LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

March 29, 2005

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

RE: Final Environmental Assessment (FEA) and Finding of No Significant Impact (FONSI) for the Pu'u Kukui Watershed Preserve FY 2006-2011 Management Plan Natural Area Partnership Program, Island of Maui

Dear Ms. Salmonson:

The Draft Environmental Assessment for the Pu'u Kukui Watershed Preserve FY 2006-2011 Management Plan for continued participation in the Natural Area Partnership Program was published in the OEQC Bulletin of January 23, 2005. After review of the public comments and of the Final Environmental Assessment, the Division of Forestry and Wildlife has determined that this project will not have significant negative effect on the environment. Thus, we have issued a Finding of No Significant Impact. Please publish this notice in the next OEQC Environmental Notice (April 8, 2005).

Enclosed are four copies of the Final Environmental Assessment and a completed OEQC publication form. Please call me or Christen Mitchell, DOFAW planner, at 587-0051 if you have any questions.

Sincerely,

PAUL J. CONRY
DOFAW Administrator

Enclosures

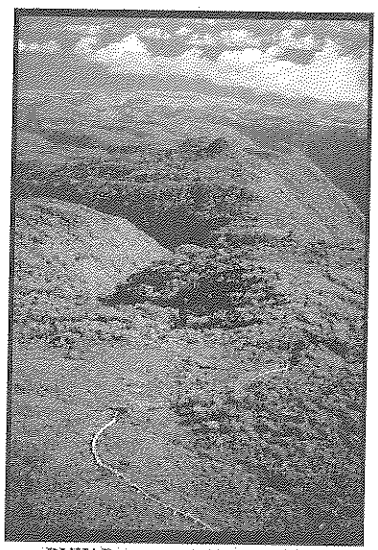
2005-04-08 FONSI
PUU KUKUI WATERSHED PRESERVE FY 2006-2011
MANAGEMENT NATURAL AREA PARTNERSHIP PROGRAM

APR - 8 2005

FINAL ENVIRONMENTAL ASSESSMENT

FOR THE

PU`U KUKUI WATERSHED PRESERVE
FY 2006-2011 MANAGEMENT PLAN
NATURAL AREA PARTNERSHIP PROGRAM



PKW Preserve, Maui, Hawai`i
Photo: R. Bartlett/ML&P ©2005

This Environmental document prepared pursuant to Chapter 343, HRS

PREPARED FOR

DIVISION OF FORESTRY & WILDLIFE
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

PREPARED BY

MAUI LAND & PINEAPPLE COMPANY, INC.
P. O. BOX 187
KAHULUI, HI 96733-6687

March 28, 2005

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I. SUMMARY

CHAPTER 343, HAWAII REVISED STATUTES (HRS) ENVIRONMENTAL ASSESSMENT

Project Name: Pu`u Kukui Watershed Preserve (PKW) Natural Area Partnership

Proposing Agency / Applicant:
Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Maui Land & Pineapple Company, Inc.
P. O. Box 187
Kahului, HI 96733-6687

Approving Agency:
Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Project Location:

Pu`u Kukui Watershed Preserve, 8,661 acres in the District of Lahaina, County of Maui, State of Hawaii

Tax Map Key	Acreage
4-1-1-17	5,780.00
4-2-1-1 (portion)	2,450.38
4-1-4-23 (portion)	0.40
4-1-5-10	1.75
4-1-5-13	2.48
4-1-5-16	<0.01
4-1-5-17	<0.01
4-3-1-1 (portion)	92.00
4-3-1-17 (portion)	334.00

Agencies Consulted/Requested to Review EA:

Federal:
US Department of Agriculture
Natural Resource Conservation Service - Maui District
US Department of Interior
Fish & Wildlife Service - Pacific Islands Ecoregion - Environmental Services

State:
DLNR/ Division of Forestry & Wildlife - Maui District
DLNR/ Division of Land Management - Maui District
DLNR/ State Historic Preservation Division
Natural Area Reserve System Commission
Research Corporation of the University of Hawai`i (RCUH)
Maui Invasive Species Committee (MISC)
West Maui Mountains Watershed Partnership (WMMWP)

County:
Department of Planning - Maui
Department of Water Supply - Maui

Private:
Conservation Council for Hawai`i
Sierra Club – Hawai`i Chapter
Earth Justice Legal Defense Fund
The Nature Conservancy of Hawai`i

II. PROJECT DESCRIPTION

Background

The Pu`u Kukui Watershed Preserve (PKW or Pu`u Kukui Preserve) was established in 1988 to protect watershed forests and associated native plants and animals. At over 8600 acres, the Pu`u Kukui Preserve is the largest privately-owned nature preserve in the state. Maui Pineapple Company, Ltd. (MPC), a subsidiary of Maui Land & Pineapple, Inc. (ML&P), began management programs in August 1988 under a management agreement with The Nature Conservancy of Hawai`i (TNCH). The Nature Conservancy assisted MPC's PKW Preserve supervisor to implement management programs, and has continued to act as a consultant to the project on an ad hoc basis. In July of 1993, ML&P entered into a six-year contract with the State of Hawai`i as the first private landowner participant in the Department of Land & Natural Resources' (DLNR) Natural Area Partnership (NAP) program. An Environmental Assessment was previously prepared for this project to satisfy NAPP requirements in 1999. However, because the Pu`u Kukui Preserve contract is scheduled to be renewed in 2005, ML&P has prepared a new 6-year management plan and this document for submittal to the DLNR as part of the application process for a new 6-year NAPP management contract. This Environmental Assessment describes possible impacts from management activities for the next six years in the Pu`u Kukui Preserve as required by the Natural Area Partnership program and State of Hawai`i law.

The following section of this Environmental Assessment consists of a brief description of the Pu`u Kukui Preserve, overview of the native resources that are protected, and how those resources complement the Natural Area Reserve System (NARS). In the next section, management considerations that have shaped the management programs are documented. A description of each management program follows, and includes a goal statement, an explanation of the management method chosen, and a detailed timeline.

Summary description of the Affected Environment

Location

The Pu`u Kukui Watershed Preserve (PKW or Pu`u Kukui Preserve) stretches from about 480 feet elevation at Honokohau Stream to the Pu`u Kukui summit - the highest point on Mauna Kahalawai (West Maui) at 5,788 feet elevation. The rain forests, shrub lands, and bogs of the Pu`u Kukui Watershed Preserve serve as a stable water source for West Maui residents and industries. Maui Land & Pineapple Company depends on the watershed for agricultural and resort use, and supplies water to neighboring landowners and the county water system for both agricultural and potable use.. Native vegetation is an essential component of this watershed system. Forest cover protects fragile mountain soils from erosion, and acts like an immense

sponge that absorbs heavy rains, as well as creating fog drip from low lying clouds. Native vegetation, including leaf litter and sensitive ground cover, allows water to percolate into the soil. Water is gradually released into streams and groundwater aquifers, rather than running off the surface in torrents into streams and ultimately to the sea. Subsequently, ML&P's conservation efforts in the Pu`u Kukui Preserve should also benefit adjacent shoreline resources; including the Honolua - Mokulei`a Marine Life Conservation District. Unique bog and stream ecosystems and native-dominated forests and shrub lands make up the majority of the watershed.

A significant amount of fresh water used by West Maui's residents, agriculture, and other commercial businesses comes from this watershed area, and active management by all West Maui landowners is needed to prevent damage to the native forests by feral ungulates (pig, goat & deer) and invading weeds. Nine strategic fences have been built cooperatively by ML&P, the State Division of Forestry & Wildlife (DOFAW), and TNCH staff in the PKW Preserve, Kahakuloa (4 fences) and Honokowai (4 fences) sections of the West Maui NAR, and the Kapunakea (1 fence) Preserve. Additionally, new fences have or are currently being constructed in cooperation with NARS and staff of the West Maui Mountains Watershed Partnership (WMMWP); a joint, public/private partnership between majority landowners of mauka conservation lands on West Maui whose intent is to protect and conserve the water and other native natural resources on their respective properties. These kinds of cooperative projects improve the efficiency of management efforts and benefit the entire Kahalawai/West Maui area.

Access to foot trails leading into the lower edge of the watershed area is mostly along ML&P owned roads through pineapple fields. Pineapple harvesting and other agricultural activities involve the use of large trucks on unpaved (and often muddy) roads, making access dangerous. This, coupled with the fragile native ecosystems in the watershed, results in a policy of restricted public access to the Pu`u Kukui Preserve. There are only two roads that access the Preserve directly; the road to Haela`au Cabin at 2,980 feet elevation on Kaulalewalewa, and a dirt road east of Honokohau Valley that starts on State owned land leased for pasture use. Both are passable only by four-wheel drive vehicles. This environmental assessment does not address any impacts resulting from MPC's agricultural activities or any other ML&P activities on its lands below the PKW Preserve.

Flora and Fauna

The Pu`u Kukui Preserve contains 15 terrestrial native natural communities (Appendix 1). These natural communities vary from lowland shrub lands to montane forests and bogs. One of these communities is considered rare, as it occurs in fewer than 20 sites worldwide: `Ohi`a *(Metrosideros)* Mixed Montane Bog. Seven of the native natural communities found in the Pu`u Kukui Preserve, including `Ohi`a Mixed Montane Bog, are also found in the West Maui NAR.

The Pu`u Kukui Preserve is home to at least 36 species of rare plants; four other taxa endemic to West Maui also occur here (Appendix 2). Eight species of rare plants found in the PKW Preserve are listed as Endangered (E) by the U. S. Fish & Wildlife Service (USFWS). Two other taxa (*Santalum freycinetianum* var. *lanaiense* [`iliahi], and *Clermontia oblongifolia* subsp. *mauiensis* [oha wai]) listed as Endangered potentially occur in the Preserve, but require further study to determine their identity. Specimens have been collected and forwarded to local herbaria but the taxa are problematic taxonomically and still undetermined. Twenty-eight other rare plant species are also listed as either Candidate (C) or Species of Concern (SOC) by the USFWS.

Three native forest birds found in the PKW Preserve's forests are also found in the West Maui NAR: the `Apapane *(Himatione sanguinea sanguinea),* `Amakihi *(Hemignathus virens wilsoni),* `I`iwi *(Vestiaria coccinea).* The PKW Preserve also provides habitat for the Pueo *(Asio flammeus sandwichensis,* Hawaiian Short-eared Owl) - a USFWS Species of Concern, as well as for migratory and sea birds such as Kolea (*Pluvalis fulva*, Pacific Golden Plover), `Ulili (*Heteroscelus incanus*, Wandering Tattler), Koa`e Kea *(Phaethon lepturus dorotheae,* White-tailed Tropicbird), the endangered `Ua`u (*Pterodroma phaeopygia,* Hawaiian Petrel), and the Threatened Newell's Shearwater or A'o (*Puffinus newellii*). Our endangered State Bird, Nene (*Nesochen sandvicensis*) has been observed several times in recent years due to the State's rearing & release program near Hana`ula, and may someday establish a breeding colony near ML&P's Haela`au Cabin on Kaulalewalewa. The small mammal & predator control program would help facilitate this.

At least seven species of rare native tree snails and two freshwater species *(Partulina perdix, P. splendida, P. tappaniana, Perdicella kuhnsi,* etc., see Appendix 3) have been observed and recorded in the PKW Preserve since management began in 1988. A snail species not seen on Maui for over half a century; *Newcombia cumingi,* was rediscovered in the PKW Preserve in 1994 by Preserve staff. Others species undoubtedly occur, but have remained undetected due to small population size or lack of adequate survey. Other rare invertebrate species include the endemic Hawaiian damselfly *(Megalagrion pacificum);* a candidate endangered species, as well as others (see Appendix 3). Also, Hawai`i's only endemic land mammal; the endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus)* has been observed by PKW Preserve staff at various locations throughout the Preserve area.

Historical/Archeological and Cultural Sites, Resources & Practices

Although no comprehensive archaeological surveys have been conducted within the boundaries of the Pu`u Kukui Preserve, no historic sites are known to exist in the area. In the lower elevations, agricultural related structures such as ditches and terraces are likely to be present while in the higher elevations only trails and/or temporary shelters might be expected. After a preliminary review of the proposed management activities by the State Historic Division (SHP) followed by a staff discussion between SHP and DOFAW, it was agreed that to ensure the

proposed management activities would have negligible or no impact on any possible historic sites, ML&P will contact the SHP prior to the commencement of any of these activities so that SHP may inspect the project areas if it deems necessary. No survey of the management sites is called for at this time. If PKW Preserve staff encounters any evidence of historic sites at a site of management activity, they will cease all management activity and immediately notify SHP staff to obtain their input and suggestions for any mitigation measures deemed necessary. Proposed fencing projects which might be considered a source of disturbance will be of relatively short length, require minimal line cutting and will be constructed with metal T-stakes that will pose little risk to potential sites. In the long term, the proposed activities should provide protection for historic and cultural resources by eliminating disturbance from ungulates, which degrade sites such as *lo`i kalo* by rooting and trampling, or displacement of these rock walls by alien tree species. Restricted access will also minimize inadvertent disturbance or intentional vandalism.

The bulk of the PKW Preserve was considered *wao akua* (lit. forest of the gods) by native Hawaiians and was deemed sacred; with little or no regular access by either the *maka`ainana* (commoners) or the *ali`i* (chiefs). What little access likely to occur was by certain *kahuna* (priests) or by those specially-trained to collect native bird feathers for an *ali`i's* cloak. These cultural practices are no longer known to occur and are unlikely to be revived given the current rare & threatened status of many of Hawaii's native forest birds. Therefore; no significant negative impact on cultural resources or historic practices by native Hawaiians is anticipated from the actions delineated in this plan. Additionally, the preservation of habitats and natural communities preserve plant and animal species integral to Hawaiian culture. Many of these species are prevalent in Hawaiian song, chant, and legend, and the protection of these species to be accomplished by this management plan will help to ensure a continuing living culture.

Adjacent Natural Resources

The PKW Preserve lies between the Kahakuloa and Honokowai sections of the state's West Maui Natural Area Reserve (Figure 1: Pu`u Kukui Watershed Preserve). These three areas, and the 1,264 acre Kapunakea Preserve (managed by The Nature Conservancy of Hawai`i), form 13,000 acres of contiguous forests that are protected by the programs of state and private natural area managers. According to DOFAW records, at least seven of the native natural communities found in Pu`u Kukui Preserve, including the `Ohi`a Mixed Montane Bog, are also found in the West Maui NAR. Of the 36 rare plants found in Pu`u Kukui, 16 are known from the West Maui NAR. Four species of land snails listed in Appendix 3 are also found in the West Maui NAR.

