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February 24, 2004

To: Genevieve Salmonson, Director
Office of Environmental Quality Control

From: Micah A. Kane, Chairman
Department of Hawaiian Home Lands

Subject: Finding of No Significant Impact (FONSI) for the Piha Mauka Forest Management Plan and Final Environmental Assessment, TMK 3-08-01: 09 por., Humuula, Hawaii

The Department of Hawaiian Home Lands has reviewed the comments received during the 30-day public comment period which began on December 8, 2003. At its regularly scheduled hearing on February 24, 2003, the Hawaiian Homes Commission determined that this project will not have significant environmental effects and issued a Finding of No Significant Impact (FONSI). Please publish this notice in the next issue of the Environmental Notice.

We have enclosed an Office of Environmental Quality Control Publication Form and four copies of the Final Environmental Assessment.

If you have any questions, call Linda Chinn at 586-3823, or have your staff call Rebecca Alakai at 587-6423.

Enc.

2004-03-08 FONSI
PIHA MAUKA FOREST MANAGEMENT PLAN
Final

Piha Mauka Forest Management Plan And Environmental Assessment

Humu`ula, Island of Hawai`i

Landowner:
Department of Hawaiian Home Lands

Approving Agency:
Hawaiian Homes Commission

Prepared by:
Department of Hawaiian Home Lands
Land Management Division

February 2004

EXECUTIVE SUMMARY

Project Name	Piha Mauka Forest Management Plan and Environmental Assessment
Landowner and Applicant	Department of Hawaiian Home Lands P.O. Box 1879 Honolulu, Hawaii 96805 Contact: Mike Robinson (cell 1-888-943-4335)
Approving Agency and Accepting Authority	Same as above
District	North Hilo, Hawaii
TMK	3-8-01:09 por.
Land Use Designation	Koa Salvage Units: State - Agriculture County - Ag-40a Kanakaleonui Bird Corridor: State - Agriculture County - Ag 40a
Anticipated Determination	Finding of No Significant Impact

Location

The Piha Mauka Forest Management Area is located along Mana-Keanakolu Road on the eastern slopes of Mauna Kea on the island of Hawaii. The management area is between Nauhi Gulch to the south, Puu Lahohinu to the north, Hilo Forest Reserve on the makai side, and the Mauna Kea Forest Reserve on the mauka side. Elevation in the project area is between 5,440 and 7,880 feet.

Proposal

Our quality of life, cultural, spiritual, and economic survival depends on the environment. Through active management, the Department of Hawaiian Home Lands (DHHL) intends to restore its koa (*Acacia koa*) forests and ecosystems, create jobs in the community, provide Hawaii's wood products market with a source of high quality hardwood, and endow the DHHL trust fund with a long term revenue stream to support our mission to "manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians."

This project proposes a 525 acre area in Kanakaleonui as a mauka to makai bird corridor. It is intended to assist native birds by creating and maintaining a flyway

connecting lower elevation koa and ohia (*Metrosideros polymorpha*) forests with the upper elevation mamane (*Sophora chrysophylla*) forests in Humuula, Hawaii.

The project also proposes to salvage koa on a total of about 930 acres of nearby former pasture lands. About 600 acres of this 930 acres is forested. The remaining 330 acres is open pasture with few or no trees present. The existing wooded pasture consists of approximately 11 to 33 koa trees per acre. Other trees species observed and measured during forest surveys included kolea (*Myrsine spp.*), mamane, ohia, and olapa (*Cheirodendron spp.*). Only koa will be salvaged. After salvage operations, an average of 6 to 15 koa trees per acre will remain, or about 50% of the current koa overstory.

Koa will be harvested according to risk of loss and vigor, rather than a more narrowly defined economic criteria of merchantable size. Reserve trees will be selected and maintained according to health and not diameter. Trees will remain to provide bird habitat, foraging opportunities for native species, and koa seed production.

Reforestation will be conducted through soil scarification and hand planting if necessary. It is expected that a viable stand of koa saplings could be re-established within a few years of project implementation. Native species other than koa are also expected to become established following salvage operations. Herbicide treatments on invasive species and competing grasses may be used if necessary. Total project acreage is about 1,455 acres.

