2000, with the Central Oahu region accounting for 276 acres of that total. The 3,685 acres figure includes a 25 percent flexibility factor (2,416 acres) to account for lands which may be held out of use for various reasons. It is recommended that the majority of this acreage be allocated to Ewa and Central Oahu.

Section 205-17, HRS. The following address the impact of the proposed reclassification on the Land Use Commission's decision-making criteria set forth in Section 205-17, HRS.

Section 205-17(3)(E), HRS

"Provision for employment opportunities and economic development."

Section 205-17 (3)(F), HRS

"Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups."

Both market and affordable housing units are planned for this development. The developer will be required to meet HFDC's affordable housing requirements. Employment opportunities will be created through construction jobs and commercial and industrial uses.

Section 205-17(3)(B), HRS

"Maintenance of valued cultural, historical, or natural resources"

According to the State Historic Preservation Division, six significant historic sites are present in the proposed reclassification area. Four of these sites are significant because they are likely to yield information on Hawaiian history and prehistory. One site is significant for its information content on Hawaiian history and for traditional cultural

significance that it has for an ethnic group. The sixth site is an excellent example of a traditional Hawaiian petroglyph site, is likely to yield information on Hawaiian prehistory, and has traditional cultural significance for Hawaiians.⁵⁸

Mitigation commitments have yet to be agreed upon. It is recommended that the developer be required to meet the requirements of DLNR's Historic Preservation Division in order to protect cultural and historic sites. It is further recommended that a flora and fauna survey be conducted and that the developer meet DLNR's requirements for the protection of flora and fauna.

Section 205-17(3)(C), HRS

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

The site is presently fallowed sugarcane land. A residential substance abuse treatment facility occupies approximately 25 acres of the site. The flat areas are evenly divided between Land Study Bureau productivity ratings of "A" and "B." The gulches have a rating of "E." Under the ALISH classification system, the land is considered Prime except for the gullies which are not classified. According to the Soil Conservation Service, the site is comprised mostly of Lahaina, Wahiawa, and Leilehua silty clay.

Although the proposed site involves prime agricultural land which was once cultivated by Oahu Sugar Company, reclassification will not at this time affect the sugar company's operations. The distance involved in hauling cane from the field to the mill is prohibitive given current sugar prices, and unless the price of sugar increases, it is expected that these lands will remain fallow.⁵⁹

Reclassification will remove "A" and "B" agricultural land from the Agricultural District. However, reclassification of these lands will address an overriding public need for affordable housing.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The reclassification of the Gentry Waiawa Expansion site conforms with the following standards, as discussed below:

⁵⁸ State Historic Preservation Division, Correspondence to OSP, August 27, 1992.

⁵⁹ Conversation with Department of Business, Economic Development & Tourism staff, Business and Development Branch, February 1992.

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(3)

"It shall include lands with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami, unstable soil conditions, and other adverse environmental effects;"

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The proposed reclassification site is located in the growing Central Oahu region adjacent to an existing urban area. It is a planned expansion of the proposed Waiawa master planned community and is immediately adjacent to Urban District lands approved for the first phase of the project. Nearby developments include Gentry Waipio and Pacific Palisades.

The proposed reclassification area is also in close proximity to the employment centers of Pearl Harbor, the International Airport and adjacent industrial areas, Waipahu, Schofield, and Wahiawa. In addition, the proposed commercial and industrial areas within the project will generate new employment opportunities.

The site itself is appropriate for urban uses. It has a general slope of less than 20 percent and is away from areas prone to adverse environmental effects.

The site is not within the hydrologic zone of contribution for the Waiawa shaft. The hydrologic zone of contribution is recommended for reclassification to the Conservation District.

The site is within the Honouliuli Sewage Treatment Plant service area. The plant is operating at capacity and expansion plans will not accommodate this proposed development.⁶⁰ It is recommended that the developer be required to meet Department of Health requirements for wastewater disposal.

The H-2 Freeway is estimated to be experiencing a LOS D in the vicinity of the project area. Construction is underway to add another traffic lane between Mililani and the Waiawa Interchange. It is recommended that the developer be required to participate with financing the remaining portion of the ongoing project to add traffic lanes in both directions of the H-2. When completed, these improvements should be sufficient to accommodate the increase in volume generated by the proposed development. However, the remaining bottleneck problem on H-1 beginning in Pearl City remains.⁶¹

School facilities will also be impacted and it is recommended that the developer be required to meet the Department of Education's requirements in this area.

The developer has proposed to coordinate with DLNR and the Board of Water Supply to address the project's water needs. It is recommended that the developer be required to address DLNR's concerns.

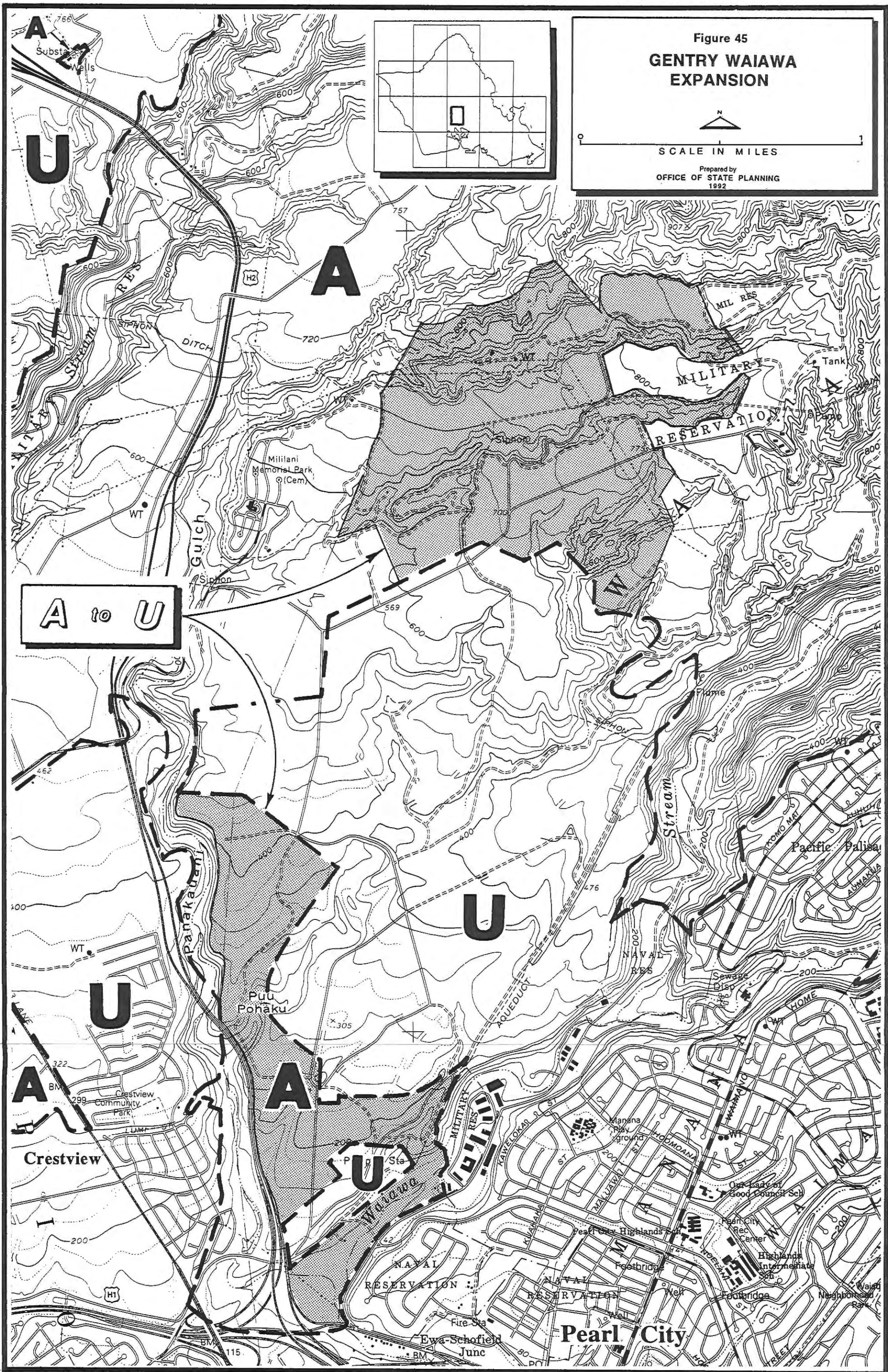
The provision of water systems, parks, and police and fire facilities should be addressed at the County level.

Conformance with Chapter 226, HRS, Hawaii State Plan. The proposed reclassification is in conformance with Section 226-19, HRS, the Hawaii State Plan, in that it provides greater opportunity for Hawaii's people to secure reasonably priced, livable homes in a manner sensitive to community needs and other land uses. It is also consistent with Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are available or can be provided with reasonable public expenditure; and directing areas or impose mitigation measures so that negative impacts on the environment would be minimized.

County Plans. The City's Development Plan Land Use map currently designates this area as Agricultural.

⁶⁰ Conversation with City and County of Honolulu, Department of Public Works, February 1992.

⁶¹ Conversation with Department of Transportation staff, February 1992.



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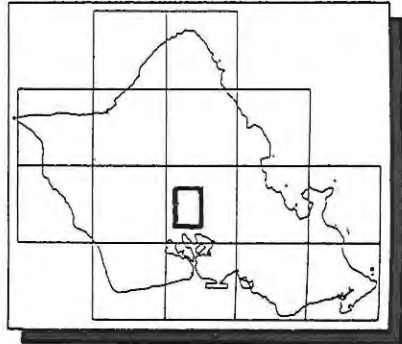


Figure 45
**GENTRY WAIAWA
EXPANSION**

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SCALE IN MILES

Prepared by
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1992

EWA

34. Pearl Harbor National Wildlife Refuge: Honouliuli Unit and Apokaa Ponds, 42 acres (A to C)

The proposed reclassification of Pearl Harbor National Wildlife Refuge: Honouliuli Unit and Apokaa Ponds, from the Agricultural District to the Conservation District meets the following standards and criteria for the Conservation District contained in Section 205-2(e), HRS: Conservation districts shall include areas necessary for . . . conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered . . .

The proposed reclassification area is located southeast of Honouliuli and is roughly bounded by West Loch on the east, sugar lands on the south, and the West Loch housing development on the west and north.

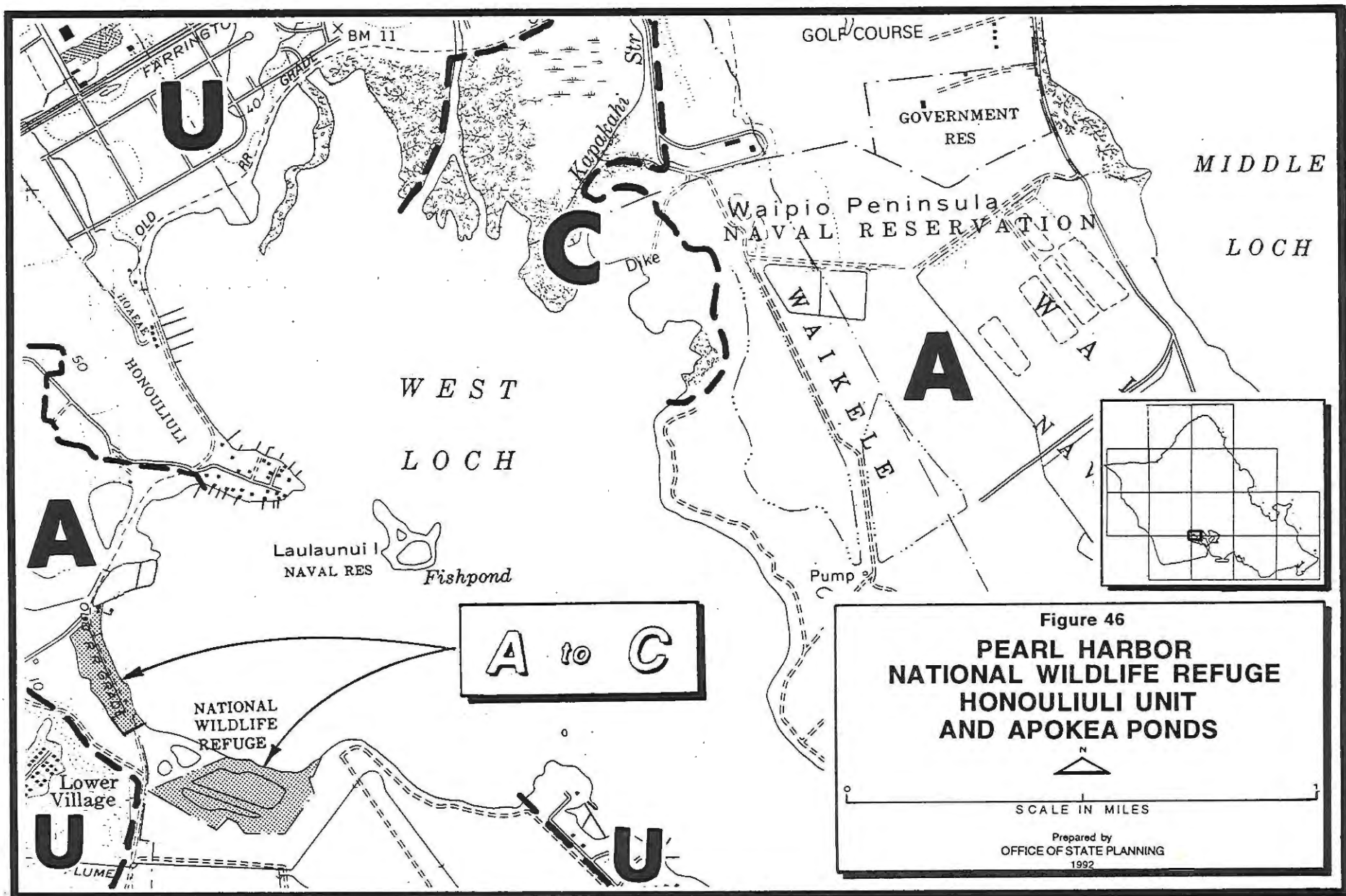
The proposed reclassification of Pearl Harbor National Wildlife Refuge: Honouliuli Unit and Apokaa Ponds, from the Agricultural District to the Conservation District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS: Preservation or maintenance of important natural systems or habitats; and Maintenance of valued cultural, historical, or natural resources.

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems of endemic plants, fish, and wildlife . . .

