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OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

February 25, 2000

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
Leoipapa A Kamehameha Building
State Office Tower, Sixth Floor
235 South Beretania Street
Honolulu, Hawai'i, 96813

Dear Ms. Salmonson,

Subject: Final EA for Kamakou Preserve Natural Area Partnership, District of Moloka'i, County of Maui, State of Hawai'i, TMK: 5-4-03:26; Final EA for Mo'omomi Preserve Natural Area Partnership, District of Moloka'i, County of Maui, State of Hawai'i, TMK: 5-1-02:37; Final EA for Waikamoi Preserve Natural Area Partnership, District of Makawao, County of Maui, State of Hawai'i, TMK: 2-3-05-4.

The Department of Land and Natural Resources has reviewed the Final Environmental Assessment for the subject projects and has determined a Finding of No Significant Impact (FONSI) for each of the projects.

Please publish notice of availability for public review of this project in the March 8, 2000 issue of the **Environmental Notice**.

We have enclosed completed publication forms for each project and four hard copies of each of the Final EAs. Since project summaries are not significantly altered from the DEA, they are not being re-submitted. Please contact Betsy Gagne at 587-0063 if you have any questions.

Sincerely,

MICHAEL G. BUCK,
Administrator

encl.

31-

2000-03-08-MA-FEA-

MAR 8 2000

FILE COPY

FINAL ENVIRONMENTAL ASSESSMENT
FOR
* WAIKAMOI PRESERVE
NATURAL AREA PARTNERSHIP *

This document prepared pursuant to Chapter 343, HRS

Prepared by
The Nature Conservancy

DEPT. OF ENVIRONMENTAL
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I. SUMMARY

**CHAPTER 343, HAWAI'I REVISED STATUTES (HRS)
ENVIRONMENTAL ASSESSMENT**

Project Name

Waikamoi Preserve Natural Area Partnership

Proposing Agency / Applicant

State of Hawai'i
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street
Honolulu, Hawai'i 96813

The Nature Conservancy
923 Nuuanu Avenue
Honolulu, Hawai'i 96817

Approving Agency

State of Hawai'i
Department of Land and Natural Resources
Division of Forestry and Wildlife

Project Location

Waikamoi Preserve, 5,230 acres in the District of Makawao, County of Maui,
State of Hawai'i.

Tax Map Key

2-3-05-4

Acreage

5,230

Agencies Consulted During Final EA Preparation

(The individuals and agencies listed were provided with copies of the preserve's draft environmental assessment, and given 4 weeks to respond. All written comments received are included in Appendix 1.)

Federal

- Environmental Protection Agency, Region 9
- Office of Senator Akaka
- Office of Senator Inouye
- Office of Representative Abercrombie
- Office of Representative Mink
- US Department of the Interior/ Haleakala National Park
- US Department of the Interior/National Biological Service
- US Department of the Army/Corps of Engineers
- US Department of the Interior/Fish and Wildlife Service
- US Department of Agriculture/ Forest Service
- US Department of Agriculture/Natural Resources Conservation Service
- US Department of Agriculture/Animal Damage Control

State

- Alu Like, Inc.
- Department of Agriculture
- Department of Hawaiian Homelands
- DLNR, Aquatic Resources Division
- DLNR, Division of Forestry and Wildlife
- DLNR, Division of Land Management
- DLNR, State Historic Preservation Division
- Natural Area Reserves System Commission
- Native Hawaiian Advisory Council
- Office of Conservation and Environmental Affairs
- Office of Hawaiian Affairs
- Office of Planning
- Representative Chris Halford
- Representative Bob Nakasone
- Representative Joseph Souki
- Representative David Morihara
- Representative Hermina Morita
- Representative Sol Kaho'ohalahala
- Senator Joseph Tanaka
- Senator Avery Chumbley
- Senator Jan Yagi Buen
- University of Hawaii, Cooperative Extension Service
- University of Hawaii, Department of Botany
- University of Hawaii, Environmental Center
- University of Hawaii, Secretariat for Conservation Biology

County

- Board of Water Supply County Council
- Department of Economic Development
- Department of Prosecuting Attorney
- Department of Public Works
- Mayor
- Planning Department

Private

A&B Hawaii, Inc.
Nelson Akiu
Amfac/JMB Hawaii
Animal Rights Hawaii
Darrell Aquino
Alan Arakawa
Steven J. Araujo
Peter D. Baldwin
Anne Brasher
Zadoc Brown, Jr.
Awapuhi Carmichael
Doug Chong
Conservation Council for Hawaii
Joseph Day
Virgil E. Day, Jr.
East Maui Irrigation Company
Sumner Erdman
Mary Evanson
Haiku Community Association
Haleakala Ranch Company
Isaac and Dana Naone Hall
James J.C. Haynes
Hawaii Audubon Society
Hawaii Botanical Society
Hokulani Holt-Padilla
Harry Hueu, Sr.
Sam Kaai
Nalani & Frances Kaauamo
Sam Kaauamo, Jr.
Solomon Kaauamo
Kamehameha Schools, Bishop Estate
Isaac E. Kanoa II
Michael H. Lyons II
Makawao-Pukalani Community
Association
Maui Aquatic Life & Wildlife Advisory
Commission
Maui Humane Society
Maui Land and Pineapple Company
Maui Tomorrow
Charles K. Maxwell, Sr.
Na Moku Aupuni O Koolau Hui
Lyons Naone III
Native Hawaiian Legal Corporation
Native Hawaiian Plant Society
Patricia J. Neal
Eddie Oliveira
Chuck Phillips
Sierra Club- Maui Group
Rene Sylva
The Outdoor Circle
Tri-Isle RC&D
Kalei Tsuha
Ulupalakua Ranch
Upcountry Hunter & Sportsman Club
Elaine Wender

Edward Wendt
West Maui Watershed Advisory
Committee

II. PROJECT DESCRIPTION

The primary goal of this project is to maintain Waikamoi Preserve's native ecosystems and protect the area's rare plants and animals. For example, the forests of Waikamoi Preserve provide vital habitat for 13 native Hawaiian birds. Waikamoi Preserve also provides essential watershed for the island of Maui. The East Maui watershed region is the largest single source of harvested surface water in the state with an average harvested flow of 60 billion gallons per year. Active management of Waikamoi Preserve contributes to the protection of the entire 100,000-acre area. The Nature Conservancy of Hawaii (TNCH) has cooperative agreements with several of its public and private neighbors to undertake joint management projects.

Summary Description of the Affected Environment

Location

The 5,230-acre Waikamoi Preserve was established in 1983 through a perpetual conservation easement with the landowner, Haleakala Ranch Company. The preserve is in East Maui and lies to the west of the state's 7,500-acre Hanawī Natural Area Reserve (NAR). Its southern boundary runs along Haleakalā National Park (HALE).

Native Natural Communities

Fourteen terrestrial native natural communities are represented in Waikamoi Preserve, two of which are considered rare: *Deschampsia* Subalpine Mesic Grassland and Māmane (*Sophora chrysophylla*) Subalpine Dry Forest (Figure 2, Appendix 2.) Eight of these terrestrial communities are also found in the adjacent Hanawī NAR (including the rare *Deschampsia* Subalpine Mesic Grassland).

Native Flora

To date, 34 rare plants have been reported in the preserve, ten of which are endemic to East Maui (found nowhere else in the world) (Appendix 3). The plants that are formally listed as endangered include *Diplazium molokaiense*, *Plantago princeps* var. *laxiflora*, *Platanthera holochila*, *Melicope balloui* and two geraniums: *Geranium multiflorum* and *Geranium arboreum*. Of the 34 rare plants known in Waikamoi Preserve, five are also found in Hanawī NAR.

Native Terrestrial Fauna

Vertebrates

Thirteen native birds have been reported from Waikamoi Preserve and of those, eight are federally listed as endangered: the crested honeycreeper or 'ākohekohe (*Palmeria dolei*), Maui parrotbill (*Pseudonestor xanthophrys*), Maui 'akepa (*Loxops coccineus ochraceus*), po'ouli (*Melanerpes formicivorus*), 'ua'u or Hawaiian dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*), 'o'u (*Psittirostra psittacea*), Maui nukupu'u (*Hemignathus lucidus affinis*), and nēnē (*Branta sandwichensis*) (Appendix 3). Five of these endangered native birds also have been reported from the Hanawī NAR. Other more common native birds found in the preserve and Hanawī NAR include 'apapane (*Himatione sanguinea*), 'i'iwi (*Vestiaria coccinea*), 'amakihi (*Hemignathus virens*), pueo (*Asio flammeus sandwichensis*), and 'alauahio (*Paroreomyza montana*). The

endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) is also found in the preserve and the adjacent NAR.

Invertebrates

Terrestrial arthropods include some of the most diverse taxonomic groups at Waikamoi, and are known to perform important ecosystem functions. These functions include pollinating native plants and serving as a food resource for insect-eating forest birds. However, most of Waikamoi's terrestrial invertebrate species have not been studied and are not well documented.

Waikamoi's aquatic invertebrates are also poorly understood. It is unlikely that native diadromous crustaceans and mollusks would be found in intermittent streams and at such high elevations; however, native aquatic insects are almost certainly present. Greater knowledge of both terrestrial and aquatic invertebrates is needed, and to that end we will be encouraging researchers to conduct such studies in Waikamoi Preserve.

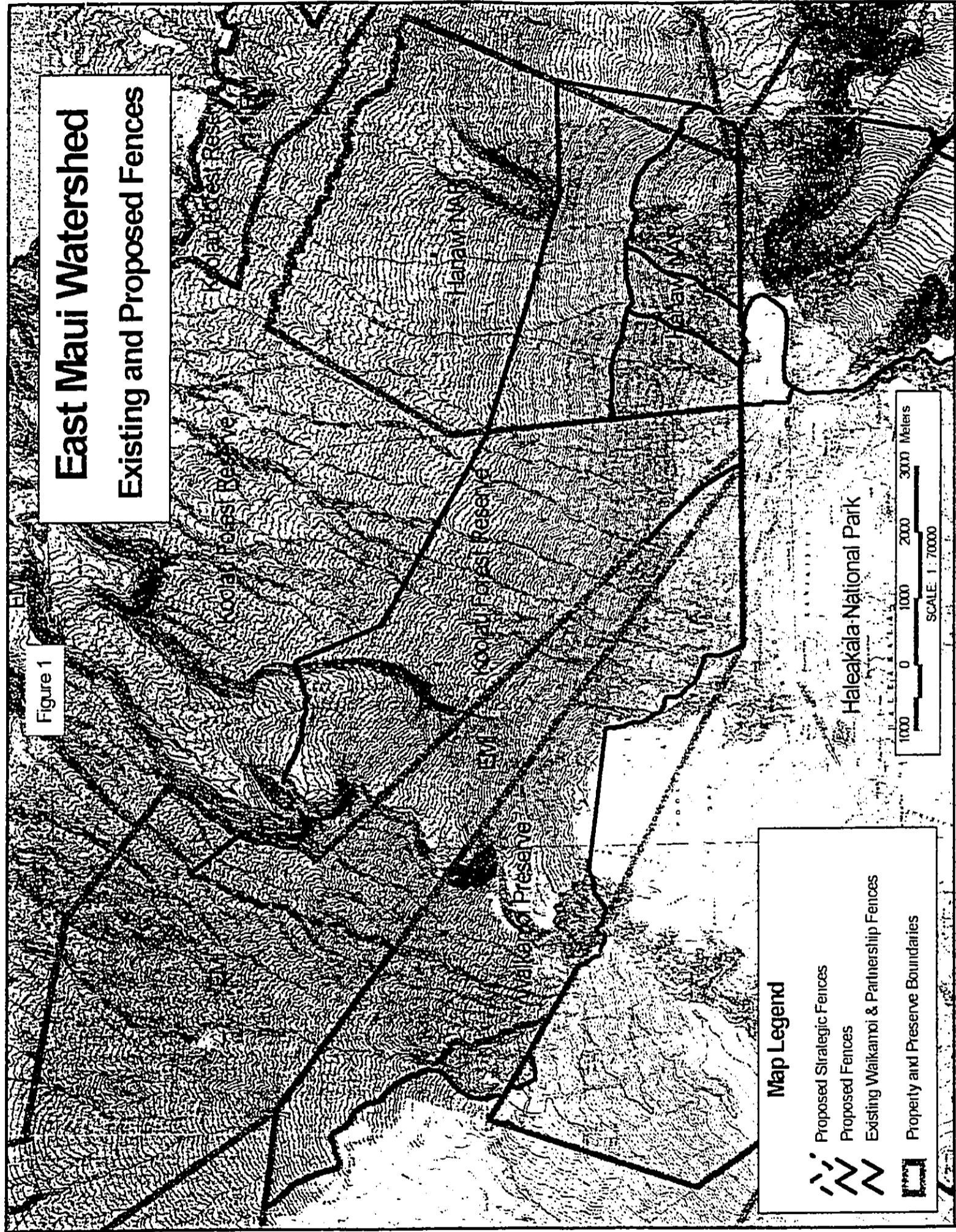
Historical/Archaeological and Cultural Sites

To date few archeological or historical sites have been identified in Waikamoi Preserve. A survey of pre-1930 maps at the State Historical Preservation Division (SHP) office in Honolulu indicates that there are two long-established trails in the preserve (Waikau and Ainahou). These trails may have potential prehistoric or historic sites associated with them, but at this point none are known. The survey also identified the Waikau Cabin as a potential historic site in the "50 years or older" category. The Civilian Conservation Corps built this cabin which burned down in the 1970's, and it is now the ruins of this site which may have historic importance. The Nature Conservancy will have a qualified archeologist survey the cabin site before undertaking any action which may impact the area. No other records identifying potentially important archeological or historical sites were found.

SHP was informed by The Nature Conservancy and the Division of Forestry and Wildlife of the full scope of management activities in Waikamoi Preserve at the time of our last Environmental Assessment. SHP agreed that management activities would involve little to no ground disturbance in the preserve. However, The Nature Conservancy has agreed to notify SHP in advance of any intent to disturb historical or archeological sites within the preserve. In the long term, The Nature Conservancy will reduce the amount of disturbance to our historical resources by removing ungulates from the preserve.

Adjacent Natural Resources

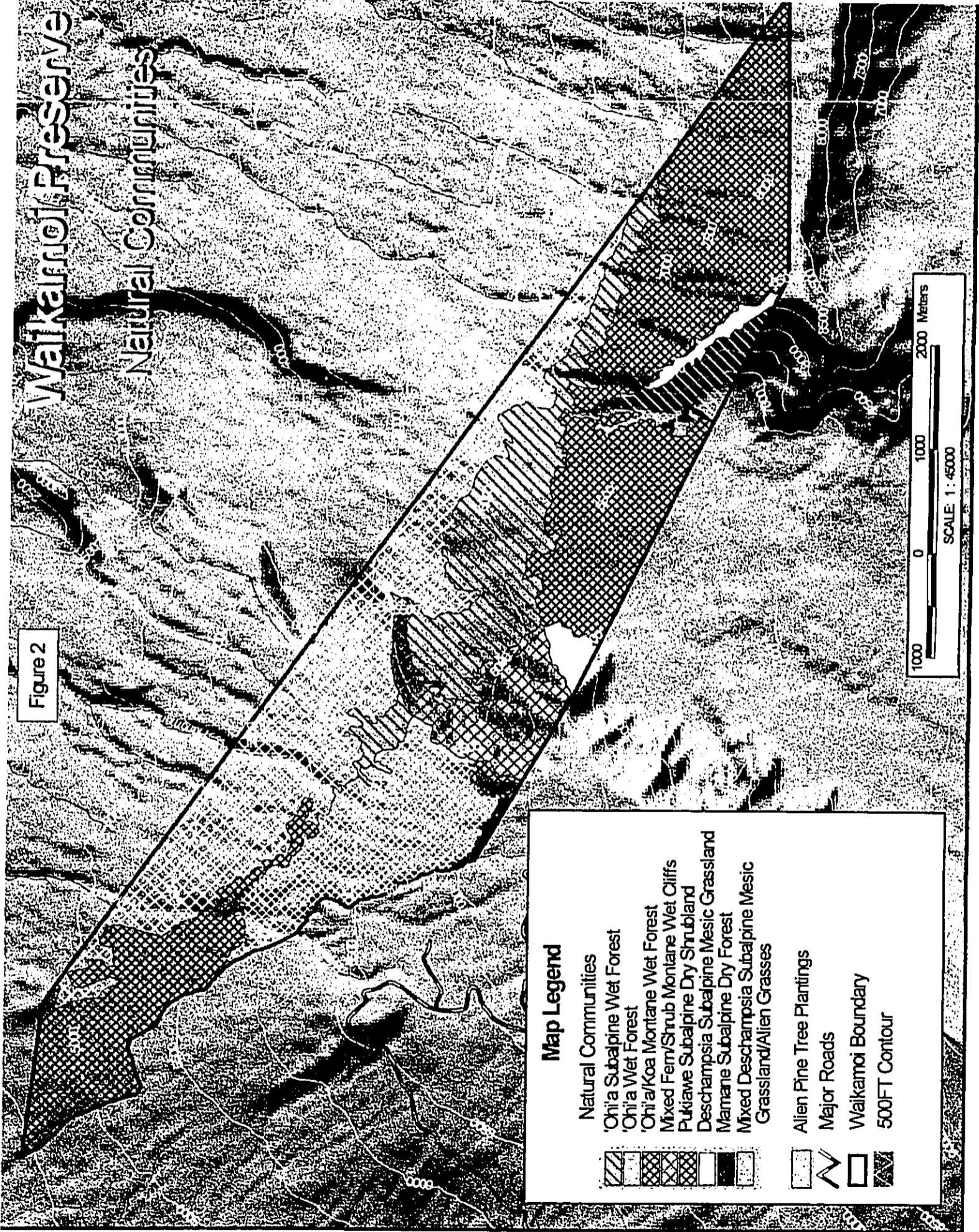
Waikamoi Preserve is adjacent to three other actively managed natural areas: Hanawī Natural Area Reserve (NAR), Haleakalā National Park (HALE), and the state's Ko'olau Forest Reserve. These managed lands, together with other private land on the northeast slope, comprise the East Maui watershed. These 100,000-acres of mostly native habitat produce 60 billion gallons of harvested water each year. This represents the largest harvested watershed in the state. The East Maui Watershed Partnership (EMWP), formed in 1991, is composed of the major public and private landowners in the watershed. The partnership's mission is to manage the native habitat of Haleakalā's north slope to ensure a healthy and intact watershed for the Maui community. This mission also ensures the long-term preservation of Maui's natural heritage, its native ecosystem.



Waikamo'i Preserve

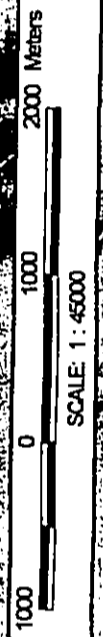
Natural Communities

Figure 2



Map Legend

	Natural Communities
	'Chi'a Subalpine Wet Forest
	'Chi'a Wet Forest
	'Chi'a/Koa Montane Wet Forest
	Mixed Fern/Shrub Montane Wet Cliffs
	Pukiawe Subalpine Dry Shrubland
	Deschampsia Subalpine Mesic Grassland
	Mamane Subalpine Dry Forest
	Mixed Deschampsia Subalpine Mesic Grassland/Alien Grasses
	Alien Pine Tree Plantings
	Major Roads
	Waikamo'i Boundary
	500FT Contour



The Hanawī NAR is habitat to nine natural communities including the rare *Deschampsia nubigena* subalpine mesic grassland. These nine natural communities provide habitat for hundreds of plant species and all common forest birds found on Maui. Besides the more common forest birds, the Hanawī NAR also provides habitat for five endangered forest birds. These include the po'ouli, Maui 'akepa, Maui parrotbill, crested honeycreeper and the Maui nukupu'u. While some of these birds have not been seen in the past few years, the parrotbill and crested honeycreeper populations seem to have stabilized, and an effort is underway to increase the critically endangered po'ouli populations. In addition to the rare and endangered birds, Hanawī NAR harbors at least eight known rare and endangered plants. These include the Maui greensword (*Argyroxiphium virescens*) and the hinahina (*Geranium multiflorum*).

The watershed areas of Haleakala National Park also border Waikamoi Preserve and contribute to the overall native habitat found in the area. In the watershed area, the National Park has seven natural communities including the rare *Deschampsia nubigena* subalpine mesic grassland. In addition, rare montane bogs are also found in the National Park. Of the twenty-four rare plants found within Haleakalā National Park, these montane bogs provide habitat for several rare plants including the greensword (*Argyroxiphium grayanum*), Hanā geranium (*Geranium hanaense*), and manene (*Plantago pachyphylla*). These bogs, grasslands, and wet forests contribute to the contiguous habitat for Maui's native forest birds, and consequently all the major forest birds are found in these forests. Historically endangered birds such as the Nukupu'u and poo'uli have lived in the forests of the National Park, but these species have not been seen there in recent years. The endangered Maui parrotbill and crested honeycreeper have been able to stabilize their populations partly due to the forests of Haleakalā National Park.

The 31,378 acre Ko'olau Forest Reserve borders the makai boundary of Waikamoi Preserve. Primarily comprised of wet 'ōhi'a dominated forest there is also a thick band of uluhe forest/shrubland at the middle elevations. Ko'olau Forest Reserve is also home to a mesic region of Koa/'Ōhi'a forest. Furthermore the Reserve is home to more than 34 rare plants, two rare land snails, and three federally endangered forest birds. In addition, the endangered Hawaiian hoary bat or 'ope'ape'a has also been seen in the forest reserve.

Sensitive Habitats

The entire native habitat found on Haleakalā's north slope is considered sensitive as it represents native resources that, in the past 1500 years, have been reduced by more than 65%. This dramatic reduction has been brought about by human as well as feral animal presence, and invasive non-native plant species which have greatly expanded their range. Once this native forest is lost, no amount of effort will bring it back. The proposed management activities contained within this document are aimed at ensuring the long-term protection of the native habitat and its resources. Potential negative effects of management activities such as the introduction of non-native plants along newly constructed fences, trails, and monitoring transects are reduced by following strict cleaning protocols for all items transported into the preserve. Furthermore, any management activity which might impact neighboring sensitive habitats in Hanawī NAR, Haleakalā National Park, or other private lands will be discussed and examined with the appropriate staff from these organizations.

General Description of the Action's Technical, Socio-Economic and Environmental Characteristics

Technical Characteristics

This project is long-term and consists of several distinct research, monitoring, and management facets. Approval of this project will assure the long-term survival of Waikamoi's unique native birds, plants, and insects. Furthermore, this project proposes the most cost-effective proactive preservation of the headwaters to the East Maui watershed.