Additionally, in 1998, other adjacent private & public (e.g. County of Maui Board of Water Supply, State of Hawaii Dept. of Land and Natural Resources) landowners of mauka conservation lands on West Maui (Mauna Kahalawai) agreed to join together to form the West Maui Mountains Watershed Partnership (WMMWP) with the intent to conserve and protect the

native biodiversity and natural resources of nearly 50,000 acres (including the 8,661 acre Pu`u Kukui Preserve) of their adjoining lands for current and future generations.

Sensitive Habitats

The sensitive habitats and resources listed above and in the appendices are found both within and adjacent to the Pu`u Kukui Preserve. The intent of all proposed management activities is to provide long term resource protection to these habitats. Negative effects such as introduction of new weeds along newly constructed fences or monitoring transects are recognized and standardized precautions will be taken to minimize the risks. Management activities that affect adjacent sensitive habitats in State Natural Area Reserves, The Nature Conservancy of Hawai`i's Kapunakea Preserve or on other private lands within the WMMWP will be coordinated with appropriate staff from these organizations to reduce any potential negative impacts (see Appendix 6).

General description of the action's technical, socioeconomic and environmental characteristics

Technical

Management Considerations

The management goal for Pu`u Kukui Preserve is to maintain the native ecosystems as intact watershed, and protect the habitat of rare Hawaiian plants and animals. This project is a long term one consisting of several different phases. Maui Land & Pineapple Company will be responsible for the completion of the management work. This section describes specific management strategies that will be undertaken to maintain and enhance the PKW Preserve. These strategies are shaped by the following considerations.

- The Pu`u Kukui Preserve encompasses a very large area, much of which is remote and extremely rugged. Inclement weather is the norm in the upper reaches. The 10 Management Units have been defined by biological and topographical features (Figure 1). Priorities for management have been determined for each unit according to the proximity of the unit to stream drainages that feed ML&P's water intakes, the extent of current disturbance, the urgency of other biological threats within and near the unit, and the feasibility of management.

- Feral ungulates remain the primary threat to the watershed, and limiting pig damage and other feral ungulate ingress is the top management priority. Prior to active management efforts, moderate to heavy damage by pigs had occurred throughout most of the watershed. Pig rooting on the forest floor destroys plants, promotes erosion and weed invasion, threatens the

stability of the watershed and introduces silt and disease to West Maui's water supply. Most weeds cannot establish themselves in undisturbed ground, but will readily grow in soil turned by pigs. Standing water collects in pig wallows and encourages the breeding of mosquitoes, which transmit bird diseases that are at least partly responsible for the low numbers of native birds on West Maui. Additionally, preventing domestic cattle from entering the watershed from adjacent pasturelands, or removal of feral cattle from the watershed remains a high priority.

- Many non-native plants observed in the watershed are shade intolerant and pose no major problem if pigs are removed and the native forest canopy and ground cover remain intact. There are several non-native weed species, however, which form monotypic stands and displace native vegetation over large areas. These habitat modifying weeds are "priority weeds" for management. Weed control activities will focus on these priority weeds throughout the watershed, with special attention to removing incipient "satellite" (outlying) weed patches to prevent their spread.

- Access to the entire Preserve area is restricted by ML&P. This policy is intended to minimize trampling of fragile soils and rare plants, prevent the spread of weeds by hikers, prevent wildland fires, and protect public safety. Volunteers or other visitors will be accompanied by appropriate staff and restricted to designated areas and trails in the Preserve. Human traffic in pristine areas, especially the upper elevation bogs, will be kept to the minimum required for watershed protection.

- Management activities in the watershed that affect adjacent NARS will be coordinated with state Natural Area Reserves staff when necessary. Staff of The Nature Conservancy will assist the Preserve manager with planning and technical advice as requested. These partnerships will maximize the cost effectiveness of management efforts at the Pu`u Kukui Preserve and provide a larger pool of management expertise to draw from.

Management Unit Descriptions

The Pu`u Kukui Preserve has been divided into 10 Management Units defined by topographical and biological features (Figure 1). Highest management priority will go to the fragile bog areas and upper reaches of Units 6, 7, 8, 9, all of Unit 10, other designated Special Ecological Areas (SEA), and drainages mauka of ML&P's Honolua Ditch system intakes. Descriptions of the units' resources, and threats to these resources, follow.

Unit 1: HONOKOHAU

The Honokohau unit covers approximately 1,250 acres and ranges from 480 feet in the stream bed of Honokohau Valley up to the 4,400 foot rim of Mauna `Eke, and collects rainfall destined for ML&P's Honokohau Ditch system's #1 intake. This unit shares most of its eastern boundary with the state's Kahakuloa section of West Maui Natural Area Reserve (NAR). Seven strategic fences have been built by DOFAW, PKW, and WMMWP staff across narrow ridges and stream corridors to prevent pigs from moving between the areas, and up to the pristine, flat-topped summit of Mauna `Eke. *Tibouchina herbacea* and *Clidemia hirta* (Koster's curse) are the two most invasive weed species in this unit, and are concentrated along the `Eke Trail. Although not yet recorded in the PKW Preserve proper, Andean Pampas grass *(Cortaderia jubata),* is known from the Kahakuloa section of the West Maui NAR immediately adjacent to Unit 1 and is considered a serious threat to native ecosystems due to its invasive reputation in California and New Zealand. PKW Preserve staff works with the Maui Invasive Species Committee (MISC) to monitor and report new locations. Native plant communities range from montane wet shrublands along the steep upper valley walls to lowland mesic forest at the lowest elevation. Rare native elements include the plants *Cyrtandra filipes, Gardenia remyi, Joinvillea ascendens, Pritchardia forbesiana Strongylodon ruber,*; and animals *Lentipes concolor, Megalagrion pacificum, M. nigrohamatum*, several terrestrial and freshwater snail species. The Endangered Hawaiian Petrel has been heard flying over this Unit.

Unit 2: KALUANUI

The Kaluanui unit's 1,000 acres range between 1,040 and 2,920 feet elevation, and collect rainfall destined for ML&P's Honokohau Ditch system's #1 and #2 intakes, respectively located in Honokohau Stream and Kaluanui Stream (the northwest drainage of Honokohau Stream). Formerly heavy pig damage has been reduced through pig control efforts in the past few years, however; continued pig control is needed to remove pigs that come up from lower elevations through the gulches. *Tibouchina herbacea* and *Clidemia hirta* are prevalent weeds of Unit 2. Natural communities include wet and mesic plant community types. Rare native elements include the plants *Cyanea asplenifolia, C. lobata, C. magnicalyx, Cyrtandra filipes, Gardenia remyi, Pritchardia forbesiana, Strongylodon ruber*; and animals *Lentipes concolor, Megalagrion pacificum, Partulina* spp. Four strategic fences have been built by PKW Preserve staff to limit feral pig movement into higher elevations.

Unit 3: HONOLUA

The Honolua unit encompasses 1,100 acres stretching from 1,040 to 2,800 feet elevation between Kaluanui (the northwest drainage of Honokohau Stream) and Honolua streams. These streams transport rainwater to ML&P's Honokohau Ditch system's #2 and #3 intakes, respectively. The two landmark peaks of Unit 3 are Keahikauo (labeled as Keahikano @ 2,013

feet elevation on USGS Lahaina Quad.) and the prominent ridge line of Honolua (2,645 feet elevation). Low levels of pig damage still occur in this unit. *Tibouchina herbacea, Clidemia hirta*, and *Andropogon virginicus* (broomsedge) are the principal weed species, with satellite populations of *Cinnamomum burmannii* and *Ardisia elliptica* (Shoebutton, Inkberry). Natural communities include a range of wet and mesic community types. Rare native elements include the plants *Cyanea asplenifolia, Gardenia remyi, Pritchardia forbesiana, Strongylodon ruber*. Animals include several species of *Partulina* tree snails; the Hawaiian Petrel and Newell's Shearwater have been heard in this Unit.; several populations of rare plants and animals occur throughout Unit 3. Three strategic fences have been built by PKW Preserve staff.

Unit 4: KEKA`ALA`AU

The 800-acre Keka`ala`au unit ranges from 1,040 feet elevation at Honolua stream to the 3,000 foot contour between Honolua and Honokahua streams; the former transports water to ML&P's #3 intake. Prominent landmarks include Pu`u Kaeo (1,683 feet elevation), and Keka`ala`au (2,358 feet elevation). Pig damage in Unit 4 has been reduced by construction of four strategic fences and removal of pigs. *Tibouchina herbacea, Cinnamomum burmannii, Ardisia elliptica* are major weed species, with a few occurrences of *Rubus argutus* (Prickly Florida blackberry) and *Clidemia hirta*. Natural communities contain a variety of lowland mesic and wet forests, including remnant Koa/`Ohi`a mesic forest. Unit 4 also contains two designated Special Ecological Areas: the *Ctenitis squamigera* (Pauoa) exclosure fence; a USFWS Endangered species, and the Keka`ala`au summit SEA; comprised of such rare taxa as *Joinvillea ascendens, Gardenia remyi,* and six endemic tree snail species. The Hawaiian Petrel and Newell's Shearwater have been heard calling over this Unit.

Unit 5: PU`U MAKANI (labeled as Pu`u Makina on USGS Napili Quad.)

One of the smallest units of the watershed, the Pu`u Makani unit covers about 400 acres from 1,440 feet elevation to the 3,000 foot contour between Honokahua and Kahana streams. Relatively little pig damage has occurred in this narrow unit, and two strategic fences have been built across narrow ridges to prevent pigs from moving up into the watershed from lower elevations. A non-native coniferous plantation of *Cryptomeria japonica* (circa 1920) dominates the Pu`u Makani (1,970 feet elevation) summit area. Wet shrub land emerges at the 2,080 foot contour and grades into `Ohi`a and `Uluhe dominated wet forest at higher elevations along the ridge. Rare elements such as *Cyrtandra munroi* occur in the Kahana Valley sub-unit. Off-road motorcycle trespass is a recurring problem in the lower reaches of Unit 5.

Unit 6: KAULALEWALEWA (labeled as Kaulalewelewe on USGS Lahaina Quad.)

One of only two units with direct 4-wheel drive access, the Kaulalewalewa unit also marks the location of ML&P's Haela`au Cabin on Kaulalewalewa peak (2,980 feet elevation),

and the Pu`u Kukui trail head. Ranging from 1,440 feet to 3,650 feet elevation between Kahana Stream and the Pu`u Kukui Trail, the Kaulalewalewa unit encompasses 650 acres and borders state lands and the Honokowai section of West Maui NAR on the southwest. Pig damage in Unit 6 has been almost nonexistent for the past several years, due to pig control activities over the past ten years. *Rubus argutus* (Prickly Florida blackberry), *R. discolor* (Himalayan blackberry), and *Tibouchina herbacea* are the priority weeds; with blackberry infestation the highest of any unit due to its original introduction at Haela`au Cabin. The range of blackberry along the trail has been reduced over the past ten years of management, and this control will continue. Natural communities include a wide variety of plant community types. Unit 6 also hosts the *Newcombia cumingi* SEA; designated to protect the only known population of a rare native tree snail species rediscovered by PKW Preserve staff in 1994. Rare elements include plants *Alectryon macrococcus, Alphitonia ponderosa, Ctenitis squamigera, Cyrtandra munroi & C. filipes, Exocarpus gaudichaudii, Strongylodon ruber*; animals include *Partulina perdix* and *P. splendida*, and the Hawaiian Petrel has been heard calling over this Unit. Three fences have been constructed by PKW Preserve staff.

Unit 7: PU`U 3,540'

At 400 acres, the Pu`u 3,540' unit crosses between Kahana and Honolua (which feeds ML&P's #3 intake) streams, stretching from 3,000 - 4,000 feet in elevation. Unit 7 centers on an unnamed hill at 3,540 feet elevation; some upper sections of forest are in nearly pristine condition. Pig damage in Unit 7 has been reduced to zero for the past six years through intensive snaring and two strategic fences constructed between units 4, 5, and 7. *Tibouchina herbacea* and *Rubus argutus* are the prevalent weeds. Natural communities consist of `Ohi`a-dominated montane wet forests and shrub lands; rare elements include *Cyanea kunthiana,* and *Joinvillea ascendens*.

Unit 8: HONOLUA UKA

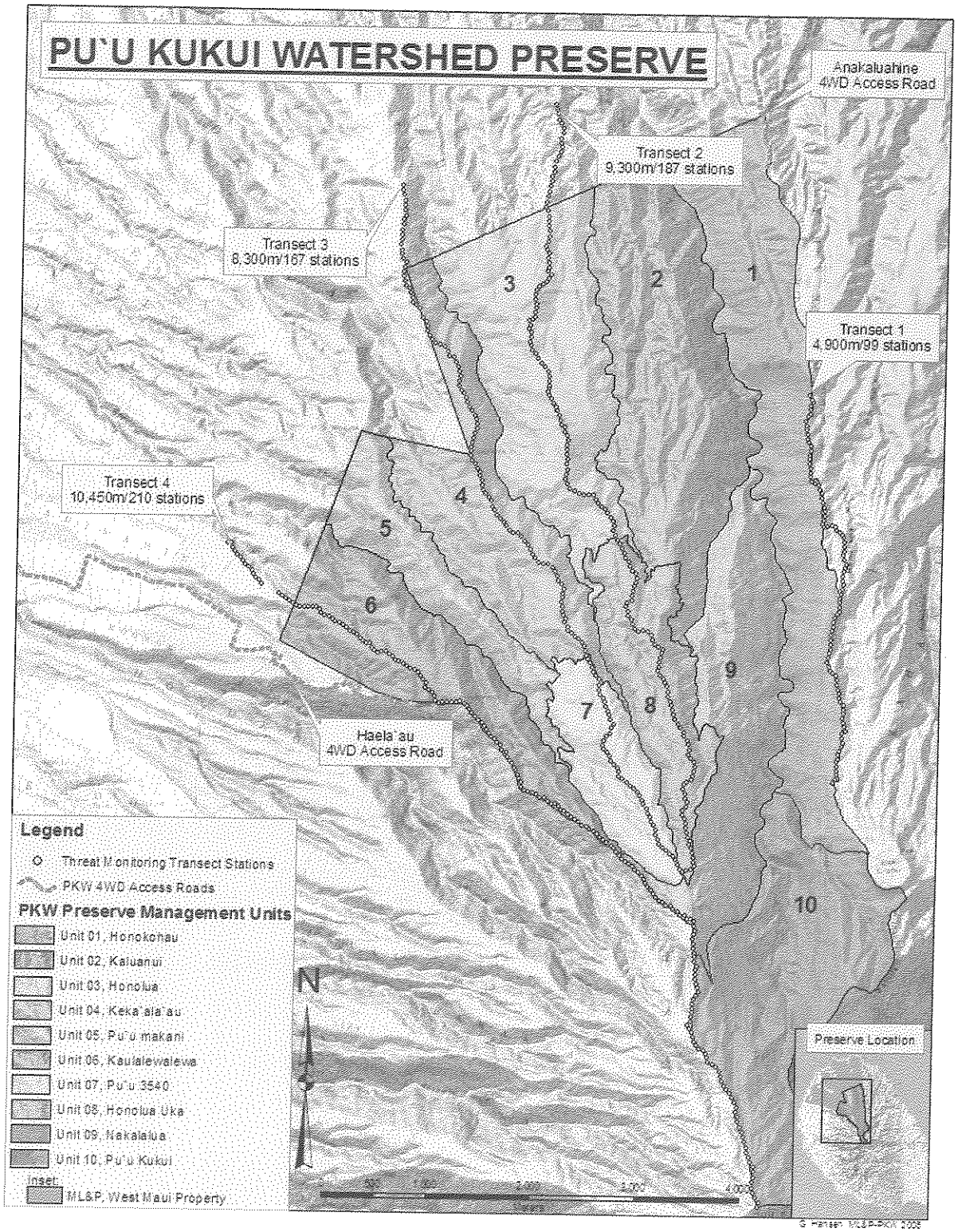
The Honolua Uka unit consists of 500 acres of `Ohi`a/mixed shrub and `Ohi`a/`Olapa montane wet forests extending from the 2,800 foot contour between Honolua Stream (which feeds ML&P's #3 intake) and the northwest tributary of Honokohau Stream up to the 4,000 foot contour. Unit 8 also includes a rare, remnant 'Ohi`a Mixed Montane, Bog community on an exposed ridge at 3,600 feet. Rare elements include plants *Cyrtandra filipes & C. lydgatei, Myrsine vaccinioides, Pteris lydgatei, Sicyos cucumerinus*. Formerly heavy pig damage occurred through most of the unit, but although pig control programs continue, activity has been reduced to zero for the past 5 years. *Tibouchina herbacea* is the most prevalent weed in Unit 8. Low numbers of blackberry plants are scattered between 2,800 feet and 3,400 feet elevation. Honolua Uka's upper section is as pristine as the upper elevations of neighboring Unit 7. Two strategic fences have been constructed by Preserve staff in Unit 8.