The Pearl Harbor National Wildlife Refuge: Honouliuli Unit and Apokaa Ponds are being proposed for reclassification to protect the wildlife habitat of endangered Hawaiian waterbirds. It is a portion of a larger complex of wetlands scattered along the Pearl Harbor area which support endangered Hawaiian waterbirds as well as migratory waterbirds. The wetland has been identified in the Hawaiian Waterbird Recovery Plan as primary habitat for endangered Hawaiian coot, stilt, koloa, and gallinule and is managed by the Federal and City governments for this purpose. As stilt habitat along the reef runway is lost, the Pearl Harbor area increases in importance to the stilts on Leeward Oahu.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.



35. Hawaii Raceway Park, 59 acres (A to U)

The proposed reclassification of 59 acres from the Agricultural District to the Urban District in Ewa, Oahu, is intended to conform the State land use designation to the existing use. The proposed reclassification area is the site of an auto racing facility.

The proposed reclassification area is located north of Campbell Industrial Park roughly bounded by Kalaeloa Boulevard on the west, Campbell Industrial Park on the south, Barbers Point NAS on the east, and the existing Urban District boundary on the north.

Conformance with Chapter 205, HRS

Section 205-2, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District lands in current urban use.

Section 205-17, HRS. The following addresses the impact of the proposed reclassification on the Land Use Commission's decision-making criteria set forth in Section 205-17, HRS.

Section 205-17(3)(E)

"Provision for employment opportunities and economic development."

The auto racing activities presently occurring on the site are a source of economic opportunity.

Section 205-17(3)(B)

"Maintenance of valued cultural, historical, or natural resources . . ."

As the proposed area is in urban use, it is believed that there are no valued cultural, natural, or historical features on site. However, it is recommended that the developer be required to meet the requirements of DLNR's Historic Preservation Division in order to protect cultural and historic sites.

Section 205-17(3)(C)

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

Because the area is in urban use, no agricultural activities will be impacted by the proposed reclassification. Portions of the site have a Land Study Bureau agricultural productivity rating of "E" and an ALISH rating of Other Agricultural Lands. The remaining portion of the site is classified as Urban. The Soil Conservation Service categorizes the soil as coral outcrop.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The reclassification of the Hawaii Raceway Park site satisfies the following standards, as discussed below:

Section 15-15-18(11)

"It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses."

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The proposed site is already in urban use and is contiguous on two sides with Urban District lands. In addition, the residential and employment centers of Kapolei will be located nearby. The land is relatively flat making it appropriate for urban activities.

A sewerage system is presently unavailable at the site and further development would need to meet Department of Health wastewater standards. Water is available through existing 24" and 20" mains in Kalaeloa Boulevard. This system should be sufficient to serve the area for the near future.⁶² Should increased uses be proposed for the property in the future, additional water sources will have to be developed. For now, the Board of Water Supply is requiring the preparation of a detailed water master plan to assess the capability of the existing system to serve future developments.

The major roads serving Campbell Industrial Park, Kalaeloa Boulevard and Malakole Road are heavily travelled and experience delays during the morning and afternoon peak hours (due in part to the egress to

⁶² Kapolei Business-Industrial Park, FEIS, Volume I, April 1990.

the freeway). The Department of Transportation estimates that the H-1 Freeway in the vicinity of the Campbell Industrial Park operates at LOS C.⁶³

Noise from Barbers Point Naval Air Station could potentially exclude some urban uses as the 60 Ldn contour bisects the site. However, this noise level is acceptable for the type of uses that are already occurring or proposed. In addition, the Raceway Park itself is a significant noise generator during races and may impact neighboring uses.

Conformance with Chapter 226, HRS, Hawaii State Plan. The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the economy, Section 226-6, HRS, increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people; and Section 226-13, HRS, encourage urban developments in close proximity to existing services and facilities. It also conforms to Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.

County Plans. The Oahu General Plan directs growth to Ewa. The area is designated Agricultural on the City's Development Plan Land Use Map.

⁶³ Conversation with Department of Transportation staff, February 1992.

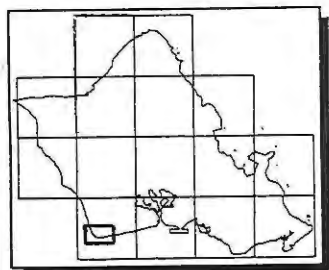
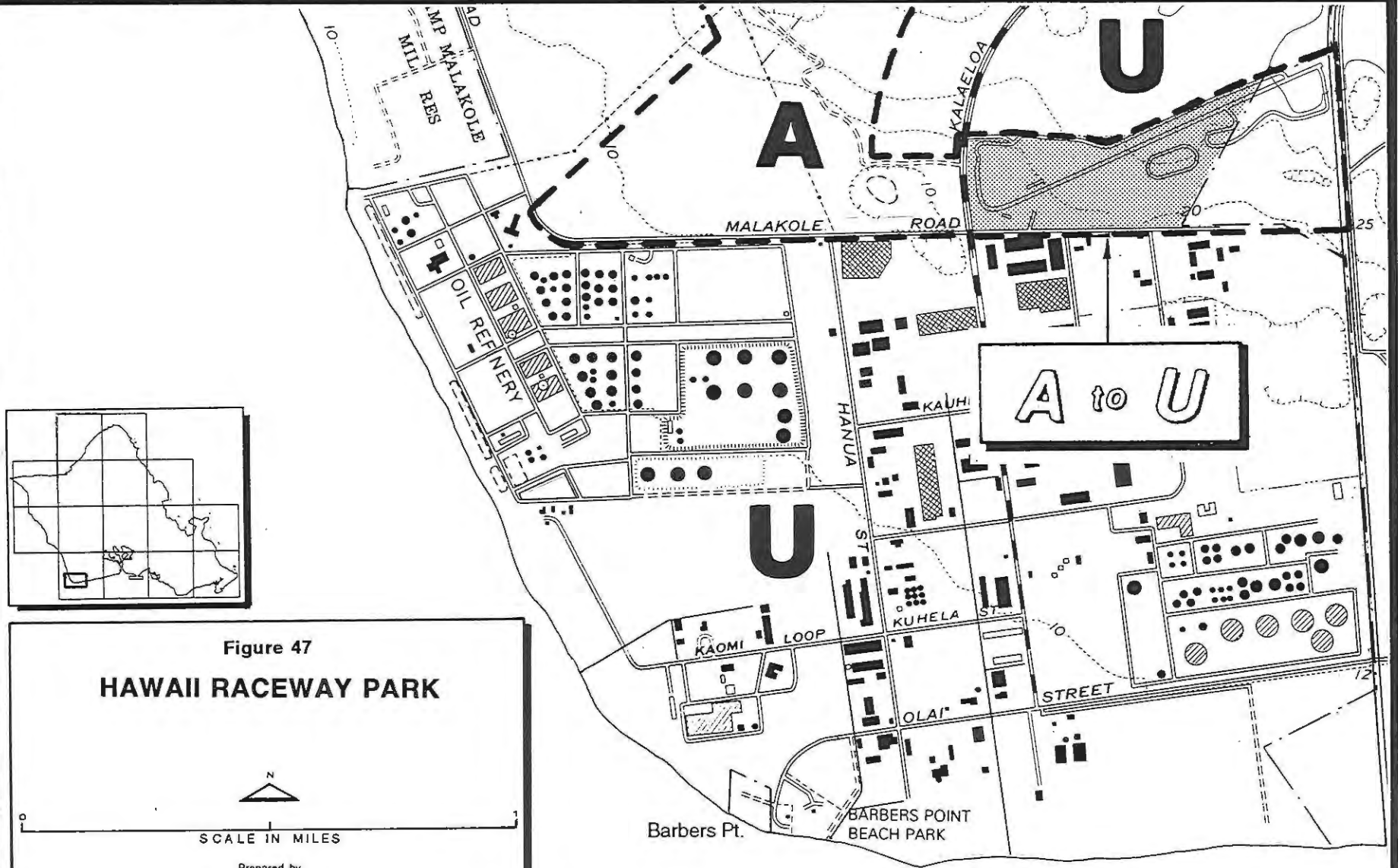


Figure 47
HAWAII RACEWAY PARK



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36. Barbers Point Harbor Expansion, 140.5 acres (A to U)

The proposed reclassification of the Barbers Point Harbor area from the Agricultural to Urban District is intended to provide for the expansion of harbor facilities on land being acquired by the Department of Transportation, Harbors Division.

The proposed reclassification area is located northwest of Campbell Industrial Park and is roughly bounded by the existing harbor on the south and west, and fallow lands on the north and east.

Conformance with Chapter 205, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., 1991, Oahu will have a deficit of approximately 3,685 acres of urban lands in the year 2000. This figure includes a 25 percent flexibility factor (2,416 acres) to account for lands which may be held out of use for various reasons. It is recommended that the majority of this acreage be allocated to Ewa and Central Oahu.

The following addresses the impact of the proposed reclassification on the Land Use Commission's decision-making criteria set forth in Section 205-17, HRS.

Section 205-17(3)(E)

"Provision for employment opportunities and economic development."

The proposed reclassification can allow the State Department of Transportation, Harbors Division, to expand its harbor facilities. This expansion would be a source of economic development.

Section 205-17(3)(B)

"Maintenance of valued cultural, historical, or natural resources
..."

No cultural, historical, or natural resources were identified during the boundary review for the proposed reclassification area. However, detailed site surveys were not undertaken and it is recommended that the developer be required to meet the requirements of DLNR's Historic Preservation Division in order to protect cultural and historic sites. It is further recommended that a flora and fauna survey be required.

Section 205-17(3)(C)

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

There will be no impact on agricultural activities. The shrub lands surrounding the gravel pit have a productivity rating of "E" as determined by the Land Study Bureau. The ALISH system has not classified this area and the Soil Conservation Service classifies the soil as coral outcropping.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The reclassification of the Barbers Point Harbor expansion area conforms with the following standards, as discussed below:

Section 15-15-18(1)

"It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses."

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute towards scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The area proposed for reclassification is adjacent to an existing urban area and to the proposed Kapolei Business-Industrial Park. It is located in close proximity to existing centers of trading and employment. The provision of support services should not involve an unreasonable investment in public expenditures.

The nearest municipal wastewater treatment plant is the Honouliuli STP which is operating at capacity. In coordination with other proposed developments in the region, plans are underway to increase plant capacity. At this time, however, there are no State Department of Health Sewage Treatment Plant Revolving Funds forecasted for Honouliuli.⁶⁴

⁶⁴ Conversation with Department of Health Staff, February 1992.

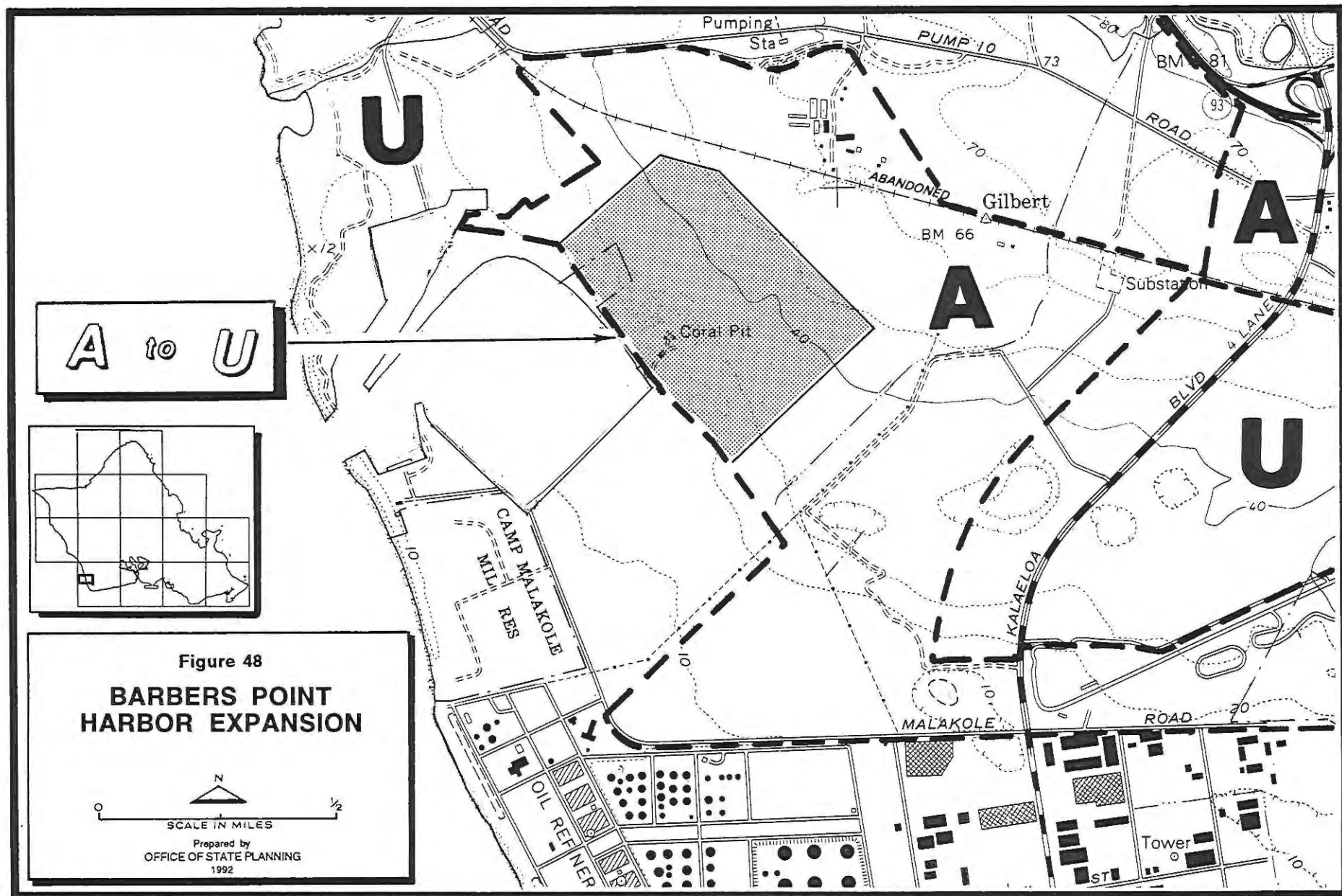
Water system adequacy will be assessed by the Board of Water Supply. The landowner, the James Campbell Estate, is a member of the Ewa Plain Water Development Corporation which was established to assess the water system requirements and coordinate improvements in the Ewa Plain.