Management Considerations

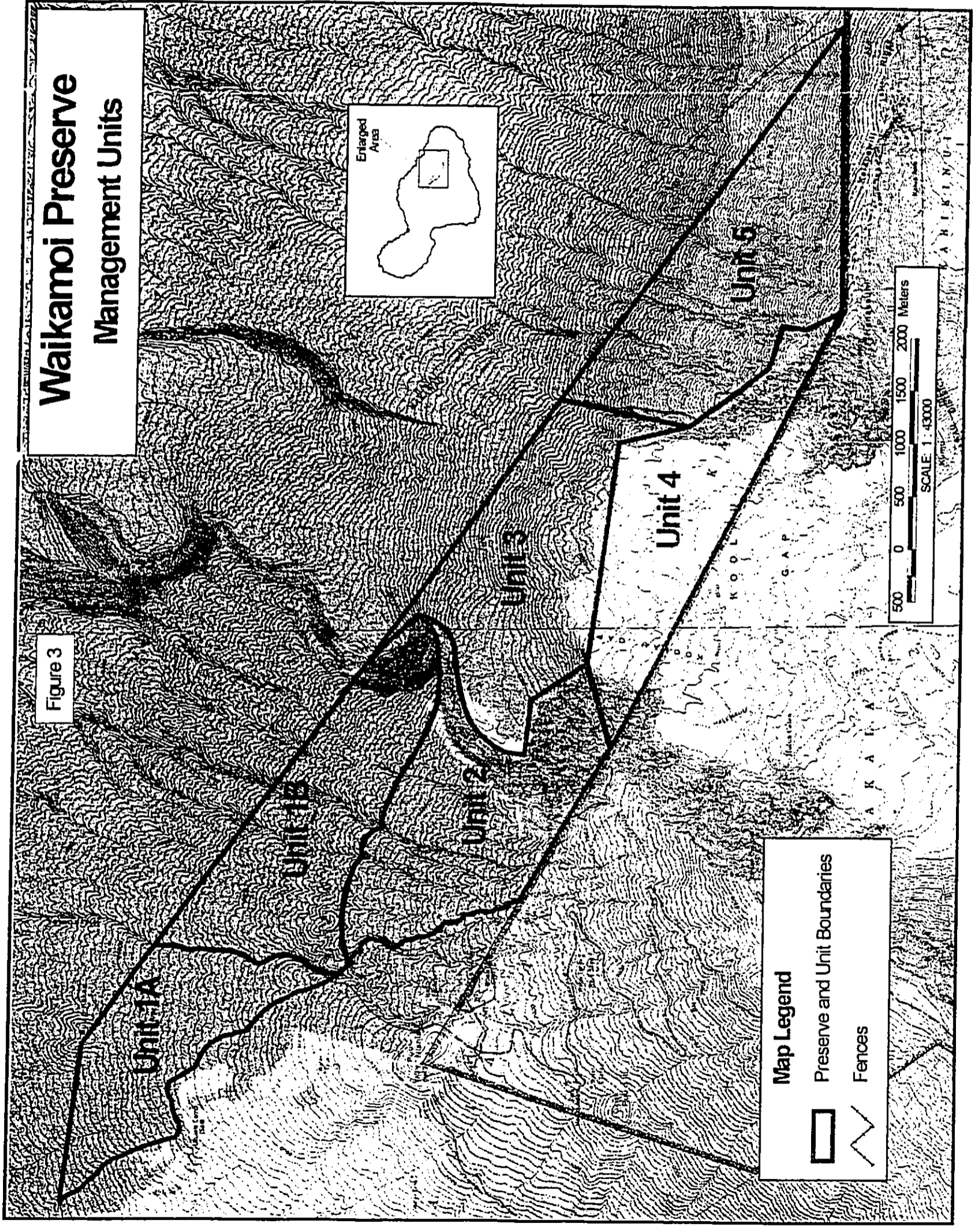
1. The importance of Waikamoi Preserve as a refuge for 13 native Hawaiian birds, 34 rare plants, and 14 natural communities cannot be overstated. It is one of the most viable and intact remaining native forests in the state. Pig damage is by far the greatest threat to the preserve and critical East Maui watershed headwaters. The primary strategy for protection of Waikamoi Preserve is to reduce damage to native vegetation and soils by removing all ungulates. Through TNCH's management activities, ungulate damage in all management units except 1A (where hunting is the only method of removal), has been reduced to near zero.
2. Waikamoi has several established habitat-modifying weed species. However, a primary management objective is to *prevent* further weed introductions. Special care must be taken to minimize negative side effects of management activities. For example, all personal and field equipment is inspected and carefully cleaned to remove seeds and insects to prevent inadvertent introductions into pristine areas.
3. Waikamoi Preserve is adjacent to three other large, managed natural areas: HALE, the state's Ko'olau Forest Reserve, and the state's Hanawī NAR. In addition, an agreement between DLNR, EMI, Keola Hāna Maui Inc., Haleakalā Ranch Company, County of Maui, TNCH, and HALE resulted in the implementation of a joint management plan for the entire East Maui watershed. Management efforts at Waikamoi Preserve will, whenever possible, complement the objectives of the East Maui Watershed Management Plan. We will coordinate management, sharing of staff, equipment and expertise with the EMWP to maximize management efficiency at Waikamoi and on partnership lands.
4. With the exception of about 800 acres of introduced pines (*Pinus* spp.) adjacent to the HALE Hosmer Grove area, Waikamoi's 5,230 acres are dominated by native species. Management activities will focus on controlling pigs (*Sus scrofa*), axis deer (*Axis axis*), miconia (*Miconia calvenscens*), gorse (*Ulex europaeus*), kāhili ginger (*Hedychium gardnerianum*), blackwood acacia (*Acacia melanoxylon*), tropical ash (*Fraxinus uhdei*), and invasive pines (*Pinus* spp.). These species pose the greatest long-term threats to Waikamoi Preserve and are feasible to control.
5. Much of Waikamoi Preserve is remote and relatively inaccessible by foot. Therefore, most management activities must be carried out by helicopter. Often, field staff will fly to one of three remote camps and work for three to five days at a time. This strategy minimizes the

inadvertent introduction of destructive alien species by reducing foot traffic from alien-infested areas.

Management Units

Waikamoi is managed in six units (Figure 3). The units are defined by topographic boundaries, similarity of natural community types, and threats. Topographic features determined the placement of fences built by TNCH and HALE. TNCH's fences tie into the HALE fence at Pu'u Nianiau and Waikamoi's easternmost tip, and extends downward in elevation. Cooperative agreements with HALE, Haleakalā Ranch, EMI (neighbors along Waikamoi's northeast boundary), the state, and the EMWP allow TNCH to work outside the preserve boundaries.

1. Unit 1A is the westernmost portion of the preserve and the lowest in elevation. Its western edge abuts Haleakalā Ranch's open pastureland. Ranging from 4,400 feet to nearly 6,000 feet elevation, it is primarily comprised of Koa/'Ōhi'a (*Acacia koa*/*Metrosideros polymorpha*) Montane Wet and Mesic Forest. This is one of the most accessible units, and ungulate management has been limited to Haleakalā Ranch employee, volunteer, and contract hunting. As a consequence, it consistently contains light to heavy pig activity. The unit is entirely fenced except for the eastern boundary, which is formed by the very steep Waikamoi Gulch. Unit 1A contains localized infestations of kāhili ginger, blackberry (*Rubus argutus*), tropical ash, gorse, eucalyptus, and pasture grasses (*Poaceae* spp.).
2. Unit 1B ranges from 5,200 feet to 6,200 feet elevation and is primarily 'Ōhi'a Montane Wet Forest with small patches of 'Akala (*Rubus hawaiiensis*) Montane Wet Shrubland, *Carex* Montane Wet Grassland, and Uluhe (*Dicranopteris*) Lowland Wet Shrubland. Over half of the unit's lower northwest boundary has been fenced to prevent ungulate ingress from EMI lands below. There is minimal pig activity in this unit due to the fence and staff ungulate control. This unit contains breeding populations of Maui parrotbill and 'Akohekohe, and has been the site of several forest bird research projects. The upper boundary is bordered by conifers and other alien vegetation, and this unit contains small patches of blackberry, ginger, eucalyptus, and conifers.
3. Unit 2, below HALE's Hosmer Grove, is dominated by dense stands of conifers. Throughout the conifers are many patches of blackwood acacia. All of the gorse in this unit has been treated and only seedlings and occasional regrowth remain (which are routinely treated every two to three years). The under story is comprised of velvet grass (*Holcus lanatus*) and other alien grasses, with a few native shrubs and ferns. This is also where blackberry has heavily invaded. However, the gulches that cross this unit are often dominated by native vegetation, some contain populations of the endangered *Geranium arboreum*. There is also a small, degraded patch of rare Māmane Subalpine Dry Forest near the center of this unit.
4. Unit 3's upper area is 'Ōhi'a Subalpine Mesic Forest. The lower area is predominately 'Ōhi'a Montane Wet Forest. This unit contains many rare plants and birds. A small portion of this unit, along the 'Ainahou pali, was once used for summer pasture by Haleakalā Ranch. This formerly grazed area is infested with blackberry and pasture grasses.



5. Unit 4 is primarily pioneer vegetation on lava flows and Pūkiawe (*Styphelia tameiameia*) Subalpine Dry Shrubland. The ground is predominately 'a'a and pāhoehoe lava. HALE's fence forms Unit 4's north boundary and divides it from the rest of the preserve. Unit 4 is pig free. Large patches of alien grasses can be found throughout Unit 4.
6. Unit 5 is comprised of 'Ōhi'a Montane Wet Forest in its lower portions. The larger upper portion is Pūkiawe Subalpine Dry Shrubland, with a narrow band of *Deschampsia* Subalpine Mesic Grassland along the southern boundary below Hanakauhi. This unit extends from 5,600 feet to nearly 8,600 feet elevation. Management activities have dramatically reduced the formerly heavy impact of goats and pigs. This unit contains some large patches of blackberry in the easternmost areas.

Management Goals

The management programs that follow are listed in order of priority for fiscal years one through six. They are: 1) Non-Native Species Control, 2) Resource Monitoring, 3) Rare Species Protection and Research, and 4) Public Outreach. Each program goal is followed by a brief description of program strategies, highlights of past and current achievements, and key management issues. Finally, a concise list of objectives for FY 2001 – 2006 is laid out for each program.

Though each program is described separately, together they form an integrated management approach. Management priorities focus on removing ungulates and habitat-modifying weeds. In addition, a comprehensive network of trails and monitoring stations has been established in Waikamoi Preserve to facilitate management activities. This system will be maintained for as long as it is useful and expanded only where needed to support resource management activities.

Program 1: Non-Native Species Control

Ungulate Control

Program Goal: To remove all ungulates from Waikamoi Preserve, and prevent future invasion.

The importance of Waikamoi Preserve as a refuge for 13 native Hawaiian birds, 34 rare plants, and 14 natural communities cannot be overstated. It is one of the most viable and intact remaining native forests in the state. Pig damage is by far the greatest threat to the preserve and critical East Maui watershed headwaters.

Therefore, pig control is the focus of the Waikamoi Preserve resource management program. In 1989, a preserve-wide network of transects was completed to measure ungulate activity. Sixty percent of the 1,450 stations on these transects showed pig disturbance. At that time, pig damage to the native vegetation and soils were extensive. Simultaneous with the establishment of these transects, snares were placed in the most remote areas of the preserve where no other control method was viable. This control program sharply reduced pig activity. The comparison (Figure 4) of current pig disturbance levels to those collected in 1980 illustrates the dramatic reduction achieved as a result of our management efforts. Recovery of native vegetation has been dramatic.

Current monitoring data indicates pig activity remains very low preserve-wide with the exception of Unit 1A where hunting has been the only ungulate control method employed. As has been demonstrated in Unit 1A and other areas in the state like Molokai, hunting alone is not sufficient to substantially decrease ungulate damage in rugged areas.

Therefore, the ungulate control program utilizes a combination of fencing, hunting (primarily contract hunting), and snaring to bring pig populations down to zero as rapidly as possible, and to prevent new populations from becoming established in the preserve. Pigs in particular reproduce at very high rates. Scientific research tells us that 70% of the population must be removed annually to maintain lower pig numbers. Snares will continue to be used until an equally effective alternative can be found. In Unit 1A, we have implemented and maintained a volunteer and contract hunting program. In spite of these efforts, Unit 1A continues to be the one area of the preserve with unacceptable levels of pig damage.

Over the past six years, approximately 3.5 miles of new fence were completed, and nearly 13 miles of fence were maintained in order to protect the preserve from pigs and goats. In addition, EMWP fence crews completed two miles of fence below (not on) Waikamoi's boundaries which protects Waikamoi Preserve and adjacent state and private lands.

Over the past 12 years, goats have been reduced from several thousand to zero through organized hunts. Occasionally, goats jump the fence into Waikamoi Preserve from neighboring lands, emphasizing the need for continued vigilance and swift control efforts to keep the goat population from reestablishing itself. Under a Memorandum of Understanding between HALE and TNCH, cooperative management projects are undertaken to benefit both areas. These management projects have included aerial hunts by HALE staff to control goats in the National Park and adjacent Waikamoi Preserve. On these hunts, TNCH pays for the helicopter time spent hunting in Waikamoi Preserve while HALE staff provide the aerial shooting expertise.

The Maui Axis Deer Group (MADG) was created in April 1996 with our assistance after the discovery of axis deer in Waikamoi Preserve. The major natural resource managers as well as the larger ranches of Maui are represented. The core group members are HALE, DOFAW, NAR System, TNCH, USFWS, Living Indigenous Forest Ecosystems (LIFE), Haleakalā Ranch, 'Ulupalakua Ranch, Kaupo Ranch, and Alan Kaufman, DVM. We continue to participate as an active member of this group to both improve our understanding of deer and to develop a coordinated island-wide deer management strategy. Deer continue to pose the greatest long-term threat to Maui's native ecosystems.

Members of MADG estimate the current deer population to be between 4000 and 8000 animals. A growth rate of 0.18 per annum was calculated from the initial 9 animals introduced in late 1958 and early 1959 and a current estimate of 4000 animals. If population growth were to continue at this rate, the projected deer population would more than double in 5 years and increase to over 25,000 within 10 years (Figure 5).

East Maui Watershed

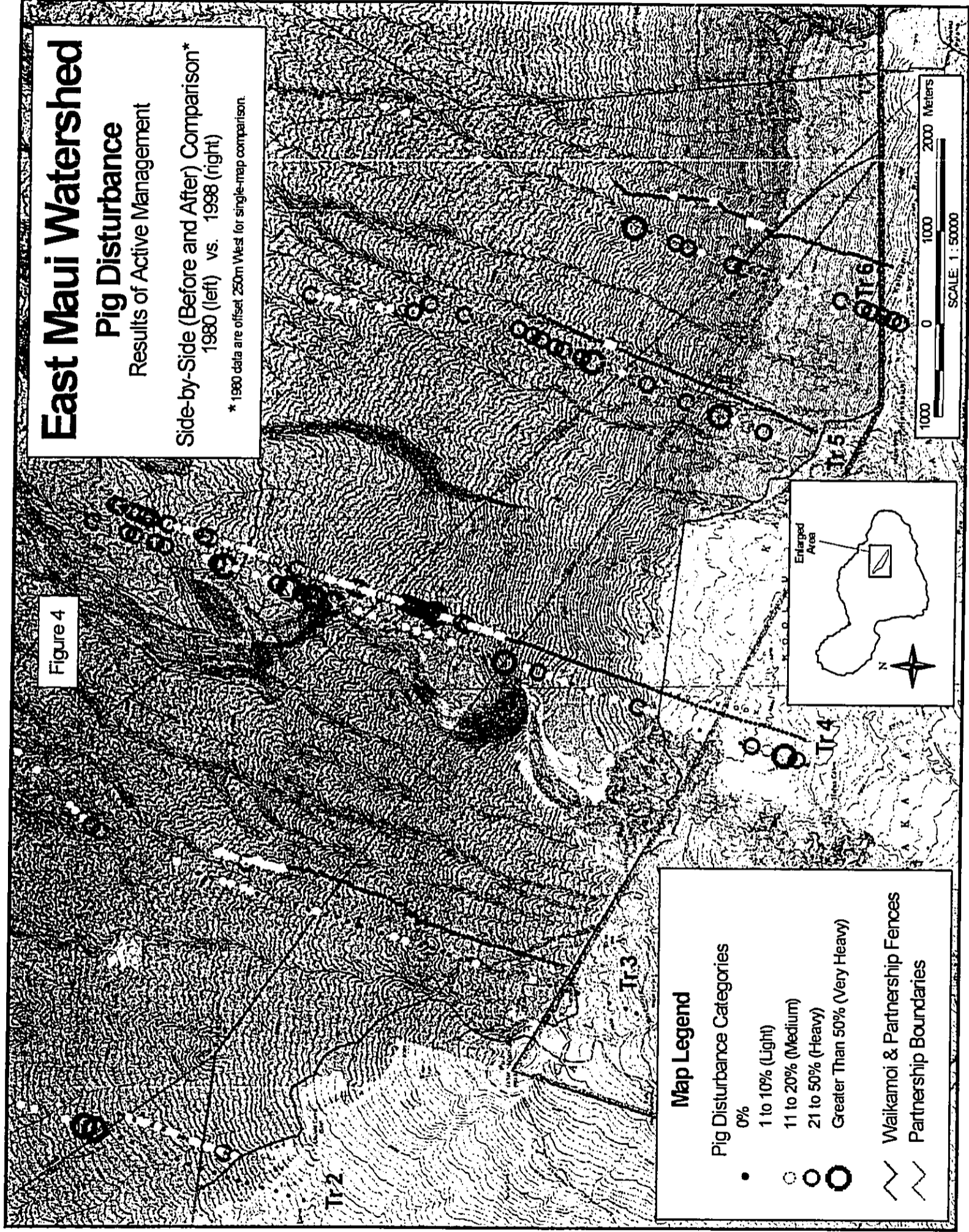
Pig Disturbance

Results of Active Management

Side-by-Side (Before and After) Comparison*
 1980 (left) vs. 1998 (right)

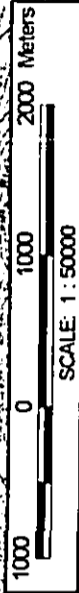
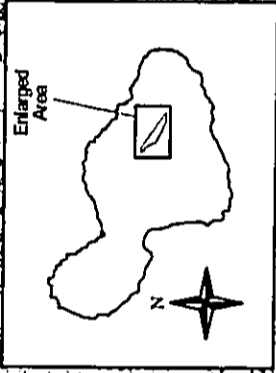
* 1980 data are offset 250m West for single-map comparison.