Unit 9: NAKALALUA

Nakalalua unit covers about 800 near-vertical acres of upper Honokohau Valley wall from the 1,000 foot elevation at Honokohau Stream (which feeds ML&P's #1 intake) to the 4,503 foot twin peaks of Nakalalua. Consisting mostly of montane wet forest and shrub land communities, the formerly heavy pig damage has been reduced to zero except for intermittent activity restricted to the Honokohau Stream corridor. *Tibouchina herbacea* and *Clidemia hirta* are the priority weed invasions. One strategic fence has been built across the Pu`u Kukui trail to prevent pigs from moving upslope; a locked gate and barbed wire also discourage human trespass. The Honokowai section of West Maui NAR neighbors Unit 9 to the southwest. The 2.5 kilometer Pu`u Kukui Boardwalk, begins near the rain gauge situated along the Pu`u Kukui trail at the base of the upper peak of Nakalalua. Rare elements include plants *Cyanea lobata, Cyrtandra filipes, & Hesperomannia arborescens.*

Unit 10: PU`U KUKUI

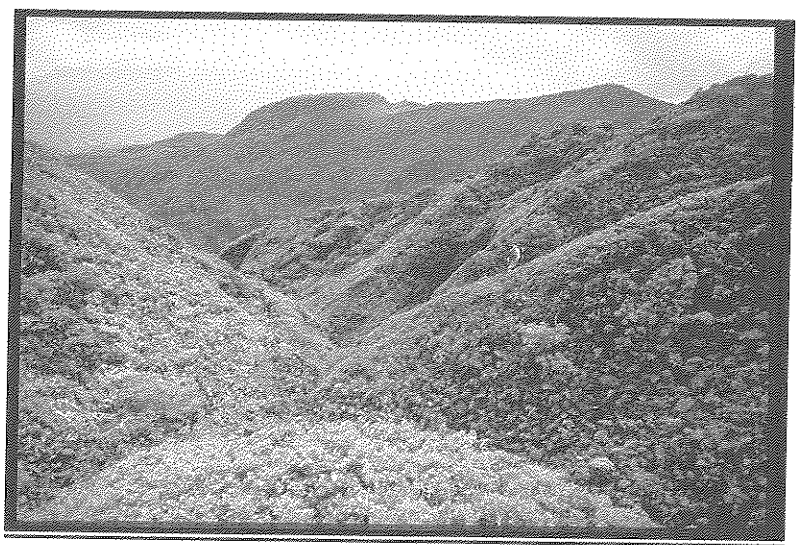
Perhaps due to its spectacularly rugged topography, severe weather and isolation, the 1,100 acre Pu`u Kukui unit has experienced the least pig damage in the watershed. However, a few pigs have historically reached the 5,788 foot Pu`u Kukui summit of Mauna Kahalawai (West Maui) and the threat of invasion into the unit along the summit approaches from adjacent properties continues to exist. Pigs that have made their way above and around Mauna `Eke to the narrow ridge between Honokohau and Waihe`e valleys have been removed. Unit 10 ranges in elevation from 720 feet at Honokohau Stream to the Pu`u Kukui summit and borders the Honokowai section of the NAR on the west and the Kahakuloa section of the West Maui NAR at Mauna `Eke. It supports rare Montane Bog communities as well as a number of rare plants; some found only on West Maui (e.g. *Argyroxiphium caliginis, Geranium hillebrandii, Myrsine vaccinioides*). The last known *Acaena exigua* – listed as Endangered by the U.S. Fish & Wildlife Service – existed here. The 2.5 kilometer Pu`u Kukui boardwalk is currently being extended the last 1000 meters through the bogs to the 5,788 foot summit and has already been shown to protect the fragile bog habitat by reducing the impacts of both PKW Preserve staff, visiting researchers, and a limited number of eco-tourists traveling through the bogs. A single strategic fence has been built by PKW Preserve staff along the trail to protect Unit 10.


PU`U KUKUI WATERSHED PRESERVE
Anakaluahine 4WD Access Road
Transect 2 9,300m/187 stations
Transect 3 8,300m/167 stations
Transect 1 4,900m/99 stations
Transect 4 10,450m/210 stations
Haela`au 4WD Access Road
1
2
3
4
5
6
7
8
9
10
Legend
Threat Monitoring Transect Stations
PKW 4WD Access Roads
PKW Preserve Management Units
Unit 01, Honokohau
Unit 02, Kaluanui
Unit 03, Honolua
Unit 04, Keka`ala`au
Unit 05, Pu`u makani
Unit 06, Kaulalewalewa
Unit 07, Pu`u 3540
Unit 08, Honolua Uka
Unit 09, Nakalalua
Unit 10, Pu`u Kukui
Inset:
ML&P, West Maui Property
N
Preserve Location

Management Goals & Programs

The long-range goal for each management program is listed below, followed by a brief description of the program strategies and how they will change over the six-year period covered in this plan. The goals and objectives are presented roughly in order of priority, but they fit together to form an integrated management strategy.

The management emphasis for the Pu`u Kukui Preserve in Year 1 will be the continued reduction of pig activity that has been underway for the past 17 years. Monitoring for pig activity and weed distribution will be maintained via utilization of the four existing transects, as well as informal survey via air and on ground. Pig activity and new weed establishment is noted during all other activities. A strategic fence, built in two phases, is being considered in Unit 1. It would connect 3 existing fences and provide a barrier to pig ingress from the east. Weed control in Year 1 will continue to focus on satellite populations of *Clidemia hirta, Ardisia elliptica, Cinnamomum burmannii*, as well as continue efforts to prevent establishment of African Tulip (*Spathodea campanulata*), Albizia (*Falcataria moluccana*), and Australian tree fern (*Sphaeropteris cooperi*). Because the wide extent of *Tibouchina herbacea* infestation in the PKW Preserve, manual & chemical control of that species will be limited to select areas; such as the Pu`u Kukui trail, to keep from further vectoring of seeds along high traffic zones. Monthly volunteer service trips will help control this infestation along the trail corridor. Replacement of water catchments strategically placed along the trail will facilitate herbicide applications for control of *Tibouchina, Rubus argutus, Paspalum conjugatum, Juncus* spp., and *Axonopus fissifolius*. Existing priorities to map and control other priority weeds (see Appendix 4) will be reevaluated in Year 1 and mapping undertaken as necessary; control of these other weeds will begin as resources permit.



Mauna `Eke (4,480' asl) **Photo: H. Oppenheimer/ML&P ©2005**

Non-Native Invasive Species Control Program

Feral Ungulate Control

GOAL: Eliminate ungulate activity in all Pu`u Kukui Preserve management units.

ML&P has established a program to prevent pig access to pristine regions and reduce pig numbers in all watershed units to zero. Progress towards this goal will be determined by the following four methods:

- Field observations of PKW Preserve staff
- Alien Threat Monitoring Transect data
- Forward Looking Infra-Red (FLIR) reconnaissance, and
- Permit Hunting Program Capture data

Since 1988, 28 (see Figure 2: PKW Fence Projects) strategically located fences have been built to block or redirect pig movements, and snares set to remove pigs from the watershed. Eight new fences were constructed since 2000, when the PKW Preserve Long-Range Management Plan was last revised - it had proposed four new fences for the six year period 2000-05. Feral goats, *Axis* deer and cattle have been reported adjacent to the area in past years, but are not currently a problem. However, if these animals are detected in the watershed, immediate efforts will be made to remove them. Eight foot high deer-proof fences are scheduled to be constructed at the top of former pineapple fields below the Preserve boundary to help prevent ingress of these destructive animals. Funding was recently approved via a $50,000 grant from USFWS.

Approximately 1800 snares are currently maintained throughout the Preserve, and an additional 400 are in adjacent Exterior Units on ML&P lands. Additional snares will be set where pig activity is detected, and snares will be maintained based on a schedule consistent with the amount of activity until data from monitoring programs indicate zero pig activity. Due to the use of wire traps (i.e. snares) to control feral ungulate populations within the Preserve, as well as the increased risk of introductions of invasive, alien species to the Preserve; no hunting is permitted within the Preserve boundaries. However, ML&P employees and a limited number of public hunters (with valid State hunting licenses) are permitted to hunt on company lands below the PKW Preserve boundary for a nominal fee. Permit hunting helps reduce the pig population below the Preserve and is intended to keep population pressures low enough to keep pigs from moving up into the Preserve from the lower elevations in search of additional food supplies, etc. The PKW Preserve manager will maintain contact with local hunting clubs and remind them of the opportunities for their members to hunt for feral pigs on company lands below the Preserve.

The current monitoring system of four transects will be maintained to continue gathering information on ungulate damage throughout a larger area of the watershed. All transects will be monitored annually to help determine preserve-wide levels of pig activity, and to help identify areas where increased management is needed. One transect per quarter will be monitored. Field notes from snare group maintenance checks will also be utilized to adjust snare numbers accordingly in response to changing levels of pig activity. Aerial ungulate population surveys will be conducted as needed, utilizing a FLIR-equipped helicopter when possible. The FLIR is heat sensitive, and can detect the warmth of an animal's body in low-growing or open vegetation, which can help identify areas that need management attention.

Ungulate Control Timeline

Year 1

- Maintain existing 2200 snares; replace snares as needed due to breakage, etc., and add or remove snares as necessary on a regular basis by management unit.
- Inspect and maintain 28 strategic fences.
- Monitor ungulate damage along 4 existing transects at least once a year.
- Conduct FLIR over-flights.
- Continue permit hunting program below PKW Preserve boundary.
- Begin strategic Fence Project Phase 1.

Year 2

- Maintain existing 2200 snares; replace snares as needed due to breakage, etc., and add or remove snares as necessary on a quarterly basis by management unit.
- Inspect and maintain 28 strategic fences.
- Monitor ungulate damage along 4 existing transects at least once a year.
- Conduct FLIR over-flights.
- Continue permit hunting program below PKW Preserve boundary.
- Complete strategic Fence Project Phase 1.

Year 3

- Add snares in any unit with fresh pig sign.
- Replace other snares in remaining snare groups as needed on a regular basis by management unit.
- Inspect and maintain 29 strategic fences.
- Monitor ungulate damage along 4 existing transects at least once a year.
- Continue permit hunting program below PKW Preserve boundary.
- Conduct FLIR over-flights.
- Begin Fence Project Phase 2.

Year 4

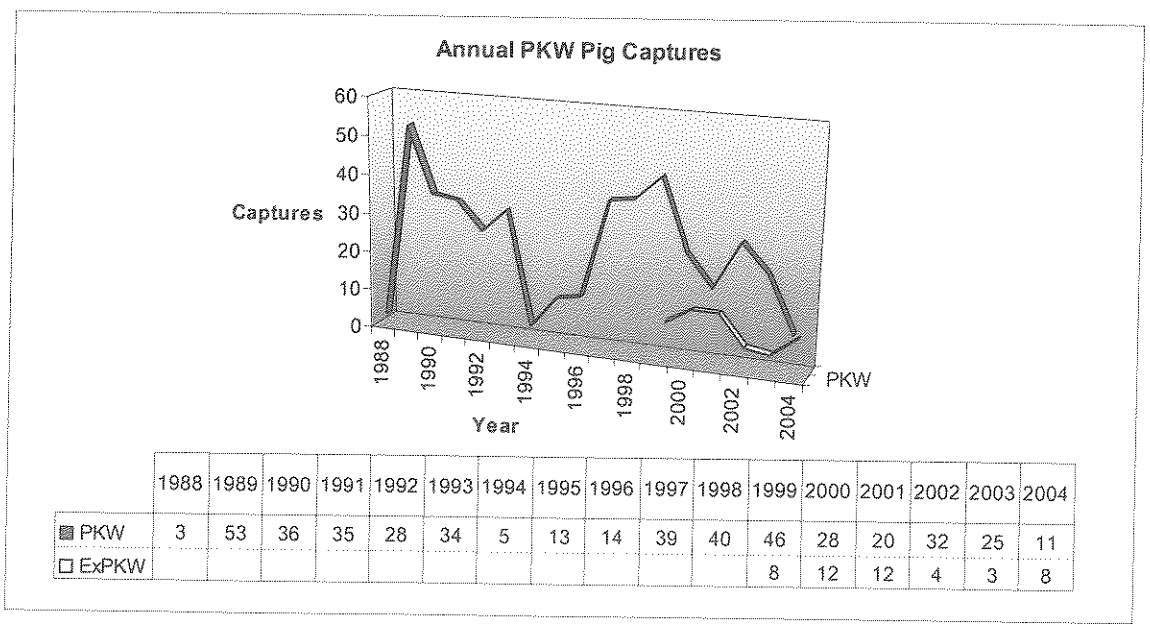
- Add snares in any unit with fresh pig sign.
- Replace other snares in remaining snare groups as needed on a regular basis by management unit.
- Inspect and maintain 30 strategic fences.
- Monitor ungulate damage along 4 existing transects at least once a year.
- Continue permit hunting program below PKW Preserve boundary.
- Conduct FLIR over-flights.