Parties Consulted

U.S. Dept. of the Interior, Fish and Wildlife Service
Hakalau Forest National Wildlife Refuge
Pacific Islands Ecoregion
U.S.D.A Forest Service, Institute of Pacific Islands Forestry
Department of Agriculture
Department of Land and Natural Resources
Department of Business, Economic Development and Tourism
Department of Transportation
University of Hawaii at Manoa, Environmental Center
County of Hawaii, Planning Department
Earth Justice Legal Defense Fund
Hawaii Forest Industry Association
Sierra Club - Moku Loa Group
The Nature Conservancy
Waimea Hawaiian Homesteaders' Association, Inc.
'Oiwi Lokahi O Ka Mokupuni O Keawe

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION AND SUMMARY

1.1 Forest-Based Sustainable Development Goals

Our quality of life, cultural, spiritual, and economic survival depends on the environment. Through active management, the Department of Hawaiian Home Lands (DHHL) intends to restore its koa (*Acacia koa*) forests and ecosystems, create jobs in the community, provide Hawaii's wood products market with a source of high quality hardwood, and endow the DHHL trust fund with a long term revenue stream to support our mission to "manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians."

The 1,455-acre Piha Mauka Forest Management Area is held in trust for native Hawaiians. DHHL's forest management plan proposes a policy that is ecologically viable, economically feasible, and socially desirable. Recreation, education, cultural, spiritual, and other opportunities will present themselves as the wooded pasture recovers from past land uses.

This project proposes a 525 acre mauka to makai bird corridor connecting Hakalau National Wildlife Refuge on the southeast and makai side to the Mauna Kea Forest Reserve on the mauka side. It is intended to assist native birds by creating and maintaining a flyway connecting lower elevation koa and ohia (*Metrosideros polymorpha*) forests with the upper elevation mamane (*Sophora chrysophylla*) forests in Humuula, Hawaii.

The project also proposes to salvage koa on a total of about 930 acres of nearby former pasture lands. About 600 acres of this 930 acres is forested. The remaining 330 acres is open pasture with few or no trees present. The existing wooded pasture consists of about 11 to 33 koa trees per acre. Other trees species observed and measured during forest surveys included kolea (*Myrsine spp.*), mamane, ohia, and olapa (*Cheirodendron spp.*). Only koa will be salvaged. After salvage operations, an average of 6 to 15 koa trees per acre will remain, or about 50% of the current koa overstory.

Koa will be harvested according to risk of loss and vigor, rather than a more narrowly defined economic criteria of merchantable size. Reserve trees will be selected and maintained according to health and not diameter. Trees will remain to provide bird habitat, foraging opportunities for native species, and koa seed production.

The project area has an existing fence to control cattle. Reforestation will be conducted through soil scarification. It is expected that a viable stand of koa saplings could become established within a few years of the project's implementation. Natural regeneration will be monitored. If forest regeneration is inadequate following overstory removal, planting from local seed sources at appropriate stocking levels may occur to assist forest recovery efforts. Herbicide treatments on invasive species and competing grasses may be used as appropriate to ensure native forest recovery.

Restoration of pasture to a diverse native forest will be an ongoing process. Research in Hawaii has shown that the control of ungulates in native forest areas, in combination with viable and present seed sources, can result in the natural regeneration of native species within a few years. Koa regeneration responds well when grass covered soils are disturbed. Native species other than koa are also expected to become established following salvage operations. Implementation of the project will be conducted in a manner that complies with applicable law for activities such as site preparation and regeneration, soil erosion control, and use of fuels and chemicals.

Sustainable forest practices can bring economic diversity and employment for our beneficiaries, enhance the environment, while retaining the rural character of the islands. DHHL's forested lands on the island of Hawaii are well placed to contribute to and support the forest industry with a range of value-added opportunities. Removing dead and dying koa from the proposed project site would generate an estimated two to four direct forestry jobs per 200 acres over a period of about three years. Indirect jobs are difficult to estimate, but a 1985 study of Hawaii's forest industry reported that "for every $1,000 increase in output in the forestry sector [general] employment will increase by 1.3 jobs".

The ratio of value to land area for koa forest land is one of the highest of all rural and agricultural land uses. Improving the long term health and diversity of the forest are keys to endowing the DHHL trust with a long term revenue stream to carry out our mission to "manage the trust effectively and to develop and deliver lands to native Hawaiians." Project status and information will be published in DHHL's annual report.