Figure 4



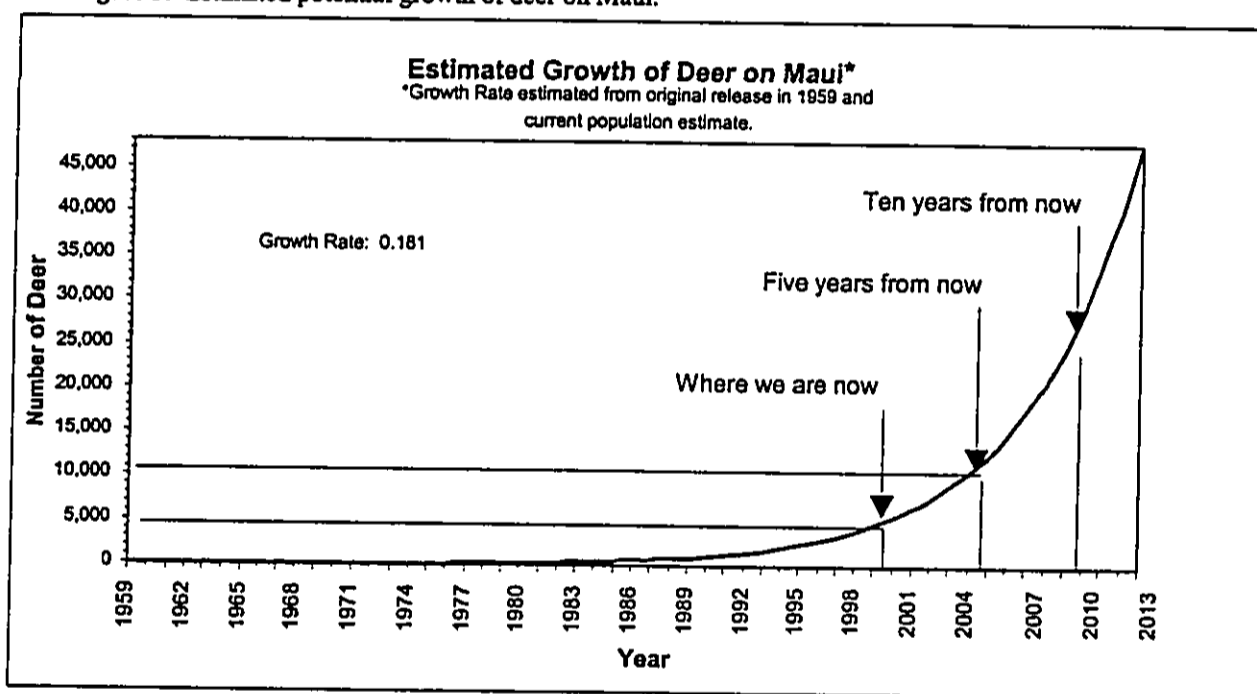
Map Legend

- Pig Disturbance Categories
- 0%
 - 1 to 10% (Light)
 - ⊙ 11 to 20% (Medium)
 - ⊗ 21 to 50% (Heavy)
 - ⊕ Greater Than 50% (Very Heavy)
- ~~~~~ Waikamoi & Partnership Fences
 - - - Partnership Boundaries



Admittedly this projected growth does not take into account actual birth rates, infant or adult mortality, availability of resources or suitable habitat, hunting pressure, or carrying capacity. It is a straightforward extrapolation based on estimated growth over the last 40 years and makes the assumption that this rate is likely to continue. This rate is actually less than growth rates observed in axis deer herds introduced to California and other areas. It is presented here to illustrate the potential for explosive growth in the next few years and the need to act quickly to control axis deer before their numbers reach potentially unmanageable levels.

Figure 5. Estimated potential growth of deer on Maui.



During the years 2001 - 2006 we will continue to maintain and improve the effectiveness of our ungulate control program. Any disruptions in the program would erase important gains and would require substantial increases in funding to realize past levels of success. Should such a disruption occur, we would be forced to review our entire budget and reallocate funding to provide for a new ungulate control program (for example the construction of costly dog kennels and the purchase and training of dogs).

In addition, we will ensure that 5 additional miles of EMWP fence are constructed on Haleakalā's north slope, and reduce pig damage above them. We also propose supporting the construction of a fence in the Hanawī NAR along the 3600' contour. Furthermore, we will determine the need for, and build strategic fences to supplement current and future EMWP fences. This is of particular importance in the Honomanū area because we are relying on Honomanū Gulch and the Ko'olau Valley pali to deter pig ingress. Finally, we will act swiftly to remove all axis deer from the Waikamoi Preserve, and we will support efforts to reduce numbers on lands adjacent to the preserve. Increasing deer populations and a developing management plan will require the adjustment of the Ungulate Control budget as axis deer become more of a management challenge.

Our current management plan of fencing, hunting, and snaring has been an effective method of pig removal for ten years. It is our intention to continue along this proven path. However, new challenges may require the need for a revision of our management practices. Increasing axis deer populations and the stretching of existing resources over additional acres of partnership lands will require the re-evaluation of our management plan. We are currently proposing to build a higher fence along Unit 1A from Pu'u Nianiau to Maile trail to prevent axis deer from entering the preserve. We plan to hire a contractor to build this 4-mile fence and are requesting \$60,500 in both FY2001 and FY2002 NAPP budgets for this purpose. Other foreseeable adjustments may be the development of a kennel and dog teams for pig and axis deer removal, and increased reliance on other groups and agencies, such as the East Maui Watershed Partnership fencing crew, to fulfill NAPP goals. Of course, any change in the management plan would require a corresponding amendment to the current projected budget. We intend to provide notice of significant changes to our management program in the semi-annual and yearly reports submitted to the Department of Land and Natural Resources.

Years 1 - 2 (FY2001 - 2002)

- Maintain preserve fences, and add strategic fences as needed
- Review need for replacing sections of Unit 1A fence in years 4, 5, and 6.
- Ensure completion and maintenance of Phase 1 and Phase 2 EMWP ungulate fences from Honomanū Stream to the Hanawī NAR.
- Support state in completing fence along the 3600' contour in Hanawī NAR.
- Continue ungulate elimination throughout the preserve and at other strategic locations. Check and maintain snares.
- Assist EMWP with ungulate control efforts above Phase 1 and 2 fences and in other strategic locations. Check and maintain snares.
- Determine ungulate ingress points above Honomanū fence and build strategic fences as needed.
- Eliminate axis deer from Waikamoi Preserve and other strategic locations.
- Install higher fence as a deer deterrent along Unit 1A from Pu'u Nianiau to Maile trail in FY2001 and FY2002.

Years 3 - 6 (FY2003 - 2006)

Maintain preserve fences, and add strategic fences as needed.

- Review need for replacing sections of Unit 1A fence in years 4, 5, and 6.
- Ensure completion and maintenance of Phase 1 and Phase 2 EMWP ungulate fences from Honomanū Stream to the Hanawī NAR.
- Support state in completing fence along the 3600' contour in Hanawī NAR.
- Continue ungulate elimination throughout the preserve and at other strategic locations. Check and maintain snares.
- Assist EMWP with ungulate control efforts above Phase 1 and 2 fences and in other strategic locations. Check and maintain snares.
- Determine ungulate ingress points above Honomanū fence and build strategic fences as needed.
- Eliminate axis deer from Waikamoi Preserve and other strategic locations.

Status of Public Hunting Opportunities

The conservation easement between TNCH and Haleakalā Ranch allows ranch employees hunting privileges as long as there is game to hunt. Public hunters willing to follow guidelines, sign a liability waiver, and complete a volunteer form will be allowed to hunt in Unit 1A of the preserve on a limited basis (when hunting will not interfere with ongoing management activities, planned guided hikes, and hunting by ranch employees.) Therefore, under these circumstances, limited volunteer hunting opportunities are available at Waikamoi Preserve. However, it should be understood that our goal is to remove all ungulates in the preserve, and no area within Waikamoi Preserve will be considered a sustained yield hunting area. There are approximately 50,000 acres available to public hunters below the preserve to meet public hunting needs. Should it become necessary, TNCH reserves the right to close Unit 1A and any other management unit in Waikamoi Preserve to hunting.

Invasive Plant Control

Program Goal: To control high priority invasive plants in the preserve, and prevent the introduction and spread of problem weeds to areas where they are not currently established.

During the past six years, we successfully controlled the worst habitat-modifying invasive plants at Waikamoi Preserve. These successes include the containment of all known gorse populations; initial and follow-up control of all known outlier populations of miconia (approximately 35,000 plants that were a direct threat to Waikamoi Preserve); and the successful containment of kahili ginger, tropical ash, and invasive pine trees.

Control work is alternately focused: as control is achieved at targeted sites for higher priority species, efforts will shift to lesser priorities. For example, success from diligent gorse treatment has led to farther spaced treatment cycles, thus less field labor to produce an acceptable level of control.

The most important aspects of our invasive plant control program are to reduce current disturbances to intact native communities, and to prevent the introduction of additional alien plant species. (Elimination of ungulates is believed to be one of the most effective means of controlling the introduction and spread of habitat-modifying weeds.) We will continue to enforce strict procedures to inspect all equipment and clothing and remove weed seeds and insects before people enter the preserve. Helicopter flights will originate from areas free of aggressive weeds.

Where possible, we will use an Integrated Pest Management (IPM) approach to weed control. This may include manual/mechanical methods, herbicide use, or assisting with biological control initiatives. Cultural control aspects (minimizing soil disturbance and new pest plant introductions) are incorporated into routine field operations. Herbicides are used when they are the most effective method for achieving our long-term goals. We will continue to train staff in the proper handling and application of herbicides. Herbicide use always follows product label instructions, and actual amounts used are generally well below label listed use rates. We are in full compliance with the state Department of Agriculture's Pesticide Enforcement Branch.

Over the next six-years Maui staff, and especially the Invasive Plant Specialist, will continue to work closely with the Melastome Action Committee (MAC), and the Maui Invasive Species

Committee (MISC). Both of these groups have been pivotal in developing a coordinated approach to containment and possible eradication of invasive plants threatening Waikamoi Preserve and other natural areas on Maui. These groups have been enormously successful in raising public awareness and funding for priority weed control projects on Maui.

Years 1 - 6 (FY2001 - 2006)

- Control all satellite populations of miconia which threaten Waikamoi Preserve.
- Scout for, control, and monitor kāhili ginger.
- Scout for, control, and monitor gorse (2-year treatment cycles).
- Control outlying populations of invasive pines, or along interpretive trails.
- Control outlying populations of blackwood acacia (2-year treatment cycles).
- Scout for, control, and monitor tropical ash (2-year treatment cycles).
- Control blackberry populations along interpretive trails, or other sites depending on available resources.
- Participate as a member of the Melastome Action Committee (MAC), and the Maui Invasive Species Committee (MISC).
- Continue strict inspection and cleaning procedures to prevent introduction of weed species not currently in the Preserve.
- Scout for, control, monitor and respond to other priority weeds as needed (see Appendix 4).

Invertebrate and Small Mammal Control

Program Goal: To increase understanding of threats posed by non-native insects, mollusks, and small mammals, and reduce their negative impact where possible.

Threats posed to native species by non-native insects and small mammals are currently poorly understood. We know that damage to native plants as a result of non-native insects and small mammals is evident throughout Maui's native ecosystems. For example, the non-native Argentine ant (*Iridomyrmex humilis*) is currently the greatest threat to the survival of the famed Haleakalā silversword (*Argyroxiphium sandwicense* ssp. *macrocephalum*); it decimates the native yellow-faced bee (*Hylaeus volcanica*) that pollinates the plant. Rats, mice, cats, and mongoose pose a threat to many native birds including the endangered ground nesting nēnē. For this reason, we have developed protocols for cleaning and monitoring our gear, which will prevent the accidental introduction of new alien species to our native ecosystems. Furthermore, to the best of our ability, we support research on the impact and control of non-native insects and small mammals in our native ecosystems. Of particular concern is the occasional presence of rabbits on lands adjacent to Waikamoi Preserve. Rabbits pose a great threat to the ability of the land to resist erosional forces since they burrow vast tunnel networks in the ground. We will actively control any rabbit populations found in Waikamoi Preserve and other strategic locations. Efforts to develop more effective techniques for controlling rats appear in the research section of this plan.

Years 1 - 6 (FY2001 - 2006)

- Follow strict procedures for preventing the introduction of new non-native invertebrates and small mammals.
- Support development of new monitoring and control techniques.

- Monitor for and eliminate rabbits in Waikamoi Preserve and other strategic areas whenever found.
- Eliminate other small mammal species as deemed necessary in Waikamoi Preserve and other strategic areas.

Program 2: Resource Monitoring

Program Goal: To track biological and physical resources of the preserve and to evaluate changes in these resources over time; to identify new threats to the preserve before they become established pests.

The purpose of resource monitoring is to help identify trends or changes to important biological and physical resources over time. Waikamoi Preserve contains 58 permanent square plots established along USFWS transects 2 through 6. Vegetation monitoring on transects 4 and 6 was last conducted in FY1996 using the permanent plots to collect data on plant species composition, distribution, abundance, and percentage cover. In addition, baseline monitoring was conducted in FY1994. The results of these efforts were compiled in 1995 in the document "*Long-Term Biological Threat Monitoring—Waikamoi Preserve, East Maui, Hawaii, 1994.*" by Guy Hughes and in "*The East Maui Watershed Monitoring*" report dated December 1996. Methods for collecting data are thoroughly described in these documents. We expect to collect data from the preserve's permanent plots every 10 years. (We previously planned to monitor the plots every 3 years, but this interval was determined to be insufficient for our purposes.) Consequently, baseline monitoring will again be conducted in FY2006.

Monitoring of non-native vegetation along five USFWS transects, measures the number of individual weed species (Figure 6), as well as the overall cumulative percent cover of non-native plants per station (Figure 7). The 1998 data serves as a benchmark for non-native plants found along these transects (the overwhelming majority are considered benign weeds that do not pose any long-term threat to native habitat stability.) Although only two transects run through managed priority weed locales, the other transects can provide an index for movement of current or potential priority invasive plants. This type of monitoring will be performed every 3-5 years, but any priority weeds will be noted along these transects during annual ungulate monitoring.

In addition to permanent vegetation plots, we measure ungulate activity levels annually on randomly placed transects. Figure 4 (on Page 10) shows a before and after comparison of data collected on these transects with the advent of pig control. Although the data collection methods employed in 1998 differ from those in 1980, they do provide an overall comparison of pig activity. Areas receiving active pig management through snaring decreased dramatically in pig activity, while activity in those areas managed only by hunting either remained the same or increased. Data collected on these transects provide a useful index of ungulate activity and indicate the level of success of ungulate removal efforts. However, field staff also create maps from field observations showing the presence of ungulate sign whenever it is detected. This information directs our ungulate removal efforts where they are needed most. For example, our annual deer observation activity map (Figure 8) show the locations and severity of all threats observed throughout the year and allows us to prioritize from greatest to smallest. Both types of threat monitoring are critical to our efforts and we will continue to invest in them over the next six years.

Forest birds will continue to be monitored every 5 years or so, according to the DOFAW statewide schedule. The last Waikamoi bird census was in FY1996. The data is maintained and analyzed by the USGS Biological Resources Division.

Data from the Waikamoi Preserve monitoring program are, and will continue to be, used to update the research needs lists, refine long-term management plans, write research proposals and grants, and refine future budget proposals.

Years 1 – 2 (FY2001 – 2002) Conduct routine ungulate scouting surveys as our primary pig monitoring method and create annual pig activity maps.

- Complete annual ungulate activity surveys and maps on USFWS transects 2 through 6.
- Monitor axis deer populations within the preserve, and on adjacent lands as needed.
- Monitor for non-native plants along USFWS transects.

Years 3 - 4 (FY2003 – 2004)

- Conduct routine ungulate scouting surveys as our primary pig monitoring method and create annual pig activity maps.
- Complete annual ungulate activity surveys and maps on USFWS transects 2 through 6.
- Monitor axis deer populations within the preserve, and on adjacent lands as needed.
- Reevaluate plan to monitor permanent vegetation plots and adjust schedule as needed.

Year 5 - 6 (FY2005 - 2006)

- Conduct routine ungulate scouting surveys as our primary pig monitoring method and create annual pig activity maps.
- Complete annual ungulate activity surveys and maps on USFWS transects 2 through 6.
- Monitor axis deer populations within the preserve, and on adjacent lands as needed.
- Monitor permanent vegetation plots on USFWS transects 2 through 6.
- Monitor for non-native plants along USFWS transects.

Program 3: Rare Species Protection and Research

Program Goal: To prevent the extinction of rare species in the preserve, and to encourage research, predator control, and captive propagation of rare plant and bird species.

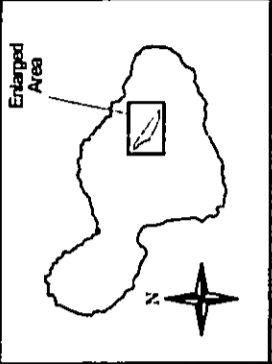
Biological surveys have shown that the preserve protects at least 34 rare plants (Appendix 2). Thirteen native birds, eight of them federally listed as endangered, have also been reported from Waikamoi (Appendix 3). TNCH uses data compiled by the Hawai'i Natural Heritage Program to identify rare species, and use the Heritage Program's definition of rare: species that exist in fewer than 20 populations worldwide.

Protecting habitat essential to the majority of the preserve's native plants and animals (by controlling ungulate damage and invasive plants) is our primary strategy. We also assess threats to the rarest species and take measures to protect them. Staff will continue to look for rare plant populations during routine management activities.

Figure 6

East Maui Watershed Weed Species Per Station

1998



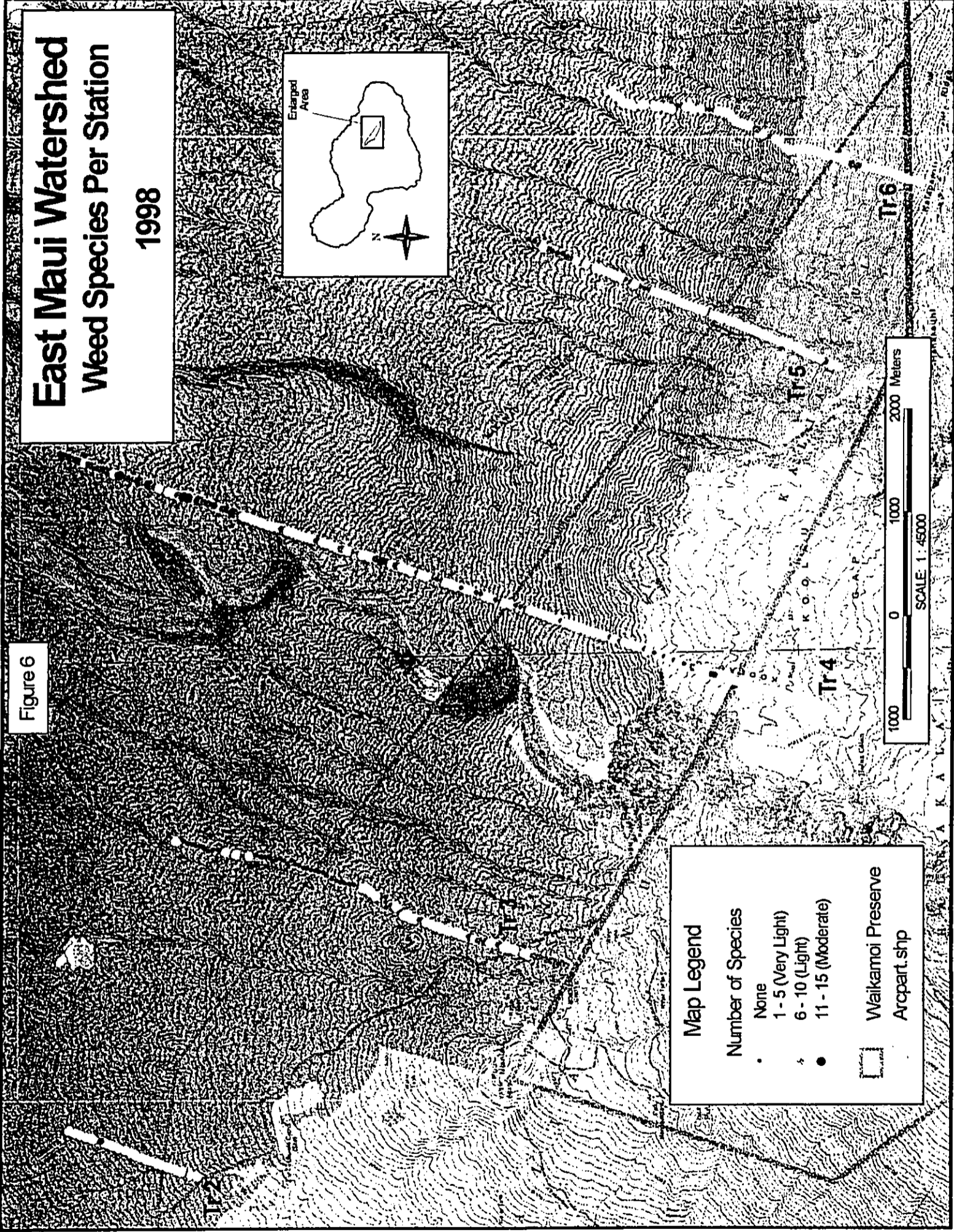
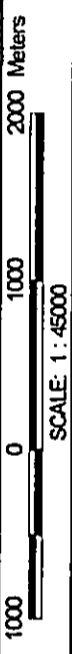
Map Legend

Number of Species

- None
- 1 - 5 (Very Light)
- 6 - 10 (Light)
- 11 - 15 (Moderate)

□ Waikamoi Preserve

Arcpart.shp



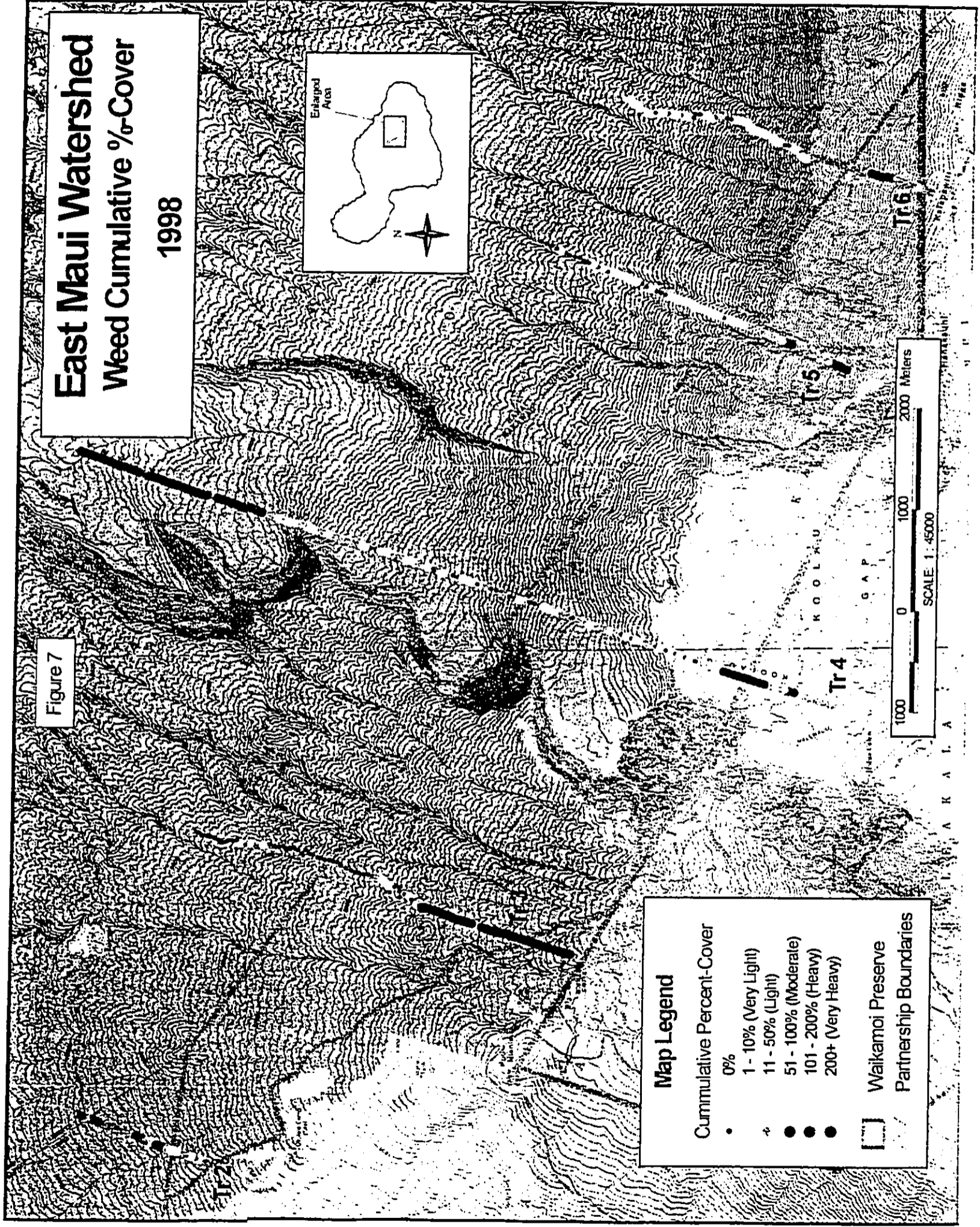


Figure 8

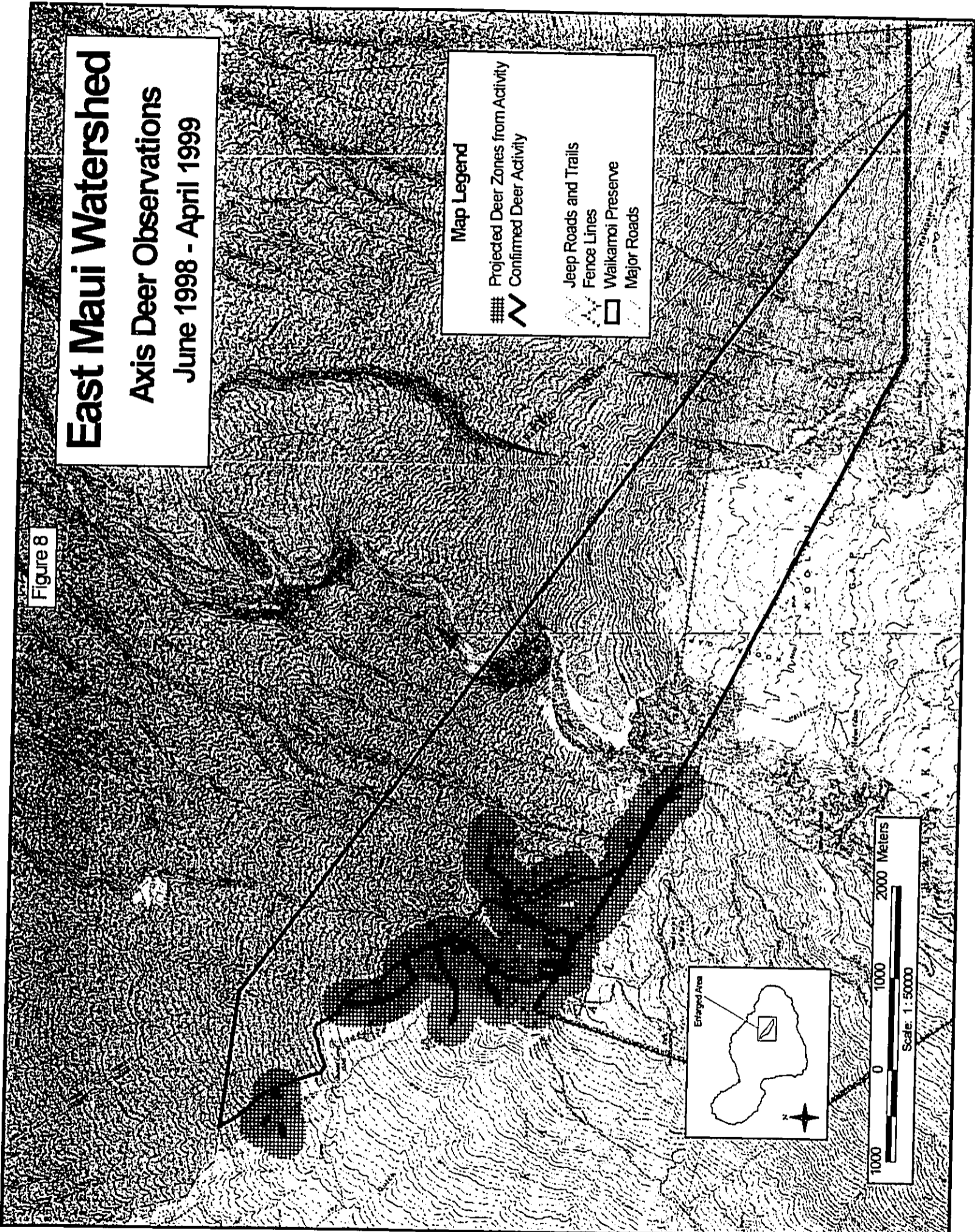
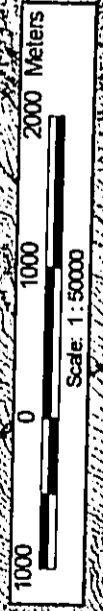
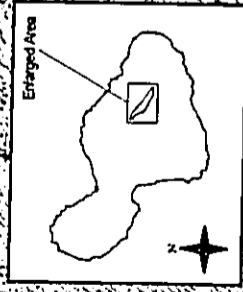
East Maui Watershed

Axis Deer Observations

June 1998 - April 1999

Map Legend

- #### Projected Deer Zones from Activity
- ∩ Confirmed Deer Activity
- Jeep Roads and Trails
- Fence Lines
- Waikararua Preserve
- Major Roads



Over the next six-years, we will continue to identify and map (using GPS) rare plant locations. In addition, we will randomly revisit rare plant populations every two years to assess the populations' current status. We will use data collection sheets developed in cooperation with the Center for Plant Conservation. The data will be analyzed and interpreted to reflect the effect of ungulate management on rare native plant populations.

We also have supported the Endangered Forest Bird Research Program, which began in FY1993. This is a cooperative research program with the Biological Resources Division (BRD) of the USGS, the state DOFAW, USFWS, and TNCH. Research objectives are to elucidate the breeding behavior and population ecology of 'kohekohe and Maui parrotbill. When this program ended in 1998, we continued our support through the Maui Forest Bird Recovery Project although the focus shifted toward the po'ouli. This project is currently directed by DOFAW and six other partners. We anticipate continuing to support these efforts over the next six years, particularly to develop better techniques for protecting all of Maui's rare forest birds. We will support the development of better techniques for controlling rats to protect forest birds over large areas. Ground based rat control can cause disturbance to native plant communities and is very costly. As the success of these ground based control programs are not well understood, we hope to fund studies to develop techniques and proper permitting for other methods, one of which is aerial broadcast of EPA approved rodenticides in critical forest bird habitat.

In addition, we will support efforts for rare plant outplanting at Waikamoi Preserve should an approved agency fund and manage this task. At this time, no agency has stepped forward to undertake this effort, but over time the need to maintain viable rare plant populations in the wild will increase and opportunities are likely to arise.

Finally, we will continue to encourage research that will help us better understand, and thereby protect the preserve's resources. TNCH funding for research is limited but, wherever possible, we provide logistical assistance to approved research projects.

Years 1 - 3 (FY2001 - 2003)

- Provide cooperative funding for forest bird research with USGS/BRD, DOFAW, USFWS, and TNCH if needed.
- Support research to develop a solution for controlling rats to protect forest birds.
- Map rare plant populations with GPS and update status of populations.
- Provide logistical support to researchers when feasible.

Year 4 - 6 (FY2004 - 2006)

- Provide cooperative funding for contracted forest bird research with USGS-BRD, DOFAW, USFWS, and TNCH.
- Map rare plant populations with GPS and update status of populations.
- Provide logistical support to researchers when feasible.

Program 4: Public Outreach

Program Goal: To build public understanding and support for the preservation of natural areas, and enlist volunteer assistance for preserve management.

In order to ensure the long-term protection and viability of the biologically significant native ecosystems throughout the state, it is imperative that a stronger constituency for public and private conservation is educated, empowered and mobilized. TNCH has identified four themes that will be incorporated in our community outreach work throughout the state: link conservation to people's lives, use a grass roots approach, build relationships, and build the capacity of others. We intend to integrate these themes in the key strategies we utilize at Waikamoi Preserve.

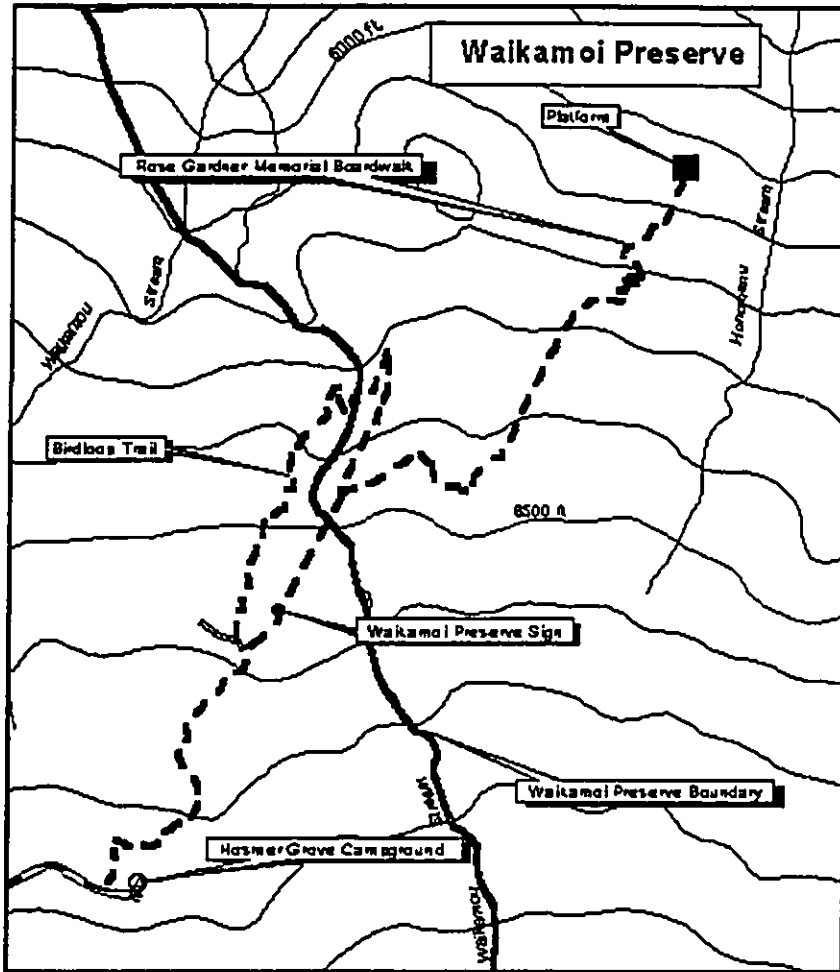
We will identify and cultivate groups and community leaders that surround the East Maui watershed. Our goals for targeted outreach are three-fold: increase awareness of Waikamoi Preserve, the East Maui watershed and native ecosystems, their importance, threats, and efforts to protect them; increase volunteer participation in conservation activities; increase advocacy for Waikamoi Preserve, the East Maui watershed and native ecosystems. We will make every effort to concentrate our efforts on groups and community leaders that may not be aware of our work, historical adversaries (i.e. hunters), partners (i.e. Haleakalā Ranch employees), and stakeholders in stewardship projects. We will utilize activities such as one-on-one contacts, slide shows, hikes and work trips. We will be sensitive to the individual and groups' style and background and attempt to complement it. This will require the combined styles, backgrounds, and expertise of the entire Maui staff.

Our most widely utilized public outreach tool is hiking in the preserve. Waikamoi Bird Loop Trail (Figure 9) continues to be the most actively used trail with HALE leading an average of two hikes per week. These regularly scheduled Monday and Thursday hikes have allowed many Maui residents and visitors to see Waikamoi. Well-trained HALE guides provide an informative and enjoyable experience for hike participants. This trail is also used for the majority of the school group hikes.

In 1994 and 1995 we installed a boardwalk on a trail (Figure 9) in a pristine area of the forest to allow greater access to the area without extensive negative impact. In FY1996, we began to lead our monthly interpretive hikes to the Boardwalk instead of the Bird Loop Trail. The Boardwalk provides access to pristine native forest and, therefore, increases interpretation opportunities. In addition, we began to co-sponsor hikes to the Boardwalk with HALE on Sunday afternoons during the same fiscal year.

Over the course of this plan, new trails will be designed and existing trails will be maintained to promote natural area education. It is our goal to provide the Maui community with high-quality, regular opportunities to visit Waikamoi Preserve.

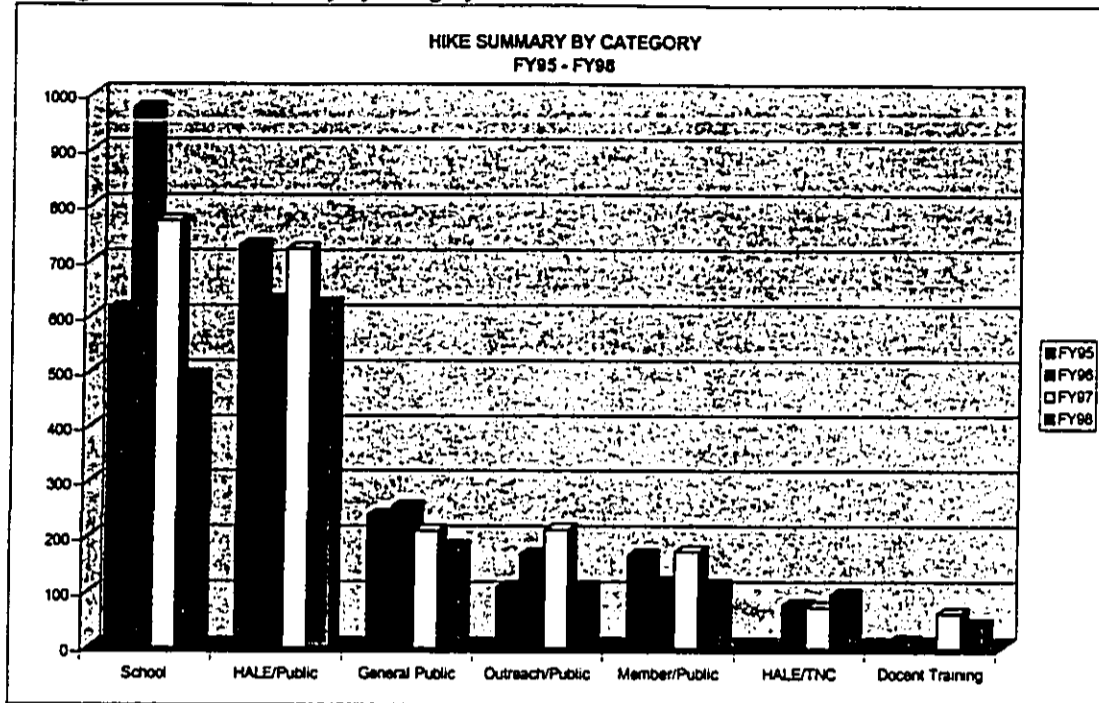
Figure 9 Trail Map



During the period FY1995 through FY1998, nearly 8,000 people visited Waikamoi Preserve. School hike participation decreased in the last few years due to the dramatic increase in transportation costs and the decrease in funding for field trips (Figure 10).

As part of our public outreach efforts, we will continue to hire two interns per year throughout the six years of this plan to expose high school and college students to careers in conservation. In recent years, our interns have been from Ke'anae, Kipahulu, Kaupō, and Pa'ia; all East Maui communities. We will continue to concentrate our recruiting efforts in the East and West Maui communities. Our interns provide us with indispensable labor, which we utilize to accomplish conservation goals while they develop work skills and learn about conservation issues. In addition, they become invaluable spokespeople for conservation and our work in their communities.