The major roadways used to access the site are Kalaeloa Boulevard and Malakole Road. Both roads are heavily traveled with long delays during the morning and afternoon peaks. The H-1 Freeway in the vicinity of the site operates at LOS C.⁶⁵ An "Ewa Region Highway Transportation Master Plan, 1997 and 2005 Roadway Concepts" report was recently completed by developers in the area along with State and City agencies. The report assesses the road improvements necessary for future developments in the region.

Conformance to Chapter 226, HRS, Hawaii State Plan. The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the economy, Section 226-6, HRS, increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people; and Section 226-13, HRS, encourage urban developments in close proximity to existing services and facilities. It also conforms to Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.

County Plans. The Oahu General Plan directs growth to Ewa. The area is designated "Agricultural" on the City's Development Plan Land Use map.

⁶⁵ Conversation with Department of Transportation Staff, February 1992.



37. Makaiwa Hills, 1,413 acres (A to U)

The proposed reclassification of 1,413 acres from the Agricultural District to the Urban District in Ewa, Oahu, is intended to allow for development of the Makaiwa Hills residential project. The project is planned to contain approximately 2,310 single and multi-family housing units, commercial uses, and other supporting services and amenities. It is situated adjacent to the residential community of Makakilo.

The proposed Makaiwa Hills reclassification area is located west of Makakilo, roughly bounded by Makakilo on the east, H-1 Freeway on the south, Waimanalo Gulch on the west, and Palehua Road on the north.

Conformance with Chapter 205, HRS

Section 205-2, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., 1991, Oahu will have a deficit of approximately 3,685 acres of urban land in the year 2000. This figure includes a 25 percent flexibility factor (2,416 acres) to account for lands which may be held out of use for various reasons. It is recommended that the majority of this acreage be allocated to Ewa and Central Oahu.

The following addresses the impact of the proposed reclassification on the Land Use Commission's decision making criteria set forth in Section 205-17, HRS. Reclassification would also favorably impact the following Land Use Commission decision-making criteria set forth in Section 205-17, HRS:

Section 205-17(3)(E)

"Provision for employment opportunities and economic development."

Section 205-17(3)(F)

Provision for housing opportunities for all income groups, particularly the low, low-moderate and gap groups."

The proposed Makaiwa Hills project will favorably impact Sections 205-17(E) and (F). The proposed project will provide single and multi-family housing units. In addition, it is recommended as a condition of approval that the developer be required to meet HFDC's affordable housing requirements. The construction of Makaiwa Hills and the commercial uses planned for it will provide employment opportunities and economic development.

Section 205-17(3)(B)

"Maintenance of valued cultural, historical, or natural resources . . ."

Eighteen significant historic sites were found at Makaiwa Hills during an inventory in 1990. Fourteen of these sites are significant for their information content, three are significant because they are excellent examples of a particular site type and because of their information content, and one site is significant because it is an excellent example of a site type, has significant information content, and has cultural significance to an ethnic group of the State.⁶⁶

The State Historic Preservation Division has agreed with mitigation recommendations for all 18 sites. Therefore, the State Historic Preservation Division has stated that the proposed Makaiwa Hills project would have "no adverse effect" to significant historic sites.

It is recommended that a flora and fauna survey be conducted and that DLNR's requirements for protection of flora and fauna be met.

Section 205-17(3)(C)

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

The Makaiwa Hills site is presently used for grazing and so will have minimal impact on the island's agricultural industry. The soils are poor, having a Land Study Bureau productivity rating of "E." The site has no ALISH rating and is classified as stony steep land by the Soil Conservation Service.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The reclassification of the subject area conforms with the following standards, as discussed below:

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

⁶⁶ State Historic Preservation Division, Correspondence to OSP, August 27, 1992.

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The proposed site for the Makaiwa Hills development is adjacent to existing urban areas. Urbanization of this area would not contribute to spot urban development. The site is located west of Makakilo and north of the City of Kapolei and Barbers Point Harbor. The housing units planned for this development will therefore be close to the planned employment center in the City of Kapolei.

Urbanization of this area would help to provide sufficient lands for urban growth for the next ten years in an area contiguous to existing urban areas and in proximity to an employment center--Kapolei. Although the proposed development is in proximity to basic services such as sewers, transportation systems, schools, etc., many of these systems are at capacity and will require major upgrades and expansion.

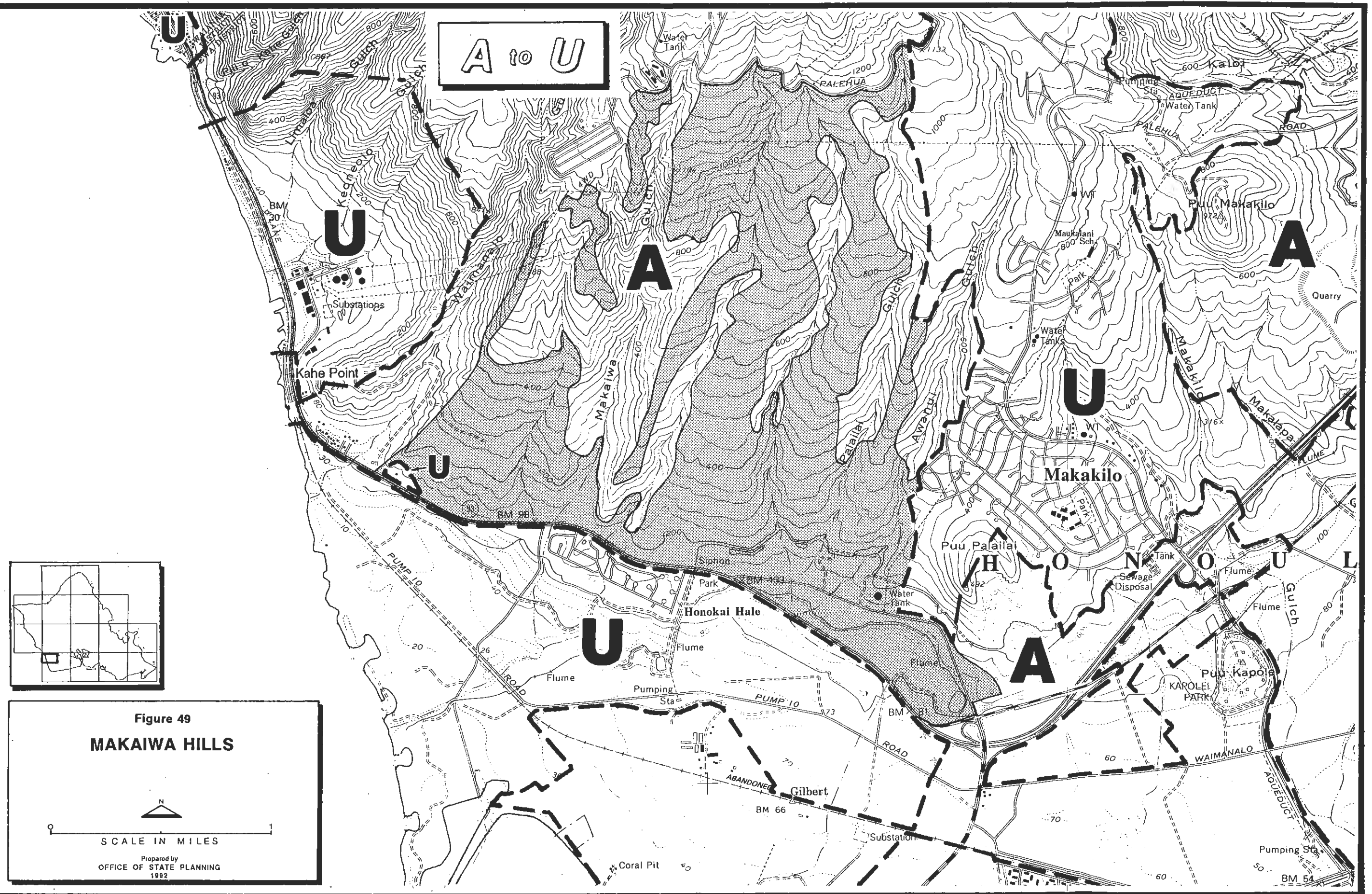
Makaiwa Hills is in the Honouliuli Sewage Treatment Plant service area. The plant is presently operating at capacity and expansion plans will not accommodate this proposed development.⁶⁷ It is, therefore, recommended that the developer be required to meet Department of Health requirements for wastewater disposal.

Public schools and transportation systems will also need improvements to accommodate the additional demand. It is recommended that the developer be required to meet Department of Education and Department of Transportation requirements in these areas.

Conformance with Chapter 226, HRS, Hawaii State Plan. The proposed reclassification is in conformance with Section 226-19, HRS, the Hawaii State Plan, in that it provides greater opportunity for Hawaii's people to secure reasonably priced, livable homes in a manner sensitive to community needs and other land uses. It is also consistent with Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.

County Plans. The Oahu General Plan contains policies to develop a secondary urban center in Ewa with its nucleus in the Kapolei area. The Development Plan Land Use map currently designates the area Agricultural.

⁶⁷ Conversation with City and County of Honolulu, Department of Public Works, February 1992.



38. Makakilo Expansion, 87 acres (A to U)

The proposed reclassification of 87 acres from the Agricultural District to the Urban District in Ewa, Oahu, is intended to allow for the continued development of the community of Makakilo. These particular areas would contain approximately 190 single-family housing units as well as recreational facilities.

Conformance with Chapter 205, HRS

Section 205, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., 1991, Oahu will have a deficit of approximately 3,685 acres of urban land in the year 2000. This figure includes a 25 percent flexibility factor (2,416 acres) to account for lands which may be held out of use for various reasons. It is recommended that the majority of this acreage be allocated to Ewa and Central Oahu.

The following addresses the impact of the proposed reclassification on the Land Use Commission's decision-making criteria set forth in Section 205-17, HRS. Reclassification would also favorably impact the following Land Use Commission decision-making criteria set forth in Section 205-17, HRS:

Section 205-17(3)(E)

"Provision for employment opportunities and economic development."

Section 205-17(3)(F)

Provision for housing opportunities for all income groups, particularly the low, low-moderate and gap groups."

The proposed project will favorably impact Sections 205-17(E) and (F). The proposed project will provide single-family housing units. In addition, it is recommended as a condition of approval that the developer be required to meet HFDC's affordable housing requirements. The construction of Makakilo Expansion will provide employment opportunities and economic development.

Section 205-17(3)(B)

"Maintenance of valued cultural, historical, or natural resources . . ."

No cultural, historical, or natural resources were identified during the boundary review for the proposed reclassification area. However, detailed site surveys were not undertaken and it is recommended that the developer be required to meet the requirements of DLNR's Historic Preservation Division in order to protect historic and cultural sites. It is further recommended that a flora and fauna survey of the site and mitigating measures be required.

Section 205-17(3)(C)

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

The Makakilo Expansion site is presently vacant, thus having minimal impact on the island's agricultural industry. The soils are poor, having a Land Study Bureau productivity rating of "E." Under the ALISH classification system, the lower parcel is considered "Other" with the remainder not classified. According to the Soil Conservation Service, the sites are comprised of stony steep lands.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The reclassification of the Makakilo Expansion site satisfies the following standards, as discussed below:

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, land contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The proposed site for the Makakilo Expansion development is adjacent to existing urban areas. Urbanization of this area would not contribute to spot urban development. The site is an expansion of Makakilo on the east and located north of the City of Kapolei and Barbers Point Harbor. The housing units planned for this development will therefore be close to the planned employment center in the City of Kapolei.

Urbanization of this area would help to provide sufficient lands for urban growth for the next ten years in an area contiguous to existing urban areas and in proximity to an employment center--Kapolei. Although the proposed development is in proximity to basic services such as sewers, transportation systems, schools, etc., many of these systems are at capacity.

Makakilo Expansion is in the Honouliuli Sewage Treatment Plant service area. The plant is presently operating at capacity and expansion plans will not accommodate this proposed development.⁶⁸ It is, therefore, recommended that the developer be required to meet Department of Health requirements for wastewater disposal.

Schools and transportation systems will also need improvements to accommodate the additional demand. It is recommended that the developer be required to meet Department of Education and Department of Transportation requirements in these areas.

Section 15-15-18(3)

"It shall include lands with satisfactory topography and drainage and reasonably free from the dangers of floods, tsunami, unstable soil conditions, and other adverse environmental effects."

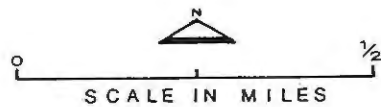
The upper (northern) site contains slopes that range from 10 percent to over 20 percent in some portions. The major portion of the areas proposed for building appears to have less than 20 percent slope. It is recommended that buildings be limited to those areas with less than 20 percent slope.

Conformance with Chapter 226, HRS, Hawaii State Plan. The proposed reclassification is in conformance with Section 226-19, HRS, the Hawaii State Plan, in that it provides greater opportunity for Hawaii's people to secure reasonably priced, livable homes in a manner sensitive to community needs and other land uses. It is also consistent with Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.