1.2 Project Site and Surrounding Area

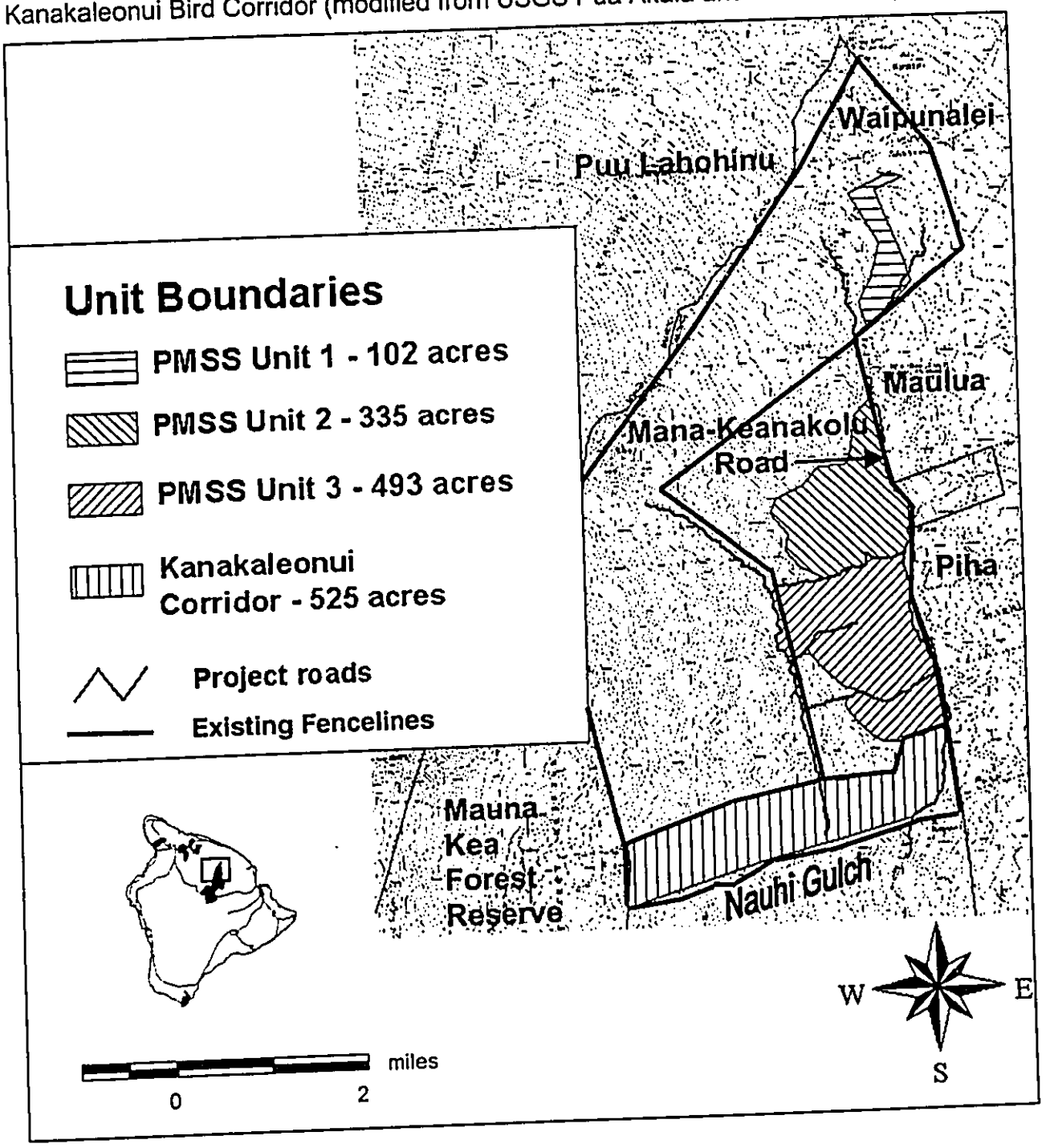
The landowner is the Department of Hawaiian Home Lands. The koa salvage units and adjacent areas are in the State agricultural district and County zoning is Ag-40a. The Kanakaleonui Bird Corridor is in the State agricultural district and County-zoned Ag-40a. Access is provided via the Mana-Keanakolu Road. Four wheel drive ranch roads enter the project area and road segments provide adequate access for management activities.

The Piha Mauka Forest Management Area is located on the eastern slopes of Mauna Kea on the island of Hawaii in the northern end of the Humuula ahupuaa. It is east and mauka of the Piha, Maulua and Waipuanlei ahupuaa. See Figure 1. The project area generally follows the Mana-Keanakolu Road located on the makai side of the Humuula ahupuaa. The management area is between Nauhi Gulch to the south, Puu Lahohinu to the north, Hilo Forest Reserve on the makai side, and the Mauna Kea Forest Reserve on the mauka side.

The Piha Mauka Forest Management Area consists of the Kanakaleonui Bird Corridor and the Piha Mauka Tract, Units 1, 2, and 3. The project site is about 1,455 acres. The

tax map key is 3-8-01:09 por. Elevation in the project area is between 5,440 and 7,880 feet. Average annual rainfall is between 20 to 40 inches per year.