Figure 10. Hike Summary by Category



In FY1993, we launched a very successful Waikamoi Preserve volunteer docent program that resulted in the training of 73 volunteer hike leaders. These knowledgeable guides, who have completed a minimum 40 hours of training in the field, lead most of our current public hikes. Docents also lead small custom hikes for community and school groups, donors, and community leaders. Training includes plant and animal identification, natural and cultural history, preserve management issues and interpretive techniques with emphasis on an ecoregional/watershed view of conservation on Maui. Increased efforts will be made to involve Hawaiians and long-time residents of Maui in this program. We expect this program to remain a vital aspect of our public outreach program during the course of this long-range plan.

Volunteers are utilized as much as possible in accomplishing our on-the-ground and outreach conservation activities. Each staff member cultivates a cadre of trained volunteers to assist them in achieving their individual conservation goals. During the period FY1995 through FY1998, nearly 800 volunteers provided over 6,500 hours of assistance. Volunteers lead hikes, control ungulates and weeds, maintain fences and trails, and assists with monitoring of threats, office tasks, and recruiting other volunteers. We will recruit volunteers from the local communities that surround the East Maui watershed.

During the next six years, we will build on the success of our regularly scheduled monthly work trips held on the third Saturday of every month by scheduling at least one additional trip per month. We will recruit groups and individuals from the surrounding communities, especially high schools, to participate in these work trips. We will use these regular work trips to identify and train individual stewardship volunteers. We will support Youth for Environmental Service (YES) in

their efforts to provide environmental presentations in schools and to recruit students for environmental service projects with the intent to develop youth volunteer and advocacy groups.

We will support the efforts of community organizations that are synchronous with our conservation goal to leverage our combined efforts and, thus, ensure the long-term protection of Waikamoi Preserve, the East Maui watershed and native ecosystems. Examples of such partnership efforts are: supporting YES efforts in developing student environmental service projects, Nā Kumu O Haleakalā in their efforts to develop Hō'ike O Haleakalā (a high school environmental education curriculum), and the development of the Maui Botanical Gardens. We will explore and cultivate advocacy groups to undertake long-term projects. We will also develop the stewardship skills of our volunteers through training and hands-on conservation activities and experiences; the outreach skills and knowledge of our docents through training and leading hikes; and the conservation management expertise of our partners in the East Maui Watershed Partnership. Transferred skills will include plant and animal identification, resource monitoring, project planning and implementation, fundraising, ungulate and weed control, threat elimination/control, and working with the media and communities.

We have formalized and developed Public Use and Commercial Activity Guidelines for Waikamoi Preserve. As noted in these guidelines, TNCH seeks to manage all of its conservation properties to promote the long-term survival of vulnerable native species and native community types. We will not knowingly engage in any practice or use that is inconsistent with this goal. The primary objective of public access to Waikamoi Preserve will be to build public understanding of, and support for, the preservation of natural areas and the mission and work of The Nature Conservancy and to enlist volunteer assistance for preserve management. The primary audience of public access to Waikamoi Preserve will continue to be the local community and others who can increase our effectiveness in accomplishing our primary objective. The level of public access is influenced by resource protection, private landowner considerations, and personnel (staff and volunteer) constraints. Included in these guidelines are provisions for limited, low-impact, commercial access on existing Waikamoi trails, which were prompted by increasing requests for access from commercial bird-watching groups. The development process involved a number of factors and considerations including (but not limited to): protecting the natural resources, providing a conservation education experience, liability, recreational use statutes, insurance, and avoiding private benefit to individuals. The process also involved input from a wide range of personnel from within and outside TNC, including commercial vendors and state personnel. All revenue generated by public use and commercial activity at Waikamoi will be used towards TNCH's one-third private-matching funds required to manage the natural resources of Waikamoi Preserve.

We routinely give presentations to community and school groups on our work and the importance of protecting natural areas in Hawai'i. In addition, we participate in community and school events (Earth Day, community festivals and fairs, etc.) through the use of displays, games, and prizes. These venues provide us with the opportunity to reach the general public, many whom are not aware of our work or the importance of preserving our natural areas.

Years 1 – 6 (FY2001 – 2006)

- Continue monthly interpretive hikes and encourage HALE to continue semi-weekly hikes into Waikamoi Preserve.

- Continue to train and use volunteer docents to lead school children and community groups. Lead a minimum of one hike per quarter that targets communities that surround our preserve.
- Expand regularly scheduled volunteer work projects to two per month.
- Utilize volunteers as much as possible in accomplishing our on the ground and outreach conservation activities.
- Present slide shows and talks to community and school groups and participate in community and school events as requested.
- Continue internship program at two interns per year.

Program 5: Personnel, Equipment, and Facilities

TNCH currently has the equivalent of eight full-time stewardship staff on Maui; we also hire two summer interns each year. Staff split their time between Waikamoi and Kapunakea Preserves with about 5.5 full-time equivalents (FTEs) dedicated to Waikamoi Preserve and 2.5 FTEs dedicated to Kapunakea. These staff also devote time to projects proposed in the East Maui Watershed Partnership management plan. A small portion of staff time will also continue to be used to support fundraising efforts. This ensures the Maui programs ability to raise its portion of the 1/3 private match and to support partnership conservation efforts on East and West Maui. We recognize that TNCH staff on Maui will occasionally work on non-NAPP funded projects. Time spent on other projects will be documented, and all associated expenses charged to the appropriate project. In addition TNCH Maui Field Office has one FTE not funded by the NAP Program which is dedicated to the statewide operation.

Office and baseyard facilities, vehicles, and field equipment are also shared between Kapunakea and Waikamoi Preserves, and will be used approximately 70% of the time at Waikamoi.

In addition to routine field duties, Maui staff must be prepared to fight fires. In 1990, Maui Project staff completed a fire-management plan for Waikamoi Preserve that includes, among other important information, a fire resources map depicting roads, helicopter landing sites, water resources, and other important information about the preserve. Over the next six years, TNCH will work cooperatively with DOFAW to prevent and suppress any fires in and around the preserve, as outlined in the fire management plan. Several field staff will continue to upgrade their fire training and readiness as opportunities arise.

TNCH routinely provides training for staff to improve job performance. In addition, supervisory staff will attend regular meetings in Honolulu. Travel funds are included within the budget in our Long Range Plan, under facilities, to cover airfare, board and lodging. Biannual increases in the travel and training budget will allow two staff to attend the Conservancy's National Stewardship Conference.

The Honolulu office of TNCH will provide technical and planning support. In particular, the Director of Science and Stewardship Operations and the Stewardship Ecologist, will assist with preparing annual plans and reports, developing and implementing monitoring and research programs, and establishing interpretive and intern programs at Waikamoi Preserve. In addition, biologists from the Hawai'i Natural Heritage Program will occasionally assist Maui staff with rare species monitoring and other stewardship projects requiring advanced technical assistance. The Hawai'i Natural Heritage Program will assist in map preparation and the testing and

implementation of GPS technology. A modest 10% overhead is included to cover a portion of TNCH's in-kind contribution of personnel administration, accounting, and other general support.

Because the NAP program requires an annual inspection, we have budgeted airfare costs for the NARS Program Manager to travel to Maui to conduct this inspection.

In keeping with TNCH's long term commitment to its Maui preserves, we will actively be searching for a permanent TNCH-owned office space and baseyard. Currently we expend almost \$20,000 a year leasing our office space and baseyard. Should a desirable permanent location be secured, we propose to use the lease rent on a mortgage to purchase and/or build a new facility. In the long run it will be more cost effective for the Maui operation to own its facility rather than to continue renting expensive office space.

Funding

The above programs comprise a six-year management plan for Waikamoi Preserve. Through the NAP program, the state pays two-thirds of the management costs for an anticipated total funded amount of \$2,030,677.

Socio-Economic Characteristics

Four types of socio-economic benefits will result from the proposed project:

1) Protection of the largest harvested watershed in the State.

Sixty billion gallons of water a year are harvested from the East Maui Watershed. Waikamoi Preserve's location at the headwaters of this watershed means that it plays a key role in the collection and distribution of water into the streams and groundwater. The importance of an intact native forest with all of its layers of trees, shrubs, and plants acting as a break to slow the falling rain cannot be understated. Slowing the impact of the rain allows the thick mats of moss, as well as the soil itself, to collect and slowly distribute water which in turn is used for agriculture and domestic purposes. Destruction of the native forest would lead to less collected water as the rate at which that water exited the watershed would be greatly increased and thus would cause a greater burden to Maui's economy.

2) Protection of Hawaii's biodiversity by protecting the habitat of Hawaii's unique species.

Waikamoi is home to 14 natural terrestrial communities as well as 13 native bird species. At least 90% of these birds and plants are found nowhere else in the world. Currently, over 30% of all medicines are directly derived from rainforest plants. By protecting our native forest we not only protect the uniqueness of Hawaii's original inhabitants, but we preserve the potential source of medical advancements which exist through these rare plants.

3) Public education and involvement in resource protection.

This program also provides the general public direct contact with some of Hawaii's native ecosystems. Through guided hikes and volunteer work parties Maui's residents are provided an opportunity to understand the important history as well as the economic benefit of a native forest.

- 4) Support of Maui's economy through the spending power of nine positions and other operational costs.

The long-term nature of this program provides a sustained support of Maui's economy. The Nature Conservancy on Maui currently employs the equivalent of eight full-time and one part time employees and one part-time employee who are full-time residents of the island of Maui. In addition, this program proposes several projects which will require the purchase of items and labor from the Maui community.

Environmental Characteristics

This project has benefited the environment since 1983 by maintaining and enhancing native ecosystems, preserving biological diversity, and promoting improved water quality. Therefore the continuation of this project will perpetuate the rehabilitation and health of our native habitat by reducing disturbance by feral animals, and eliminating competition from invasive weeds. This in turn will lead to the long term viability of not only the more common plants and birds, but also the resurgence of many of the rare and endangered plants and birds known to frequent Waikamoi Preserve. In addition, a stable native ecosystem will mean a stable distribution of quality water to the Maui community.

III. SUMMARY OF MAJOR IMPACTS

Major Impacts - Positive

- Reduction of ungulate activity in order to promote a sustained and measurable recovery of native vegetation in all management units. The long-term goal is for all ungulates to be removed from Waikamoi Preserve.
- Reduction of habitat modifying weeds currently in the preserve, and the long-term exclusion of weeds which could threaten Waikamoi Preserve's native ecosystems.
- Long-term monitoring and evaluation of biological and physical resources, and adjustment of management activities to reflect positive or negative changes in those resources.
- Logistical and financial support to approved research projects will improve management and protection of resources inside the preserve as well as other critical natural areas throughout the state.
- Prevention of the extinction of endangered species.
- Promotion of a more stable water regime both in and below the preserve through the removal of feral animals and habitat modifying weeds.
- Improved water quality (within and below the preserve) by:
 1. Decreasing siltation of streams and near-shore waters through long-term maintenance of an intact native forest.
 2. Reducing potential for contamination of the water supply by bacterial coliform and leptospirosis by eliminating all ungulates.
- Preservation of birds and plants crucial to Hawaiian history, tradition, and natural heritage.

Major Impacts - Negative

No major negative impacts are expected to result from this plan. However The Nature Conservancy has identified two potential negative impacts:

- Introduction of non-native weeds to fence lines, trails, and monitoring transects.
- Very limited localized herbicide contamination.

IV. ALTERNATIVES CONSIDERED

The Nature Conservancy has considered decreased and increased levels of management activity. Through twelve years of monitoring and management of Waikamoi Preserve, The Nature Conservancy has determined that lower levels of management currently would be insufficient to provide protection from non-native ungulate and weed threats. Slowing the pace of management could jeopardize the progress made in controlling feral animals, weeds and other serious threats. A no-action alternative would cause the reduction of native Hawaiian ecosystems and the extinction of rare and endangered Hawaiian birds and plants. Increased levels of management are not currently possible due to funding and resource restrictions. The proposed project maximizes the current funding and resources and provides for an effective management of Waikamoi Preserve's native ecosystems.

V. PROPOSED MITIGATION MEASURES

The Nature Conservancy has developed a comprehensive protocol for reducing the potential for an accidental introduction of non-native weeds into the managed areas. This includes cleaning procedures for all clothing and gear to be used in native habitat; use of separate boots, clothing, and gear for different management areas (depending on the presence or absence of habitat modifying weeds); inspection of all items entering native habitat; and originating all helicopter flights from weed free landing zones.

Herbicide contamination will be avoided by following herbicide use and disposal protocols. Only extremely small amounts of non-restricted herbicide are used. (Use of restricted herbicides is currently not done. Restricted herbicides will only be considered as a last resort and then will only be applied according to labeled instructions and Federal and State law.) Application of all herbicide follows labeled use instructions, and concentrated quantities never exceed safe levels. Furthermore, our Invasive Plant Specialist is certified by the state Department of Agriculture's Pesticide Branch, and personally trains anyone who applies herbicides in Waikamoi Preserve. Lastly, the use of herbicides would only be employed after it has been determined that other weed elimination methods are not effective.

VI. DETERMINATION

No significant negative impacts to the environment are expected to result from the implementation of the proposed activities.

VII. FINDINGS, AND REASONS SUPPORTING DETERMINATION

The proposed activities are expected to benefit rare species and native natural communities both in the project area and on adjacent lands. For example, ungulate control will protect rare plants and rare natural communities from browsing, soil disturbance, and the spread of certain weeds in animal feces. In addition, active weed control in the project area will also help protect rare birds, plants and natural communities by ensuring an intact native habitat. Finally, active management of Waikamoi Preserve will promote a more stable water regime both in and below the project area by reducing the potential for rapid runoff from disturbed and degraded areas.

The risk of major negative impacts is very low. Through a rigorous cleaning and monitoring program, the risk of introduction or spread of new weed species by humans is minimal. Negative management-related impacts on historical resources in the preserve are expected to be negligible. And lastly, the risk of herbicide contamination is low due to the small amounts of herbicide used, the training of all people applying herbicides, and the following of all pesticide labels and state and federal laws.

Significance Criteria

To date, two poorly defined historical trails and one historical cabin have been identified in Waikamoi Preserve; no other historical structures have been discovered. Historically very few people were allowed into the upper elevations of the Hawaiian forest so it is unlikely that there are any historical structures within the preserve. However staff has been instructed to report anything that could be of cultural or historic importance. Everyday management does not pose a threat to any structures that may exist within the preserve. (Please refer to Historical/Archaeological and Cultural Sites in this document.)

Since its inception, Waikamoi Preserve has increased the public's access to the area. Previously, the preserve was a private cattle ranch with restricted access. As just one example of the number of people who have been educated on guided hikes in Waikamoi Preserve, during the period FY1995 to 1998, nearly 8000 people visited one of two interpretive trails in the preserve. (Please refer to Program 4: Public Outreach in this document.)

The Nature Conservancy is in full compliance with the letter and spirit of the law as stated in Chapter 344 of the state environmental policy. The efforts to establish the Waikamoi Preserve in order to protect Hawaii's unique plants and birds is at the forefront of the purpose of Chapter 344. The Nature Conservancy will continue to improve the environmental quality of Hawaii through its efforts in Waikamoi Preserve for many years to come.

The 5,230-acre Waikamoi Preserve is part of the 100,000-acre East Maui watershed. This region is the largest single source of harvested surface water in the state, with an average harvested flow of 60 billion gallons per year. Waikamoi Preserve represents the headwaters of the East Maui watershed and active management is essential in providing the necessary water for residential and agricultural use. A degraded native forest will increase the rate at which water exits the watershed and will necessitate the reconstruction of costly collecting stations to accommodate the more rapidly flowing water. An intact native forest will provide a cheaper source of water for Maui's residents and businesses.

Public health is improved through the management of Waikamoi Preserve. By removing feral ungulates, known carriers of water borne pathogens, a source of contamination is removed from

the public water supply. Furthermore, an intact forest increases the filtration of water flowing into Maui aquifers, and thus provides cleaner water.

As the majority of Waikamoi Preserve is not accessible by foot, there is no effect on population changes nor effect on public facilities. Waikamoi Preserve is located in a conservation district and therefore any development of infrastructure is strictly prohibited.

Our primary strategy for protection of Waikamoi Preserve is to reduce damage to native vegetation and soils by removing all feral ungulates. Ecoregion-wide protection significantly reduces environmental degradation by preserving Hawaii's native birds and plants.

State Historical Preservation Division and TNCH have agreed that management activities would involve little to no ground disturbance in the preserve. The cumulative impact of feral ungulate browsing and invasive pest weeds by far exceeds the minimal impact of our management activities. Feral ungulates damage native forests by eating the roots and disturbing native plants which are vital to the survival of the many rare, threatened and endangered birds and plants located in Waikamoi Preserve. The positive impact of The Nature Conservancy's strategy of fencing and feral ungulate removal has been evidenced in Waikamoi where a resurgence in rare and endangered plants has been seen.

Protection of the watershed, by elimination of feral ungulates that spread diseases, promotes better water quality. There are no management activities which effect ambient noise levels, but localized increases in noise do occur when helicopter travel to remote parts of the preserve are required. Management of Waikamoi Preserve will not affect air quality, as an intact forest helps the environment by absorbing carbon dioxide and, at the same time, by providing the oxygen we need.

Waikamoi Preserve will not negatively affect an environmentally sensitive area, or suffer damage as it is not located in a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal waters, etc. While The Nature Conservancy considers Waikamoi Preserve to be a sensitive area, it is *without* the management activities outlined in this document that the preserve will be negatively impacted.

Located on the upper area of Haleakalā's North Slope between the 4400' to 8400' elevation, Waikamoi Preserve does not affect scenic vistas and viewplanes. The only structures that could be seen in the preserve are fences. The vast majority of these fences are well below the canopy of the forest, and those that are not are so far from the public view as to be indiscernible as fences.

As there are no structures in the project area, management of Waikamoi Preserve requires only a modest amount of energy in vehicular and helicopter transportation to complete management projects.

Permits and Approvals

As outlined by the Rules Regulating Application, Approval and Administration of the Natural Area Partnership Program, the final EA, a partnership agreement (contract) and a long range plan are submitted to the Board of Land and Natural Resources for approval prior to project commencement.

In addition, the Maui program holds a current Wildlife Control Permit from DLNR, which is valid for one year from date of issue and is renewed yearly.

VIII. EA PREPARATION INFORMATION

This document was prepared by staff of The Nature Conservancy, in consultation with Randy Kennedy and Betsy Gagné, staff members in the Department of Land and Natural Resources, Division of Forestry and Wildlife, Natural Area Reserves System program. The primary EA preparer is:

Anders Frank Lyons
Natural Resource Manager
The Nature Conservancy
1116 Smith Street, Suite 201
Honolulu, Hawai'i 96817
(808) 537-4508

This environmental assessment incorporates many sections and figures from the Waikamoi Preserve Long Range Management Plan (e.g., all maps, descriptions of resources, and proposed activities). Please refer to the management plan for details pertaining to the project budget.

IX. APPENDICES

APPENDIX 1
COMMENTS RECEIVED DURING CONSULTATION
(AND RESPONSES)

MOLOKAI - LANAI SOIL AND WATER CONSERVATION DISTRICT



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Hoolehua, HI 96729
Phone (808) 567-6869
FAX (808) 567-9062



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Daniel K. Akaka