Years 5/6

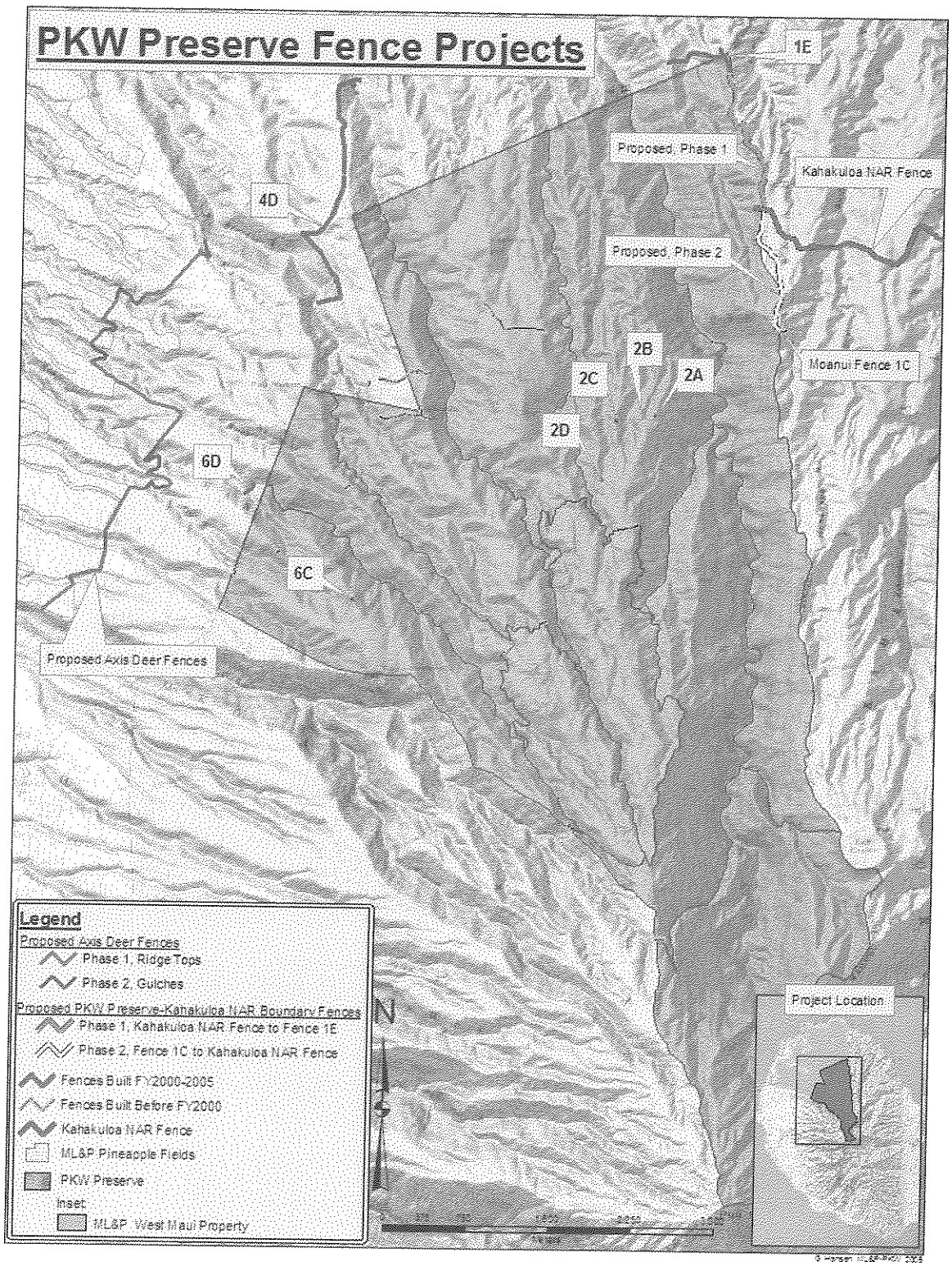
- Add snares in any unit with fresh pig sign.
- Inspect and maintain 30 strategic fences.
- Monitor ungulate damage along 4 existing transects at least once a year.
- Continue permit hunting program below PKW Preserve boundary.
- Conduct FLIR over-flights.

Additionally, due to its expertise & experience, PKW Preserve staff has been contracted by the Maui County BWS to conduct feral pig control on it's Waihe`e Valley lands. It is anticipated that WMMWP staff will also assist in this invasive species control effort.

Annual PKW Preserve Pig Captures
(Since 1988)



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
PKW	3	53	36	35	28	34	5	13	14	39	40	46	28	20	32	25	11
ExPKW												8	12	12	4	3	8


PKW Preserve Fence Projects
1E
Proposed, Phase 1
Kahakuloa NAR Fence
4D
Proposed, Phase 2
2B
2C
2A
Moanui Fence 1C
2D
6D
6C
Proposed Axis Deer Fences
Legend
Proposed Axis Deer Fences
Phase 1, Ridge Tops
Phase 2, Gulches
Proposed PKW Preserve-Kahakuloa NAR Boundary Fences
Phase 1, Kahakuloa NAR Fence to Fence 1E
Phase 2, Fence 1C to Kahakuloa NAR Fence
Fences Built FY2000-2005
Fences Built Before FY2000
Kahakuloa NAR Fence
ML&P Pineapple Fields
PKW Preserve
Inset:
ML&P West Maui Property
N
Project Location

Weed Control

GOAL: Reduce the range of habitat-modifying weeds and prevent introduction of non-native plants.

Progress towards this goal will be met by concentrating weed control efforts in the following areas:

- Satellite populations of priority weed species.
- Immediate threats to rare taxa or SEA.
- Incipient populations of new invasive species.
- *Tibouchina herbacea, Rubus argutus* along lower Pu`u Kukui trail.
- Monitoring of invasive species populations adjacent to PKW Preserve.
- Available biological control agent releases for *Clidemia hirta,* etc.
- Mapping of priority weed species.
- Data entry of all control efforts.
- Identification and inventory of all vascular plant species in all PKW Preserve and Exterior Units.

Reducing disturbances to intact native vegetation will be one of the most effective methods to prevent weeds from becoming established. However, there are weeds established in the preserve that require control. The weed control strategy for the Pu`u Kukui Preserve will concentrate on controlling "satellite" populations of priority weeds and preventing further expansion of weeds into pristine areas. Incipient weed populations will be targeted for expedited eradication. Treatment of large, well established weed populations is generally not practical or cost-efficient, and these weeds are controlled only enough to prevent their further spread until existing and future biological control agents can be developed and made available. Weed control efforts will require an integrated program of applying known control methods, monitoring effectiveness, and refining control methods.

The 4 monitoring transects used to measure ungulate damage are also used to note all weed presence and densities using a simple Presence/Absence method. Maps showing ranges of priority weeds can be used to track the location of known populations, and to determine if the weeds are expanding their range. Transect data is entered in the PKW Preserve database (based in MS Access) for further analysis. Existing range maps include; *Acacia mearnsii, Ardisia elliptica, Cinnamomum burmannii, Clidemia hirta, Falcataria moluccana, Morella (Myrica) cerifera, Passiflora ligularis, Rubus argutus, R. discolor, Sphaeropteris cooperi, Spathodea campanulata, Tibouchina herbacea*, among others. Existing maps and additional maps of priority weed species will be updated on an annual basis as deemed necessary.

Pu`u Kukui Preserve staff and volunteers continue to manually remove all *Tibouchina* in a narrow 5 meter wide corridor along the first mile of Pu`u Kukui Trail on a monthly basis.

The use of chemical control methods will be minimized and only herbicides approved for use in watersheds will be used. All staff will undergo required pesticide application training to maintain their existing Hawai`i Department of Agriculture (HDOA) Commercial Pesticide Applicator licenses. Weed control is labor-intensive and benefits from technologically sophisticated techniques, and will require technical support from the University of Hawaii Cooperative Extension Service, the National Park Service, and other researchers. The development of biological control methods for priority weeds by programs underway in the U. S. Forest Service, National Park Service and at the HDOA will be encouraged by making study sites available as requested. Deployment of these control agents will be made whenever they are available. PKW Preserve staff will continue to discuss and map weed species, locations, and control methods with TNCH & WMMWP.

The PKW Preserve manager has served as chairman of the Tri-Isle Resource, Conservation and Development Council's (Tri-Isle RC&D) Melastome Action Committee (MAC) since its inception in 1991 and as the chairman of the Research Corporation of the University of Hawaii's (RCUH) Maui Invasive Species Committee (MISC) since its evolution from the MAC in December, 1997. These committees' goal is to identify solutions and act to reduce the invasions and extent of *Melastome* weeds and other invasive pest species in forested and watershed areas throughout the state through long-term biological control, and short-term manual and chemical control.

ML&P will continue its ongoing policy of field equipment & gear sanitization to prevent the introduction and spread of new and/or established weeds in the PKW Preserve. Those who enter the watershed area will be required to clean their clothing, boots, equipment and camping gear of soil and plant material to prevent weed introduction. Wherever possible, helicopter flights into the watershed will originate from weed free areas such as wooden platforms or pavement, and all materials hauled into the watershed will be inspected and cleaned to remove soil, plant material, and insects. Helicopter landing sites and areas frequented by staff will be inspected for new weed species each trip.

A 2.5 kilometer boardwalk has been built over severely damaged sections of the Pu`u Kukui trail to reduce the spread of weeds in the pristine bog areas of Unit 10. Much of the higher elevation trail crosses boggy areas with very fragile ground cover. In some areas hikers had created 20 foot wide paths to avoid sinking in the deep mud. Delicate native ground-cover and rare endemic plants were being destroyed and weeds were spreading along the disturbed trail corridor. The boardwalk has been completed, but 175 meters of the original boardwalk, built in 1991, remains to be rebuilt with double (16") wide planking (vs. single 8"), and level steps.

Although the extent of *Tibouchina herbacea* infiltration of the Pu`u Kukui Preserve has rendered manual and chemical controls in large part futile, the Preserve staff will continue to treat satellite populations that are found in the SEAs, immediately surrounding rare taxa, and along the lower Pu`u Kukui trail. Additionally, the Preserve manager will continue participation in MISC and the Coordinating Group for Alien Pest Species (CGAPS) in hopes of the eventual discovery and development of an effective biological control agent(s) for *Tibouchina herbacea* and other invasive plant pests.

Weed Control Timeline

Year 1

- Continue participation in MISC to promote biological control solutions to widespread *Tibouchina herbacea* and other eradication strategies for other priority invasive species in the PKW Preserve.
- Continue implementing biological control agents targeting *Clidemia hirta.*
- Continue satellite population control of priority weed species.
- Continue control of weeds threatening rare taxa or SEAs.
- Continue eradication of incipient populations of invasive weeds in and immediately adjacent to the Preserve on ML&P lands and/or with approval from adjacent landowners.
- Continue control of priority weed species along Pu`u Kukui trail corridor.
- Continue monitoring weed presence along 4 existing transects (see ungulate control section).
- Update lists & range maps of prevalent and priority weeds annually.
- Update control efforts in the PKW Preserve Database.

Year 2

- Continue participation in MISC to promote biological control solutions to widespread *Tibouchina herbacea* and other eradication strategies for other priority invasive species in the PKW Preserve.
- Continue implementing biological control agents targeting *Clidemia hirta.*
- Continue satellite population control of priority weed species.
- Continue control of weeds threatening rare taxa or SEAs.
- Continue eradication of incipient populations of invasive weeds in and immediately adjacent to the Preserve on ML&P lands and/or with approval from adjacent landowners.
- Continue control of priority weed species along Pu`u Kukui trail corridor.
- Continue monitoring weed presence along 4 existing transects (see ungulate control section).
- Update lists & range maps of prevalent and priority weeds annually.
- Update control efforts in the PKW Preserve Database.

Years 3 / 4

- Continue participation in MISC to promote biological control solutions to widespread *Tibouchina herbacea* and other eradication strategies for other priority invasive species in the PKW Preserve.
- Continue implementing biological control agents targeting *Clidemia hirta.*
- Continue satellite population control of priority weed species.
- Continue control of weeds threatening rare taxa or SEAs.
- Continue eradication of incipient populations of invasive weeds in and immediately adjacent to the Preserve on ML&P lands and/or with approval from adjacent landowners.
- Continue control of priority weed species along Pu`u Kukui trail corridor.
- Continue monitoring weed presence along 4 existing transects (see ungulate control section).
- Update lists & range maps of prevalent and priority weeds annually.
- Update control efforts in the PKW Preserve Database.

Years 5 / 6

- Continue participation in MISC to promote biological control solutions to widespread *Tibouchina herbacea* and other eradication strategies for other priority invasive species in the PKW Preserve.
- Continue implementing biological control agents targeting *Clidemia hirta.*
- Continue satellite population control of priority weed species.
- Continue control of weeds threatening rare taxa or SEAs.
- Continue eradication of incipient populations of invasive weeds in and immediately adjacent to PKW Preserve on ML&P lands and/or with approval from adjacent landowners.
- Continue control of priority weed species along Pu`u Kukui trail corridor.
- Continue monitoring weed presence along 4 existing transects (see ungulate control section).
- Update lists & range maps of prevalent and priority weeds annually.
- Update control efforts in the PKW Preserve Database.

Invertebrate and Small Mammal Control

GOAL: To reduce negative impacts of non-native invertebrates and small mammals.

Non-native insects, mollusks and small mammals (rats, mongooses, feral cats, etc.) are poorly understood but widely acknowledged threats to native species and ecosystem stability. Ants, yellow jackets (*Vespula* spp.) and snails like *Euglandina rosea* (Rosy wolf snail) have displaced native invertebrate fauna at lower elevations. Rats (*Rattus* spp.) and mongooses (*Herpestes auropunctatus*) are major predators of both flora and fauna. Over the next six years at Pu`u Kukui Preserve, incidental sign of small mammals and non-native invertebrates will be noted, and traps will be set where mammal sign is seen.

Small mammal control will continue by setting traps around camp sites for rats and mongoose during each visit. Material attractive to these pests will be securely stored or removed. Incidental sign of small mammals will continue to be noted as part of the daily field observations of PKW Preserve staff.

Use of the rodenticide *Diphacinone* has been discontinued due to the inability to maintain fresh supplies at bait stations, as required by the label. PKW Preserve staff continues to support efforts to register this toxicant for aerial broadcast application.