Figure 1: Project Location. Piha Mauka Salvage Sale (PMSS) Units 1, 2, and 3 and the Kanakaleonui Bird Corridor (modified from USGS Pua Akala and Keanakolu quads).



The Piha Mauka Tract, Units 1, 2 and 3 are located north of Kanakaleonui and extend along the east boundary with the Hilo Forest Reserve to directly mauka of the existing Waipunalei Mauka Salvage Sale area. Unit 1, located adjacent to the Waipunalei Mauka koa salvage area, is approximately 102 acres in size. Unit 2, located southwest of the David Douglas memorial site, is approximately 335 acres in size. Unit 3, adjacent to and north of Kanakaleonui, is about 492 acres in size.

Figure 2: Aerial Photo of the Piha Mauka Tract, Unit 1 (boundaries are approximate).

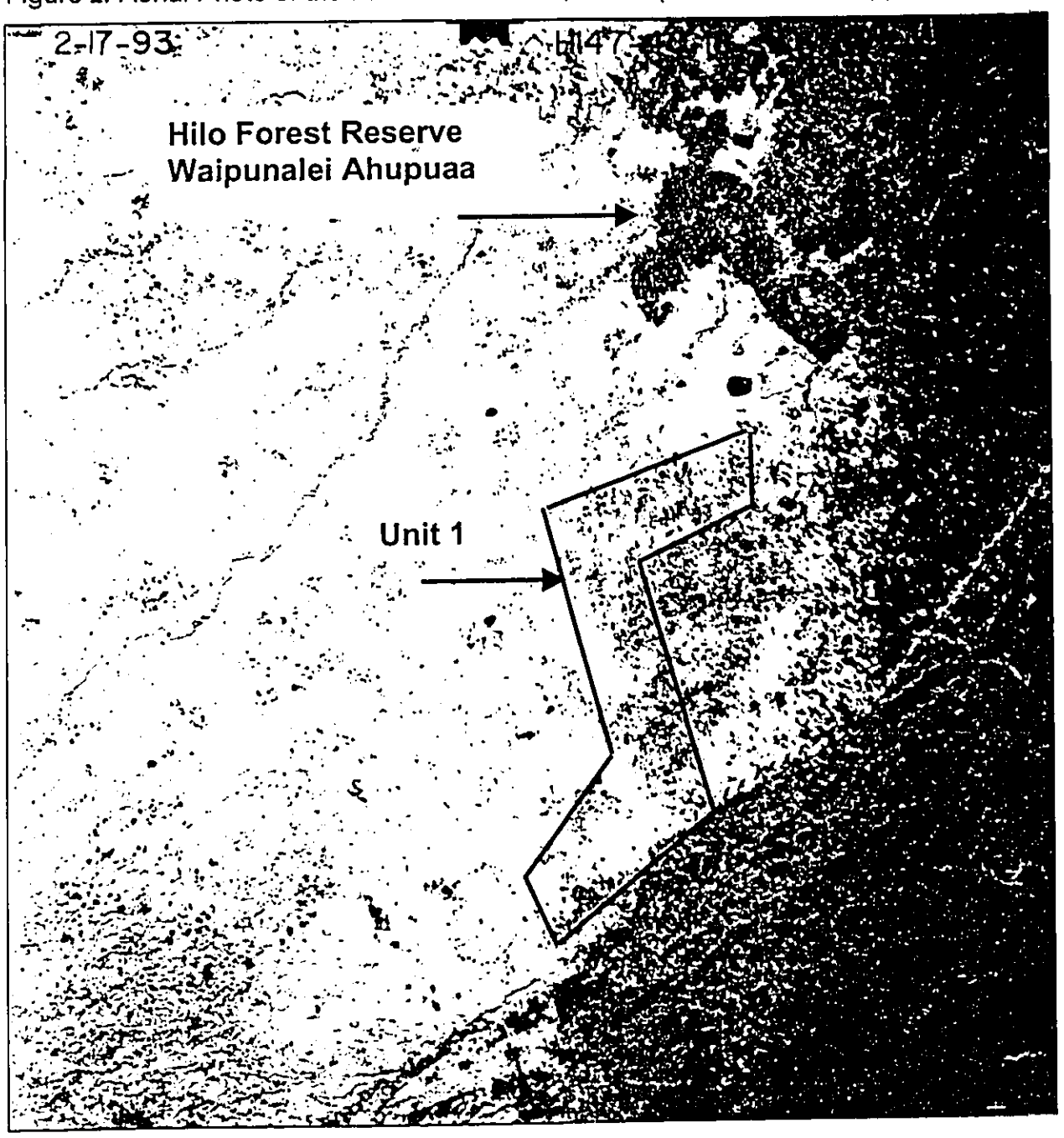
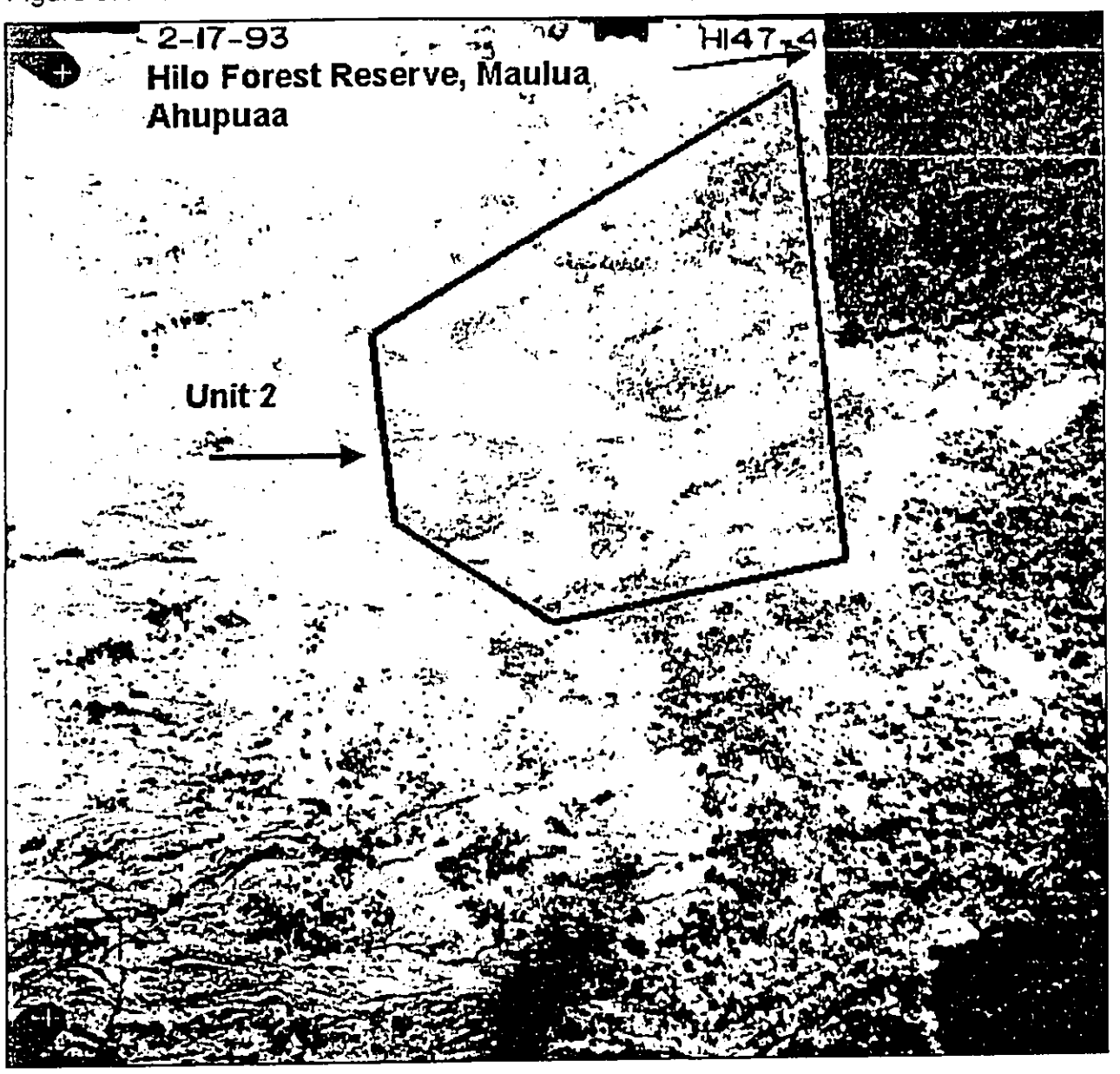


Figure 3: Aerial Photo of the Piha Mauka Tract, Unit 2 (boundaries are approximate).