United States Senate
WASHINGTON, DC 20510-1103

Member
COMMITTEE ON ENERGY AND
NATURAL RESOURCES
COMMITTEE ON GOVERNMENTAL
AFFAIRS
COMMITTEE ON INDIAN AFFAIRS
COMMITTEE ON VETERANS AFFAIRS

December 9, 1999

December 15, 1999

Mr. Michael G. Buck, Administrator
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 224
Honolulu, Hawaii 96813

Mr. Michael G. Buck
Administrator
Division of Forestry and Wildlife
Department of Land and Natural Resources
1151 Punchbowl Street, Room 224
Honolulu, HI 96813

Subject: Comments on Draft Environmental Assessments for Kamakou Preserve, Moloka'i and Mo'omomi Preserve, Moloka'i, for Mo'omomi Preserve Natural Area Partnership

Dear Mr. Buck:

The Moloka'i - Lanai Soil and Water Conservation District would like to thank you for the opportunity to review the Draft Environmental Assessments for the Kamakou and Mo'omomi Preserves here on Moloka'i. These assessments seem to be adequate and the District has no comments at this time. However, we would like to take this opportunity to commend The Nature Conservancy of Hawaii and your agency for your continuing hard work and dedication to the protection and preservation of our precious natural resources here on Moloka'i.

Sincerely,

Paul K. Eila
Paul K. Eila
MLSWCD Chairman

Dear Mike:

Thank you for your recent letter soliciting comments on the Draft Environmental Assessments (DEAs) for reauthorization of various wildlife preserves as participants in the Natural Area Partnership Program. I will review the DEAs and, if necessary, provide comments for the record.

Thank you for continuing to keep my office apprised of your agency's activities. I look forward to renewing our partnership on various issues in the coming session of Congress.

Aloha pumehana,

Daniel K. Akaka
DANIEL K. AKAKA
U.S. Senator

TNCH DEA, NAPP

From: Dave.Hopper@efs.gov
To: kennedhged.org
Date: Wed, Dec 1, 1999, 11:25 AM
Subject: TNCH DEA, NAPP

Tue, Dec 7, 1999 9:56 AM

Rec'd 12-2-99

JAMES TOMO APANA
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

November 30, 1999

Mr. Michael G. Buck, Administrator
State Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 224
Honolulu, Hawaii 96813

Dear Mr. Buck:

SUBJECT: DRAFT EA FOR KAMAKOU, MO'OMOMI, AND WAIKAMOI
PRESERVES FOR REAUTHORIZATION AS PARTICIPANTS IN
THE NATURAL AREA PARTNERSHIP PROGRAM

Thank you for the opportunity to comment on the subject environmental assessments.

You may wish to include as a positive impact to this program that ungulate control also reduces downstream flooding concerns. As the County maintains some drainage facilities makai of these preserves, this program benefits downstream facilities and properties.

If you have any questions, please contact me at (808) 270-7845.

Sincerely,

DAVID GOODE
Deputy Director of Public Works
and Waste Management

DG:mt

To Randy Kennedy, NARS, DLNR; 1 Dec. 1999

Randy,

We reviewed the recent (23 Nov. 1999) DEAs for TNCH's preserves on Maui and Molokai (Kamakou, Waikamoi, and Mo'omomi). TNCH adequately addressed FWS comments that were provided by our office on 22 October 1999, and we will make no further comments.

Dave Hopper

JAMES "KIMO" APANA
MAYOR



OFFICE OF THE MAYOR
Ke'ena O Ka Mea

COUNTY OF MAUI
Kalana O Maui

December 21, 1999

→ Randy K

200 South High Street
Wailuku, Maui, Hawaii USA
96793-2153
Telephone (808) 270-7855
Fax (808) 270-7870
e-mail: mauiamayr@wailuku.net

Mr. Michael Buck, Administrator
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Buck:

RE: Draft Environmental Assessments for Waikamoi Preserve (Maui),
Kamakou Preserve (Molokai) and Moomomi Preserve (Molokai) for
Reauthorization as Participants in the Natural Area Partnership
Program

Thank you for the opportunity to provide you with comments on the
above-referenced Draft Environmental Assessments (DEA).

As a partner in this program, we support the reauthorization of the Natural Area
Partnership Program. We recognize the importance of these preserves and their need
for long-term management. This particular approach has shown itself to be an
effective tool in preserving our resources for the generations to come.

We believe the public participation aspects of the management plans are
especially important as it fosters a sense of community and adds to the effectiveness
of the program.

If you have any questions, please contact Mr. William Spence, Staff Planner, of
the Maui Planning Department at 270-7735.

Sincerely yours,

JAMES "KIMO" APANA
Mayor, County of Maui

Mr. Michael Buck, Administrator
December 21, 1999
Page 2

JA:WRS:cmb

c: John E. Min, Planning Director
Brian Miskae, Executive Assistant to the Mayor
William Spence, Staff Planner
Mark White, Maui TNC
Project File
General File
S:\ALLI\WILL\AAACORES\BUCK3.WPD

MONIKA A. CATTIEN
DEPARTMENT OF NATURAL RESOURCES



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DRAFT ENVIRONMENTAL ASSESSMENT DIVISION
101 Kamehameha Boulevard
Honolulu, Hawaii 96813

MONIKA A. CATTIEN
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DRAFT ENVIRONMENTAL ASSESSMENT DIVISION
101 KAMEHAMEHA BOULEVARD
HONOLULU, HAWAII 96813

January 10, 2000

MEMORANDUM

LOG NO: 24696 ✓
DOC NO: 9912CD22

TO: Mr. Michael G. Buck, Administrator
Division of Forestry and Wildlife

FROM: Don Hibbard, Administrator
State Historic Preservation Division

SUBJECT: Chapter 6E-42 Historic Preservation Review of the Draft Environmental Assessment (DEA) for the Waikamoi Preserve/Natural Area Partnership Kaliainui Ahupua'a, Makawao District, Island of Maui
TMK: 2-3-05:004

Thank you for the opportunity to comment on your letter of October 5, 1999. Our review is based on reports, maps and aerial photographs maintained at the State Historic Preservation Office; no field inspection was made of the subject property.

A search of our records indicates no archaeological inventory surveys have been conducted within the boundaries of the Waikamoi Preserve. However, we note the recently submitted Draft Environmental Assessment contains a section of background research indicating three historic sites (Waikau and Ainahou trails and Waikau Cabin, which has since burned down) are located within the preserve. We further note the Nature Conservancy has agreed to have a qualified archaeologist survey the cabin site before conducting any ground altering activities in the area.

In previous correspondence from this office during our review of the preparation of an environmental assessment for the Waikamoi Preserve (SHPD DOC NO: 9312AG22) we requested that the environmental assessment include a section establishing the likely settlement pattern or land use of the area during the pre-Contact period in order to predict the likelihood of historic sites being present, and the possible nature and distribution of these sites. We presume the archaeological survey will contain this information.

Also we request that should any new management activities involve ground altering activities, we be provided the opportunity to review the plans prior to their commencement.

Please call Cathleen Dagher at 692-8023 if you have any questions.

CD:jk

c: Ms. Liz Gordon (fax: 378-4423)

MONIKA A. CATTIEN
DEPARTMENT OF NATURAL RESOURCES



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DRAFT ENVIRONMENTAL ASSESSMENT DIVISION
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DRAFT ENVIRONMENTAL ASSESSMENT DIVISION
101 KAMEHAMEHA BOULEVARD
HONOLULU, HAWAII 96813

January 28, 2000

MEMORANDUM

LOG NO: 24793 ✓
DOC NO: 0001CD38

TO: Mr. Michael Buck, Administrator
Division of Forestry and Wildlife

FROM: Don Hibbard, Administrator
State Historic Preservation Division

SUBJECT: Clarifications Regarding the Chapter 6E-42 Historic Preservation Review of the Draft Environmental Assessment (DEA) for the Waikamoi Preserve/Natural Area Partnership Kaliainui Ahupua'a, Makawao District, Island of Maui
TMK: 2-3-05:004

Pursuant to the recent telephone conversation, January 26, 2000, between Cathleen Dagher of our office and Alenka Remec, of the Nature Conservancy, we would like to provide the following clarifications of our review comments for the DEA prepared for the Waikamoi Preserve/Natural Area Partnership (SHPD DOC NO: 9912CD22, 10 January 2000).

We concur with the Nature Conservancy's commitment to conduct an archaeological inventory survey of the cabin area, prior to any land altering activities in that area. As we commented previously (SHPD DOC NO: 9312AG22), we would recommend that a background study also be done which would include a discussion of the settlement pattern (pre-Contact and early historic land-use) of the area in order to determine the likelihood of historic sites being present and the possible nature and distribution of these sites. Thus, the report documenting the results of the inventory survey can also incorporate the results of the background study.

Finally, we note that you intend to install a number of fencelines (Draft Environmental Assessment, November 5, 1999; p. 18) but, as of now, do not have more specific information on each fence line corridor. Therefore, as the Waikamoi Preserve has not undergone an archaeological inventory survey, we would request the opportunity to review and comment on each fence line corridor as plans become available in order to determine what affects, if any, the fence may have on significant historic sites.

Please call Cathleen Dagher at 692-3023 if you have any questions.

CD:jen

c: Ms. Alenka Remec, Nature Conservancy (fax: 545-2019)
Ms. Liz Gordon, Haleakala National Park (fax: 378-4423)

The Nature Conservancy
of Hawai'i
1116 Smith Street
Honolulu, Hawaii 96817
Phone (808) 537-4500
Facsimile (808) 545-2019

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February 23, 2000

Mr. Don Hibbard
Administrator
State Historic Preservation Division
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Subject: Draft Environmental Assessment for Waikamoi Preserve Natural Area Partnership

Dear Mr. Hibbard:

Your memoranda of January 10 and 28 to Michael Buck [SHP DOC NO's: 9912SC13 and 00001CD38] were forwarded to The Nature Conservancy for response. Thank you for your careful review of our draft assessment and for your well-considered suggestions regarding management planned for Waikamoi.

As discussed with your staff and documented in your memorandum of January 28, 2000, the Conservancy is committed to conducting an archeological inventory survey of the cabin area prior to any land altering activity in that area. Such a survey would also include a background study of possible pre-contact settlement patterns. However, at this time, we have no plans for any land altering activities in the cabin area.

In addition, the Conservancy will inform your agency on the specific location of any future fencelines and will work with your staff to determine what effects if any, the fenceline may have on significant historic sites. For your additional information I have attached the EA that was completed in 1996 for the majority of these fencelines.

Again, thank you for your response.

Sincerely,

Alenka Remec
Director, Science and Stewardship Operations

enclosure

cc: Mike Buck, DLNR
Randy Kennedy, DLNR
Betsy Gagné, DLNR
Mark White, TNCH Maui
Anders Lyons, TNCH Maui

JAMIN J. CAVETANO
CONTROLLER



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

228 SOUTH BERTANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 588-4188
FACSIMILE (808) 588-4188

December 21, 1999

Mr. Tim Johns, Chair
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Johns:

Subject: Draft Environmental Assessment for the Kamakou,
Mo'omomi, and Waikamoi Preserves Natural Area
Partnership, Molokai and Maui

Thank you for the opportunity to review the subject document. We
have the following questions and comments.

1. Please include a list of all approvals (State, Federal,
County) required for the project in the final environmental
assessment.

Should you have any questions, please call Jeyan Thirugnanam at
586-4185.

Sincerely,

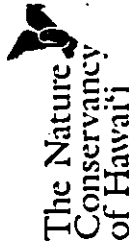
Genevieve Salmonson
Genevieve Salmonson
Director

c: Nature Conservancy

The Nature
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of Hawaii
1115 South Street
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Harriet K. Springer

The Nature
Conservancy
International
Headquarters
1215 N. J Street N.W., Suite 100
Washington, D.C. 20005-1006
http://www.tnc.org



February 22, 2000

Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Dear Ms. Salmonson:

Subject: Draft Environmental Assessment for Waikamoi, Kamakou and Moomomi
Preserves Natural Area Partnership

Your 1/22/99 memorandum to the Department of Land and Natural Resources was
forwarded to The Nature Conservancy for response. In the Final Environmental
Assessment we have added a statement under the section "Findings, and Reasons
Supporting Determination" that clarifies the needed approval for this project to proceed.

Under the "Rules Regulating Application, Approval and Administration of the Natural
Area Partnership Program," the partnership agreement (contract and long-range plan) is
submitted to the Board of Land and Natural Resources for final approval prior to
project commencement.

TNC also holds a current Wildlife Control Permit for night-time hunting of deer on
Maui. This permit is valid for one year and is renewed annually.

Thank you for your comments. Please contact me at 537-4508 if I have not adequately
addressed your concerns.

Sincerely,

Alenka Remec

Alenka Remec
Director Science and Stewardship Operations

cc: Mike Buck, DLNR
Randy Kennedy, DLNR
Betsy Gagne, DLNR
Mark White, TNCII Maui
Anders Lyons, TNCII Maui



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*Randy K
Betty J*

23 December, 1999

Department of Land and Natural Resources
State of Hawaii
Division of Forestry and Wildlife
1151 Punchbowl Street
Honolulu, Hawaii 96813
Via FAX: 587.0160

The Nature Conservancy of Hawaii
1116 Smith Street Suite 201
Honolulu, Hawaii 96817
Via FAX: 545.2019

Re: Draft Environmental Assessment
Mo'omomi Preserve (Molokai)
Natural Area Partnership
And
Draft Environmental Assessment
Kamakou Preserve (Molokai)
Natural Area Partnership
And
Draft Environmental Assessment
Waikamoi Preserve (Maui)
Natural Areas Partnership

Animal Rights Hawaii (ARH) is responding to the above mentioned draft environmental assessments for the continued contractual relationship between the State of Hawaii and the Nature Conservancy of Hawaii (TNCH)

ARH has grave reservations regarding the proposed contract's empowerment of TNCH as well as other various government agencies to utilize animal control methods which are universally considered inhumane, cruel and useless in the long range plan to remove introduced species from the above mentioned properties.

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We have, in the past, implored TNCH to use its vast private resources, as well as those tax payer funded monies awarded by the State of Hawaii, to find and implement humane, effective, long-range programs (such as already available immunosterilisation) towards re-establishing a friendly environment for native species.

We have also stated that the invasion of large portions of lands in Hawaii by herds of cattle and the devastation of native forests in the clearing of lands for these cattle, as well as the resulting pollution of lands by cattle dung and runoff and pollution resulting from slaughter and processing, have created massive environmental degradation far worse than that produced by introduced animals. The State of Hawaii continues to ignore the environmental dangers of the livestock industry in Hawaii and chooses to concentrate on its own program of ethnic cleansing against animals who have no lobbying power nor wealthy donors to speak for them.

Although the goals of the proposed EAs (to protect native species) are worthy, the methods, including maximum kills of cats, pigs, deer, goats and rodents and mongooses, are cruel and unacceptable.

ARH hereby states our intention to participate in the planning and evaluation process for any and all programs involving animal control in activities by the State of Hawaii and its partners in land management. Please include us in your consultation list.

Truly,

Cathy Goeggele
Director, Research and Investigations

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February 22, 2000

Cathy Goeggel
Director, Research and Investigations
Animal Rights Hawaii
P.O. Box 10845
Honolulu, HI. 96816

RE: Response to the Draft Environmental Assessment for Waikamoi Preserve

Dear Ms. Goeggel,

Your letter to the Department of Land and Natural Resources was forwarded to The Nature Conservancy of Hawaii (TNC-H) for response. Thank you for responding to our request for comments on the Draft Environmental Assessment for Waikamoi Preserve.

While feral cattle are causing damage to Hawaii's native ecosystems in some areas, they have been excluded from Waikamoi Preserve for a long time through our use of fences. Cattle therefore are not considered a threat to the preserve. There are, however, introduced animals such as pigs, goats, and deer which continue to destroy our native ecosystems, and these are the targets of our control efforts. Because of the heavy damage these animals inflict on our native forests, their presence in our preserve is cause for great concern.

Feral animals continually eat away and otherwise disturb the understory that provides for new forest growth. Over time, the regeneration of new trees ceases, while existing trees grow old and die. Without native trees and plants, the birds begin to disappear, slowly at first and then more rapidly. For the forest, and the native plants and animals that live there, what is occurring is a cruel and lengthy death sentence.

Statewide we have seen over half of our native habitat destroyed in just 1500 years, and historic accounts of the native bird population show their range diminishing at incredible rates. In Waikamoi Preserve alone we have seven species of native birds that are endangered or rare. In light of these facts, our effort to protect the remaining native habitat is essential.

We employ several tools in managing our preserves. Fencing off an area to be protected is integral to our management efforts. Fencing keeps pigs out and reduces the number of pigs that need to be removed from our preserve. We also employ a variety of one-way gates, which provide the pigs inside the preserve access to the outside. Second, we encourage public hunters to hunt in the more accessible areas of the preserve. While hunting has its own opponents, this method has been accepted as appropriate by the Humane Society of Maui. In addition to public hunters we use contract hunters -- paid professionals who do intensive hunting and harvest all meat. As an initial tool in removing pigs from an area we have also flown public hunters into remote areas. While this strategy is effective with high populations, it becomes less effective as populations diminish. Snaring is only used as a last resort in the most fragile and remote areas where no other method has proven effective.

The Hawaii Department of Land and Natural Resources, the National Park Service, The Nature Conservancy, and others have worked for many years developing effective control programs to reduce the devastating effects of pigs and other alien species invading our forests. The National Park Service, especially, has conducted major research in Hawaii on hunting, trapping, baiting, snaring and other feral animal control methods. We have collaborated with experts elsewhere in the United States and abroad, taking advantage of this collective knowledge to develop our current program. We have learned that both for the protection of the forest and to minimize the number of feral animals that must be killed, control programs must be very aggressive. An effective control program must use a variety of methods to first reduce the feral animal population in an area to very low levels as quickly as possible, and then to keep it low.

We are dedicating staff and funding to search for additional control methods that can replace snaring. There are several possibilities, but it will be some time before they are practical for Hawaii.

Commonly proposed alternatives to snaring such as poison and birth control are opposed by many and are not feasible. No poison of any kind is currently legal for pigs or goats in the United States. While birth control is theoretically possible and has been applied to many mammal species in controlled settings, it is not yet practical for use in remote, wild populations. We recently supported a project to develop a vaccine for immunization of pigs. The findings show that a contraceptive (not sterilization) effect was achieved in 50% of the animals. However, the vaccine must be delivered by injection and needs to be re-administered by two specifically timed boosters. Thus, such a method, while technically possible in a controlled environment, is not practical in a dense rain forest setting with free-ranging, wild populations. Also, there are serious concerns about the impacts these animals would continue to have on the environment while they remained alive. Nevertheless, we continue to stay abreast of contraceptive research and other developments as possible future alternatives.

Again, thank you for responding to our request for comments on the Draft Environmental Assessment for Waikamoi Preserve.

Aloha,

Alenka Remec
Director, Science and Stewardship Operations

Cc: Mike Buck, DLNR
Randy Kennedy, DLNR
Betsy Gagné, DLNR
Mark White, TNC-H Maui
Anders Lyons, TNC-H Maui

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December 21, 1999

Steven J. Araujo
PO Box 637
(808) 966-7215
Kurtistown, HI 96760

Michael Buck
Administrator
Division of Forestry and Wildlife
DLNR
1151 Punchbowl St
Honolulu, HI 96813

Dear Mike,

Thank you for the opportunity to provide testimony on the Re-assessment for the reauthorization of TNCH's application for the Natural Area Partnership Program.

These plans are not well written management plans. There are many discrepancies and repetitions as mentioned in some detail. (See attached sheets.) All of these plans should be re-written and detailed. There should be accounts for actual problem areas-size, etc., amount of man-hours, amount of herbicides used, type(s) of herbicides used, and approximate total cost of projects etc. It is suggested that until this is done and again sent out for public review, all renewals for this Partnership should not be reauthorize.

I do believe that public comment on matters such as these should be made more public friendly. Meaning that, the vast majority of the public has no idea of this sort of happenings. Perhaps public advertisements such as newspapers, etc., might be the method of delivery. Public comments need to come from the general public and not only certain interest groups. What happens in Hawaii affects all of the people and all of their generations. These programs are publicly funded and information regarding these programs and the use of funds should be made more available to the public. Therefore, DLNR should do its utmost to provide the general public with full information on the happenings that are occurring and will possibly occur in the State of Hawaii.

Please provide me with answers to all of my questions and concerns that I have given to you on the attached sheets. I would also like to know as stated in HRS 195-6.5 Natural Area Partnership Program (b) if their was a transfer of fee title or conservation easement granted to the State by TNCH? Please reply as soon as possible. Thank you.

Sincerely,

Steven J. Araujo

Steven J. Araujo
cc. Tim Johns (BLNR Chairman)
Betsy Gagne (Secretary of NARS Commission)
Randy Kennedy (Native Resources Program Manager)
Other interested parties

Waikamoi

Page 6: Natural Communities- Of these 14 communities, who is it that considers 2 communities rare?

Page 10: Sensitive Habitats- This section talks about Sensitive Habitat in Haleakala National Park and adjoining lands. What does this have to do with Waikamoi? It has also been mentioned at a program called after dark in the park on July 11, 1999 that the term Sensitive Areas were conjured by National Park Administration to receive more funds for their programs. These minutes are on video file at Volcano National Park. Is TNCH and BLNR and DLNR aware of this? If not, the suggestion is to become aware and not get caught up in something you don't want to be caught in.

Page 11-19: As stated through out these pages, for ten years, snaring and contract hunting has been the strategy used to reduce game mammal populations except in unit 1a where it states that game mammal populations have not been reduced. Under heading Status of Public Hunting it states that ranch employees have the hunting priority and that TNC Reserves the right to close all areas to hunting.- I will remind you of HRS 195-6.5 where it states (2)(A)(B):

...The management plan shall include provisions to allow public hunting wherever feasible; provided that:

- (A) Hunting activities shall be in compliance with applicable laws; and
- (B) Game animals shall not be introduced to any partnership area and hunting shall be conducted as a conservation purpose of this program.