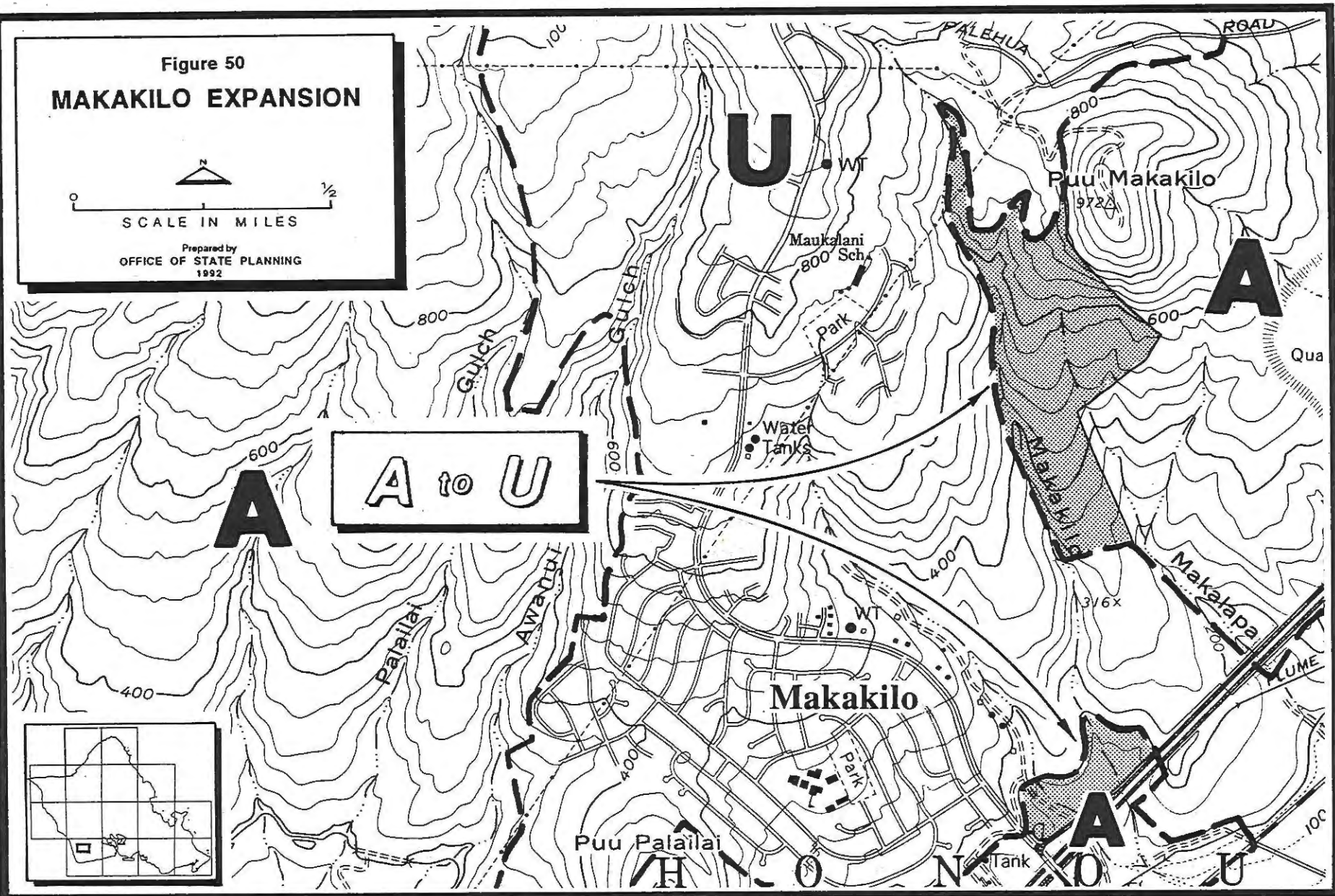
County Plans. The Oahu General Plan contains policies to develop a secondary urban center in Ewa with its nucleus in the Kapolei area. The Development Plan Land Use map currently designates the area Agricultural.

⁶⁸ Conversation with City and County of Honolulu, Department of Public Works, February 1992.

Figure 50
MAKAKILO EXPANSION



Prepared by
OFFICE OF STATE PLANNING
1992



39. Additional Urban Lands in Ewa, 1,823 acres (A to U)

The proposed reclassification of 1,823 acres from the Agricultural District to the Urban District in Ewa, Oahu, is intended to help meet Oahu's projected demand for urban lands. The reclassification area consists of four sites: the area for the proposed Kapolei Business-Industrial Park; the Kapolei Town Center area; the area proposed for the Laulani Fairways development; and the existing Myers/Seibu Golf Course.

The proposed reclassification area is on the Ewa plain bounded by Ko Olina Resort on the west, Campbell Industrial Park, Barbers Point NAS and Ewa Beach on the south, H-1 Freeway on the north, and sugar lands on the east.

Conformance with Chapter 205, HRS

Section 205-2, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, 1991, Oahu will have a deficit of approximately 3,685 acres of urban lands in the year 2000. This figure includes a 25 percent flexibility factor (2,416 acres) to account for lands which may be held out of use for various reasons. It is recommended that the majority of this acreage be allocated to Ewa and Central Oahu.

The following addresses the impact of the proposed reclassification on the Land Use Commission's decision-making criteria set forth in Section 205-17, HRS.

Section 205-17(3)(E)

"Provision for employment opportunities and economic development."

Section 205-17(3)(F)

"Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups."

The proposed Kapolei Business-Industrial Park would create an estimated 4,751 jobs through 2010 and ultimately would create 9,748 jobs. These jobs would be in manufacturing, construction, transportation, and retail, among other. The character of the park will be complementary to the existing James Campbell Industrial Park.⁶⁹

The Kapolei Town Center will contain a mix of residential, commercial, light industrial, public facilities, and park and open space uses. Approximately 1,708 dwelling units are planned

⁶⁹ William E. Wanket, Final EIS, Kapolei Business-Industrial Park, Vol. I, April 1990, pp. 13, 22.

for this area.⁷⁰ It is recommended that the developer be required to meet HFDC affordable housing requirements. A portion of this recommendation (hatched area on map) will be given Priority 1 status. This area, encompassing approximately 50 acres, is the area planned for State and County buildings. An additional 8 acres located to the north of the hatched area will also be used for government buildings; however, this area is already in the Urban District. Of the area being recommended for Priority 1 reclassification, State facilities will occupy approximately 30 acres and County facilities approximately 20 acres.

Proposed for the Laulani Fairways site are approximately 1,100 single-family units and 725 multi-family units.⁷¹ This is a City and County of Honolulu Department of Housing and Community Development project which will provide affordable housing. The project is also planned to contain 20 acres of commercial space as well as park and open space uses.

Section 205-17(3)(B)

"Maintenance of valued cultural, historical, or natural resources ..."

The State Historic Preservation Division has stated that in the Kapolei Town Center area, the Laulani Fairways site and the Myers/Seibu Golf Course site, it is unlikely that significant historic sites remain. Therefore, the change in land use classification should have "no effect" on significant historic sites.

In the Kapolei Business-Industrial Park area, there are five areas that contain historic sites. A brief reconnaissance survey of the largest of these areas located in the northwest corner of the park, inventoried 24 historic sites. Among these sites are two large sinkholes which the State Historic Preservation Division feels should be passively preserved. An inventory survey has not been completed for this area and mitigation commitments have not been agreed to. The State Historic Preservation Division has stated that this area should not be reclassified without a commitment to preservation.

The second area within the park site is a large enclosure within an abandoned cane field. Although no formal significant evaluation of this site has been made, the State Historic Preservation Division believes this site may be significant for its information content.

⁷⁰ Helber, Hastert & Kimura, Planners, Kapolei Town Center, Application for Development Plan Amendment and Environmental Assessment, February 23, 1988, p.8.

⁷¹ Development Plan Application and Environmental Assessment, Laulani Fairways, September 1991, p.10.

The third area is Tongg Ranch, an elevated limestone formation. Tongg Ranch may contain historic structures and sinkholes.

The fourth area is the OR&L Right-of-Way. This site is listed in the National Register of Historic Places and any activity in the vicinity of this site needs to be evaluated for its potential effects on this site.

The fifth area is an approximately eight-acre parcel at the northwest corner of Malakole and Hanua Roads. This area contains over 100 sinkholes of which 80 percent are likely to contain significant historic and/or paleontological remains. Campbell Estate has agreed to placing a fence around the area and also to a five-year period (beginning in April 1990) to develop and implement a mitigation plan. The State Historic Preservation Division strongly supports preservation of this area. No mitigation commitments have been agreed upon yet.

Because this parcel is less than 15 acres, OSP will not initiate a petition for reclassification to the Conservation District. A condition of approval for reclassification to the Urban District should be some mechanism to provide for protection of the sinkholes, e.g., a conservation easement. OSP also recommends that a flora and fauna survey be required for all areas within the subject area and that DLNR's requirements for mitigation be met.

Section 205-17(3)

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

In the business-industrial park portion, existing land uses include coral mining, raceway park, tree nursery (10 acres), and sugarcane cultivation (145 acres). In addition, the entire town center portion is in sugarcane cultivation as is most of Laulani Fairways site (301 acres). By itself, the reclassification of this area should not significantly affect Oahu Sugar Company. However, when considering the cumulative impacts of other proposed developments in Ewa and Central Oahu, the Oahu Sugar Company may be required to modify its operations. The remainder of the Laulani Fairways site is being developed as the Myers/Seibu golf course.

The State Department of Health (DOH) has expressed concern that noise associated with existing agricultural activities may adversely impact upon the proposed residential developments. It is recommended that the developer address DOH concerns in this regard.

The Land Study Bureau classifies the business-industrial park area as approximately 65 percent "E" lands, 21 percent "C" lands, and 14 percent "B" lands. Under the ALISH classification, the sugarcane area is considered "Other" (the remainder of the area is not rated). The Soil Conservation Service classifies the soils as 86 percent coral outcrop, 13 percent stony silty clay loam, and one percent as silty clay loam. The town center area is evenly divided between "B" and

"C" land and Puu Kapolei is rated "E." The ALISH system rates this area as "Prime" and "Other," and the Soil Conservation Service classifies the soil as mostly Honouliuli clay and Mamala stony silty clay loam, although there is a pocket of Ewa silty loam near Kalaeloa Boulevard and Lahaina silty clay at Puu Kapolei. The Laulani Fairways site is 78 percent "C" lands and 22 percent "A" lands. Approximately 29 percent is classified as "Prime" under the ALISH system with the remainder classified as "Other." The major soil types in this area are silty clay loam and stony silty clay loam.

Although lands which are rated as "A" and "B" by the Land Study Bureau and lands rated as "Prime" under the ALISH system will be removed from the Agricultural District, these lands are needed to meet urban land requirements and to address an overriding public need for the development of affordable housing.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The proposed reclassification satisfies the following standards, as discussed below:

Section 15-15-18(1)

"It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses."

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, lands contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The areas proposed for reclassification are located adjacent to existing urban areas and already contain some urban uses. They are in close proximity to centers of trading and employment, including Barbers Point NAS and James Campbell Industrial Park.

Because cesspools are used in the business-industrial park and town center areas, there is no system in place to handle the projected wastewater needs. The Honouliuli Sewage Treatment Plant is the closest plant and is currently operating at capacity. Plans to increase its capacity are being coordinated with other potential users. It is recommended that the developer be required to meet Department of Health wastewater standards.

Wastewater from Laulani Fairways development will be accommodated by the County's Ewa sewer system and transported to the Honouliuli Sewage Treatment Plant. This is a primary treatment facility which is presently operating at capacity. The City and County may be required by the Federal government to upgrade the facility to secondary treatment in 1995. The project will be eligible for revolving fund assistance at that time. The development's sewer system will be designed in accordance with the standards of the Division of Wastewater Management, Department of Public Works, City and County of Honolulu.⁷²

The Board of Water Supply is requiring the preparation of a water master plan for the Kapolei region subject to their approval. A dual water system comprised of potable and non-potable systems is being proposed. At Laulani Fairways, the existing water system is already at capacity. The County and the Board of Water Supply are proposing the development of a storage and transmission facility to serve the County's Ewa Villages and Laulani Fairways housing projects. This project includes a 3 million gallon reservoir at the Kunia 228 site and a 20" and 16" line.⁷³

H-1 in the Kapolei area is estimated to be operating at LOS C by Department of Transportation staff. Improvements to enhance access to H-1 via interior roads and connectors and the use of contraflow lanes are being considered. An "Ewa Region Highway Transportation Master Plan, 1997 and 2005 Roadways Concepts" report was recently completed by developers in the area and State and City agencies. The report contains proposals for major roadway realignments and access ramp improvements in the Ewa area. However, the State Department of

⁷² Development Plan Application and Environmental Assessment, Laulani Fairways, September 1991, p.31.

⁷³ Development Plan Application and Environmental Assessment, Laulani Fairways, September 1991, p.29.

Transportation is not entirely comfortable with traffic forecast estimates contained in the report.⁷⁴ A separate Traffic Impact Study will be conducted for determining the impact of the Laulani Fairways development.

It is recommended that the developer be required to address the Department of Education's concerns regarding schools.

Conformance with Chapter 226, HRS, Hawaii State Plan. The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the economy, Section 226-6, HRS, increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people; and Section 226-13, HRS, encourage urban developments in close proximity to existing services and facilities. It also conforms to Priority Guidelines for population growth and land resources, Section 225-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.

County Plans. The Oahu General Plan contains policies to develop a secondary urban center in Ewa with its nucleus in the Kapolei area. The City's Development Plan Land Use map designates the business-industrial park site mostly Industrial with some Agricultural; the Laulani Fairways and Myers/Seibu golf course areas as Agricultural; and the town center area as Commercial, Low Density Apartment, Parks and Recreation, and Public and Quasi Public.

⁷⁴ Conversation with OSP, February 1992.