The primary land use was cattle ranching and the current landscape is open to wooded pasture. Except for Forest Reserve boundaries, owned by the Department of Land and Natural Resources (DLNR), all Units are bordered by former pasture lands. The adjacent Forest Reserves are known to contain endangered flora and fauna. The Reserves also contain banana poka, feral ungulates, and are public hunting areas. The Mauna Kea Forest Reserve, mauka of the Piha Mauka tract and adjacent to the Kanakaleonui Tract, contains feral sheep, endangered birds, and is a public hunting area. The nearby Hakalau Forest National Wildlife Refuge, makai of the project area at Maulua Nui also contains endangered flora and fauna, invasive species, and feral ungulates.

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Figure 4: Aerial Photo of the Piha Mauka Tract, Unit 3 (boundaries are approximate).

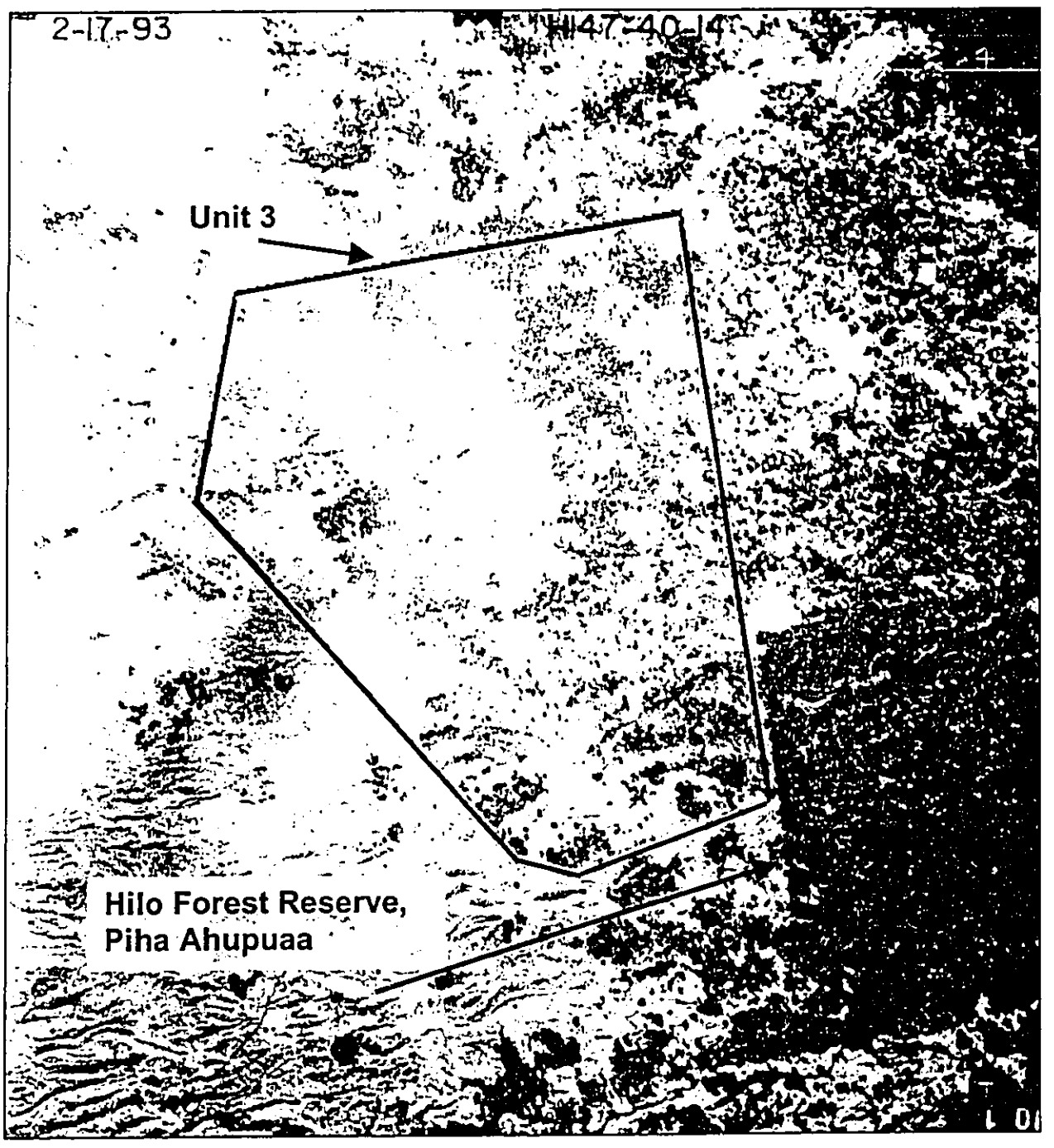
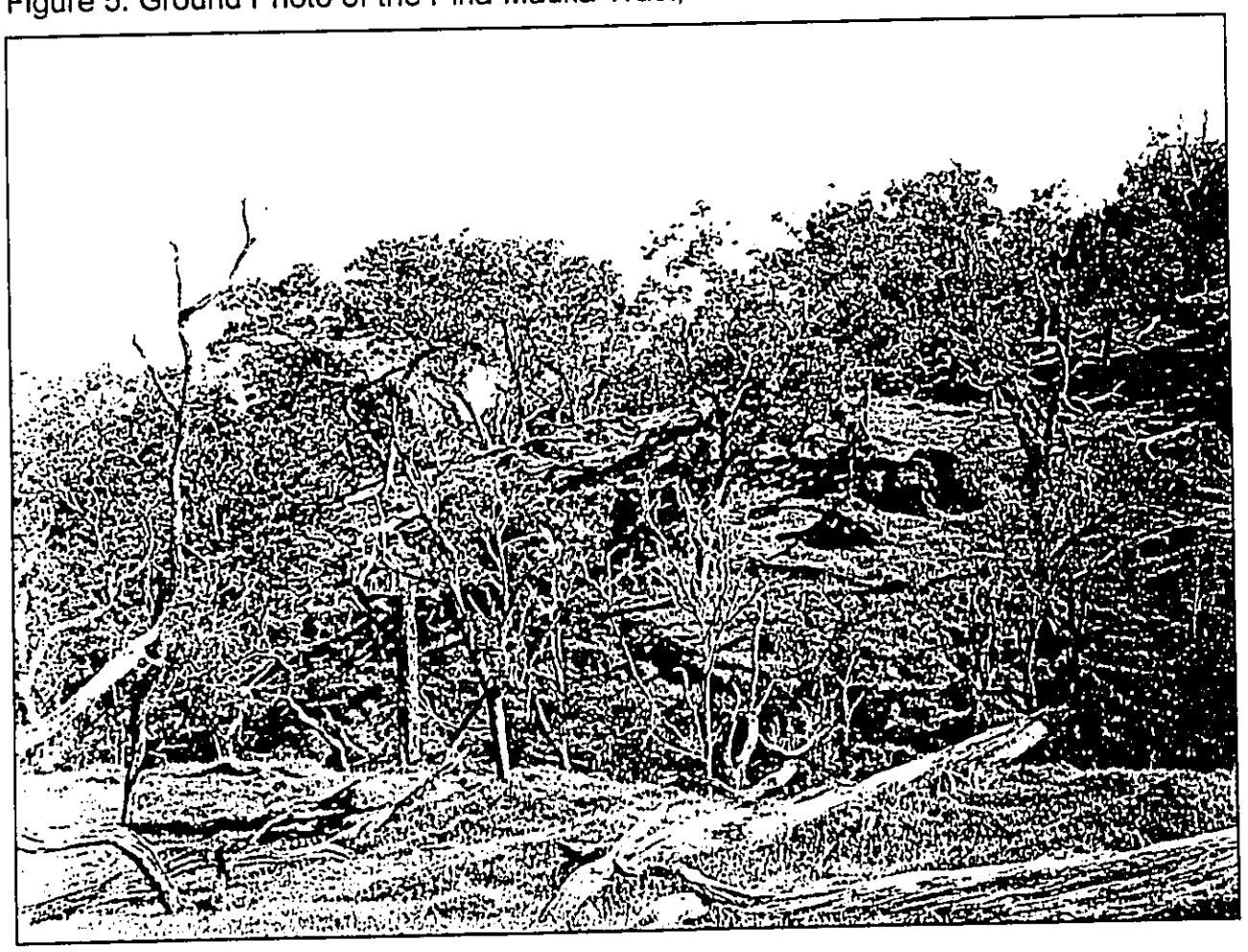