Invertebrate and Small Mammal Control Timeline

Year 1

- Continue to set rat and mongoose traps around camp sites and observe for small mammal sign.
- Continue to set traps in SEAs to protect rare native tree snail species.
- Note daily field observations of small mammal sign and non-native invertebrate presence.
- Continue to reset snap traps along lower half of Pu`u Kukui Trail.

Year 2

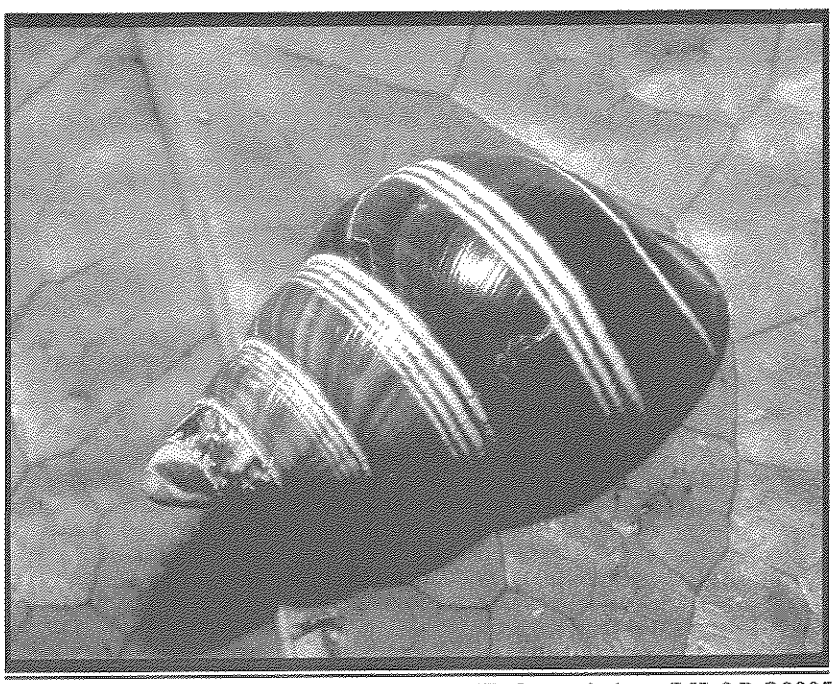
- Continue to set rat and mongoose traps around camp sites and observe for small mammal sign.
- Continue to set traps in SEAs to protect rare native tree snail species.
- Note daily field observations of small mammal sign and non-native invertebrate presence.
- Continue to reset snap traps along lower half of Pu`u Kukui Trail.

Year 3 / 4

- Continue to set rat and mongoose traps around camp sites and observe for small mammal sign.
- Continue to set traps in SEAs to protect rare native tree snail species.
- Note daily field observations of small mammal sign and non-native invertebrate presence.
- Continue to reset snap traps along lower half of Pu`u Kukui Trail.

Years 5 / 6

- Continue to set rat and mongoose traps around camp sites and observe for small mammal sign.
- Continue to set traps in SEAs to protect rare native tree snail species.
- Note daily field observations of small mammal sign and non-native invertebrate presence.
- Continue to reset snap traps along lower half of Pu`u Kukui Trail.



Partulina splendida **(Pupu kani`oe) Photo: H. Oppenheimer/ML&P ©2005**

Monitoring and Research

GOAL: To track biological and physical resources in the watershed and evaluate changes in these resources over time; to identify new threats to the watershed; to provide logistical support to approved research projects that will improve management understanding of the watershed's resources.

Scientific monitoring is needed to measure the effectiveness of management programs, and the condition of natural resources within the watershed. The monitoring transects mentioned in the non-native species control sections evaluate those programs as well as 17 long-range monitoring vegetation plots and over a dozen photo-point monitoring stations established over the past 16 years. Additional monitoring which may be needed to track the major resources and threats to these resources within the watershed may be implemented. The PKW Preserve staff has also participated in joint USFWS/DOFAW forest bird census training exercises as well as actual monitoring of forest bird resources on Mauna Kahalawai (West Maui), Haleakala (East Maui), and Moloka`i as primary and secondary observers. PKW Preserve staff will also continue data collection and maintenance of its database and biological inventory.

Scientific research in Pu`u Kukui Preserve benefits Preserve staff; whose increased knowledge should result in better management decisions to protect the Preserve's natural resources, as well as society in general; as a better understanding of our planet's complex biodiversity could result in better management decisions that should ultimately serve to protect Earth's natural resources for generations to come. However, unfettered research access could have negative impacts on Preserve resources. Therefore; all scientific research will be allowed on a permit basis only. The PKW Preserve manager & staff will evaluate all research proposals for potential direct and indirect impacts on the watershed and its resources. Proposed projects will also be evaluated based on the pertinence of the research. Only those projects deemed safe to the resources and of high priority will be allowed. Only researchers from accredited and valid organizations and agencies will be permitted access to the Preserve and its natural resources.

Monitoring and Research Timeline

Year 1

- Continue providing logistical support for approved research projects in the watershed.
- Continue updating photo-monitoring point stations as schedule allows.
- Conduct at least one remote survey trip annually to identify & inventory native resources and threats to same.
- Maintain two USGS meteorological climate stations at Pu`u Kukui and Kaulalewalewa.

- Continue to gather GPS coordinates for all infrastructure, rare element occurrences, priority weeds, etc. for inclusion in the PKW GIS.
- Participate in USFWS/DOFAW forest bird census.

Year 2

- Continue providing logistical support for approved research projects in the watershed.
- Continue updating photo-monitoring point stations as schedule allows.
- Conduct at least one remote survey trip annually to identify & inventory native resources and threats to same.
- Maintain two USGS meteorological climate stations at Pu`u Kukui and Kaulalewalewa.
- Continue to gather GPS coordinates for all infrastructure, rare element occurrences, priority weeds, etc. for inclusion in the PKW GIS.
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Years 3 / 4

- Continue providing logistical support for approved research projects in the watershed.
- Continue updating photo-monitoring point stations as schedule allows.
- Conduct at least one remote survey trip annually to identify & inventory native resources and threats to same.
- Maintain two USGS meteorological climate stations at Pu`u Kukui and Kaulalewalewa.
- Continue to gather GPS coordinates for all infrastructure, rare element occurrences, priority weeds, etc. for inclusion in the PKW GIS.
- Participate in USFWS/DOFAW forest bird census.

Years 5 / 6

- Continue providing logistical support for approved research projects in the watershed.
- Continue updating photo-monitoring point stations as schedule allows.
- Conduct at least one remote survey trip annually to identify & inventory native resources and threats to same.
- Maintain two USGS meteorological climate stations at Pu`u Kukui and Kaulalewalewa.
- Continue to gather GPS coordinates for all infrastructure, rare element occurrences, priority weeds, etc. for inclusion in the PKW GIS.
- Participate in USFWS/DOFAW forest bird census.

Rare Species Protection

GOAL: To prevent the extinction of rare species in the watershed.

Protection of the Preserve's natural communities is essential to protecting the rare native species that depend on these ecosystems for survival. In addition, more rare species may be discovered in new areas of the watershed with further exploration. However, particularly rare plants and animals may need more immediate attention and direct management than current habitat protection measures and programs provide.

The goal of this program is to identify the rarest species and threats to them, and implement management to prevent their loss. Surveys of flora and fauna will be conducted in-house by PKW Preserve staff and visiting biologists at substantial savings over contracted consultants, however; the PKW Preserve manager will not hesitate to hire appropriate expert consultants as needed to assist the Preserve staff in protecting rare taxa from the threat of extinction. Programs such as *in situ* exclosure fences, *ex situ* propagation and restoration of rare taxa will be implemented as determined necessary or as opportunities arise to enhance the viability of rare species.

The construction of a nursery at Kaulalewalewa (2,980' elev.), funded in part by a USDA Natural Resource Conservation Service grant for propagation of the rare Mauna Kahalawai (West Maui) endemic fan palm *Pritchardia forbesiana*, should be completed by mid-2005. PKW Preserve staff will continue to collect propagules of rare species for the University of Hawaii's Lyon Arboretum, and work with staff from the National Tropical Botanical Garden in Lawai, Kaua`i to conserve and protect IUCN listed Genetic Safety Net species.

Rare Species Protection Timeline

Year 1

- Continue collection & delivery of rare taxa propagules to appropriate facilities (e.g. University of Hawaii's Lyon Arboretum, National Tropical Botanical Garden [NTBG]).
- Maintain information exchanges with leading conservation organizations regarding biological resources and threats on Maui.
- Continue to survey for new plant & animal populations with in-house staff.
- Continue to map rare species and include in PKW GIS.
- Maintain PKW Preserve Database of rare species.
- Continue maintenance of *Ctenitis squamigera* SEA.
- Continue maintenance of *Newcombia cumingi* SEA.
- Continue *Pritchardia forbesiana* propagation and restoration project with USDA-NRCS Wildlife Habitat Incentive Program (WHIP) funds.

Year 2

- Continue collection & delivery of rare taxa propagules to appropriate facilities (e.g. University of Hawaii's Lyon Arboretum, NTBG).
- Maintain information exchanges with leading conservation organizations regarding biological resources and threats on Maui.
- Continue to survey for new plant & animal populations with in-house staff.
- Continue to map rare species and include in PKW GIS.
- Maintain PKW Preserve Database of rare species.
- Continue maintenance of *Ctenitis squamigera* SEA.
- Continue maintenance of *Newcombia cumingi* SEA.
- Continue *Pritchardia forbesiana* propagation and restoration project with USDA-NRCS Wildlife Habitat Incentive Program (WHIP) funds.

Years 3 / 4

- Continue collection & delivery of rare taxa propagules to appropriate facilities (e.g. University of Hawaii's Lyon Arboretum, NTBG).
- Maintain information exchanges with leading conservation organizations regarding biological resources and threats on Maui.
- Continue to survey for new plant & animal populations with in-house staff.
- Continue to map rare species and include in PKW GIS.
- Maintain PKW Preserve Database of rare species.
- Continue maintenance of *Ctenitis squamigera* SEA.
- Continue maintenance of *Newcombia cumingi* SEA.
- Continue *Pritchardia forbesiana* propagation and restoration project with USDA-NRCS Wildlife Habitat Incentive Program (WHIP) funds.

Years 5 / 6

- Continue collection & delivery of rare taxa propagules to appropriate facilities (e.g. University of Hawaii's Lyon Arboretum, NTBG).
- Maintain information exchanges with leading conservation organizations regarding biological resources and threats on Maui.
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- Maintain PKW Preserve Database of rare species.
- Continue maintenance of *Ctenitis squamigera* SEA.
- Continue maintenance of *Newcombia cumingi* SEA.
- Continue *Pritchardia forbesiana* propagation and restoration project with USDA-NRCS Wildlife Habitat Incentive Program (WHIP) funds.

Personnel, Equipment, and Facilities

GOAL: To provide adequate manpower and equipment to meet the goals and objectives of this plan.

The Pu`u Kukui Preserve manager is responsible for the implementation of this plan. The volume of work outlined in this plan requires the PKW Preserve manager to be assisted by one field operations supervisor and three full-time field technicians. A field operations supervisor and an additional full-time field technician will help ensure that schedules can be met and longer trips can be made into the remote watershed areas, reducing helicopter time and creating more efficient working schedules. However, contract labor may provide more than one additional person at a time, for labor-intensive trips, such as; fence, boardwalk or platform/shelter construction and installations.

The current staffing level consists of one PKW Preserve manager and two full-time PKW Preserve field technicians. Planning and Technical Assistance funds budgeted will cover consultant fees for technical assistance such as monitoring techniques, and occasional *in situ* consultation with outside consultants.

PKW Preserve staff will attend regularly scheduled emergency training courses offered by ML&P, DOFAW, National Park Service, and the American Red Cross. Staff will attend refresher emergency training courses on an annual basis or as required to maintain certifications.

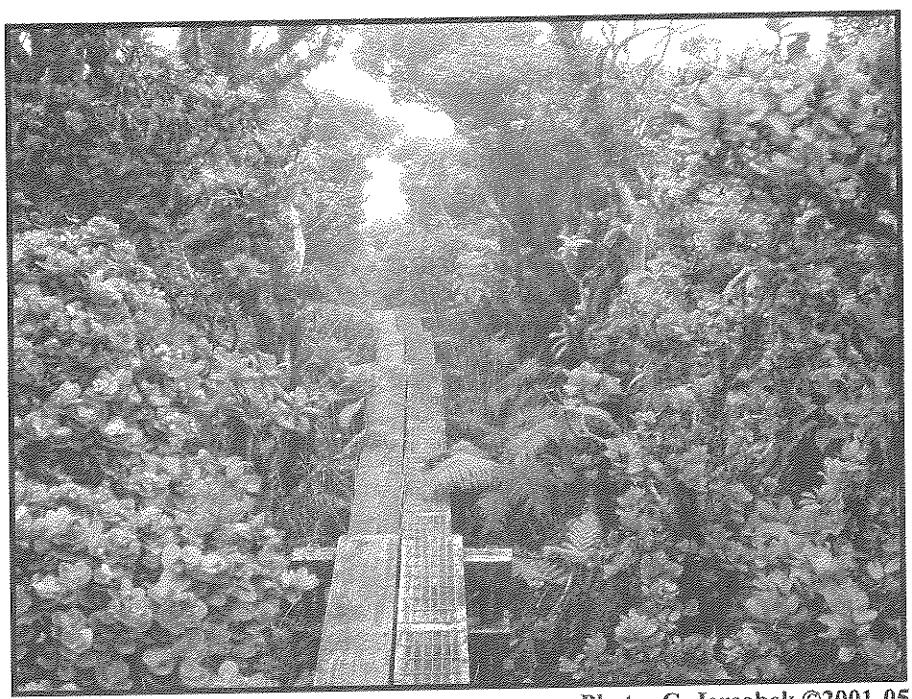
Volunteers can help reduce management costs of labor-intensive tasks such as fence construction, weed control, and trail maintenance. However, working conditions in remote sections of the Pu`u Kukui Preserve can be hazardous and adequate safety training and supervision for volunteers must be provided. Also, sufficient insurance coverage should be in place for all volunteers (additional insurance costs are not shown in the following volunteer costs). The Pu`u Kukui Preserve manager will cultivate and schedule volunteers to assist with appropriate watershed projects. Volunteer group size will be limited to minimize impact on fragile trails or habitat, and volunteers will be escorted by Preserve staff in order to support the policy of keeping the watershed closed to the general public.