I would also like to mention that 195-6.5 mentions nothing about total eradication or use of snares and contract hunting. This might be in violation of the law. The rest of this writing is not a management plan for a specific area. It talks about other partners and corporation with other agencies and for education, and areas outside the reserve.

Kamakou

Page 5: Native Flora- States Kamakou is home to 35 rare plant taxa. But only 18 are federally listed as endangered. Then why are the remaining 17 plant taxa considered rare and by whose determination creates them to be rare?

Page 9: Management Considerations- Please explain to me how prior to 1982 the Kamakou Preserve area was part of the States Molokai Forest Reserve and how TNCH has gained the right to manage this area under the natural area partnership program and apply for funding under this program?

Page 10: #5 states- part of the area is closed during herbicide spraying. Is this a wise management decision reason being pg. 5 states this area is a ground water recharge and surface water source area. Have any water samples been taken and been tested for contamination? Also as written this sounds like broadcast spraying. Are these areas checked for native invertebrates that may be in the spray zone before herbicide is applied?

Page 8-10: Sensitive Areas- What are these sensitive areas? What types of plants incorporate the areas and where are they? What are traditional collection levels? Who determines the levels of the specific items collected?

Page 13: Lower Accessible Areas- Why are these tree plantations included within the preserve? Weren't these trees planted for future harvest and income for the State? This area should be removed from this preserve.

Page 14: Last Paragraph- Here it states that a fence line was completed in 1995 to monitor vegetation changes. Data was compiled from 1995-1997 and states that visual observations indicate that the fence is working, activities most prevalent outside the fence. Was this fence constructed to monitor vegetation changes or mammal activity? As stated, vegetation changes. So does this mean that the activity of vegetation changes, growing, seeding, etc., is most prevalent outside the fence?

Page 16: Status of Public Hunting- What is the status of public hunting? All this short paragraph states is that these areas are open to public hunting 7 days a week with no bag limit and closed during certain hazardous times.

Page 17-28: The rest of these pages repeats what was previously written with the addition of monitoring programs incorporated into different paragraphs.

In conclusion this plan should be rewritten and more detailed descriptions management actions outlined in the plan. Furthermore it is TNCH that has and is advocating at meetings, in their newsletters, and other publications that most native species are found nowhere else on earth. If these species are found nowhere else on earth, then how can TNCH give these species a global ranking(G-1,G-2,G-3)?

Mo'omoi

Page 5: Native Flora- If 8 of 25 taxa are rare and actually only 5 are federally listed on the federal endangered species list. How and who considers the rest rare? The species *Marsilea Villosa* hasn't been found on the preserve since the 1970's and was "rediscovered" west of the preserve. Then how can one say that this plant is one of the 25 native plant taxa that occurs in this preserve?

Page 8: Where is the fire plan?

Page 10: What is the traditional collection levels? Who determines the level of specific species collected and the traditional collection level?

Page 11: Ungulate Control Timeline- Under this heading it states TNCH will assist Molokai Ranch with maintenance of barbed wire cattle fence. On page 9 under Management Considerations it states that TNCH and Molokai Ranch have a fencing agreement that states the ranch is responsible for repairing fence breaks.

To access the need for future fencing for deer and to complete studies on the effects of deer on the native vegetation without allowing public hunting is ridiculous. By having game mammals in a fenced off area without an adequate public hunting program to keep the mammals under control these animals will have a heavy impact on the vegetation. Or is this study intended to prove that these animals need to be eradicated as stated in all the other studies done on game mammals and native vegetation?

Page 11: Weed Control- If *Reichardia* has become a problem in the past 3 years. What was the size of the area then and the size of it now? Why does it state that by removing *kiawe* clumps that other weeds may invade these areas and that cattle can facilitate weed invasion by disturbing the ground? If cattle hoof depressions and grazing facilitate weed invasion the isn't it a sure fact that the *kiawe* clump removal will have the same or even worse results? So what's the need for monitoring?

Page 12: Weed Control Timeline- TNCH for many years has been emphasizing the degradation of native vegetation by non native species. Since this is known by TNCH there should be no need for monitoring. A comprehensive, realistic management plan should be written and realistic management carried out.

Program 2: If data was collected from 1992 and compiled in 1998 then what is the result? In the second paragraph, it is stated that aerial photographic monitoring might be incorporated then goes on to say this type of monitoring would determine when control should begin. Isn't control supposed to be an ongoing activity?

The third paragraph mentions specific research with permits were done on preserve. What are the research projects and their findings and why aren't they stated?

Pages 14-16: As stated TNC is working with Molokai community groups on management of this preserve, then what have these groups come up with and why isn't it in this project plan renewal?

Page 18: VII findings- Here it states that weed control will help protect rare dune ecosystems but on page 17 under Major Impacts-Neg. it states that by removing weeds it could be destabilizing to the sand. Which is it? Here it also states that TNC's management of this preserve helps prevent over harvesting of coastal resources, but states above that the coastal management laws are not under their jurisdiction. They also state on page 11 that there is limited resources for enforcement, so on that case, how can TNC state that their management prevents over harvesting? Also, bag limits are only set for certain coastal resources, not all.

Page 19: Significance Criteria- Here it states that approximately 500 people visit this preserve every year. Then it goes on to say that there are no facilities or plans to create facilities on the preserve. It also states that preventing cattle from entering the preserve would cause less cattle fecal waste on the ground. The major question here is, which fecal waste is more environmentally and humanly harmful? Where does the human fecal waste go?

In conclusion, TNC should rewrite this proposal and write a comprehensive detailed management plan for this preserve. This plan is not even a management plan. How can anyone say that this is a 6 year management plan. Noting from fig. 2 map, this preserve is more than 75% non-native, which means that only a very small portion of this area should be considered a natural area. Where is the plan? If the partnership should continue, then the non-native areas should not be included in the 2 for 1 State funding. Although this area contains paleontological and archaeological sites, I believe that this does not fall under the chapter providing the partnership funds. TNC should inquire with other agencies to seek funding to manage this portion of their preserve, including road maintenance. Also, it is TNCH that has been advocating at meetings, in newsletters and other publications that most of these native Hawaiian species are found nowhere else on earth. If these species are found nowhere else on earth, then how can TNCH give these species a global ranking (G-1, G-2, G-3)?

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
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1151 PUNCHBOWL STREET
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Timothy E. Johns
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY

Janet E. Kawelo

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HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

February 8, 2000

Steven J. Araujo
P.O. Box 637
Kurtistown, HI. 96760

RE: Waikamoi, Kamakou and Moomomi Draft Environmental Assessment

Dear Mr. Araujo,

Thank you for responding to our request for comments on the Waikamoi, Kamakou and Moomomi Draft Environmental Assessment. Your letter has been forwarded to The Nature Conservancy of Hawaii (TNCH) who have responded in detail to your inquiries.

In the letter, you indicated that:

1. "The management plans are not well written and should include more specific details about the day to day operation of the Preserves". These plans were written for the initial application of the Preserves into the Natural Area Partnership Program (NAPP) six years ago and meet public review at that time. They have been updated to reflect current management goals and objectives, which are very similar today as then -- to protect and preserve Hawaii's unique native resources on private lands. The format and level of detail for the management plans are that used by TNC both in Hawaii and nationally and in fact have been used extensively in Hawaii by other managers of conservation lands.

2. "Public comments on the re-authorizations of NAPPs should be made more public friendly". In the case of the re-authorizations of these contracts, the public has opportunities to comment at the NARS Commission meeting, the Environmental Assessment process which is advertised through the OEQC Bulletin, and the BLNR meeting.

Your other comments have been addressed in TNCH's response letter.

Thank you again for your response to our request for comments.

Aloha,

A handwritten signature in cursive script, appearing to read "M. Buck".

Michael G. Buck
DOFAW Administrator



February 5, 2000

Steven J. Araujo
P.O. Box 637
Kurtistown, HI. 96760

RE: Draft Environmental Assessments for Waikamoi, Kamakou
and Mo'omomi Natural Area Partnerships

Dear Mr. Araujo,

Your letter dated December 21, 1999, to the Department of Land and Natural Resources was forwarded to The Nature Conservancy of Hawaii (TNC) for response relative to TNC's activities. Thank you for taking the time to review the Waikamoi, Kamakou and Mo'omomi Preserves Draft Environmental Assessments (EAs) and for providing comments for us to consider in preparation of final EAs for these projects. We would like to respond to the concerns detailed in your letter:

WAIKAMOI:

First, "...*(Was) there a transfer of fee title or conservation easement granted to the State by THE CONSERVANCY?*" The Waikamoi Preserve, as shown on page 6 of the draft EA, was established when Haleakala Ranch granted The Nature Conservancy a permanent conservation easement. Haleakala Ranch maintains the fee title to that tax map key (TMK). Under HRS 195-6.5 (b) (1), to qualify under this program an applicant shall be a landowner or a cooperating entity of private land of natural area reserve quality and shall agree to "dedicate the private land in perpetuity through a transfer of fee title or a conservation easement to the state or a cooperating entity." In the case of Waikamoi, the Conservancy is the cooperating entity that was granted a conservation easement from the landowner.

Second, Natural Communities:

Fourteen terrestrial native natural communities are represented in Waikamoi Preserve, two of which are considered rare: Deschampsia Subalpine Metic Grassland and Māmane (*Sophora chrysophylla*) Subalpine Dry Forest. The Heritage Program and biologists familiar to Waikamoi have recorded these two natural communities as being rare because they occur only in the Waikamoi area and no where else in the world. Both rare native shrublands have less than five existing locations worldwide. Please

refer to the definitions of the Heritage Global Rankings and the Federal Status on the enclosed Hawaii'i Heritage Program document.

Third, *What do sensitive habitats in adjoining lands, like Haleakala National Park, have to do with Waikamoi?*

The entire native habitat found on Haleakala's north slope is considered sensitive because it represents native resources that have been reduced by more than half during the past 1,500 years. This dramatic reduction has been brought about by human as well as feral animal presence, and by invasive non-native plant species, which have greatly expanded their range. Once this native forest is lost, no amount of effort will bring it back. The proposed management activities contained within the draft EA are aimed at ensuring the long-term protection of the native habitat and its resources. The potential negative effects of management activities, such as the introduction of non-native plants along newly constructed fences, trails, and monitoring transects, are reduced by following strict cleaning protocols for all items transported into the preserve. Furthermore, any management activity that might impact neighboring sensitive habitats in Hanawi NAR, Haleakala National Park, or other private lands will be discussed and examined with the appropriate staff from these organizations.

Fourth, Hawaii Revised Statutes 195-6.5:

The portion of HRS 195-6.5, that you have quoted, reads in its entirety: [In order to qualify under this program, an applicant shall...] "Have the land managed by the cooperating entity or qualified landowner according to a management plan prepared by the cooperating entity or landowner and approved by the board that meets the standards established by the department for the system. The management plan shall include provisions to allow public hunting wherever feasible; provided that:

- (A) Hunting activities shall be in compliance with applicable laws; and
- (B) Game animals shall not be introduced to any partnership area and hunting shall be conducted as a conservation purpose of this program."

The central goal of the Natural Area Partnership Program is the protection of Hawaii's native ecosystems, and all management activities undertaken should directly contribute to that goal. In Waikamoi Preserve, the conservation easement between the Conservancy and Haleakala Ranch allows ranch employees hunting privileges as long as there is game to hunt. This is a private contractual condition to the Conservancy's right to protect the property under the conservation easement and is not in any way connected to the NAP program. Public hunters willing to follow guidelines, sign a liability waiver, and complete a volunteer form will be allowed to hunt in Unit 1A of the preserve on a limited basis (when hunting will not interfere with ongoing management activities, planned guided hikes, and hunting by ranch employees). Under these circumstances, limited volunteer hunting opportunities are available at Waikamoi Preserve. However, it should be understood that our goal is to remove all ungulates in the preserve, and no area within Waikamoi Preserve will be considered a sustained yield hunting area. At

times, hunting in other areas of the preserve has also been possible when it could be combined with our management activities.

Finally, the items you mention -- partnerships, working in cooperation with other agencies for education, and areas outside the reserve -- are all aspects of a management plan as specified by the "Rules Regulating Application, Approval and Administration of the Natural Area Partnership Program," Chapter 210 of title 13, Hawaii Administrative Rules. These rules were enacted by the DLNR pursuant to HRS 195-5 "Rules and Regulations." The NAPP rules also mention that a management plan should describe programs, including non-native species control among others. It should also be noted that, as stated by law, all NAPP plans are subject to final approval by the Board of Land and Natural Resources (BLNR) prior to implementation.

KAMAKOU

Native Flora:

Page 5: The Hawai'i Natural Heritage Program and biologists familiar to the Kamakou area have identified the 35 plant taxa as being rare due to the number of populations in the world. The 35 plant taxa are all considered rare with or without federal endangered species designation. The Heritage Program states the facts of the species and does not manipulate or judge whether a species is rare or not. The number of population locations, number of individuals, and immediate threats determine the rarity of each species. The remaining 17 plant taxa are considered rare due to the above criteria. Even though they are not considered federally endangered today, they may be designated endangered in the near future. Many of these 17 species have a federal designation as "Species of Concern" (SOC). The SOC designation is the first step in identifying species that may be considered endangered. (Please refer to the enclosed Hawai'i Heritage Program document for a definition of the Heritage Global Ranking System and Federal Status.)

Management Consideration:

Page 9: In 1982, Molokai Ranch, Limited, transferred a conservation easement to The Nature Conservancy to manage the Kamakou Preserve area as a nature preserve. Molokai Ranch was and still is the landowner of the Kamakou Preserve area. The Ranch has a previous forest reserve surrender agreement with the State of Hawai'i. However, the conservation easement amends the surrender agreement that allows the Conservancy to manage the area for the purpose of a nature preserve. The Kamakou Preserve qualifies for the Natural Area Partnership Program (NAPP) because it is of natural area reserve quality, is owned privately, and the landowner, Molokai Ranch, has an easement with a "cooperating" conservation entity (the Conservancy). The Kamakou Preserve became a part of the NAPP program in 1995, thirteen years after it was established in 1982.

Herbicide use:

Page 10: The Nature Conservancy requires all use of herbicides to be in compliance with approved herbicide labels and State of Hawai'i Department of Agriculture regulations. In addition, targeted species are treated by spot treatment, not broadcast spraying. The rates of application are a fraction of the listed rates on the product labels, and application methods are designed to minimize any non-target impact.

Sensitive areas:

Page 8-10: As stated in Management Consideration #6, "TNCII-sponsored management activities increase access to these sensitive areas." A sensitive area would be any area that is relatively intact (primarily native plants and a few alien species) or an area with rare and endangered species. Because the native vegetation communities at our Kamakou Preserve are highly regarded by the scientific and conservation communities, the entire preserve's native plant communities would be considered sensitive to over-collecting.

Lower accessible areas:

Page 13: One of the main reasons the pine plantations were established was to stop erosion and increase watershed potential. These plantations are within the boundaries of the preserve for several reasons: 1) there are extensive native plant communities that surround the plantations; 2) some of the rarest native hardwood tree species are found in pockets of the lower pine plantations; and 3) the property's boundaries happen to include some of the lower pine plantation and the cost of subdividing these areas out would be cost prohibitive.

Fencing:

Page 14: The fence was constructed to control the movement of feral animals from the outside to the inside of the preserve. Monitoring (both animal activity/damage and vegetation changes/introduction) plays a key role in detecting changes that occur on both sides of the fence. We have noticed vegetation recovery on the inside of the fence with animal activity occurring only on the outside of the fence. We will adjust the wording in the final EA and the long-range plan to make this point clear.

Status of public hunting:

Page 16: At Kamakou, hunting is open all year round, which means you can hunt there anytime, and there is no bag limit, which means you can capture as much game as you want. Closure of the preserve during hazardous periods means hunting may be closed due to circumstances such as fires, unsafe road conditions, and herbicide application periods.

Management Programs:

Page 17-28: These pages contain more detailed descriptions of key management programs including weed control, natural resource monitoring and research, rare species protection, community outreach, emergency and safety and logistical and

Fireplan:
Page 8: As mentioned under Emergency and Safety programs, the Mo'omomi wildfire management plan is reviewed annually with the lead emergency agency (Molokai Fire Department) and the State Division of Forestry and Wildlife for the purpose of best coordinating activities in the case of wildfire. Copies are distributed to these agencies and Molokai Ranch, the adjacent landowner.

Collection of native materials:
Page 10: We advocate working with local native Hawaiian groups to develop practices that will sustain and conserve the natural resources while also allowing native Hawaiians to exercise their traditional rights. Conservancy-sponsored activities have greatly increased human access to the preserve and therefore we have an obligation to see to it that the Conservancy's own activities do not lead to over-collecting and negatively damage the resources.

Ungulate Control Timeline
Page 11: You have stated correctly that Molokai Ranch is responsible for the fence. However, because grazing cattle represents one of the most destructive forces to the dune ecosystem, we have taken a proactive approach to help the ranch monitor the condition of the fence. When we decide to help with the repairs, the Ranch provides all the fencing materials. Because of our proactive approach, Ranch personnel have become very responsive when we notify them that there is a breach in the fence and their cattle are encroaching on our preserve. The only feral animals within the preserve are axis deer. Presently, the cattle fence does not restrict the movement of deer in and out of the preserve. The studies are to find out how we should manage for deer in the preserve.

Weed control:
Page 11: *Reichardia tingitana* is a recent weed that has invaded a large part of the preserve. However, because *reichardia* is an annual plant and is only present for part of the year, we are not sure of the full extent of the invasion and are still learning how to manage it. Kiawe, on the other hand, is a weed with which we have extensive trial experience. Our biggest concern, as you have pointed out, is the potential invasion of other noxious weeds into the areas where we are removing kiawe. However, our studies show that the removal of kiawe fosters the growth of the native 'aki 'aki grass (*Sporobolus virginicus*). This has given us the evidence and confidence to end the trials and begin implementation of kiawe removal. Note that we are only removing clumps of kiawe that occur in native-dominated areas. In essence, we are removing an alien plant and adding increasing areas that will be native dominated. As for cattle grazing and trampling, they impact the native areas directly and introduce alien weeds (such as *reichardia*) through their manure.

Weed Control Timeline:
Page 12: I believe you are misunderstanding a section here. Natural Resource Monitoring is the beginning of a new section and is not part of the Weed Control

operational support. The NAPP rules mentioned in our responses under Waikamoi require that these aspects of management be described in the plan.

Re: Global ranking:
The Global Rank is an international ranking system developed by the Natural Heritage network. It determines the rarity of a species worldwide, and guides agencies to set priorities for protection. The ranking system is based on an element's number of occurrences and individuals, health, threats, etc. While the Heritage Global Ranking is independent from the U.S. Fish and Wildlife Federal List of Endangered Species, the USFWS often cites the Heritage Ranking to help convey the rare and imperiled status of a particular species. (Please refer to the enclosed Hawai'i Natural Heritage Program document for a definition of the Heritage Global Ranking System and Federal Status.)

In conclusion, the global ranking of Hawai'i's native species is an indication of the uniqueness of Hawai'i's endemic biota -- found nowhere else on the globe -- and a further reason why it needs to be preserved and protected, before it is too late.

MO'OMOMI

Native Flora:
Page 5: The Hawai'i Natural Heritage Program and biologists familiar to the Mo'omomi area have identified the 25 plant taxa as being rare due to the number of populations in the world. The 25 plant taxa are all considered rare with or without federal endangered species designation. The Heritage Program states the focus of the species and does not manipulate or judge whether a species should be rare or not. The number of known population locations, the number of individuals, and the immediate threats determine the rarity of each species. The remaining five plant taxa are considered rare due to the above criteria. Even though they are not considered federally endangered today, they may be designated endangered in the near future. Some of these five species have a federal designation as "Species of Concern" (SOC). The SOC designation is the first step in identifying species that may be considered endangered. (Please refer to the enclosed Hawai'i Natural Heritage Program document for a definition of the Heritage Global Ranking System and Federal Status.)