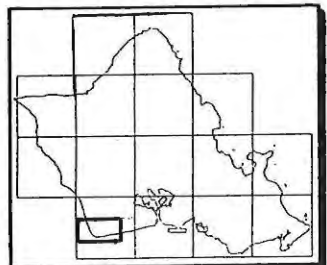
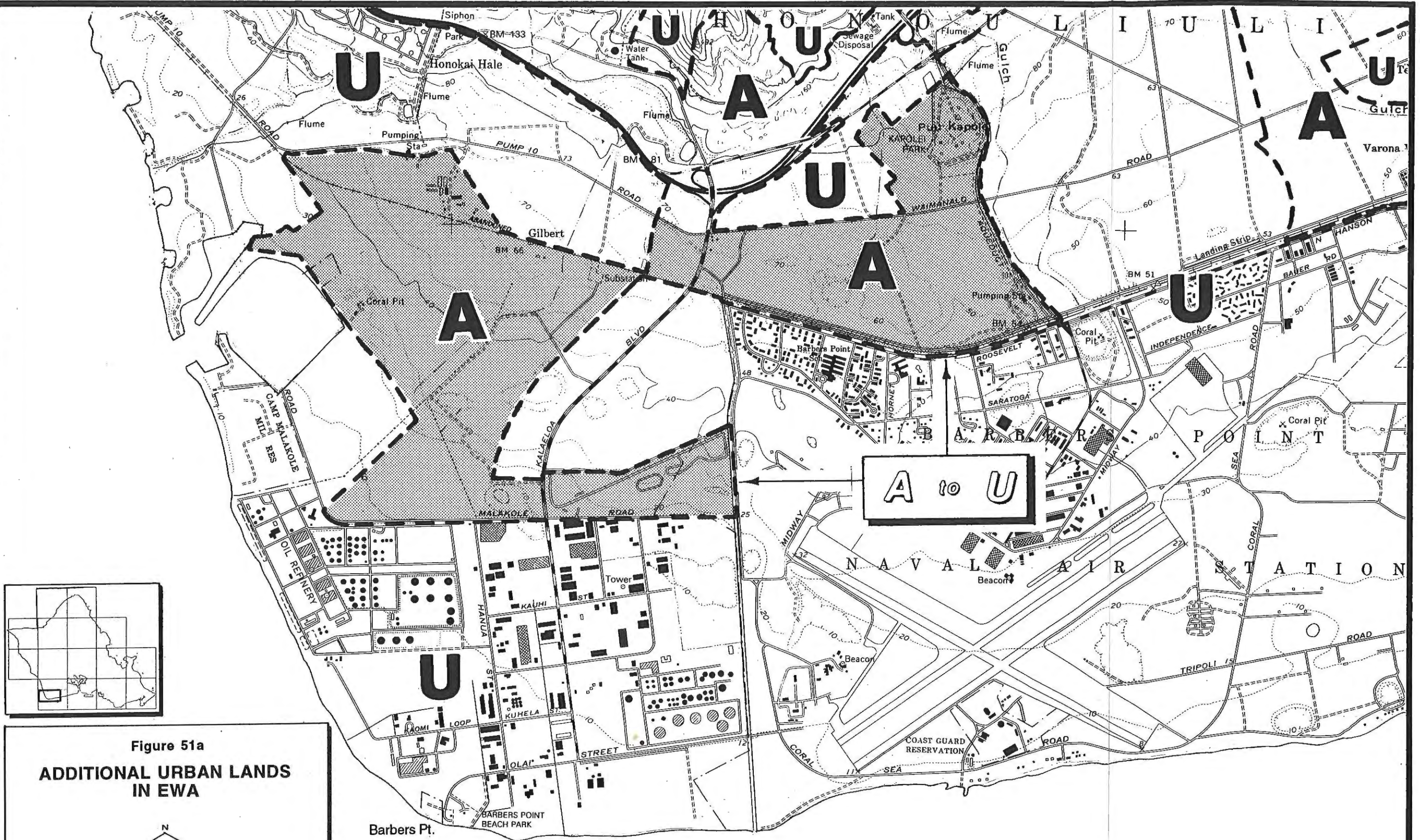


Figure 51a
ADDITIONAL URBAN LANDS
IN EWA

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0 1
SCALE IN MILES

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1992

40. State and County Building Complex, 50 acres (A to U)

The proposed reclassification of 50 acres from the Agricultural District to the Urban District in Ewa is intended to allow for the development of State and County facilities. The proposed reclassification area is a portion of the Additional Urban Lands in Ewa recommendation. This area is part of the Kapolei Town Center currently under construction.

The proposed reclassification area is on the Ewa plain roughly bounded by Kalaeloa Boulevard on the west, Barbers Point NAS on the south, H-1 Freeway on the north, and fallow lands on the east.

Conformance with Chapter 205, HRS

Section 205-2, HRS. The proposed reclassification is consistent with Section 205-2, HRS, in that it includes in the Urban District a sufficient reserve area for foreseeable urban growth. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, 1991, Oahu will have a deficit of approximately 3,685 acres of urban land in the year 2000. This figure includes a 25 percent flexibility factor (2,416 acres) to account for lands which may be held out of use for various reasons. It is recommended that the majority of this acreage be allocated to Ewa and Central Oahu.

The following addresses the impact of the proposed reclassification on the Land Use Commission's decision-making criteria set forth in Section 205-17, HRS:

Section 205-17(3)(E)

"Provision for employment opportunities and economic development."

This recommendation is the Priority 1 status portion of the Additional Urban Lands in Ewa recommendation and can be identified as the hatched area on the map. This area, encompassing approximately 50 acres, is the area planned for State and County buildings. An additional eight acres located to the north of the hatched area will also be used for government buildings; however, this area is already in the Urban District. Of the area being recommended for Priority 1 reclassification, State facilities will occupy approximately 30 acres and County facilities approximately 20 acres.

The State and County facilities will be part of the Kapolei Town Center which will contain a mix of residential, commercial, light industrial, public facilities, and park and open space uses.

Section 205-17(3)(B)

"Maintenance of valued cultural, historical, or natural resources ..."

No cultural, historical, or natural resources are believed to be located in the area proposed for reclassification. However, it is recommended that the developer be required to meet the requirements of DLNR's Historic Preservation Division in order to protect cultural and historical sites. It is further recommended that a flora and fauna survey be required.

Section 205-17(3)(C)

"Maintenance of other natural resources relevant to Hawaii's economy including but not limited to agricultural resources."

A major portion of this recommendation is currently in sugarcane cultivation. By itself, the reclassification of this area should not significantly affect Oahu Sugar Company (OSCo). However, when considering the cumulative impacts of other proposed developments in Ewa and Central Oahu, OSCo may be required to modify its operations.

The Land Study Bureau classifies the Town Center area as being evenly divided between "B" and "C" lands. The ALISH system rates this area as "Prime" and "Other," and the Soil Conservation Service classifies the soil as mostly Honouliuli clay and Mamala stony silty clay loam.

Conformance with State Land Use Commission Rules. Section 15-15-18, Hawaii Administrative Rules, defines the standards which the Land Use Commission uses in determining the boundaries for the Urban District. The proposed reclassification conforms with the following standards, as discussed below:

Section 15-15-18(1)

"It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses."

Section 15-15-18(2)(A)

"Proximity to centers of trading and employment . . ."

Section 15-15-18(2)(C)

"Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection."

Section 15-15-18(2)(D)

"Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection."

Section 15-15-18(4)

"In determining urban growth for the next ten years, or in amending the boundary, lands contiguous with existing urban areas shall be given more consideration than non-contiguous land . . ."

Section 15-15-18(5)

"It shall include lands in appropriate locations for new urban concentrations . . ."

Section 15-15-18(7)

"It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services."

The area proposed for reclassification is located adjacent to existing urban areas and already contain some urban uses. It is in close proximity to centers of trading and employment, including Barbers Point NAS and James Campbell Industrial Park.

The Honouliuli Sewage Treatment Plan is the closest plant and is currently operating at capacity. Plans to increase its capacity are being coordinated with other potential users. It is recommended that the developer be required to meet Department of Health wastewater standards.

The Board of Water Supply is requiring the preparation of a water master plan for the Kapolei region subject to their approval. A dual water system comprised of potable and non-potable systems is being proposed.

H-1 in the Kapolei area is estimated to be operating at LOS C by Department of Transportation staff. Improvements to enhance access to H-1 via interior roads and connectors and the use of contraflow lanes are being considered. An "Ewa Region Highway Transportation Master Plan, 1997 and 2005 Roadways Concepts" report was recently completed by developers in the area and State and City agencies. The report contains proposals for major roadway realignments and access ramp improvements in the Ewa area. However, the State Department of Transportation is not entirely comfortable with traffic forecast estimates contained in the report.⁷⁵ A separate Traffic Impact Study will be conducted for determining the impact of the Laulani Fairways development.

It is recommended that the developer be required to address the Department of Education's concerns regarding schools.

Conformance with Chapter 226, HRS, Hawaii State Plan. The proposed reclassification conforms to the objectives and policies of the Hawaii State Plan for the economy, Section 226-6, HRS, increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people; and Section 226-13, HRS, encourage urban developments in close proximity to existing services and facilities. It also conforms to Priority Guidelines for population growth and land resources, Section 225-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.

County Plans. The Oahu General Plan contains policies to develop a secondary urban center in Ewa with its nucleus in the Kapolei area. The City's Development Plan Land Use map designates the proposed area as "Commercial."

⁷⁵ Conversation with OSP, February 1992.

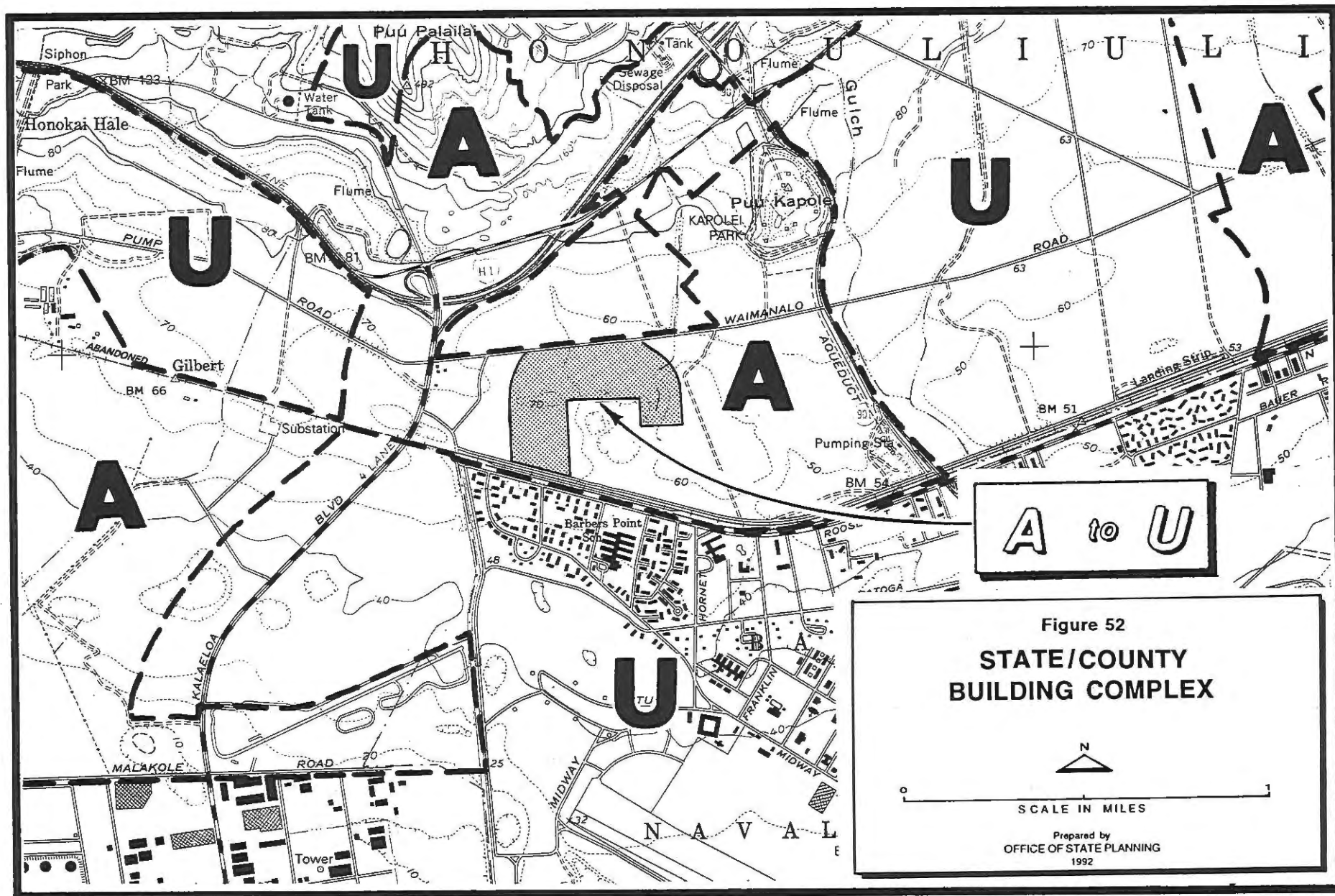


Figure 52
**STATE/COUNTY
 BUILDING COMPLEX**

Prepared by
 OFFICE OF STATE PLANNING
 1992

WAIANAE

41. Kauaopuu, 43.7 acres (A to C)

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

A portion of this site is owned by the Department of Hawaiian Home Lands. Reclassification will not affect the portion as DHHL land is not subject to the State Land Use Law.

The proposed reclassification area is located on Kauaopuu north of Lualualei Naval Reservation and roughly bounded by the Waianae Kai Forest Reserve on the east, Lualualei Naval Reservation on the south, and the 600-foot contour on the north and west.

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

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

Section 15-15-20(5) It shall include lands necessary for . . . conserving natural ecosystems and endemic plants . . .

Kauaopuu is an expansion of the Conservation District to the 600-foot elevation level to protect the only known current occurrence of a rare 'akoko plant.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for the physical environment, Sections 226-11, 12 and 13, HRS, including but not limited to, encouraging the protection of rare or endangered plant and animal species and habitats native to Hawaii, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, identifying critical environmental areas in Hawaii.

42. Nanakuli Residence Lots, Series 7-9, 48 acres (A to U)

The proposed reclassification of Nanakuli Residence Lots, Series 7-9, from the Agricultural District to the Urban District meets the following standards and criteria for the Urban District contained in Section 205-2(a)(1), HRS: In the establishment of boundaries of urban districts those lands that are now in urban use and a sufficient reserve area for foreseeable urban growth shall be included . . .

However, the site is owned by the Department of Hawaiian Home Lands. As such, a petition will not be initiated for this site since these lands are not subject to the State Land Use Law.

The proposed reclassification area is located in Nanakuli roughly bounded by Nanakuli Stream on the west, residential units adjacent to Farrington Highway on the south, and fallow lands on the north and east.

The proposed reclassification of Nanakuli Residence Lots, Series 7-9, from the Agricultural District to the Urban District will impact favorably the following areas of statewide concern set forth under Section 205-17, HRS, Provision of housing opportunities for all income groups, particularly the low, low-moderate gap groups.

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

Section 15-15-18(2) It shall take into consideration the following specific factors:

- (A) Proximity to centers of trading and employment . . .
- (C) Proximity to basic services such as sewers, transportation systems, water, sanitation, schools, parks, and police and fire protection; and
- (D) Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection . . .

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

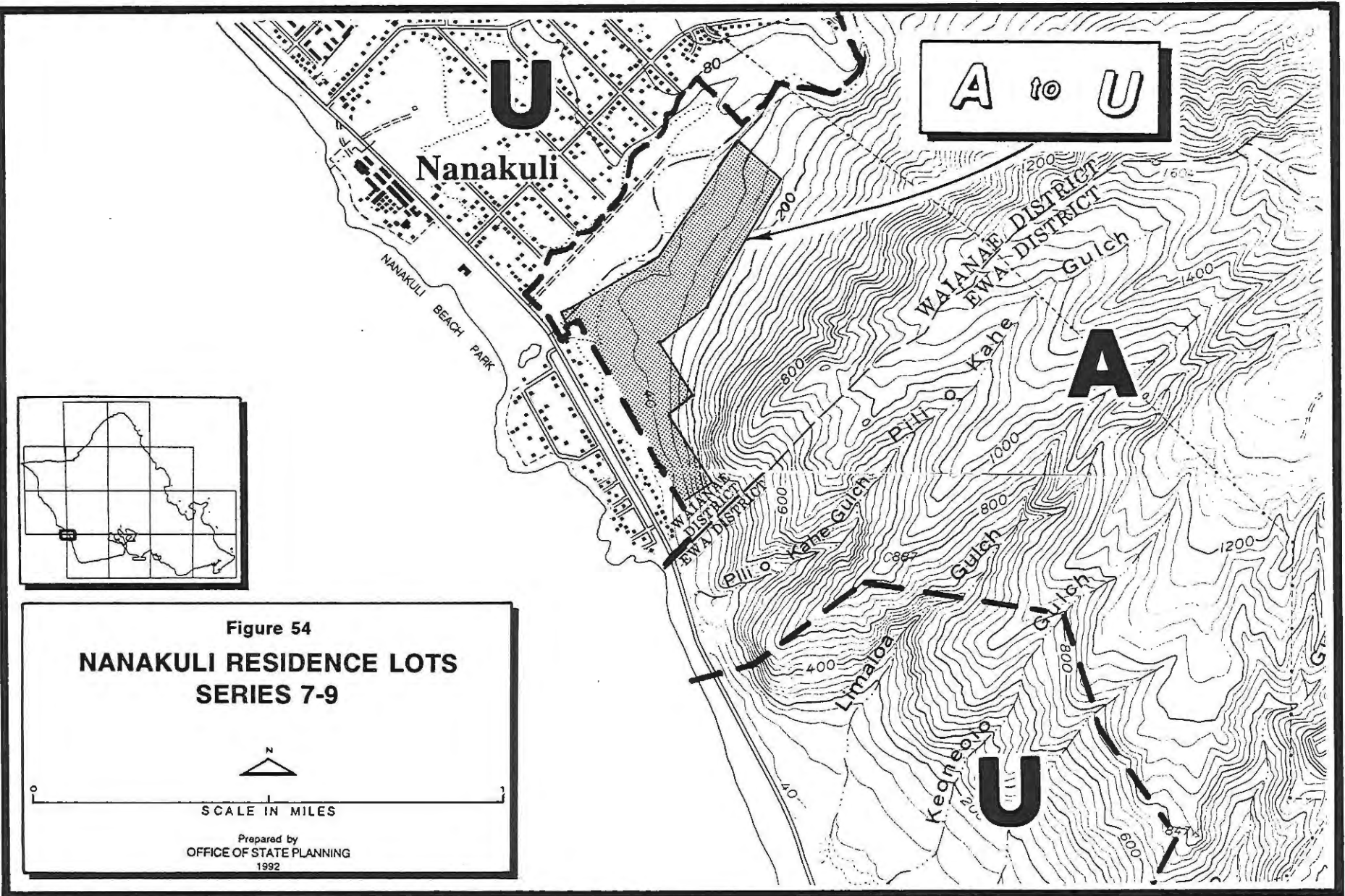
Section 15-15-18(5) It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the State and county general plans . . .

Section 15-15-18(7) It shall not include lands, the urbanization of which will contribute toward scattered spot development, necessitating unreasonable investment in public infrastructure or support services . . .

The Nanakuli Residence Lots, Series 7-9, recommendation is an expansion of the Nanakuli Residence Lots being developed by the Department of Hawaiian Home Lands for Native Hawaiian beneficiaries of the Hawaiian Homes Commission Act, 1921, as amended. According to the Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., 1991, the island of Oahu will need approximately 3,700 acres of urban land in 2000 to meet demand. The recommended area's makai boundary is adjacent to an area already reclassified to Urban by the Land Use Commission and is in the existing community of Nanakuli. The site has a general slope of less than 20 percent.

The proposed development will consist of 167 residence lots ranging in size from 6,000 to 15,000 square feet.

The proposed reclassification also conforms to the objectives and policies of the Hawaii State Plan for socio-cultural advancement-housing, Section 226-19, HRS, including but not limited to, effectively accommodating the housing needs of Hawaii's people; stimulating and promoting feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households; promoting design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas, and Priority Guidelines for population growth and land resources, Section 226-104, HRS, including but not limited to, encouraging urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditure; and directing future urban development away from critical environmental areas or impose mitigation measures so that negative impacts on the environment would be minimized.



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APPENDICES

APPENDIX A
DETAILED TABLES ON URBAN LAND REQUIREMENTS

Table A-1

**AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
CITY AND COUNTY OF HONOLULU
1995
(in acres)**

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			RESORT			COUNTY-						SURPLUS/
	ZONED			ZONED			ZONED			ZONED			ZONED	OTHER	TOTAL	PUBLIC AREA	TOTAL	(DEFICIT)	
	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	1995	SURPLUS/	DEV.	DEV.	DEV.	1995	1995	OF URBAN	
	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN LANDS	URBAN 1/	URBAN	DEMAND	DEMAND	LANDS	
PRIMARY URBAN CTR	345	288	57	55	40	15	105	111	(6)	0	34	(34)	505	30	535	24	497	38	
EWA	793	980	(187)	78	98	(20)	352	101	251	82	25	57	1,305	1,330	2,635	81	1,285	1,350	
CENTRAL OAHU	246	1,304	(1,058)	39	79	(40)	119	128	(9)	0	0	0	404	1,598	2,002	62	1,573	429	
EAST HONOLULU	557	583	(26)	7	15	(8)	0	5	(5)	0	0	0	564	41	605	6	609	(4)	
KOOLAUPOKO	281	1,586	(1,305)	11	16	(5)	0	2	(2)	0	0	0	292	379	671	3	1,607	(936)	
KOOLAULOA	91	143	(52)	13	6	7	0	1	(1)	119	30	89	223	81	304	0	180	124	
NORTH SHORE	67	96	(29)	8	4	4	0	0	0	0	0	0	75	192	267	2	102	165	
WAIANAE	458	1,119	(661)	11	12	(1)	13	1	12	27	9	18	509	865	1,374	5	1,146	228	
SUBTOTAL	2,838	6,099	(3,261)	222	270	(48)	589	349	240	228	98	130	3,877	4,516	8,393	183	6,999	1,394	
25% FLEXIBILITY FACTOR		1,525			68			87			25					46	1,750	(1,750)	
TOTAL	2,838	7,624	(3,261)	222	338	(48)	589	436	240	228	123	130	3,877	4,516	8,393	229	8,749	(356)	

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

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

Table A-2

**AVAILABLE URBAN LANDS TO MEET FUTURE DEMANDS
CITY AND COUNTY OF HONOLULU
2010
(in acres)**

	RESIDENTIAL ZONED			COMMERCIAL ZONED			INDUSTRIAL ZONED			RESORT ZONED			COUNTY- ZONED	OTHER	TOTAL	PUBLIC AREA	TOTAL	SURPLUS/ (DEFICIT)
	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	2010	SURPLUS/ (DEFICIT)	DEV.	DEV.	DEV.	2010	2010	OF URBAN
	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN	DEMAND	(DEFICIT)	URBAN LANDS	URBAN 1/	URBAN	DEMAND	DEMAND	LANDS
PRIMARY URBAN CTR	345	881	(536)	55	98	(43)	105	239	(134)	0	48	(48)	505	30	535	24	1,290	(755)
EWA	793	3,713	(2,920)	78	412	(334)	352	418	(66)	82	122	(40)	1,305	1,330	2,635	295	4,960	(2,325)
CENTRAL OAHU	246	2,683	(2,437)	39	246	(207)	119	226	(107)	0	0	0	404	1,598	2,002	207	3,362	(1,360)
EAST HONOLULU	557	978	(421)	7	39	(32)	0	4	(4)	0	0	0	564	41	605	13	1,034	(429)
KOOLAUPOKO	281	2,060	(1,779)	11	33	(22)	0	6	(6)	0	0	0	292	379	671	6	2,105	(1,434)
KOOLAULOA	91	43	48	13	12	1	0	1	(1)	119	133	(14)	223	81	304	0	189	115
NORTH SHORE	67	186	(119)	8	8	0	0	1	(1)	0	0	0	75	192	267	4	199	68
WAIANAE	458	1,803	(1,345)	11	28	(17)	13	3	10	27	32	(5)	509	865	1,374	10	1,876	(502)
SUBTOTAL	2,838	12,347	(9,509)	222	876	(654)	589	898	(309)	228	335	(107)	3,877	4,516	8,393	559	15,015	(6,622)
25% FLEXIBILITY FACTOR		3,087			219			225			84					140	3,754	(3,754)
TOTAL	2,838	15,434	(9,509)	222	1,095	(654)	589	1,123	(309)	228	419	(107)	3,877	4,516	8,393	699	18,769	(10,376)

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

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

Table A-3

**POPULATION PROJECTIONS
CITY AND COUNTY OF HONOLULU
1990-2010**

	1990 POP.	PERCENT	1995 POP.	PERCENT	2000 POP.	PERCENT	2005 POP.	PERCENT	2010 POP.	PERCENT
PRIMARY URBAN CTR	464,324	53.9%	476,213	52.3%	473,663	50.8%	473,084	49.2%	473,945	47.4%
EWA	40,201	4.7%	57,805	6.3%	72,695	7.8%	90,716	9.4%	117,015	11.7%
CENTRAL OAHU	118,634	13.8%	130,120	14.3%	139,218	14.9%	147,901	15.4%	156,647	15.7%
EAST HONOLULU	51,064	5.9%	54,065	5.9%	55,169	5.9%	56,308	5.9%	57,654	5.8%
KOOLAUPOKO	120,405	14.0%	122,062	13.4%	121,964	13.1%	122,713	12.8%	123,383	12.3%
KOOLAULOA	14,275	1.7%	13,942	1.5%	12,743	1.4%	11,920	1.2%	11,228	1.1%
NORTH SHORE	16,960	2.0%	18,131	2.0%	18,443	2.0%	18,733	1.9%	19,091	1.9%
WAIANAE	35,737	4.1%	38,061	4.2%	38,904	4.2%	39,726	4.1%	40,537	4.1%
TOTAL	861,600	100.0%	910,399	100.0%	932,799	100.0%	961,101	100.0%	999,500	100.0%

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

Table A-4

RESIDENTIAL UNIT DEMAND CITY AND COUNTY OF HONOLULU 1990-2010

	1990	HOUSE- HOLD	TOTAL	1995	HOUSE- HOLD	TOTAL	2000	HOUSE- HOLD	TOTAL	2005	HOUSE- HOLD	TOTAL	2010	HOUSE- HOLD	TOTAL
	POP.	@2.86 PPH	DEMAND	POP.	2.80 PPH	DEMAND	POP.	@2.73 PPH	DEMAND	POP.	@2.69 PPH	DEMAND	POP.	@2.66 PPH	DEMAND
	1/	2/	3/	1/	2/	3/									
PRIMARY URBAN CT	484,324	155,857	163,650	478,213	163,273	171,437	473,663	168,563	174,891	473,084	168,833	177,275	473,945	171,048	179,800
EWA	40,201	13,494	14,169	57,805	19,819	20,810	72,695	25,563	26,841	90,716	32,374	33,993	117,015	42,231	44,343
CENTRAL OAHU	118,634	39,821	41,812	130,120	44,613	46,843	139,218	48,956	51,404	147,901	52,783	55,422	156,647	56,534	59,361
EAST HONOLULU	51,064	17,140	17,997	54,065	18,537	19,463	55,169	19,400	20,370	56,308	20,095	21,100	57,654	20,807	21,848
KOOLAUPOKO	120,405	40,416	42,438	122,062	41,850	43,942	121,964	42,888	45,033	122,713	43,793	45,983	123,383	44,529	46,756
KOOLAULOA	14,275	4,792	5,031	13,942	4,780	5,019	12,743	4,481	4,705	11,920	4,254	4,467	11,228	4,052	4,255
NORTH SHORE	16,960	5,693	5,978	18,131	6,216	6,527	18,443	6,485	6,810	18,733	6,685	7,020	19,091	6,890	7,234
WAIANAE	35,737	11,996	12,595	38,061	13,049	13,702	38,904	13,681	14,365	39,726	14,177	14,886	40,537	14,630	15,361
TOTAL	881,800	289,208	303,889	910,399	312,137	327,744	932,799	328,017	344,418	961,101	342,995	360,145	999,500	360,722	378,758

1/ Department of General Planning.

2/ 96% of population in households; declining persons per household factors.

3/ Includes units to satisfy 5% desired vacancy rate.

4/ The projections of housing need in this report reflect the high end of a range of projections. These projections are based on DBED Series M-K population projections and assume declining household sizes ranging from 2.86 persons per household in 1990 to 2.66 persons per household in 2010. These household sizes are much lower than those reported by the 1990 census and decrease at a faster rate than extrapolations made using census data. Additionally, estimations of land required to accommodate housing need are based on single family densities ranging from 3.5 to 5.5 dwelling units per acre.

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

Table A-5

RESIDENTIAL AREA REQUIREMENTS CITY AND COUNTY OF HONOLULU 2010

	1990 UNITS 1/	2010 DEMAND (UNITS) 2/	ADDITIONAL UNITS NEEDED	PERCENT SINGLE FAMILY 3/	SF- DENSITY UNITS/AC 4/	MF- DENSITY UNITS/AC 4/	SF- ACRES NEEDED 5/	MF- ACRES NEEDED 5/	TOTAL ACRES NEEDED
PRIMARY URBAN CTR	167,473	179,600	12,127	38.3%	6.3	52.1	737	144	881
EWA	12,367	44,343	31,976	78.4%	7.9	12.8	3,173	540	3,713
CENTRAL OAHU	35,002	59,361	24,359	65.1%	7.7	13.7	2,062	621	2,683
EAST HONOLULU	15,949	21,848	5,899	81.9%	5.4	12.8	895	83	978
KOOLAUPOKO	34,526	46,756	12,230	79.7%	5.7	7.1	1,710	350	2,060
KOOLAULOA	3,924	4,255	331	78.9%	6.9	12.8	38	5	43
NORTH SHORE	5,784	7,234	1,450	88.4%	7.4	12.8	173	13	186
WAIANAE	10,984	15,361	4,377	69.9%	1.8	12.8	1,700	103	1,803
TOTAL	286,009	378,758	92,749				10,488	1,858	12,347

1/ Department of General Planning

2/ See Residential Demand table.

3/ 1989 data, from Department of General Planning, Development Plan Status Report, 1990.

4/ From Dept. of General Planning, Residential Development Implications of the Development Plans, 1985, Table 4. Medium density apartment factor used for PUC, with low density apartment factors used elsewhere.

5/ Increase in units divided by density factor.