Maui Pineapple Company's Honolua Plantation baseyard provides space for the Pu`u Kukui Preserve staff and equipment storage needs, and associated costs as "facilities". Other "facilities" in the PKW Preserve are needed to improve management efficiency. ML&P's Haela`au Cabin, located at the top of a 4-wheel drive road to the Pu`u Kukui trailhead at Kaulalewalewa, is used by PKW Preserve staff, volunteers and visiting researchers for lower elevation work. Annual maintenance of the cabin is needed to keep the building (built circa 1925) in usable condition. Nine (20'x20'(6), 16'x12'(1), 12'x12'(1), 8'x12'(1)) wooden helicopter landing platforms have been established provide safe landing zones, to protect fragile

vegetation from helicopter landings, and to prevent the establishment of additional weeds. Additional camp platforms/helicopter landing zones (LZ) may be installed as needed. All construction in the Conservation District will comply with current state regulations and NAP program rules.

Currently, the PKW has two dedicated 4-wheel drive vehicles to provide access to the watershed's lower areas and helicopter pickup sites by PKW staff. As new staffing is added to fulfill expanded Preserve operational requirements, additional 4-wheel drive vehicles dedicated to the Preserve's management will be needed to ensure regular transportation to and from work sites.

Road and trail maintenance is needed to keep the main ground access routes to the watershed open; principally the 4-wheel drive to Haela`au Cabin, and the Pu`u Kukui Trail on the watershed's southwest boundary. Heavy winter rains cause erosion and washouts on the road, and periodic maintenance is needed to fill potholes and improve drainage to lessen erosion on the only regularly used vehicle access to the watershed. The existing 2.5 kilometer boardwalk over the muddy parts of the upper Pu`u Kukui trail is currently in the process of being rebuilt along the final 175m stretch of the original (1991) boardwalk to increase safety by widening and leveling the walking surface. Impacts from these activities should affect only surface vegetation and will be temporary in duration.



PKW Preserve Boardwalk **Photo: C. Jersabek ©2001-05**

Socioeconomic

This project currently provides full-time employment for three ML&P employees with a projected increase to five full-time Preserve staff. Additionally, the bulk of project expenditures are projected to stay in the local economy. Services, such as helicopter charter, are with locally owned & operated companies. Materials and supplies are purchased locally whenever possible.

In addition, the rain forests and bogs of the Pu`u Kukui Watershed Preserve serve as a stable water source for West Maui residents and industries. Maui Land & Pineapple Company depends on the watershed for agricultural and resort use, and supplies water to the county water system and neighboring landowners. Native vegetation is an essential component of this watershed system. Forest cover protects fragile mountain soils from erosion, and acts like an immense sponge that absorbs heavy rains. Water is gradually released into streams and groundwater aquifers, rather than running off the surface in torrents to the sea. Subsequently, ML&P's conservation efforts in the Pu`u Kukui Preserve should also benefit both the recreational and natural resources of the Honolua - Mokulei`a Marine Life Conservation District.

Preservation of biodiversity has been recognized as a legitimate and necessary goal for society. This project provides multiple opportunities to protect and preserve examples of unique natural ecosystems and their attendant native species. When appropriate, volunteers will be utilized in various management projects thus providing educational and recreational opportunities for the general public. Additionally, the Permit Hunting Program provides recreational opportunities for those that qualify to participate, and allows local families to supplement their diet with wild game.

Environmental

This project is expected to create positive impacts on the environment in the form of maintaining or enhancing water quality, maintaining or enhancing native ecosystem habitats and their component species, maintaining or enhancing biological diversity. The maintenance of natural "view planes" will enhance the aesthetics of the area. A short term increase in noise levels will occur when helicopters are used to transport staff and supplies to remote areas. Pilots will be instructed to follow flight paths that avoid flying over residential areas according to FAA guidelines.

III. SUMMARY OF MAJOR IMPACTS

Major Impacts - Positive

- Reduction of ungulate activity to a level that will promote and sustain measurable recovery of native vegetation in all Pu`u Kukui management units.
- Reduction of the range of habitat-modifying weeds and prevention of introduction of new problem weeds.
- Reduction of known threats by non-native invertebrates and small mammals.
- Tracking of biological and physical resources in the watershed and evaluation of changes in these resources over time to identify new threats to the watershed.
- Logistical support to approved research projects will improve management understanding of the watershed's resources.
- Prevention of the extinction of rare species in the watershed.

Major Impacts - Negative

- One potential impact is the accidental introduction or spread of new weed species by managers or visitors on equipment, supplies or transport vehicles; however, with care, no major negative impacts are expected to result from the proposed activities.

IV. ALTERNATIVES CONSIDERED

- No alternatives were considered to the proposed activities. A no-action alternative would not provide any of the listed positive impacts and would ultimately lead to increased feral ungulate destruction of the watershed, replacement of native vegetation with alien species, and extinctions of rare native species and was therefore not seriously considered.

V. PROPOSED MITIGATION MEASURES

- To prevent the accidental introduction or spread of weed species, anyone entering the watershed area will be required to clean their clothing, boots, equipment and camping gear of soil and plant material. A written protocol is provided to all visitors to follow.
- Wherever possible, helicopter flights into the watershed will originate from weed-free areas such as wooden platforms or pavement, and all materials hauled into the

watershed will be inspected and cleaned to remove soil, plant material, and insects. Helicopter landing sites and areas frequented by staff will be inspected for weeds each trip.

VI. DETERMINATION

- A negative declaration is anticipated for this project. No significant negative impacts to the environment are expected to result from the implementation of the proposed activities as set forth below:

VII. FINDINGS AND REASONS FOR SUPPORTING DETERMINATION

SIGNIFICANCE CRITERIA: According to the Department of Health Rules (I 1-200-12), an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

1. **Involved an irrevocable commitment to loss or destruction of any natural or cultural resources;**
   - Implementation of the proposed activities is expected to produce positive impacts on a number of rare species and native ecosystems found in the area.
   - Control of ungulates and weed species will enhance the native ecosystems and protect the native biological diversity of the area. Through a careful and rigorous cleaning and monitoring program, the introduction or spread of new weed species is expected to be minimal.
   - Impacts on historic and cultural resources are expected to be negligible, given the remote nature of the area with few, if any, historic resources to be expected, and given the nature of the proposed activities.
2. **Curtails the range of beneficial uses of the environment;**
   - The subject property is zoned conservation and all actions described in this plan are intended to protect the native & cultural natural resources on the property.
3. **Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;**
   - The proposed actions in this plan are consistent with the Environmental Policies established in Chapter 344, HRS, and the National Environmental Policy Act.
4. **Substantially affects the economic or social welfare of the community or state;**
   - New employment opportunities presented by this project will generate new sources of direct and indirect revenue for individuals and the County of Maui by providing both temporary and long-term employment opportunities during

the project period. Indirect employment in a wide range of service related industries will also be created from materials & services provided during the project period.

5. **Substantially affects public health;**
   - Protection of the area will help ensure a stable water source for West Maui's agricultural, tourist, as well as other commercial and residential needs.
6. **Involves substantial secondary impacts, such as populations changes or effects on public facilities;**
   - Protection of the area will help ensure a stable water source for West Maui's agricultural, tourist, as well as other commercial and residential needs and help reduce the need to develop additional water resources to serve the West Maui population at public expense during the project period.
7. **Involves a substantial degradation of environmental quality;**
   - The actions described in this plan are intended to protect the native & cultural natural resources on the property and substantially improve the quality of the natural environment.
8. **Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;**
   - The actions described in this plan are intended to protect the native & cultural natural resources on the property and substantially improve the quality of the natural environment for future generations of Maui's residents and visitors to benefit from & enjoy.
9. **Substantially affects a rare, threatened or endangered species or its habitat;**
   - Implementation of the proposed activities is expected to produce positive impacts on a number of rare species and native ecosystems found in the area.
10. **Detrimentally affects air or water quality or ambient noise levels;**
    - Protection of the area will help ensure a stable water source and improve water quality for West Maui's agricultural, tourist, as well as other commercial and residential needs. Other impacts to public health will be insignificant or not detectable over the duration of the project.
11. **Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.**
    - Protection of the area will help ensure a stable water source for West Maui's agricultural, tourist, as well as other commercial and residential needs.
    - Reduction in feral animal activity will help decrease erosion; which will, in turn, decrease sedimentation of near-shore marine ecosystems, and will also reduce the amounts of bacteria in freshwater streams and public potable water systems.

12. **Substantially affects scenic vistas and view planes identified in county or state plans or studies;**
    - Any additional physical improvements (i.e. feral animal control fences, helicopter landing platforms, etc.) will not be readily visible by the general public, except from higher elevations in low-flying aircraft.
13. **Requires substantial energy consumption.**
    - The actions described in the proposed plan will not require substantial energy consumption relative to other similar projects.

VIII. LIST OF PREPARERS

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The Pu`u Kukui Watershed Preserve Long Range Management Plan was prepared by ML&P's Pu`u Kukui Watershed Preserve department staff. The plan has been submitted to the Natural Area Reserves System Commission for consideration as a Natural Area Partnership (NAP) project for fiscal years 2006 through 2011. This document incorporates many sections and figures from that plan (e.g. all maps, descriptions of resources and proposed activities) and is an updated version of an Environmental Assessment prepared in 2000 by PKW Preserve staff. Please refer to the management plan for project budget details.

APPENDIX 1

Natural Plant Communities of the Pu`u Kukui Watershed Preserve

As described by Gagne and Cuddihy in the *Manual of the Flowering Plants of Hawai`i*, the floristic composition of the islands can be classified according to environmental situation and the dominance of particular components. *Principal community types* - presented here in **boldface** -are general groupings based on elevation, moisture and physiognomy regimes. Within the principal community types are found unique plant communities, which are named according to their respective dominant components. Seventeen unique plant communities within eight principal community types are found within the lowland and montane regions of the PKW Preserve. Only native dominated communities are listed here:

Lowland Mesic Shrubland
- *`Ohi`a (Metrosideros)* Lowland Mesic Shrubland
- *Pukiawe/A`ali`i (Styphelia/Dodonaea)* Lowland Mesic Shrubland

Lowland Mesic Forest
- *`Ohi`a (Metrosideros)* Lowland Mesic Forest
- *Papala/Papala kepau (Charpentiera/Pisonia)* Riparian Forest
- *Lama/`Ohi`a* (Diospyros/Metrosideros) Lowland Mesic Forest

Lowland Wet Shrubland
- *Mamaki (Pipturus)* Wet Shrubland

Lowland Wet Forest
- *`Ohi`a/Uluhe (Metrosideros/Dicranopteris)* Fern Forest
- *`Ohi`a (Metrosideros)* Lowland Wet Forest
- *`Ohi`a/Olapa (Metrosideros/Cheirodendron)* Lowland Wet Forest
- *Koa/`Ohi`a (Acacia/Metrosideros)* Lowland Forest

Montane Wet Sedgelands
- *Carex* Sedgeland

Montane Wet Mixed Communities
- *`Ohi`a (Metrosideros)* Montane Wet Mixed Community
  - Subtype: *`Ohi`a/Kuolohia/Oreobolus* Mixed Bog

Montane Wet Shrubland
- Mixed Fern Shrubland
- *`Ohi`a (Metrosideros)* Montane Wet Shrubland

Montane Wet Forest
- *`Ohi`a (Metrosideros)* Montane Wet Forest

APPENDIX 2

Rare Plants of the Pu`u Kukui Watershed Preserve As Listed by the U.S. Fish & Wildlife Service

Endangered:

1. *Acaena exigua* (Liliwai)**
2. *Alectryon macrococcus* (Mahoe)
3. *Ctenitis squamigera* (Pauoa)
4. *Cyanea lobata* (Haha)*
5. *Cyanea magnicalyx* (Haha)*
6. *Cyrtandra munroi* (Ha`iwale)
7. *Hesperomannia arborescens*
8. *Pteris lidgatei* (Lydgate's Pteris fern)
9. *Sanicula purpurea* (Snakeroot)

Candidates:

1. *Cyanea asplenifolia* (Haha)+
2. *Cyrtandra filipes* (Ha`iwale)

Species of Concern:

1. *Alphitonia ponderosa* (Kauila)
2. *Anoectochilus sandwicensis* (Honohono)
3. *Argyroxiphium caliginis* (`Eke silversword)*
4. *Bidens conjuncta* (Ko`oko`olau)*
5. *Calamagrostis expansa* (Reed grass)
6. *Calamagrostis hillebrandii* (Reed grass)
7. *Cyanea kunthiana* (Haha)+
8. *Cyrtandra lydgatei* (Ha`iwale)
9. *Dicanthelium koolauensis*
10. *Doodia lyonii*
11. *Eurya sandwicensis* (Anini)
12. *Exocarpos gaudichaudii* (Hulumoa)
13. *Gardenia remyi* (Nanu)
14. *Geranium hillebrandii* (Nohoanu)*
15. *Hedyotis formosa*
16. *Hibiscus kokio* subsp. *kokio* (Koki`o ula)
17. *Hillebrandia sandwicensis* (Pua maka nui)
18. *Joinvillea ascendens* subsp. *ascendens* (`Ohe)
19. *Keysseria maviensis* (Howaiaulu)
20. *Liparis hawaiensis* (Awapuhiakanaloa)

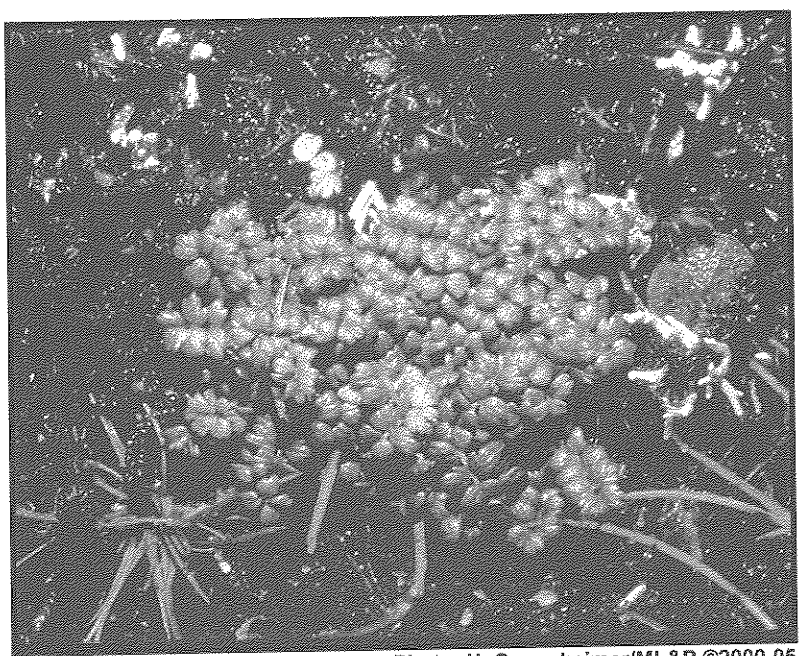
APPENDIX 2

21. *Myrsine vaccinioides* (Kolea)*
22. *Phyllostegia stachyoides*
23. *Pritchardia forbesiana* (Loulu)*
24. *Sicyos cucumerinis* (Panunu kuahiwi)
25. *Strongylodon ruber* (Nuku i`iwi)
26. *Wikstroemia bicornuta* (`Akia)