As for the *Marsilea villosa*: While species such as this may not have been recorded for a few years, they are still considered extant due to the likelihood of "rediscovering" the population or an individual species. In many areas, species with older observation dates are still considered possibly existing, either due to environmental factors, or because biological surveys have not been done, or because the area is extremely remote and access is difficult. For the *Marsilea*, environmental conditions must be adequate for the species to appear again. The *Marsilea* may lay dormant for many years, and requires heavy rains for the aquatic fern to multiply.

Timeline. Natural Resource Monitoring, or monitoring, is the way we measure changes of all resources over time. These changes act as a barometer and help us identify why the changes are occurring. We then apply this knowledge to our ongoing management efforts. As for the data that has been collected, we are in the process of analyzing it this year. We do not yet have the final results.

Research Summary:

Regarding research conducted in the preserve, please refer to the enclosed copy listing research activities on all Molokai preserves.

Community Groups:

Pages 14-16: As stated, we support the efforts of community groups that seek to manage natural resources. In the case of Mo'omomi, the focus of Hui Malama o Mo'omomi is on marine resources. The focus of the Conservancy's work at our Mo'omomi Preserve is on terrestrial sand dune ecosystems. We complement one another and are willing to work together for the betterment of the land and sea. A copy of the Mo'omomi Hui management document can be obtained through a request to the Hui.

Findings:

Page 18: The Kiawe example mentioned previously under weed control is the best example as to why weed removal is beneficial to the preserve. We will not be removing any weeds in a "clear-cut" manner that will expose vast amounts of bare dunes. Anything that directly destroys the native flora, like cattle, will have direct impact and result in bare, unstable dunes.

We are subject to State fishing/harvesting laws. The way the Conservancy contributes is by not allowing commercial harvest on the preserve, and by regulating access.

Significance criteria:

Page 19: Trips to Mo'omomi are predominantly day trips. Local fishermen are the main overnight visitors and we encourage them to bury their fecal waste. There are no plans to construct amenities. Mo'omomi is still a wild land and the Molokai community would like it to remain that way. We do try to exercise the utmost care of the area when taking visitors to our preserve.

The funds we request are for the management of the native areas within the preserve. We will restate in the Executive Summary of the final Long-Range Plan that we are looking for "other sources" of funding and expertise to manage the archaeological and paleontological resources. The global ranking as described previously under Kamakou is a further indication of the uniqueness of Hawai'i endemic biota -- found nowhere else on the globe -- and a further reason why it needs to be preserved and protected, before it is too late.

Finally, you have repeatedly included a blanket statement that calls for the rewriting of the Waikamoi, Kamakou, and Mo'omomi management plans because they are not detailed enough. These management plans are written as is dictated by the NAPP rules that govern this entire process. Land management is not a static activity; it requires frequent revision and development based on lessons learned from experience. That is why the process also calls for progress reports throughout the year to develop and adjust management practices. By providing a long-range plan and fulfilling the reporting requirements set out by the NAPP rules, The Nature Conservancy is in full compliance with the program.

Again, thank you for your response to our request for comments.

Aloha,



Alenka Remec
Director, Science and Stewardship Operations

Enclosures (2):

Hawai'i Natural Heritage Program (with List of Federal Status and Heritage Global Ranks)
Molokai Preserves Research

cc: Mike Buck, DLNR
Randy Kennedy, DLNR
Betsy Gagné, DLNR
Mark White, TNCH Maui
Anders Lyons, TNCH Maui
Ed Misaki, TNCH Molokai

Chuck Phillips
633 Kulike Road
Haiku, Maui 96708

Michael Buck
Div. of Forestry and Wildlife
1151 Punchbowl St.
Honolulu, Hawaii

Dear Mr. Buck,

Enclosed is a list of my comments on the draft EA. for the Waikamoi Preserve. Thank you for the opportunity to comment and I would appreciate a written reply in response to those comments. Also, please send me a copy of:

1. The conservation easement (Sept. 8, 1993) between Haleakala Ranch Co. and The Nature Conservancy, in it's entirety.
2. The "East Maui Watershed Partnership Management Plan," which is referred to in the first paragraph on page 26 of the long-range management plan for Waikamoi Preserve.
3. A copy of the allocation of \$490,000.00 that was made for "The Fence Project to Protect the East Maui Watershed."

Yours Truly,



Chuck Phillips

Chuck Phillips
633 Kulike Rd.
Haiku Maui 96708

Michael Buck
Div. of Forestry and Wildlife
1151 Punchbowl St.
Honolulu, Hawaii

Dear Mr. Buck,

The following are my comments on the draft Environmental Assessment (EA) for Waikamoi Preserve:

1. "Page 19. Status of Public Hunting Opportunities." The Draft EA clearly states that the conservation easement between The Nature Conservancy Hawaii (TNCH) and Haleakala Ranch allows ranch employees priority hunting privileges and that public hunting will be allowed only in unit 1 A and only if it does not interfere with hunting by ranch employees.

The draft EA goes on to say that there are approximately 50,000 acres available to public hunters below the preserve to meet public hunting needs and that TNCH reserves the right to arbitrarily close unit 1A to public hunting.

"Act 326, Section 1, Chapter 195 (b) (3). An Act for a Bill Relating to Natural Area Partnerships" states, "The management plans shall include provisions to allow public hunting wherever feasible; provided that hunting activities shall be in compliance with applicable laws; and provided further that game animals shall not be introduced into any partnership area and hunting shall be conducted as part of the conservation purposes of this program." TNCH. It is clearly in violation of this clause and has been since Waikamoi Preserve joined the Natural Area Partnership Program (NAPP).

TNCH's budget for Waikamoi Preserve FY2001 through FY2006 is three million forty-six thousand and two dollars (\$3,046,002.00). The states share of this budget is two million thirty thousand six hundred and sixty-seven dollars (2,030,667.00). This means that Waikamoi Preserve is budgeted to receive an average of three hundred and thirty-eight thousand four hundred and forty-four dollars (\$338,444.00) in public funds from the state of Hawaii for each of those six years. This does not include an additional sixty thousand and five hundred dollars (\$60,500.00) in FY2001 and another sixty thousand and five hundred dollars (\$60,500.00) in FY2002 to build a four mile axis deer fencing project.

TNCH's Waikamoi Preserve was admitted into the NAPP in May 1994 and has been publicly funded on a 2-1 matching fund basis ever since. The Natural Area Partnership Agreement, which TNCH made with the state when it joined NAPP, page 26.3.2(e)(1) states that in the event that the managing partner defaults on this agreement, all matching funds paid by the state in the previous 6 years shall be returned to the state with interest.

I feel that until TNCH complies with this clause(Act 326,Section 1,Chapter 195(b)(3)),all public funding should be curtailed.

2. My next area of concern is your use of steel snares as a method of animal control in which the trapped animals are left to die a slow lingering death of dehydration, starvation, shock and to be eaten alive by the insect larvae that hatch in the open cuts which are inflicted by the snare. If the logistics to monitor an animal trap are not available then that trap should not be set. The biologists and personnel connected with the Division of Forestry and Wildlife (DoFAW) and TNCH have consistently ignored input by long time residents and hunters and subsequently have underestimated the long distances in elevation over which the forest reserve could be fitted with one way openings that will allow the pigs to pass on their migration downward but prevent passage in the upward direction. These would be used in conjunction with a fence design that would guide the animals into the openings. The One way openings presently in use are of an inferior design, in the wrong places, far too few and far too far between. Given enough time and proper implementation, this method can eliminate the use of snares above the fences. The use of these contraptions should be classified as a felony rather than a standard operating procedure.

On page 17 you state that axis deer pose the greatest new long-term threat to Maui's native ecosystem. You state on page 18 and 19 that your goal is to eliminate axis deer from Waikamoi Preserve and other

strategic locations. Therefore, the methods of eradication, which are already being implemented, and those which are likely to be proposed should be clearly listed in the final EA.

On page 18, you state that a foreseeable adjustment may be the development of kennel and dog teams for pig and axis deer removal. I will point out that due to a sizeable number of young hunters who have recently reached the ages where they can hunt on their own rather than with a group of older hunters such as their fathers, the available hunting areas have become overtaxed, too few and too small for the expanding number of hunters. There are a considerable number of hunters with a large number of capable and well trained hunting dogs who would be willing to assist in this endeavor provided that they or their dogs would not be placed in danger by your eradication efforts or your use of rodenticides. Your proposed funding of a kennel and dog teams would not only be unnecessary but would also be a blatant misuse of public funds. Environment Hawaii, page 6, Nov. 1999 quotes knowledgeable sources as stating that "nighttime hunting from helicopters using special infrared goggles would almost certainly be required to make a meaningful dent in the population." In 1997 the Maui axis deer group (MADG) was formed by representatives of groups that share an interest in seeing the deer's range limited. Dr. Alan Kaufman DVM, a member of MADG and also a member of the American Wildlife Veterinarians stated, "Currently, the only effective method of wildlife population management of axis deer in Hawaii is through intensive organized hunting." I wholeheartedly agree and strongly urge that public hunting should be allowed in any and all accessible locations within the proposed areas of eradication to lessen the need to perpetrate such a needless slaughter of our wildlife, as aerial shooting would be.

The DLNR administrative rules page 123-7.513-123-9, nuisance or crop damage, states in essence, that the board must issue a permit authorizing the destruction or control of nuisance animals and that the method of destruction shall be stated on the permit. If you have this permit, please identify or if otherwise state the authorization that allows you to ignore this administrative rule in the final EA. Your record, as pertaining to cruelty to animals, is a disgrace.

3. I find the finding of no significant impact inappropriate. On page 32 you state, "Waikamoi Preserve's location at the headwaters of this watershed means that it plays a key role in the collection and distribution of water into streams and groundwater." Waikamoi Preserve's boundary is also approximately 1 mile from 2 large reservoirs which supply water to the upcountry area.

On page 20 you state, "Herbicides are used when they are our most effective method of achieving our long term goals." I assume that, by that statement, you are saying that herbicides are your standard method of weed control. On that page you also refer to the use of biological control initiatives. Of particular concern is your statement on page 26 that you hope to fund studies to develop other means of rodent control that involve the aerial broadcast of rodenticides in critical forest bird habitat."

I am aware that you have an introduced weed problem along the fence-lines and the helicopter landing pads which is worsening with time and could require considerable quantities of herbicide. This is one of the adverse impacts of fencing.

In a letter to the DoFAW in March 1999, I suggested the potential benefit of an environmental impact study which would evaluate the cumulative impact of the many miles of fence-line that presently cross our forest reserves, to include the impact of those fences still in the planning stages and the introduction of alien weed species that is perpetually inherent to these projects. In his written reply, Wesley Wong director of the DOFAW on Maui, stated that all legal criteria had been met and that no further study was necessary.

I believe that your network of fence-lines in conjunction with your tendency to over-manage will eventually be the root cause of problems far greater than those at hand and again I suggest that the impact of the construction of these many miles of fence-line and the maintenance of those fence-lines including the impact of herbicides, rodenticides, biological control initiatives, and any misc. toxic substances in use or in the planning stages in Waikamoi Preserve and the East Maui Watershed, as a whole, should be the subject of an Environmental Impact Statement. I suggest that these studies take place before it is too late to take advantage of the recommendations and the accumulated store of knowledge that such studies could bring to light.

I further suggest the cessation of all but the most critical of the aforementioned activities and the suspension of such activities until such time as the appropriate studies have been completed and made a matter of public record.

I also recommend that the final EA, of this and all other preserves contain descriptions and explanations of herbicide, rodenticide, and biological control programs to include the name and description of the product and technical data; quantity to be used; location and area of project; any long or short term

impact on the water supply to include the impact on water quality as related to pathogenic microorganisms produced by the putrefying carcasses of the rodents killed by these substances, the numbers of which would increase in correspondence to a sudden acceleration of your rodenticide programs by aerial broadcast or other means; studies on the impacts of these substances on native species including aquatic life, by both primary and secondary poisoning.

It is also possible that a public forum, where this matter can be addressed and comments can be taken, could be in order.

4. On March 22, 1999, I wrote a letter to the DoFAW in which I expressed my concern that these fence projects are not made available for competitive bidding.

On page 18 you state, "we will insure that five additional miles of East Maui Watershed fence are constructed on Halekai's North Slope and reduce pig damage above them." This I assume is a reference to phase 2 of the fence project entitled, "A Fence Project to Protect the East Maui Watershed." In my (March 22) letter to the DoFAW which was written shortly after the first of the 2 sections of phase 1 of this project was completed, I expressed my concern in regard to the excessive cost of this project. In his April reply, Wesley Wong states that fence construction in remote areas of the East Maui Watershed routinely costs one hundred thousand dollars (\$100,000.00) per mile.

Phase 1 of this project was recently completed at a cost of one hundred and seventy-eight thousand dollars (\$178,000.00) per mile. The 2.3 miles of Phase 1 of this project cost a total of four hundred and nine thousand five hundred and fifty-one dollars and fifty-one cents (\$409,551.51).

The funding comes from a 1995 state budget proviso (Act 218, SLM 1995, Part 2 Section 26). An allocation of \$490,000.00 has been made for this project.

In view of the fact that, according to figures received from RCUIL, the cost of phase 1 of this fence project has exceeded even Mr. Wong's overly inflated estimate by 78%, I request that the financial records of this project be made available for public review in the most minute detail available at your earliest convenience.

I feel that the cost of phase 1 of this project could be indicative of wasteful, incompetent and negligent management. It could also be an indicator of misuse of funds due to conflicts of interest, graft, embezzlement, theft and or an unlawful and secretive diversion of state funds.

A thorough and expedient investigation of this project could prevent the recurrence of a similar situation in the future, lead to the recovery of a portion of the misused funds and the prosecution of those responsible.

According to the publication entitled A Guidebook For The Hawaii State Review Process, page 34, putting any solid material on conservation land requires a Conservation District Use Permit. A representative of the DLNR told me that the DoFAW had not been required to obtain this permit for "The Fence Project to Protect the East Maui Watershed". I then wrote a letter to the Chairperson of Land and Natural Resources in which I inquired as to why the DoFAW was allowed to ignore this regulation. I was not afforded a reply.

5. Why are the revenues produced by commercial vendors used to reduce only the TNCH's one third of the operating budget of this preserve as stated on page 317? If revenues are produced, they should be used to reduce the total operating budget and lighten the public's share of the burden as well. All such commercial activities should be listed and described in the final EA., accompanied by a disclosure of all revenues both direct and indirect that are generated by or, in any manner, derived from these enterprises. After all, this is a partnership.

6. This preserve directly supports 15000 acres of state and private conservation land. In the final EA please identify the owner or owners of this privately owned land; specify how many acres of private property are included in this 15000 acre parcel; list all tax map key numbers; explain in detail their relationship with TNCH including descriptions of conservation easements, leases or any other transfer of ownership.

The conservation easements of all the Natural Area Preserves should be made available for public review. This should include all financial agreements between The Nature Conservancy, TNCH, and the owners of the preserve lands to include purchase price, promissory notes and all terms of payment. This is a reasonable requirement due to the fact that these transactions directly result in the acceptance of each Natural Area Preserve into the NAPP, and subsequent eligibility for public funding.

7. In it's Conservation District Use Permit application for a Special Management Area Permit (File # SH-57787-2028) to manage it's system of Nature Preserves, the TNCH states that it proposes to establish and maintain a privately funded system of Nature Preserves. This permit was approved by DLNR on 11/4/87. The TNCH states more than once in this application that these Natural Area Preserves will be completely privately funded.

Today, the operating budgets of these preserves are publicly funded by 2-1 state matching funds. On page 32, I was surprised to learn that the TNCH also receives 2-1 matching funds for it's office rent and that the TNCH intends to buy a TNCHI ownal office and base yard with 2-1 state matching funds. Please explain this plan, in further detail, in the final EA. The TNCH sounds, to me, more like a dependent than a partner.

Waikamoi Preserve as well as all the other privately owned Natural Area Preserves is funded by the state with public funds at a rate which is many times higher per acre than the states own publicly owned Natural Area Reserves. In reference to the under-funding of the Natural Area Reserves, an article in Environment Hawaii, page 1, Nov. 1999 states, "One can only wonder why the state treats the resources under it's care as some kind of unloved step children." I believe that the under-funding of the publicly owned Natural Area Reserves is a direct result of the over-funding of the privately owned Natural Area Preserves. The states priority and first responsibility should be to the publicly owned Natural Area Reserves. The publicly owned Natural Area Reserves should receive as much funding per acre as the privately owned Natural Area Preserves.

This regrettable situation is due to the relationship between the Legislature, the DLNR and the influential and powerful owners of the land on which these privately owned Natural Area Preserves are established, who operate in conjunction with the TNCH.

The owners of the land, on which these Natural Area Preserves are located, on Maui, are Haleakala Ranch Co., Maui Pineapple Co. LTD., AMFAC/MB, Hawaii Inc.

Each person can use this information to form his own opinion. My opinion is that this is, in its final essence, a betrayal of the public trust.

For discussion on these and related topics, visit our Web Site: <http://www.halehaku.com>

Thank you for the opportunity to comment.

Yours Truly,

Chuck Phillips

Chuck Phillips

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
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PROGRAM
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CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

February 8, 2000

Chuck Phillips
633 Kulike Road
Haiku, Hawaii 96708

Re: Waikamoi Draft Environmental Assessment

Dear Mr. Phillips,

Thank you for responding to our request for comments on the Waikamoi Preserve Draft Environmental Assessment. Your letter has been forwarded to The Nature Conservancy of Hawaii (TNCH) who have responded in detail to your inquiries.

In the letter, you requested information on the allocation for \$490,000 to fund the 'Fence Project to Protect the East Maui Watershed'. These projects are separate from the Waikamoi Draft Environmental Assessment and are East Maui Watershed Partnership (EMWP) projects under DLNR/DOFAW jurisdiction. The TNCH response letter gave a summary of the EMWP allotment. The 'Fence Project' was constructed in partnership with the University of Hawaii Pacific Co-operative Studies Unit (see attached) and under the supervision of Ron Nagata of Haleakala National Park. This was necessary because of the specialized and diverse knowledge and experience needed in building fences in these areas. These include topographical considerations, weed prevention protocols, and extensive knowledge of native plants.

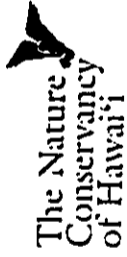
Your other comments have been addressed in TNCH's response letter.

Thank you again for your response to our request for comments.

Aloha,

A handwritten signature in cursive script, appearing to read "Michael G. Buck".

Michael G. Buck
DOFAW Administrator



February 5, 2000

Chuck Phillips
633 Kulike Road
Haiku, Hawaii 96708

Re: Draft Environmental Assessment for Waikamoi Preserve
Natural Area Partnership

Dear Mr. Phillips,

Your letter to the Department of Land and Natural Resources (DLNR) was forwarded to The Nature Conservancy of Hawaii (TNCH) for response relative to TNCH activities. Thank you for responding to our request for comments on the Waikamoi Preserve Draft Environmental Assessment.

I would like to point out that this Environmental Assessment is specifically for the Waikamoi Preserve. Several of your comments concern other East Maui Watershed Partnership (EMWP) projects. Those projects are covered by their own environmental assessment process and concerns over these do not have a direct bearing on Waikamoi Preserve's EA. However, every effort has been made to answer all your questions as well as to provide clarification on the East Maui Watershed and the associated partnership.

The East Maui Watershed is the largest harvested source of surface water in Hawaii, providing more than 60 billion gallons of water per year to meet residential, commercial, and agricultural needs in upcountry, East, and Central Maui, and stream water supporting farming and other uses along the entire windward coast. This area also comprises some of Hawaii's richest remaining native rain forest, habitat for the world's greatest concentration of endangered birds, as well as several other plant and animal species found nowhere else on earth. Although portions of the watershed are actively protected (Hanawi Natural Area Reserve, Haleakala National Park, and Waikamoi Preserve), over half of this forest continues to be degraded by feral animals, introduced weeds, and other threats leading to species loss, accelerated erosion, and siltation of downstream and coastal waters. Formed in 1991, the EMWP is a voluntary effort between six public and private landowners and the County of Maui working together to protect the 100,000-acre core of this critical watershed.