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

Table A-6

**RESIDENTIAL AREA REQUIREMENTS
CITY AND COUNTY OF HONOLULU
1995-2010
(summary)**

	1990 UNITS	1995 UNITS DEMAND	ACRES NEEDED	2000 UNITS DEMAND	ACRES NEEDED	2005 UNITS DEMAND	ACRES NEEDED	2010 UNITS DEMAND	ACRES NEEDED
PRIMARY URBAN CTR	167,473	171,437	3,964	174,891	539	177,275	712	179,600	881
EWA	12,367	20,810	8,443	26,841	1,681	33,993	2,511	44,343	3,713
CENTRAL OAHU	35,002	46,843	11,841	51,404	1,806	55,422	2,249	59,361	2,683
EAST HONOLULU	15,949	19,463	3,514	20,370	733	21,100	854	21,848	978
KOOLAUPOKO	34,526	43,942	9,416	45,033	1,770	45,983	1,930	46,756	2,060
KOOLAULOA	3,924	5,019	1,095	4,705	102	4,467	71	4,255	43
NORTH SHORE	5,784	6,527	743	6,810	132	7,020	159	7,234	186
WAIANAE	10,984	13,702	2,718	14,365	1,392	14,886	1,607	15,361	1,803
TOTAL	286,009	327,744	41,735	344,418	8,155	360,145	10,092	378,758	12,347

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

Table A-7

**COMMERCIAL AREA REQUIREMENTS
CITY AND COUNTY OF HONOLULU
1995-2010**

	1990	1995			2000			2005			2010		
	COMMERCIAL EMPLOYMENT	EMPLOYMENT INCREASE	SQ FT INCREASE	ACRES NEEDED	EMPLOYMENT INCREASE	SQ FT INCREASE	ACRES NEEDED	EMPLOYMENT INCREASE	SQ FT INCREASE	ACRES NEEDED	EMPLOYMENT INCREASE	SQ FT INCREASE	ACRES NEEDED
	1/	1/	2/	3/	4/		4/						
PRIMARY URBAN CTR	195,421	10,544	2,636,000	30	17,362	4,340,500	50	21,518	5,379,500	62	24,963	6,240,750	72
EWA	7,218	6,442	1,610,500	74	13,208	3,302,000	152	19,750	4,937,500	227	27,330	6,832,500	314
CENTRAL OAHU	20,141	5,198	1,299,500	60	9,882	2,470,500	113	13,187	3,296,750	151	15,818	3,954,500	182
EAST HONOLULU	5,395	1,000	250,000	11	1,662	415,500	19	2,085	521,250	24	2,457	614,250	28
KOOLAUPOKO	17,414	1,016	254,000	12	1,542	385,500	18	1,862	465,500	21	2,081	520,250	24
KOOLAULOA	4,564	367	91,750	4	694	173,500	8	740	185,000	8	773	193,250	9
NORTH SHORE	2,583	292	73,000	3	411	102,750	5	473	118,250	5	525	131,250	6
WAIANAE	5,140	809	202,250	9	1,281	320,250	15	1,569	392,250	18	1,793	448,250	21
TOTAL	257,876	25,668	6,417,000	204	46,042	11,510,500	379	61,184	15,296,000	517	75,740	18,935,000	654

1/ Department of General Planning, employment projections by DP area.

2/ Commercial square feet increase based on one employee per 250 square feet of commercial space.

3/ Based on floor area ratios of 2.0 for PUC, 0.5 for outlying areas.

4/ Cumulative employment increases and acreage needs through 2010.

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

Table A-8

INDUSTRIAL AREA REQUIREMENTS CITY AND COUNTY OF HONOLULU 1995-2010

	1990 INDUSTRL EMPLOYMT 1/	1995 EMPLOYMT INCREASE 2/	ACRES NEEDED 3/	2000 EMPLOYMT INCREASE 4/	ACRES NEEDED 4/	2005 EMPLOYMT INCREASE	ACRES NEEDED	2010 EMPLOYMT INCREASE	ACRES NEEDED
PRIMARY URBAN CTR	70,593	1,151	111	1,877	182	2,183	211	2,470	239
EWA	6,211	3,190	101	4,686	183	10,113	299	13,332	418
CENTRAL OAHU	5,669	2,916	128	4,369	227	3,820	221	3,163	226
EAST HONOLULU	829	360	5	244	4	225	4	211	4
KOOLAUPOKO	2,433	23	2	33	3	40	4	65	6
KOOLAULOA	677	77	1	9	1	11	1	14	1
NORTH SHORE	1,179	4	0	6	1	8	1	15	1
WAIANAE	986	213	1	119	2	78	2	28	3
TOTAL	88,577	7,934	349	11,343	603	16,478	743	19,298	898

1/ Department of General Planning, employment projections by DP area. Includes Transportation/Warehousing, General Industrial and Construction employment.

2/ Increase from 1990 to 1995.

3/ Calculated from industrial absorption rates (John Childs & Company, 1988).

4/ Cumulative employment increases and additional acreage needs.

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

Table A-9

**RESORT AREA REQUIREMENTS
CITY AND COUNTY OF HONOLULU
1995-2010**

	1990 VISITOR UNITS 1/	DENSITY UNITS/ACRE 2/	1995 VISITOR UNITS 3/	ACRES NEEDED 4/	2000 VISITOR UNITS	ACRES NEEDED	2005 VISITOR UNITS	ACRES NEEDED	2010 VISITOR UNITS	ACRES NEEDED
PRIMARY URBAN CTR	35,655	173	41,554	34	43,103	0	43,717	47	43,885	48
EWA	14	45	1,134	25	2,450	54	3,911	87	5,514	122
CENTRAL OAHU	10	0	10	0	10	0	10	0	10	0
EAST HONOLULU	370	0	370	0	370	0	370	0	370	0
KOOLAUPOKO	73	0	73	0	73	0	73	0	73	0
KOOLAULOA	630	30	1,517	30	2,467	61	3,502	96	4,630	133
NORTH SHORE	2	0	2	0	2	0	2	0	2	0
WAIANAE	516	25	739	9	924	16	1,115	24	1,316	32
TOTAL	37,270		45,400	97	49,400	132	52,700	253	55,800	335

1/ 1990 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 on the basis of planned visitor unit developments.

4/ Additional units divided by density factor for area; cumulative totals from 1995.

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

Table A-10

**PUBLIC AREA NEEDS
SCHOOL SPACE REQUIREMENTS
CITY AND COUNTY OF HONOLULU
1995-2010**

	1990	1995	2000					2005					2010					ACRES NEEDED
	HOUSE- HOLDS	HOUSEHOLD INCREASE	STUDENT INCREASE	ACRES NEEDED		HOUSEHOLD INCREASE	STUDENT INCREASE	ACRES NEEDED	HOUSEHOLD INCREASE	STUDENT INCREASE	ACRES NEEDED	HOUSEHOLD INCREASE	STUDENT INCREASE	ACRES NEEDED				
			K-8 1/ HS 1/	2/ 3/	3/ K-8	HS	3/ K-8	HS	3/ K-8	HS	3/ K-8	HS	3/ K-8	HS				
PRIMARY URBAN CTR	155,857	7,416	3,337	1,632	0	10,706	4,818	2,355	0	12,976	5,839	2,855	0	15,191	6,836	3,342	0	
EWA	13,494	6,325	2,846	1,392	46	12,069	5,431	2,655	67	18,880	8,496	4,154	88	28,737	12,932	6,322	141	
CENTRAL OAHU	39,821	4,792	2,156	1,054	39	9,135	4,111	2,010	53	12,962	5,833	2,852	67	16,713	7,521	3,677	131	
EAST HONOLULU	17,140	1,397	629	307	0	2,260	1,017	497	0	2,955	1,330	650	0	3,667	1,650	807	0	
KOOLAUPOKO	40,418	1,434	645	315	0	2,472	1,112	544	0	3,377	1,520	743	0	4,113	1,851	905	0	
KOOLAULOA	4,792	(12)	(5)	(3)	0	(311)	(140)	(68)	0	(538)	(242)	(118)	0	(740)	(333)	(163)	0	
NORTH SHORE	5,693	523	235	115	0	792	356	174	0	992	446	218	0	1,197	539	263	0	
WAIANAE	11,996	1,053	474	232	0	1,685	758	371	0	2,181	981	480	0	2,634	1,185	579	0	
TOTAL	289,209	22,928	10,317	5,044	85	38,808	17,463	8,538	120	53,785	24,203	11,834	155	71,512	32,181	15,732	272	

1/ Kindergarten to eighth grade, and high school. Based on County ratios of student enrollment to total households, 1980 Census.

2/ For Ewa and Central Oahu only. Other areas assumed to be accommodated by existing schools. 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 and Associates, 1991.

Table A-11

**PUBLIC AREA NEEDS
PARKS SPACE REQUIREMENTS
CITY AND COUNTY OF HONOLULU
1995-2010**

	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
PRIMARY URBAN CTR	464,324	11,889	24	9,339	24	8,760	24	9,621	24
EWA	40,201	17,604	35	32,494	65	50,515	101	76,814	154
CENTRAL OAHU	118,634	11,486	23	20,584	41	29,267	58	38,013	76
EAST HONOLULU	51,064	3,001	6	4,105	8	5,244	10	6,590	13
KOOLAUPOKO	120,405	1,657	3	1,559	3	2,308	4	2,978	6
KOOLAULOA	14,275	(333)	0	(1,532)	0	(2,355)	0	(3,047)	0
NORTH SHORE	16,960	1,171	2	1,483	3	1,773	3	2,131	4
WAIANAE	35,737	2,324	5	3,167	6	3,989	8	4,800	10
TOTAL	861,600	48,799	98	71,199	150	99,501	208	137,900	287

1/ See Population Projections table.

2/ Based on 2 acres per 1,000 population.

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

APPENDIX B

CUMULATIVE IMPACTS ON OAHU SUGAR COMPANY
AND ON INFRASTRUCTURE SYSTEMS

Oahu Sugar Company

As of mid-1991, Oahu Sugar Company (OSCo) cultivated 11,446 acres in Leeward Oahu. Four of the Five-Year Boundary Review recommendations affect lands presently used by OSCo, though only two of these recommendations affect lands currently in cultivation. The two recommendations affecting OSCo's cultivated lands are Additional Urban Lands in Ewa and the Barbers Point Harbor Expansion (see Table).

The cumulative effect of these recommendations is to reduce OSCo's cultivated acreage by 551 acres, leaving the plantation with 10,895 acres. This loss in acreage would occur primarily in the Kapolei Business/Industrial Park area and the proposed Laulani Fairways project site. It is anticipated that reductions in sugarcane acreages would be phased in over a period of several years in order to allow the company to adjust and minimize impacts on its operations.

In addition to the reduction in OSCo acreage resulting from boundary review recommendations, there are a number of other proposed developments affecting OSCo lands. In all, these other developments, if approved, would reduce OSCo's cultivated acreage by 1,686 acres. Combined with boundary review recommendations, OSCo would lose approximately 2,237 acres of cultivated land. A couple of indirect factors will also affect the amount of cultivated land OSCo ultimately has. For one, an additional 94 acres of sugarcane can be considered lost as these lands will become remnant as neighboring lands are taken out of cultivation. Secondly, approximately 586 acres of land presently laying fallow could be replanted.

On balance, then, OSCo should have approximately 8,717 acres in cultivation after the withdrawal of lands for development. Accounting for just the boundary review recommendations, OSCo would have approximately 10,895 acres remaining. These figures remain above the 8,000+ acres which have been cited as the minimum acreage necessary for OSCo to remain viable.

The boundary review recommendations do require the removal of "A" and "B" rated agricultural lands from production. However, there is an overriding public need for affordable housing on Oahu. Reclassification of these areas to the Urban District could potentially allow for the development of 3,000 housing units at Mililani Mauka, Increment 2; 2,130 units at Makaiwa Hills; 1,708 units in the Kapolei Town Center area; and 1,825 units at Laulani Fairways. The proposed reclassifications would also allow for development of commercial, industrial, and recreational uses in Ewa and Central Oahu.

Further, the Urban Land Requirements Study, Wilson Okamoto & Associates, Inc., 1991, finds that Oahu will have a deficit of 3,685 acres of urban land in 2000 (including a 25 percent flexibility factor). The proposed reclassifications will address that need and are consistent with the State's proposal to direct growth to Ewa and Central Oahu.

Even without these recommendations, the continued use of these lands for sugarcane is in question as OSCo's leases expire in 1995 and 1996.

Oahu Sugar

Proposals Affecting Oahu Sugar Company					
11,446 acres in cultivation in mid-1991					
	ACREAGE PROPOSED TO URBAN				
PROPOSAL TO URBAN	TOTAL	IN CULTIV.	OTHER LANDS	PRESENT USE	STATUS
<i>OSP Boundary Review</i>					
Additional Urban Lands in Ewa	1823	551	1272	Sugarcane; other uses	Petition in 92-93
State and County Bldg Complex	50	0	0		Petition in 92-93
Makaiwa Hills	1356	0	1356	Undeveloped	Petition in 92-93
Barbers Point Harbor Exp.*	141	10	131	Sugarcane; other	Petition in 92-93
Hawaii Raceway Park*	59	0	59	Motorsports facility	Petition in 92-93
Subtotals:	3179	551	2628		
<i>Other Proposals</i>					
Royal Kunia Phase II	655	655	0	Sugarcane	DP amend. rej. 7/91
(other parcel affected by KV)	241	241	0	Sugarcane	
Kapolei Town Center**	305	150	155	Sugarcane; construction	Underway
Kunia Golf Course	203	190	13	Sugarcane	1996 at earliest
Kapolei Knolls	80	55	25		
Ewa Vill. Master Plan (DHCD)	606	320	286	Sugarcane; some development	FEIS completed
Kapolei Sports & Rec Center	75	75	0	Sugarcane	Summer 1992
Kapolei Bus/Ind Park*	552	145	407	Sugarcane; other uses	FEIS completed
Subtotals:	2165	1686	479		
Eventual Remnant Property (-)	94	94			
Add replanting of fallow fields (+)	586	586			
Totals:	5836	2729	3107		
REMAINING OSC CULTIVATED ACREAGE:		8717			
Subtracting for only OSP recs.:		10895			
*acreage is part of the Additional Urban Lands in Ewa proposal and so is not included in subtotals.					
**balance not covered under Additional Urban Lands in Ewa recommendation.					

Impacts on Infrastructure System

The report, Infrastructure Constraints and Opportunities to 2010, Eugene P. Dashiell, AICP, Planning Services, 1991, assesses the impacts of projected demand on roads, solid waste, water and sewerage systems on Oahu. The M-K population projections were used to determine demand.