* Indicates plants that are endemic to West Maui
\+ Indicates plants that are endemic to Maui
** Last known individual seen Jan., 2000 by Preserve staff

Plants with no current USFWS Status that are **Endemic** to Mauna Kahalawai (West Maui) and are found in PKW Preserve:

1. *Cyanea scabra* (Haha)
2. *Hypolepis punctata* subsp. *mauiensis* (Olua)
3. *Metrosideros polymorpha* var. *pseudorugosa* (`Ohia)
4. *Sphagnum wheeleri* (Wheeler's Sphagnum moss)



Acaena exigua **(Liliwai)** **Photo: H. Oppenheimer/ML&P ©2000-05**

APPENDIX 3

Rare Animals of the Pu`u Kukui Watershed Preserve As Listed by the U.S. Fish & Wildlife Service

Endangered:

Vertebrate:

Branta sandvicensis (Nene / Hawaiian Goose)
Lasiuris cinereus semotus (`Ope`ape`a / Hawaiian Hoary Bat)
Pterodroma phaeopygia sandwichensis (`Ua`u / Hawaiian Petrel)

Candidate:

Vertebrate:

Puffinus newelli (`A`o / Newell's Shearwater)

Invertebrate:

Megalagrion pacificum (pina`o `ula / (Hawaiian Damselfly)

Species of Concern:

Vertebrate:

Asio flammeus sandwichensis (Pueo / Hawaiian Short-Eared Owl)
Lentipes concolor (O`opu alamo`o / Hawaiian Red-Tailed Goby)

Invertebrate:

Megalagrion nigrohamatum (pina`o / (Hawaiian Damselfly)
Coleotichus blackburniae (Koa bug)
Nesotocus giffardii
Plagithmysus alani
Plagithmysus cf. *laticollis*
Rhynchogonus lahainae (beetle)
Catinella baldwinii (Amber snail)
Lymnaea aulacospira
Neritina granosa (Hihiwai)
Newcombia cumingi (Cuming's Newcombia tree snail)
Partulina perdix (Pupu kani oe / Maui tree snail)
Partulina splendida (Pupu kani oe / Maui tree snail)
Partulina tappaniana (Pupu kani oe / Maui tree snail)
Perdicella kuhnsi (Pupu kani oe / Maui tree snail)
Philonesia spp.

APPENDIX 4

PREVALENT HABITAT-MODIFYING WEED SPECIES OF THE PKW PRESERVE & ADJACENT AREAS
(PKW PRESERVE PRIORITY WEED CONTROL SPECIES in boldface)*

1. **Formosan koa**	***Acacia confusa* (Ex PKW)**
2. Tasmanian blackwood	*Acacia melanoxylon* (Ex PKW)
3. Maui pamakani	*Ageratina adenophora*
4. Kukui	*Aleurites moluccana*
5. Broomsedge	*Andropogon virginicus*
6. Sweet vernal grass	*Anthoxanthum odoratum*
7. **Shoebutton, Inkberry***	***Ardisia elliptica***
8. Hammock fern	*Blechnum appendiculatum*
9. Butterfly bush	*Buddleia asiatica*
10. **Padang cassia***	***Cinnamomum burmannii***
11. **Koster's curse***	***Clidemia hirta***
12. **Andean pampas grass***	***Cortaderia jubata* (Ex PKW)**
13. **Albizia***	***Falcataria moluccana* (Ex PKW)**
14. Tropical ash*	*Fraxinus uhdei* (Ex PKW)
15. **Velvet grass***	***Holcus lanatus***
16. Moonflower	*Ipomoea alba*
17. **Japanese bog rush***	***Juncus effusus***
18. **rush***	***Juncus planifolius***
19. Molasses grass*	*Melinis minutiflora*
20. **Wax myrtle***	***Morella (Myrica) cerifera***
21. **Hilo grass**	***Paspalum conjugatum***
22. **Vasey grass**	***Paspalum urvillei***
23. **Sweet Granadilla**	***Passiflora ligularis***
24. **Waiawi, Strawberry guava***	***Psidium cattleianum***
25. Guava	*Psidium guajava*
26. **Prickly Florida blackberry***	***Rubus argutus***
27. **Himalayan blackberry***	***Rubus discolor***
28. Thimbleberry	*Rubus rosifolius*
29. Glenwood grass	*Sacciolepis indica*
30. Brazilian pepper	*Schinus terebinthifolius*
31. **African tulip***	***Spathodea campanulata***
32. **Australian Tree Fern***	***Sphaeropteris cooperi***
33. **Cane *Tibouchina****	***Tibouchina herbacea***

APPENDIX 5

Prevention of Alien Species Introduction

Protocol for Entry into Maui Land & Pineapple Company's Pu'u Kukui Watershed Preserve (PKW/Pu`u Kukui Preserve), including Haela`au Cabin, Honokohau Ditch Trail & Honokohau Dam.

TO: Maui Land & Pineapple Company (ML&P)/Maui Pineapple Company (MPC)/Kapalua Land Company (KLC) employees, Harmer Communications employees, volunteers, researchers, visitors, guests and any and all others entering the PKW Preserve.

It has been well documented that, along with habitat destruction, alien species of plants and animals (including insects, mammals, birds, reptiles, fish, etc.) have had severe negative impacts on Hawaii's unique native ecosystems. Maui Land & Pineapple Company (ML&P) is committed to the protection of these ecosystems (forests, shrublands, bogs, etc.) recognizing their vital role as the best possible watershed cover. Control of established alien species and ***prevention*** of introducing new ones is the top priority as set forth in the Pu'u Kukui Preserve Management Plan. Due to limited resources, we ask that all those entering the PKW Preserve spend a little time and effort to make certain that all gear, clothing, materials, vehicles, etc. are clean and clear of non-native organisms that may inadvertently be transported and introduced. Please help us to be a part of the solution and not part of the problem. As the saying goes "An ounce of prevention is worth a pound of cure".

Here's what *YOU* can do to help:

For those driving to Haela`au Cabin, wash the underside of your vehicle. All ML&P/MPC/KLC employees should use the high-pressure hose at the wash rack at Honolua Plantation baseyard. Others should ask the PKW Preserve manager/staff or the Plantation Superintendent about its use. Tires, wheel wells, bumpers, truck beds, etc. should be hosed down to remove mud that may have seeds or spores of non-native plants. Materials and gear should be checked (including tools, lumber, firewood, etc.) and cleaned. PKW Preserve staff may inspect anything entering the Preserve and may deny access/entry if it is contaminated. A can of Raid or other insecticidal spray can be handy for ants or other insects/spiders that may have escaped detection. It also helps to sweep out the inside of the vehicle as well. Coolers, dishes, food and containers can all carry unwanted hitchhikers. If an item is heavily infested it is better to discard and/or replace it rather than clean it only partially. **Waivers *must* be signed; minors *must* have their parents or legal guardians signature.**

For those entering the PKW Preserve via helicopter, the Landing Zone (LZ) at the point of departure should be as weed free as possible. Cement or asphalt is preferable to grass or dirt. There is a cement slab LZ at the Honolua baseyard 'ball- field'. If gear and supplies are to be transported via sling or cargo net, these must be inspected prior to packing, not only for contaminants but also for any damages that may compromise the security of the material and the safety of the pilot and the people on the ground. It is best to assume that something is stuck in the netting and hose it down. Bucket bottoms can be hosed or cleaned with a stiff fiber or nylon brush. It is usually easier to clean gear and materials when they are dry. Camping and hiking gear is particularly prone to carrying hitchhikers. Tents can be turned inside-out; tubular framed cots and chairs should be checked for clods of dirt at open ends; mesh or netting on clothing or backpacks are good places for weed seeds to attach themselves and need to be inspected carefully. Footwear seems to be the easiest way for weeds to catch a ride into new areas. A stiff fiber brush is very effective for cleaning; a knife may be needed for stubborn areas such as treads and lugs. Be sure to inspect your shoelaces, as well the insides of boots and shoes.

PKW Preserve staff should monitor all LZs and campsites for weed presence, noting any new introductions. For those who will be moving across large areas of the Preserve, it is always best to work from higher elevations that are usually more weed free, down to lower and usually weedier elevations. The best scenario is to have gear and clothing dedicated to pristine areas (usually designated as a Special Ecological Area or SEA). Another quick and effective practice is to empty all bags and backpacks, turn them upside-down, and shake out any debris which may include weed seeds/spores and/or insects/eggs. Try to avoid eating food the day before which has tiny seeds such as tomatoes, guava, lilikoi, etc.

Pack out **All** trash-organic trash such as banana skins, orange peels, apple cores, etc. can have seeds or insects/eggs or more inconspicuous and potentially harmful bacteria, blight, pathogens, disease, etc. When "Nature Calls" stay away from streams and streambeds. Bury your waste. For those staying overnight in remote backcountry locations, ask Preserve staff for a portable waste disposal system. Food wastes also feed rats and other undesirable animals and should be taken out - if you brought it in you can take it out.

If you are allergic to bee stings or have any medical condition that requires medications, bring enough medication along; the group leader and Preserve staff should also be notified. Smoking is strongly discouraged; campfires and fireworks are strictly prohibited.

It is recommended that a cellular phone or two-way radio be taken in the event of emergency (injury, fire, etc.) or change in logistics such as pickup time or place. The PKW Preserve manager and Plantation Superintendent's phone/pager #'s are listed

below. For those using two-way radios, a check time and channel should be prearranged.

Please report anything unusual such as animal sightings, trespassers, fence damage, etc. as soon as possible.

Keys are the responsibility of those who have signed for them or received them from MPC/PKW Preserve staff.

Remember after leaving the Preserve that it is also your responsibility to avoid transporting potentially harmful non-native species to the next place. Many researchers and visitors are on busy schedules and go from one island to another. It must be remembered that not all alien species are on all islands or in all areas of the same island; *Miconia* is on East Maui but not West Maui; *Tibouchina* is not yet on Kauai.

Your kokua/assistance to ho`omalama/care for the Pu`u Kukui Preserve is greatly appreciated.

Mahalo nui loa no kou kokua,

Randy Bartlett
PKW Preserve Manager

For Emergency Use *Only*

Randy Bartlett, PKW Manager, office: 669-1687 cell: 870-6443
Hank Oppenheimer, PKW Field Technician III, office: 669-1687 cell: 870-6444
Maui Pineapple Company, Honolua Plantation office: 669-6201
Vance Honda, Honolua Plantation Superintendent, office: 669-6201 cell: 870-8870

050328 revised rtb

APPENDIX 6

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

February 18, 2005

Mr. Peter Young, Chair
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Young:

Subject: Draft EA for the Pu'u Kukui Watershed Preserve FY 2006-2011 Management Plan
Natural Area Partnership Program

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

1. Please describe the impacts of the management plan on cultural resources and practices. p.19
2. Please describe the impacts on hunting activities. If necessary, please consult with hunting groups. p.17
3. Please provide your findings and reasons for supporting the finding of no significant impact based on all 13 criteria in HAR 11-200-12. Please see the enclosed example. p.35
4. Please list the permits that would be required for this action. p.34
5. Please provide a short summary of the impacts of taking no action.

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

Sincerely,

Genevieve Salmonson
Director

C: Maui Pineapple Company

MAUI LAND & PINEAPPLE COMPANY, INC.

March 28, 2005

Ms. Genevieve Salmonson
Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawai`i 96813

Re: Pu`u Kukui Watershed Preserve
Years 2006-2011 Management Plan – Draft Environmental Assessment

Aloha Ms. Salmonson:

Thank you for your comments pertaining to the Draft Environmental Assessment of our proposed 2006-2011 Long Range Management Plan for Maui Land & Pineapple Company's (ML&P) Pu`u Kukui Preserve.

Please see our responses to your comments of February 18, 2005 as addressed to Mr. Peter Young, Chair of the Department of Land and Natural Resources:

1. "Please describe the impacts of the management plan on cultural resources and practices."
    a. Please see pages 8-9 of the Final Environmental Assessment for the Pu`u Kukui Watershed Preserve's Long Range Management Plan as shown below:

"Historical/Archeological and Cultural Sites, Resources & Practices

Although no comprehensive archaeological surveys have been conducted within the boundaries of the Pu`u Kukui Preserve, no historic sites are known to exist in the area. In the lower elevations, agricultural related structures such as ditches and terraces are likely to be present while in the higher elevations only trails and/or temporary shelters might be expected. After a preliminary review of the proposed management activities by the State Historic Division (SHP) followed by a staff discussion between SHP and DOFAW, it was agreed that to ensure the proposed management activities would have negligible or no impact on any possible historic sites, ML&P will contact the SHP prior to the commencement of any of these activities so that SHP may inspect the project areas

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if it deems necessary. No survey of the management sites is called for at this time. If PKW Preserve staff encounters any evidence of historic sites at a site of management activity, they will cease all management activity and immediately notify SHP staff to obtain their input and suggestions for any mitigation measures deemed necessary. Proposed fencing projects which might be considered a source of disturbance will be of relatively short length, require minimal line cutting and will be constructed with metal T-stakes that will pose little risk to potential sites. In the long term, the proposed activities should provide protection for historic and cultural resources by eliminating disturbance from ungulates, which degrade sites such as *lo`i kalo* by rooting and trampling, or displacement of these rock walls by alien tree species. Restricted access will also minimize inadvertent disturbance or intentional vandalism.

The bulk of the PKW Preserve was considered *wao akua* (lit. forest of the gods) by native Hawaiians and was deemed sacred; with little or no regular access by either the *maka`ainana* (commoners) or the *ali`i* (chiefs). What little access likely to occur was by certain *kahuna* (priests) or by those specially-trained to collect native bird feathers for an *ali`i's* cloak. These cultural practices are no longer known to occur and are unlikely to be revived given the current rare & threatened status of many of Hawaii's native forest birds. Therefore; no significant negative impact on cultural resources or historic practices by native Hawaiians is anticipated from the actions delineated in this plan. Additionally, the preservation of habitats and natural communities preserve plant and animal species integral to Hawaiian culture. Many of these species are prevalent in Hawaiian song, chant, and legend, and the protection of these species to be accomplished by this management plan will help to ensure a continuing living culture."