Waikamoi Preserve is located in this core area and was accepted into the state's Natural Area Partnership Program (NAPP) in 1992. The program was established to provide matching state support for the management of private lands that are of natural area reserve quality and are dedicated to conservation in perpetuity. Lands of natural area reserve quality are defined by statute as those land and water areas that contain unique natural resources "such as geologic and volcanological features and distinctive marine and terrestrial plants and animals many of which occur nowhere else in the world and that are highly vulnerable to loss by the growth of population and technology."

The fact that Hawaii is losing its oldest and often most unique inhabitants precipitated the development of the NAP program through statute. It must be kept in mind at all times that the intent of this law is to preserve our incredible native resources.

Listed below are our responses to your comments; note that we are responding in numerical order and so please refer back to your original letter for the corresponding questions

- 1. The Nature Conservancy is in full compliance with the statutes that were enacted by Act 326 SLH 1991. Hawaii Revised Statutes 195-6.5 (b) (2) in its entirety reads:

[In order to qualify under this program, an applicant be a landowner or a cooperating entity of private land of natural reserve quality and shall agree to:]
"Have the land managed by the cooperating entity or qualified landowner according to a management plan prepared by the cooperating entity or landowner and approved by the board that meets the standards established by the department for the system. The management plan shall include provisions to allow public hunting wherever feasible; provided that:

- (A) Hunting activities shall be in compliance with applicable laws; and
- (B) Game animals shall not be introduced to any partnership area and hunting shall be conducted as a conservation purpose of this program."

Under Section 195-6.5 (b) (2), land covered under the Natural Area Partnership Program is managed according to an approved management plan that is focused on preserving native ecosystems. Hunting is one tool in that plan and will be utilized as long as it is feasible from a management standpoint -- that it provides for the betterment of the native ecosystems. In addition it must be in compliance with all applicable laws. In Waikamoi Preserve, the conservation easement between the Conservancy and Haleakala Ranch allows ranch employees hunting privileges as long as there is game to hunt. This is a private contractual condition to the Conservancy's right to protect the property under the conservation easement and is not in any way connected to the NAP program. Public hunters willing to follow guidelines, sign a liability waiver, and complete a volunteer form will be allowed to hunt in Unit 1A of the preserve. As is clearly stated in our management plan, our goal is to remove all ungulates in the preserve, and no area within Waikamoi Preserve will be considered a sustained-yield hunting area. At times, hunting in other areas of the preserve has also been possible. This was the case with the hunter fly-in program conducted above the recently completed Ko'olau Gap fence.

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We are currently using staff hunting and limited volunteer hunting to remove deer in the preserve and also have a state Wildlife Control Permit to hunt deer at night. Serious safety concerns due to the proximity of this area to our interpretive hiking trails, Haleakalā National Park's Hosmer Grove campground, and the state highway leading to the park have forced us to maintain strict controls on hunting activities in the area. Other removal methods under consideration are constructing one-way gates for deer, building live traps along the new fence line, using drive nets to capture live deer, and developing a dog team to round up deer herds.

Through the Natural Area Partnership Program contract and renewal process, the Conservancy receives Board of Land and Natural Resources approval to implement its six-year long-range management plan, which includes ungulate control.

3. There are three general methods for controlling exotic weeds that threaten Hawaii's native ecosystems: manual/ mechanical, chemical, and biological. The best and most successful weed control strategies integrate and balance all of these methods - a strategy known as Integrated Pest Management (IPM). In fact, the more difficult the weed management problem is, the more likely an integrated pest management approach will be applied.

Thousands of hours of volunteer labor have been utilized in manual and mechanical control of current weed populations. These control methods include pulling, digging, chopping, or sawing, and we fully anticipate using an equal or greater amount of volunteer effort in the coming years. Biological controls as part of an environmentally compatible IPM program have been released by the Hawaii Department of Agriculture (HDOA) on gorse infestations on Maui, and we cooperate fully with any efforts by HDOA to enhance an IPM program for combating priority weeds at Waikamoi Preserve.

Routine protocols are followed before entering the Preserve to prevent any further introductions of alien species. Footwear and gear are inspected for weeds and cleaned. And, in some cases, gear used only at Waikamoi Preserve is allowed. All helicopter landing zones, campsites, fence lines, and frequently used trails are monitored for the presence of any new species of weeds. Ongoing data has shown absolutely no new introductions to any of these sites.

In areas where disturbance by manual labor would be detrimental to the neighboring native plants, targeted weed species are treated by spot, not broadcast treatment, thus minimizing total amounts of herbicides used over a broader acreage. These rates are a fraction of the listed rates on the product labels, and application methods are designed to minimize any non-target impact. These products, rigorously tested and certified by the Environmental Protection Agency, have a short-term environmental fate (20-40 day half life) and are well below known levels at risk for leeching into the water table. The EPA approves all listed products for use in forests. The State of Hawaii Department of Agriculture Pesticide Enforcement Division has conducted regular site inspections at Waikamoi Preserve and approves of our limited herbicide use.

2. The Hawaii's Department of Land and Natural Resources, the National Park Service, The Nature Conservancy, and others have worked for many years to develop effective control programs to reduce the devastating effects of pigs and other alien species invading our native-dominated forests. The National Park Service, especially, has conducted major research in Hawaii's on hunting, trapping, baiting, snaring and other feral animal control methods. We have collaborated with experts elsewhere in the United States and abroad, taking advantage of this collective knowledge to develop our current program. We have learned that, both for the protection of the forest and to minimize the number of feral animals that must be killed, control programs must be very aggressive. An effective control program must use a variety of methods to reduce the feral animal population in an area to very low levels as quickly as possible, and keep it low.

As mentioned before, hunting is employed in our preserve when it is effective in removing animals and feasible from a management standpoint to do so. Hunting typically requires the use of trained dogs to locate pigs in dense vegetation; the safety of both dogs and hunters becomes a major concern in remote, rugged locations. Also, as pig numbers reach lower levels and as surviving animals become wary of hunters and dogs, hunting becomes less effective. A population large enough to do significant damage and to reproduce quickly can continue to elude hunters, even within fenced areas. Therefore, hunting cannot be the only tool employed.

The Conservancy and the EMWP currently install one-way gates on all newly built fences. Far from your assertion that they are ineffective and inferior in design, these one-way gates have been operating as intended. While a variety of types are in use, they are all based on tried and true pig hunter designs. In fact, we were given a prototype by the executive council of the Ko'olau Hunter Volunteer Group (KHVG), and a number of gates have been built from that design. The EMWP lobbied to obtain funds to assist in the formation of the KHVG to provide increased hunter access to the lower elevations of the watershed to reduce pig numbers in that area. These veteran hunters meet frequently with the Conservancy and the other partners on issues relating to hunting and development of non-lethal removal techniques.

For the past year deer have begun moving into Waikamoi Preserve. Our current fences are built to keep out pigs and goats and are not effective against Axis deer. For this reason, we will build a fence along the Haleakalā Ranch boundary in an effort to stop the deer from entering the preserve. Without an effective barrier we will not be able to keep deer from damaging our native ecosystems. Although the current deer population in the preserve is relatively small, it has already caused significant grazing and trampling damage to the rare māmane shrubland near the Haleakalā National Park. Contrary to your assertion in point one, the monies budgeted for the fence are included in the overall budget for FY 2001-2002 and will be cost shared, with the Conservancy providing 1/3 and the State 2/3.

The Conservancy currently does not employ rodenticides at Waikamoi preserve. The Conservancy has made limited areas of Waikamoi available for a study by the DLNR's Division of Forestry and Wildlife (DOFAW) and the United States Fish and Wildlife Service (USFWS) to test non-target risks of the use of rodenticides. However, only placebo bait blocks -- containing no rodenticide -- will be used in Waikamoi Preserve. This limited study is part of a larger project to develop a more effective and cost efficient technique for controlling predators in natural areas. We fully agree that the public should be involved in this process, and DOFAW staff has already attended several community meetings. The results of testing as well as proposed actions of this larger project will be covered by a separate Environmental Assessment undertaken by DOFAW and USFWS and I encourage you to participate.

In preparing and finalizing the Environmental Assessment for Waikamoi, the Conservancy and DOFAW are following all of the guidelines required by the State Environmental review process.

4. The EMWP fencing projects are covered by their own environmental review process and are therefore not addressed in the Waikamoi EA. However, we will address the question here. A total of \$800,000 was originally appropriated by the Hawai'i State Legislature -- for the East Maui Watershed Management. This allocation provided \$200,000 for micronia control, \$100,000 for increased hunter access and safety in the lower elevations of the watershed, \$490,000 for a crew to implement EMWP projects, and \$10,000 for a public education campaign by the office of the Chairman of the Department of Land and Natural Resources.

The State sought a sole source bid exemption to allow for the hiring of a crew capable of building the needed type of fence. The formal bid process typically focuses only on costs and is insufficient for this purpose. A sole source exemption was necessary because of the specialized and diverse knowledge and experience needed in building fences in these remote areas. These include topographical considerations, weed prevention protocols, and extensive knowledge of native plants. The crew was also to be used for other East Maui Watershed Management projects. All of these requirements played a role in determining the final choice of the crew.

While fence building is the priority, the four-person crew, hired by the Research Corporation of the University of Hawai'i (an affiliate of the University of Hawai'i) and administered by Haleakala National Park, participates in several management activities which benefit the partnership. This includes, but is not limited to, building fences, fence inspections, and weed control on partnership lands. In addition, there are expenses incurred by the project for various types of training, including wildland fire, first responder and helicopter training. Many of these must be renewed yearly in order to keep the staff current on state and federal requirements. Lastly, because the crew is made up of state employees there are mandated overhead costs as well as vacation and sick leave. These are real costs which must be incorporated into any calculation of the project cost.

Costs for building fences in remote and rugged native habitat are also more complex than your figures identify. This project utilizes the most advanced fencing material available, called Beznal, which is about a third more expensive than Class 3 Galvanized, but expected to last twice as long. The fence design necessary for this level of control increases the cost as well. These fences are comprised of a vertical and horizontal layer. The uneven terrain combined with the pigs' ability to force their way under fences, requires the use of fencing laid on the ground. By attaching the standing and laying pieces together the pigs are kept from forcing their way under the fences. Other costs associated with these fences are the building and installing of numerous one-way gates and associated channeling fences. Furthermore, the remote and rugged nature of the terrain mandates the use of helicopters to transport people and materials safely and efficiently. A reliance on helicopters as the sole mode of transportation has also contributed to the increased cost of developing these fences.

5. To date commercial tours have generated only \$800 in revenue. This program is still in the development stage. Our commercial activity guidelines were not initiated to generate additional revenue. Rather, they were developed in response to numerous requests from interested tour guides and vendors. We needed to respond to these requests while at the same time having guidelines in place to protect the natural resources of the preserve.

6. The only other private landowner in the immediate vicinity of the Waikamoi Preserve is the East Maui Irrigation Company, whose land lies on Waikamoi's northern boundary. Both East Maui Irrigation and The Nature Conservancy of Hawai'i are active members of the East Maui Watershed Partnership. As such, we participate in planning and management on a mutual basis. There have been no "... easements, leases or other transfer of ownership..." other than that already stated between Haleakala Ranch and The Nature Conservancy. While it is true that conservation easements are a prerequisite for eligibility in the Natural Area Partnership Program, they are private, confidential, legal documents between the landowner and The Nature Conservancy and are not public documents.

7. The Board of Land and Natural Resources granted Waikamoi's original Conservation District Use Permit at a time when all of the Conservancy's nature preserves in Hawai'i were privately funded. The State developed and approved the Natural Area Partnership Program because it felt that a majority of residents of Hawai'i would benefit from the active management of all public and privately owned native ecosystems. When Waikamoi Preserve was admitted into the Natural Area Partnership Program in 1992, the Conservancy followed the rules and regulations developed by the department. These requirements include the preparation of a long-range plan by the applicant and the joint preparation (applicant and department) of an environmental assessment. In the NAPP contractual agreement between the Conservancy and the state it clearly specifies that the preserve is funded 1/3 by The Nature Conservancy and 2/3 by the state.

An office and baseyard are essential to the Conservancy's management of its two NAPP projects on Maui: Waikamoi and Kapunakea Preserves. Thus, NAPP-related costs of

these facilities are covered under the NAPP agreements, with the State providing 2/3 of the management funds. The Conservancy is looking for permanent facilities because of our long-term commitment to conservation on Maui.

With the Hanawi NAR located centrally in the East Maui Watershed, and given its proximity to the Waikamoi Preserve, we agree with you that increased funding for management of this and other state NARS would greatly benefit Hawai'i's native ecosystems. However, funding for Natural Area Partnership Program and State natural areas comes from two different sources; the Natural Area Partnership Program is funded by a percentage of the state's conveyance tax from a special fund while the NARS is funded by the state's general fund through the department. The Conservancy has long maintained that an increase in funding to help protect publicly held native ecosystems is desperately needed.

In summary, introduced animals such as pigs, goats, and deer are precipitating the death of the native forest. This death does not occur overnight, but rather is a much slower process. Feral animals continually eat away and otherwise disturb the understory that provides for new forest growth. Over time, the regeneration of new trees ceases, while existing trees grow old and die. Without native trees and plants, the birds begin to disappear, slowly at first and then more rapidly. For the forest, and the native plants and animals that live there, what is occurring is a cruel and lengthy death sentence.

Statewide we have seen over half of our native habitat destroyed and historic accounts of the native bird population show their range diminishing at incredible rates. These disturbing trends are the driving force behind The Nature Conservancy's commitment to Hawai'i's last remaining ecosystems. They are also the reason Hawai'i legislators felt compelled to develop the Natural Area Partnership Program and make the management of those ecosystems possible.

Thank you again for your response to our request for comments.

Aloha,



Alenka Remec
Director, Science and Stewardship Operations

cc:

Mike Buck, DLNR
Randy Kennedy, DLNR
Betsy Gagné, DLNR
Mark White, TNCH Maui
Anders Lyons, TNCH Maui

APPENDIX 2
NATIVE NATURAL COMMUNITIES OF WAIKAMOI PRESERVE

NATURAL COMMUNITY NAME	GLOBAL RANK
Lowland	
Uluhe (<i>Dicranopteris linearis</i>) Lowland Wet Shrubland	G4
Montane	
'Ākala (<i>Rubus hawaiiensis</i>) Montane Wet Shrubland *	G3
<i>Carex</i> Montane Wet Grassland *	G3
Koal'Ōhi'a (<i>Acacia koa</i> / <i>Metrosideros polymorpha</i>) Montane Wet Forest *	G3
Mixed Fern/Mixed Shrub Montane Wet Shrubland *	G3
'Ōhi'a /Hāpu'u (<i>Metrosideros polymorpha</i> / <i>Cibotium</i> spp.) Montane Wet Forest	G3
'Ōhi'a (<i>Metrosideros polymorpha</i>)/Mixed Shrub Montane Wet Forest *	G3
'Ōhi'a /'Ōlapa (<i>Metrosideros polymorpha</i> / <i>Cheirodendron</i> spp.) Montane Wet Forest	G3
'Ōhi'a /Uluhe (<i>Metrosideros polymorpha</i> / <i>Dicranopteris</i>) Montane Wet Forest *	G3
Subalpine	
<i>Deschampsia nubigena</i> Subalpine Mesic Grassland* *	G2

Māmane (<i>Sophora chrysophylla</i>) Subalpine Dry Forest*	G2
'Ōhi'a (<i>Metrosideros polymorpha</i>) Subalpine Mesic Forest #	G3
Pūkiawe (<i>Styphelia tameiameia</i>) Mixed Subalpine Dry Shrubland	G3
Multizonal	
Pioneer Vegetation on Lava Flow	G3
Subterranean Communities	
Uncharacterized Montane Lava Tube*	GU
Uncharacterized Subalpine Lava Tube*	G1G2
Aquatic Communities	
Hawaiian Intermittent Stream	G4

* Rare natural community # Also known from Hanawi NAR

Key to Global Ranks as defined by Heritage Program:

- G2 = Imperiled globally (typically 6-20 current occurrences).
- G3 = Restricted range (typically 21-100 current occurrences).
- G4 = Apparently secure globally (> 100 occurrences).
- GU = Natural community rank uncertain (rank uncertain, provisionally considered rare).

APPENDIX 3
RARE NATIVE PLANTS OF WAIKAMOI PRESERVE

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	FEDERAL STATUS
<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i> *	'āhinahina, silversword	G2T2	LT
<i>Argyroxiphium virescens</i> *	Greensword	GH	SOC
<i>Asplenium schizophyllum</i>		G1	SOC
<i>Bidens campylothecha</i> ssp. <i>pentamera</i> +	ko'oko'olau, koko'olau	G2T2	SOC
<i>Calamagrostis expansa</i> *		G2	SOC
<i>Clermontia tuberculata</i> *	'ōhā, 'ōhā wai	G1	SOC
<i>Cyanea horrida</i> * *	'ōhā, hāhā, 'ōhā wai	G2	SOC
<i>Cyanea kunthiana</i> +	'ōhā, hāhā, 'ōhā wai	G2	SOC
<i>Cystopteris douglasii</i>		G2	SOC
<i>Diplazium molokaiense</i>		G1	LE
<i>Dryopteris</i> sp. 3		G1	SOC
<i>Geranium arboreum</i> *	hinahina, nohoanu	G1	LE
<i>Geranium multiflorum</i> * *	hinahina, nohoanu	G2	LE
<i>Lagenifera maviensis</i>	hōwaiāulu	G2	SOC
<i>Peperomia subpetiolata</i> *	'ala'ala wai nui	G1	C
<i>Phyllostegia bracteata</i> + *		G1	C
<i>Phyllostegia haleakalae</i>		G1	-
<i>Plantago princeps</i> var. <i>laxiflora</i>	ale	G2T1	LE
<i>Platanthera holochila</i> *		G1	LE
<i>Ranunculus mauiensis</i>	makou	G2	SOC
<i>Rubus macraei</i>	'ākala, 'ākalakala	G2	SOC
<i>Sicyos cucumerinus</i>	'ānunu, kūpala	G1	SOC
<i>Wikstroemia villosa</i> +	'ākia	GH	SOC
<i>Cyanea arborea</i> *	'ōhā, hāhā, 'ōhā wai	GH	SOC
<i>Embelia pacifica</i>	kilioe	G2	SOC
<i>Hillebrandia sandwicensis</i>	pua maka nui	G2	SOC
<i>Melicope haleakalae</i> *	alani	G2	SOC
<i>Melicope balloui</i> *	alani	G1	LE
<i>Phytolacca sandwicensis</i>	pōpolo kū mai	G3	SOC

<i>Sanicula sandwicensis</i>		G2	SOC
<i>Santalum haleakalae</i> *	'iliahi	G2	-
<i>Sisyrinchium acre</i>	mau'u lā'ili, mau'u hō'ula 'ili		-
<i>Microlepia mauiensis</i>	palapalai	G2	SOC
<i>Nothoctrum longifolium</i>	'aiea	G2	-

+ Known only from Maui * Known only from East Maui # Also known from Hanawi NAR

Key to Global Ranks as defined by Hawaii Heritage Program:

- G1 = Species critically imperiled globally (typically 1-5 current occurrences).
- G2 = Species imperiled globally (typically 6-20 current occurrences).
- G3 = Species moderately imperiled globally.
- GH = Species known only from historical occurrences (not observed in last 15 years).
- T1 = Subspecies or variety critically imperiled globally.
- T2 = Subspecies or variety imperiled globally (typically 6-20 current occurrences).

Key to Federal Status:

- LE = Taxa formally listed as endangered.
- LT = Taxa formally listed as threatened.
- C = Persisting in cultivation
- SOC = Species of Concern

**APPENDIX 4
RARE NATIVE ANIMALS OF WAIKAMOI PRESERVE**

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	FEDERAL STATUS
Mammals			
<i>Lasiurus cinereus semotus</i> *	'ōpe'ape'a, Hawaiian hoary bat	G5T2	LE
Birds			
<i>Branta sandvicensis</i> #	nēnē, Hawaiian goose	G1	LE
<i>Hemignathus lucidus affinus</i> # *	Maui nukupu'u	G1T1	LE
<i>Loxops coccineus ochraceus</i> #	Maui 'ākepa, 'akepeu'ie	G2T1	LE
<i>Melamprosops phaeosoma</i> †	po'ouli	G1	LE
<i>Moho</i> sp. 1 (Maui) +	'ō'ō	G1	-
<i>Palmeria dolei</i> #	'ākohekohe, crested honeycreeper	G2	LE
<i>Pseudonestor xanthophrys</i> #	Maui parrotbill	G1	LE
<i>Psittirostra psittacea</i> ‡	'ō 'ū	G1	LE
<i>Pterodroma phaeopygia sandwichensis</i>	'ua'u, Hawaiian dark-rumped petrel	G2T2	LE

Also known from adjacent Hanawi NAR.

† Unconfirmed sighting; known from adjacent Hanawi NAR.

* Known in adjacent areas; thought to occur in Waikamoi.

+ Possible audio sightings on numerous dates between 1973+1979 by P. & W. Banko.

‡ Considered extinct on Maui.

Key to Global Ranks as defined by Hawaii Heritage Program:

- G1 = Species critically imperiled globally (typically 1+5 current occurrences).
- G2 = Species imperiled globally (typically 6+20 current occurrences).
- G3 = Restricted range (typically 21+100 current occurrences).
- G5 = Demonstrably secure globally.
- T1 = Subspecies or variety critically imperiled globally.
- T2 = Subspecies or variety imperiled globally.

Key to Federal Status:

- LE = Taxa formally listed as endangered.

APPENDIX 5

PRIORITY WEEDS OF WAIKAMOI PRESERVE
(in order of priority)

SCIENTIFIC NAME	COMMON NAME
<i>Hedychium gardnerianum</i>	Kāhili ginger
<i>Ulex europaeus</i>	Gorse
<i>Pinus patula</i>	Mexican weeping pine
<i>Pinus radiata</i>	Monterey pine
<i>Acacia melanoxylon</i>	Blackwood acacia
<i>Fraxinus uhdei</i>	Tropical ash
<i>Rubus argutus</i>	Blackberry

PRIORITY WEEDS OF WAIKAMOI PRESERVE
(not yet established in Preserve)

SCIENTIFIC NAME	COMMON NAME
<i>Miconia calvescens</i>	Miconia
<i>Cortaderia jubata</i>	Pampas grass
<i>Tibouchina herbacea</i>	Cane tibouchina
<i>Clidemia hirta</i>	Clidemia
<i>Setaria palmifolia</i>	Palmgrass
<i>Psidium cattleianum</i>	Strawberry guava
<i>Paspalum conjugatum</i>	Hilo grass
<i>Hedychium coronarium</i>	White ginger
<i>Cyathea cooperi</i>	Australian tree fern