The boundary review recommendations to reclassify lands to the Urban District will impact roads, water and sewerage systems in Ewa and Central Oahu as well as school and social service facilities. Water availability in Ewa, water source development, groundwater quality, the capacity of wastewater treatment facilities and highway congestion are critical concerns. However, the designation of lands needed to meet urban requirements for the next ten years will enable landowners and developers to do long-term infrastructure planning and assist in coordinating public/private development of needed system improvements.

APPENDIX C
PRELIMINARY TMK LISTING FOR OAHU RECOMMENDATIONS

OAHU TMK

NORTH SHORE:

1. Kaena Coastline

6-9-01 04 (por.)
6-9-03:02 (por.)
6-9-04:01 (por.)
6-9-04:07 (por.)
6-9-04:12 (por.)
6-9-04:13 (por.)
6-9-04:14
6-9-04:15
6-9-04:16
6-9-04:17
6-9-05:01
6-9-05:02
6-9-05:03
6-9-05:04
6-9-05:05
6-9-05:06 (por.)
6-9-05:07 (por.)

2. Northern Waianae Range

6-7-02:04 (por.)
6-7-02:06 (por.)
6-7-02:27 (por.)
6-7-03:02 (por.)
6-7-03:03
6-7-03:04 (por.)
6-7-04:01 (por.)
6-7-04:03 (por.)
6-7-04:04 (por.)
6-8-02:06
6-8-02:07 (por.)
6-8-03:05 (por.)
6-8-07:01
6-9-03:03 (por.)
7-7-01:01 (por.)

3. Makaleha Stream, 100 foot corridor, Crowbar Ranch & Dillingham Field Ponds

6-8-02:18 (por.)
6-8-03:04 (por.)
6-8-03:15 (por.)
6-8-03:17 (por.)
6-8-03:19 (por.)
6-8-03:30 (por.)
6-8-03:35 (por.)
6-8-03:39 (por.)
6-8-03:40 (por.)
6-8-07:01 (por.)
6-8-07:02 (por.)

4. Paukauila Stream (includes Helemano and Opauala)

6-2-06:01 (por.)
6-2-06:02 (por.)
6-2-06:07 (por.)
6-2-06:08
6-2-06:09 (por.)
6-2-06:15 (por.)
6-2-07:01 (por.)
6-2-07:02 (por.)
6-2-07:03 (por.)
6-2-07:06 (por.)
6-2-07:11 (por.)
6-2-07:32
6-2-10:01 (por.)
6-2-11:01 (por.)
6-4-01:01 (por.)
6-4-01:04 (por.)
6-4-01:05 (por.)
6-4-02:01 (por.)
6-4-02:02 (por.)
6-4-03:03 (por.)
6-4-04:01 (por.)

5. Haleiwa Lotus Fields

6-6-01:03
6-6-01:04
6-6-01:05
6-6-01:06
6-6-01:09
6-6-01:10
6-6-01:11
6-6-01:12
6-6-01:14
6-6-01:16
6-6-01:17 (por.)
6-6-01:29
6-6-01:50
6-6-03:01
6-6-03:02 (por.)
6-6-03:25 (por.)
6-6-04:02 (por.)
6-6-04:03
6-6-04:04 (por.)
6-6-04:05 (por.)
6-6-04:06
6-6-04:08
6-6-04:09 (por.)
6-6-04:10
6-6-04:11 (por.)
6-6-04:26 (por.)
6-6-05:21
6-6-05:22
6-6-05:23 (por.)

5. Haleiwa Lotus Fields con't

6-6-08:01
6-6-08:02 (por.)
6-6-08:04 (por.)
6-6-09:02 (por.)
6-6-09:04 (por.)
6-6-09:10
6-6-09:11
6-6-09:13 (por.)
6-6-09:15 (por.)
6-6-09:19 (por.)
6-6-09:21 (por.)
6-6-09:30
6-6-09:31
6-6-09:32
6-6-09:34 (por.)
6-6-09:37 (por.)
6-6-09:38 (por.)

6. Anahulu Stream, 100 foot corridor

6-2-04:01 (por.)
6-2-04:03 (por.)
6-2-04:28 (por.)
6-2-04:29 (por.)
6-2-04:30 (por.)
6-2-04:32 (por.)
6-2-04:35 (por.)
6-2-04:42
6-2-04:43 (por.)
6-2-08:04 (por.)
6-2-08:05 (por.)
6-2-08:06 (por.)
6-2-08:10 (por.)
6-2-08:11 (por.)
6-2-08:12
6-2-08:15 (por.)
6-2-08:25 (por.)

7. Ukoa Marsh & Loko Ea Fishpond

6-2-02:01 (por.)
6-2-02:02 (por.)
6-2-02:03 (por.)
6-2-02:04 (por.)
6-2-02:06 (por.)
6-2-02:23 (por.)
6-2-03:01 (por.)
6-2-03:02

KOOLAULOA:

8. Punahoolapa Marsh

5-6-03:40 (por.)
5-6-03:44 (por.)

8. Punahoolapa Marsh con't

5-7-01:33 (por.)

9. James Campbell NWR: Punamano and Kii Units

5-6-02:20

5-6-02:22

5-6-03:09

10. Kahuku Wetlands

5-6-02:01 (por.)

5-6-02:07

5-6-02:08

5-6-02:09 (por.)

5-6-02:10 (por.)

5-6-02:16 (por.)

5-6-02:19

5-6-02:21 (por.)

5-6-03:01 (por.)

5-6-03:04

5-6-03:05

5-6-03:38 (por.)

5-6-03:45 (por.)

5-6-04:20 (por.)

5-6-04:21 (por)

5-6-04:22

5-6-04:23

5-6-04:24 (por.)

5-6-04:28 (por.)

5-6-04:29 (por.)

5-6-04:32

5-6-04:34 (por.)

5-6-04:43 (por.)

11. Koloa Gulch

5-5-06:01 (por.)

12. Kaluanui Stream

5-3-09:19 (por.)

5-3-09:68 (por.)

5-3-09:70 (por.)

5-3-09:79 (por.)

5-3-09:81 (por.)

5-3-09:82 (por.)

5-3-09:83 (por.)

5-3-11:09 (por.)

5-3-12:01 (por.)

5-3-12:08 (por.)

5-3-12:10 (por.)

13. Punaluu Stream

5-3-03:01 (por.)

5-3-03:05 (por.)

5-3-03:09 (por.)

13. Punaluu Stream con't

5-3-04:01 (por.)
5-3-04:02 (por.)
5-3-07:07 (por.)
5-3-07:23 (por.)

14. Kaaawa Stream

5-1-01:01 (por.)
5-1-01:03 (por.)
5-1-01:05 (por.)
5-1-01:06
5-1-04:01 (por.)
5-1-04:02
5-1-04:03
5-1-08:07 (por.)
5-1-09:01 (por.)
5-1-09:02 (por.)
5-1-09:04 (por.)

KOOLAUPOKO:

15. Hakipuu 200-ft. Elevation Area

4-9-02:01 (por.)
4-9-02:02
4-9-04:02 (por.)
4-9-05:01 (por.)

16. Waikane Watershed

4-8-04:03
4-8-04:04 (por.)
4-8-04:05
4-8-05:01
4-8-05:06
4-8-05:07
4-8-05:12 (por.)
4-8-06:08 (por.)
4-8-06:09

17. Waihee Wetlands

4-7-13:01 (por.)
4-7-13:10
4-7-13:11
4-7-13:12
4-7-13:16
4-7-13:24 (por.)
4-7-58:01 (por.)

18. Waihee Valley Mauka

4-7-06:10 (por.)
4-7-06:22 (por.)

19. Ahuimanu (Kahaluu) Taro Loi System

4-7-51:04 (por.)

4-7-51:09

20. Heeia Marsh & Meadowlands

4-6-16:01 (por.)

4-6-16:02

4-6-16:10

4-6-16:12

21. Mount Olomana

4-1-08:13 (por.)

4-1-10:74 (por.)

4-1-10:93 (por.)

4-2-06:02 (por.)

22. Kawaiinui Complex, Maunawili Stream and 100 foot corridor

4-2-01:01 (por.)

4-2-06:01 (por.)

4-2-07:01 (por.)

4-2-07:06 (por.)

4-2-07:09 (por.)

4-2-07:10 (por.)

4-2-08:01 (por.)

4-2-09:01 (por.)

4-2-09:06 (por.)

4-2-13:07

4-2-13:10 (por.)

4-2-13:20

4-2-13:21 (por.)

4-2-13:23

4-2-13:38 (por.)

4-2-13:39

4-2-13:40 (por.)

4-2-16:01 (por.)

4-2-16:02

4-2-17:20 (por.)

4-4-34:25

23. Bellows AFB Wetlands

4-1-13:10 (por.)

4-1-15:01 (por.)

24. Queen's Beach & Sandy Beach

3-9-10:01 (por.)

3-9-11:02 (por.)

3-9-11:03

3-9-11:05

25. Koko Crater

3-9-10:01 (por.)

3-9-10:25 (por.)

3-9-12:01 (por.)

26. Diamond Head State Monument

STATE OF HAWAII

3-1-42:10
3-1-42:21
3-1-42:23
3-1-42:24
3-1-42:25
3-1-42:36
3-1-42:37

PRIMARY URBAN CENTER:

27. Kalihi Valley

1-4-07:01 (por.)
1-4-14:26
1-4-16:03
1-4-18:10 (por.)
1-4-18:11 (por.)
1-4-18:12 (por.)
1-4-18:13 (por.)
1-4-18:14 (por.)
1-4-18:15 (por.)
1-4-18:16 (por.)
1-4-22:02 (por.)
1-4-22:03 (por.)
1-4-22:04 (por.)
1-4-22:08 (por.)
1-4-22:15
1-4-22:17

28. Pearl Harbor NWR: Waiawa Unit

9-6-01:01 (por.)

29. Leeward Koolau Watershed

6-2-11:01 (por.)
6-4-02:01 (por.)
6-4-02:01 (por.)
7-1-02:04 (por.)
7-1-02:07 (por.)
7-1-02:11
9-5-03:01 (por.)
9-5-03:10 (por.)
9-5-03:11 (por.)
9-5-03:13
9-6-05:01 (por.)
9-6-05:02
9-6-05:10 (por.)
9-6-05:11 (por.)
9-7-25:02 (por.)
9-7-25:15
9-9-07:01 (por.)
9-9-07:02 (por.)
9-9-07:03

29. Leeward Koolau Watershed con't

9-9-07:04
9-9-07:13
9-9-08:01 (por.)
9-9-09:13 (por.)
9-9-19:01
9-9-19:02 (por.)

30. Hydrologic Zone of Contribution: U.S. Navy Waiawa Shaft

9-6-04:01 (por.)
9-6-05:01 (por.)
9-6-05:02
9-6-05:08 (por.)
9-6-05:09 (por.)
9-6-05:10
9-6-05:11 (por.)
9-6-05:14 (por.)
9-7-25:15 (por.)

31. Waikele Wetlands

Wetlands do not show up on the TMK maps, however they are adjacent to the following TMK:

9-04-01:11
9-04-01:12

32. Leeward Waianae Foothills

9-2-02:01 (por.)
9-2-03:05 (por.)
9-2-03:68 (por.)
9-2-03:79 (por.)
9-2-04:01 (por.)
9-2-04:05 (por.)
9-2-04:06 (por.)
9-2-05:02 (por.)

33. Gentry Waiawa Expansion

9-4-06:11 (por.)
9-4-06:16 (por.)
9-6-04:01 (por.)
9-6-04:16 (por.)
9-6-05:01 (por.)
9-6-05:03
9-6-05:04
9-6-05:05
9-6-05:07 (por.)
9-6-05:08 (por.)
9-6-05:13
9-6-05:14 (por.)

34. Pearl Harbor NWR: Honouliuli Unit and Apokaa Wetlands

9-1-10:14 (por.)
9-1-17:06 (por.)
9-1-17:12 (por.)

34. Pearl Harbor NWR: Honouliuli Unit and Apokaa Wetlands con't
9-1-17:44 (por.)

35. Hawaii Raceway Park
9-1-15:15

36. Barbers Point Harbor Expansion
9-1-14:02 (por.)

37. Makaiwa Hills
9-1-15:05
9-1-15:11
9-1-15:17
9-1-16:09 (por.)
9-2-03:02 (por.)
9-2-03:41
9-2-03:43
9-2-03:44

38. Makakilo Expansion
9-2-03:18 (por.)
9-2-03:75 (por.)
9-2-03:81 (por.)

39. Additional Urban Lands in Ewa
9-1-10:06
9-1-10:07 (por.)
9-1-10:11 (por.)
9-1-10:13
9-1-10:16 (por.)
9-1-14:02
9-1-15:01 (por.)
9-1-15:02 (por.)
9-1-15:04 (por.)
9-1-15:13
9-1-15:15
9-1-15:16
9-1-16:01 (por.)
9-1-16:02
9-1-16:18
9-1-16:21
9-1-16:22
9-1-16:24 (por.)
9-1-16:26 (por.)

40. State and County Building Complex
9-1-16:01 (por.)

WAIANAE:

41. Kauaopuu
8-5-05:01
8-5-05:35 (por.)

41. Kauaopuu con't

8-5-05:36 (por.)

8-5-06:11 (por.)

8-6-03:09 (por.)

8-8-01:01 (por.)

42. Nanakuli Resident Lot ,Series 7-9

8-9-07:10

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CDUA	Conservation District Use Application
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOE	Department of Education
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DOT	Department of Transportation
FR	Forest Reserves
GMA	Game Management Areas
HAVONP	Hawaii Volcanoes National Park
HHP	Hawaii Heritage Program
HOST	Hawaii Ocean Science Technology
HRS	Hawaii Revised Statutes
LESA	Land Evaluation and Site Assessment
LESAC	Land Evaluation and Site Assessment Commission
LUC	Land Use Commission
LUPAG	Land Use Pattern Allocation Guide Maps
mgd	Million gallons per day
MLCD	Marine Life Conservation Districts
NARS	Natural Area Reserves System
NELH	Natural Energy Laboratory of Hawaii
NHP	National Historic Park
NHS	National Historic Sites
NP	National Parks
NWR	National Wildlife Refuge
OSP	Office of State Planning
SLH	Session Laws of Hawaii
UCPC	United Cane Planters' Cooperative
UH	University of Hawaii
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WWTP	Wastewater Treatment Plant