2. "Please describe the impacts on hunting activities. If necessary, please consult with hunting groups."
    a. Please see page 18 of the Final Environmental Assessment for the Pu`u Kukui Watershed Preserve's Long Range Management Plan as shown below:

There should be no impacts on hunting activities related to this project as "no hunting is permitted within the Preserve boundaries. However, ML&P employees and a limited number of public hunters (with valid State hunting licenses) are permitted to hunt on company lands below the PKW Preserve boundary for a nominal fee. Permit hunting helps reduce the pig population below the Preserve and is intended to keep population pressures low enough to keep pigs from moving up into the Preserve from the lower elevations in search of additional food supplies, etc. The PKW Preserve manager will maintain contact with local hunting clubs and remind them of the opportunities for their members to hunt for feral pigs on company lands below the Preserve."

3. "Please provide your findings and reasons for supporting the finding of no significant impact based on all 13 criteria in HAR 11-200-12."

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a. Please see page 35-37 of the Final Environmental Assessment for the Pu`u Kukui Watershed Preserve's Long Range Management Plan.

4. "Please list the permits that would be required for this action."
   a. Approval of application for NAPP contract renewal by Board of Land and Natural Resources.

5. "Please provide a short summary of the impacts of taking no action."
   a. Please see page 34 of the Final Environmental Assessment for the Pu`u Kukui Watershed Preserve's Long Range Management Plan as shown below:

"A no-action alternative would not provide any of the listed positive impacts and would ultimately lead to increased feral ungulate destruction of the watershed, replacement of native vegetation with alien species, and extinctions of rare native species and was therefore not seriously considered."

We would be pleased to continue our partnership with the State's Natural Area Partnership Program as part of our ongoing commitment to protecting Maui's native natural resources that provide our communities with clean, fresh water and a unique and beautiful storehouse of biodiversity that exists no where else in the world.

Please feel free to contact me should you have any further comments or concerns.

Mahalo nui loa no kou kokua,

Randy Bartlett
Manager/Pu`u Kukui Watershed

Cc: Ryan Churchill, VP/Community Development
Warren A. Suzuki, SVP/Government & Community Relations
Randall W. Kennedy, Manager/Natural Area Programs/DLNR

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ENVIRONMENTAL LAW CLINIC AT STANFORD UNIVERSITY

January 20, 2005

Randal T. Bartlett
Maui Pineapple Company, Ltd.
Honolua Plantation
4900 Honoapi`ilani Highway
Lahaina, Maui, HI 96761-9183

Re: Draft Environmental Assessment Regarding Maui Pineapple Company's Management Plan For Fiscal Years 2006-11 For Pu`u Kukui Watershed Preserve

Dear Randy,

Mahalo nui for the opportunity to review Maui Pineapple Company, Ltd.'s Draft Environmental Assessment for its Management Plan for Pu`u Kukui Watershed Preserve for Fiscal Years 2006-2011 ("DEA"). We appreciate your considerable efforts to protect and enhance this natural and cultural treasure.

Although we don't have substantive comments on your DEA at this time, we urge you to contact Ed Lindsey, President of Maui Cultural Lands Inc. This organization, and Mr. Lindsey in particular, are very knowledgeable about historic and cultural sites in this area and can help to inform decisionmaking regarding the placement of fences, helicopter landing pads, and other structures. We also recommend that you contact Lucienne deNaie at Maui Tomorrow for the same reason:

Ed Lindsey
Maui Cultural Lands Inc.
1087-A Pookela Rd.
Makawao, HI 96768

Lucienne deNaie
Maui Tomorrow
P.O. Box 791180
Pā`ia, HI 96779

Finally, as part of your monitoring and research (pages 27-28), we urge you to examine the impacts of surface water diversions on streams flowing through or otherwise affected by the preserve. We also urge you to restore stream flow as part of your management efforts. Free flowing streams are the lifeblood of our `āina, and are necessary to enable functional ahupua`a systems.

Please don't hesitate to contact me if you have any questions or require additional information.

Me ke aloha,

D. Kapua Sproat

223 SOUTH KING STREET, SUITE 400 HONOLULU, HI 96813-4501
T: 808.599.2436 F: 808.521.6841 E: eajushi@earthjustice.org W: www.earthjustice.org

From: Randy Bartlett (PKW) [mailto:rbartlett@mlpmaui.com]
Sent: Friday, January 21, 2005 5:54 PM
To: 'Kapua Sproat'
Cc: 'Hank L. Oppenheimer (PKW)'; 'Greg R. Hansen (PKW)'
Subject: RE: ML&P's PKW DEA comments

Aloha e Kapua:

Mahalo nui no kou kokua...appreciate you taking the time to review & comment on our PKW LRMP DEA...will contact Ed Lindsey & Lucienne DeNaie re same...mahalo for their contact info!-...

Re Restoring Stream Flow...Although I do not have direct responsibility for our water/irrigation systems and therefore; can only provide "unofficial" comments fyi, I thought you should know that I have encouraged our leadership to release more water (which they have done!-) directly at our Honokohau Valley #1 Intake/Diversion, so that the stream once again flows continuously from mountain to the sea; which should begin to improve the habitat situation for native aquatic species & improve the chances of them completing their life cycles btwn stream/ocean. We have also contracted w/an aquatic biologist (John Ford) to monitor the situation and document any (hopefully) improvement in Honokohau's riparian habitat. We are also considering the possibility of releasing additional water at our #1 Intake in Honokohau Valley; contingent upon the likely closing of our "Taro" gate outlet - which feeds water from the Honolua Ditch back into Honokohau stream a distance makai of #1 Intake. This action would increase the total continuous streamflow below #1 Intake to the remaining reach of the stream & down into Honokohau Bay, and in turn, increase available habitat for native aquatic species to return to and colonize in the stream.

Additionally, we are also seriously considering the possibility of closing our #2 Kaluanui ((which feeds Honokohau) stream and our #3 Honolua stream intakes so that those waters could return in full to their respective streams; although we consider it unlikely that there will be enough volume released back into the stream to create a continuous/perennial streamflow throughout the year in either situation.

Under our new Chairman/CEO/President David Cole's leadership and vision of creating both environmentally, socially & economically sustainable communities on Maui, I'm very excited & hopeful that ML&P will make even greater strides towards realizing our ecological "kuleana no ka `aina." To those ends, we are planning the creation of three new environmental programs; a Riparian Conservation & Restoration Program, a Coastal Conservation & Restoration Program, and a Marine Conservation & Restoration Program, which will build upon our efforts for the past 17 years to protect the native habitat & species in our 8,661 acre Pu`u Kukui Watershed Preserve and strive to create a truly integrated, world-class, hills-to-ocean (H2O;-) nature preserve that honors & emulates our host culture's ahupua`a resource management system. We have also begun identifying potential environmental monitoring & restoration sites in riparian, coastal & marine zones, are participating in marine naturalist training in anticipation of creating our own education/volunteer programs for students, residents & visitors alike - in cooperation w/existing agencies/orgs (e.g. DLNR-DAR, Project S.E.A.-Link, TNCH, UH-CCRT, MCC, Maui Ocean Center, Hawai`i Nature Center, etc.), and we've begun talking w/researchers in Hawai`i and on the mainland about collaborating on various monitoring, restoration & education projects...Our expanded conservation plans & actions over the next several years will likely place an additional 3,100-6,800+ acres of private conservation/ag-zoned lands under conservation/restoration protection & programs that will work together to restore native habitat to healthier conditions for future generations of native plants, animals, kanaka & their keiki to enjoy & recreate in.

Mahalo nui loa for your efforts to protect Hawai`i's native species & the ecosystems they've created over the millenia. It is my sincere hope that ML&P and EarthJustice can realize our mutual goals w/out wasting a lot of time/money in court - or a lot of water in intermittent or hardened streambeds either!-)

E malama pono `oe, me ke aloha a hui hou aku,
Randy
~~~~~~
Randal T. Bartlett
Maui Invasive Species Committee, Chair pro tem
Pu`u Kukui Watershed/Preserve, Supervisor
Maui Pineapple Company, Ltd.
Honolua Plantation
4900 Honoapi`ilani Highway
Lahaina, Maui, HI 96761-9183
ph/fx:808.669.1687, fax:808.669.7089, cell:808.870.6443
mailto:rbartlett@mlpmaui.com or rtb@lava.net
http://www.hear.org/misc - Maui Invasive Species Committee
http://www.maui.net/~mauilnp/puu_kukui.html - ML&P's PKW Preserve (old)
http://www.mauiland.com/puukukui.shtml - MLP's PKW Preserve (NEW!-)
http://community.webshots.com/album/5947669KZCgdCAPBz - PKW 2000
http://community.webshots.com/album/9329411JYTMUzcpDP - PKW 2001
http://community.webshots.com/album/37462419ObLMhd - PKW 2002
http://community.webshots.com/album/67473539ssjFkO - PKW 2003
http://community.webshots.com/album/198151030odKPiV - PKW 2004 (NEW!-)
http://cards.webshots.com/cp-14203955-PYmO-album/27894535bXKbaFGcNu
- PKW Rare Flora & Fauna
~~~~~~
"Imua e na poki'i a inu i ka wai 'awa'awa. `A`ohe hope i ho`i mai ai." - Paiea Kamehameha /
"Forward my children and drink the bitter waters. There is no turning back." – King Kamehameha I
"Ua mau ke ea o ka `aina i ka pono." - Kauikeaouli /
"The life of the land is perpetuated in righteousness." - King Kamehameha III
"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends to do otherwise." - Aldo Leopold
"The only economic policy that will succeed is one that respects the principles of ecology." - Lester R. Brown
"Wherever you go, there you are..." -- "Buckaroo Banzai: Adventures in the 8th Dimension"
"Violence is the last resort of the incompetent." – Robert A. Heinlein
"Have no fear of perfection - you'll never reach it." - Salvador Dali
"If you want change, you must be the change." - Mahatma Gandhi
"Man's heart away from nature becomes hard. " - Standing Bear
"640K ought to be enough for anybody." - Bill Gates, 1981
"This is it." - Wyatt Musashi Maui Bartlett, 1996

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Hawaii Chapter, Maui Group
P.O. Box 791180, Paia, HI 96779

January 18, 2005

Randy Bartlett
Maui Pineapple Co., LT.
P.O. Box 187
Kahului, Hi 96732-0187

Re: Pu'u Kukui Watershed Preserve
Years 2006-2011 Watershed Management Plan

Dear. Mr. Bartlett,

Thank you for allowing the Sierra Club to review the above referenced Draft Environmental Assessment.

I want to commend you on a thorough and responsible Environmental Assessment. Maui Pine's continuing stewardship of the area is exemplary. Should any archeological discoveries be made please notify the pertinent authorities.

Sincerely yours,

Lance W. Holter

Lance W. Holter
Sierra Club Chair - Maui Group and Conservation Chair- Hawaii Chapter

MAUI LAND & PINEAPPLE COMPANY, INC.

March 28, 2005

Mr. Lance W. Holter
Sierra Club
P. O. Box 791180
Pai`a, Maui, HI 96779

Re: Pu`u Kukui Watershed Preserve
Years 2006-2011 Management Plan – Draft Environmental Assessment

Aloha Lance:

Thank you for your supportive comments pertaining to the Draft Environmental Assessment of our proposed 2006-2011 Long Range Management Plan for Maui Land & Pineapple Company's (ML&P) Pu`u Kukui Preserve.

We are pleased to continue our partnership with the State's Natural Area Partnership Program as part of our ongoing commitment to protecting Maui's native natural resources that provide our communities with clean, fresh water and a unique and beautiful storehouse of biodiversity that exists no where else in the world.

Mahalo nui loa no kou kokua,

Randy Bartlett
Manager/Pu`u Kukui Watershed

Cc: Ryan Churchill, VP/Community Development
Warren A. Suzuki, SVP/Government & Community Relations
Randall W. Kennedy, Manager/Natural Area Programs/DLNR

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----- Message from <Gordon_Smith@r1.fws.gov> on Fri, 17 Dec 2004 13:32:26 -1000 -----

To: <rbartlett@mlpmaui.com>

Subject: Puu Kukui Mang't Plan DEA (was: Please review '041129dea-usfws-gshultz)

Randy,
We circulated the Puu Kukui Management Plan DEA through our Ecological Services programs for review. We concluded that we do not have significant comments or concerns and will not respond with a letter. Thank you for the opportunity to review the DEA.

Gordon Smith
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
300 Ala Moana Blvd. Rm 3-122, Box 50088
Honolulu HI 96850
Ph. (808) 792-9400 Fax (808) 792-9581
E-mail: gordon_smith@fws.gov

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
FIRST DEPUTY

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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CONSERVATION AND COASTAL LANDS
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

Division of Forestry & Wildlife
54 SOUTH HIGH STREET, ROOM 101
WAILUKU, HAWAII 96793

December 17, 2004

Mr. Randall Bartlett
Puu Kukui Watershed Supervisor
Maui Pineapple Company, Ltd.
P. O. Box 187
Kahului, HI 96732-0187

Dear Mr. Bartlett: Randy

Thank you for providing us an opportunity to review and comment on the Draft Environmental Assessment for the Pu'u Kukui Watershed Preserve FY 2006-11 Management Plan Natural Area Partnership Program.

Over the past 13 years, the Department of Land and Natural Resources has been a partner in this valuable project.

The protection and preservation of native ecosystems and watershed is an arduous task. One so large that with our limited resources, the Department would be hard pressed to undertake, if not for willing partners as Maui Pineapple Company.

Through shared goals and visions and continued cooperative effort, the uniqueness of Maui's flora and fauna will not only be preserved but enhanced.

Sincerely,

John S. Cumming
Forestry and Wildlife Manager

cc: Paul J. Conry
Randall Kennedy

MAUI LAND & PINEAPPLE COMPANY, INC.

March 28, 2005

Mr. John S. Cumming
Forestry & Wildlife Manager
Division of Forestry & Wildlife
Department of Land and Natural Resources
54 South High Street, Room 101
Wailuku, HI 96793

Re: Pu`u Kukui Watershed Preserve
Years 2006-2011 Management Plan – Draft Environmental Assessment

Aloha Mr. Cumming:

Thank you for your supportive comments pertaining to the Draft Environmental Assessment of our proposed 2006-2011 Long Range Management Plan for Maui Land & Pineapple Company's (ML&P) Pu`u Kukui Preserve.

We are pleased to continue our partnership with the State's Natural Area Partnership Program as part of our ongoing commitment to protecting Maui's native natural resources that provide our communities with clean, fresh water and a unique and beautiful storehouse of biodiversity that exists no where else in the world.

We also look forward to working together with you and your staff at DOFAW Maui as we continue our joint conservation work in the West Maui Mountains Watershed Partnership.

Mahalo nui loa no kou kokua,

Randy Bartlett
Manager/Pu`u Kukui Watershed

Cc: Ryan Churchill, VP/Community Development
Warren A. Suzuki, SVP/Government & Community Relations
Randall W. Kennedy, Manager/Natural Area Programs/DLNR

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