Figure 5 is a photo of the Piha Mauka Tract, Unit 2, but is generally representative of all three Units. The management area forest is unhealthy and dying and the ground is littered with dead koa and mamane trees and broken branches. Factors such as over-maturity, root compaction from cattle, and disease have caused many trees to break, rot, and die. Many understory trees are dying as well, as evidenced by sparse crowns, cracked or peeling bark, or damaged tops from falling koa. Cattle and sheep grazing and fence post cutting have degraded and reduced the canopy and ground covers of the project area until only a remnant forest remains. No threatened or endangered plants have been observed during field visits to the site.

Figure 5: Ground Photo of the Piha Mauka Tract, Unit 2.



Kanakaleonui, located north of Nauhi Gulch, is approximately 525 acres. It runs in a mauka to makai direction with Hakalau Forest National Wildlife Refuge on the southeast and makai side to the Mauna Kea Forest Reserve on the mauka side. Kanakaleonui is open to wooded pasture. See Figure 6.

Figure 6: Ground Photo of the Proposed Kanakaleonui Bird Corridor.

1.3 Department of Hawaiian Home Lands

DHHL is responsible for administering the Hawaiian Home Lands' program and the Hawaiian Homes Commission Act of 1920. The Act reserved 203,500 acres of public lands for homesteading by native Hawaiians and created its governing body, the Hawaiian Homes Commission.

1.4 Project Schedule

Time Frame	Action
March 2003 - February 2004	Complete the Piha Mauka Forest Management Plan and Environmental Assessment
February 2004 - April 2004	Prepare and Distribute Requests for Proposals
April 2004 – May 2004	Select Contractor and Approve License
June 2004 – July 2008	Implement the Forest Management Plan

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2. PROPOSED ACTION

2.1 Forest-Based Sustainable Development

2.1.1 Remove Cattle

Prior to harvest and reforestation, cattle will be removed and controlled as necessary. Existing fences will be maintained to minimize reintroduction of ungulates to the area.

2.1.2 *Kanakaleonui Bird Corridor*

To maintain and reestablish connectivity of habitat and bird populations among the currently fragmented patches, a corridor between the koa-ohia forest of Hakalau Forest National Wildlife Refuge and the mamane forest in the Mauna Kea Forest Reserve is proposed. Removing cattle in the corridor and protecting the existing koa and mamane may reestablish a connection between native bird populations in these two areas and habitat types. Figure 7 shows existing bird corridors in the Hakalau Forest National Wildlife Refuge. The proposed Kanakaleonui Bird Corridor is located northeast of Hakalau.

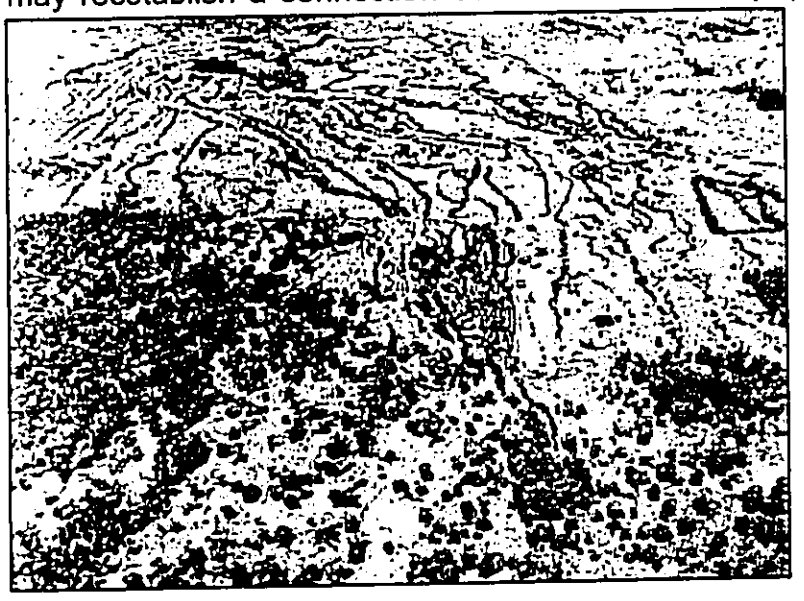

Figure 7: Aerial Photo of the Hakalau Forest National Wildlife Refuge Bird Corridors. Courtesy of Hakalau FNWR.

Kanakaleonui contains some of the highest elevation stands of koa and mamane forest remaining on the east side of Mauna Kea. Portions of Kanakaleonui consist of rough and crumbly a'a lava and the existing koa appear better suited as bird habitat rather than merchantable koa. If funding is secured, some areas may be scarified to reduce competing grass cover. Enhancement plantings of mamane and other species at higher elevations may also be conducted. Natural regeneration will be monitored and undesirable species will be controlled as necessary.

2.1.3 Reserve Trees in the Piha Mauka Tract

A modified koa salvage will occur in the Piha Mauka Tract Units 1, 2 and 3 to achieve DHHL's project goals to restore koa forests and ecosystems, create jobs in the

community, provide Hawaii's wood products market with a source of high quality hardwood, and endow the DHHL trust fund with a long term revenue stream

Reserve trees will be selected based on their health and will remain to provide nesting, forage habitat, and koa seed production onsite. An inventory of the site in 1998 measured koa resources in two cover types of forested stands. Cover type 1 has a high stocking of koa and averages 30 trees per acre with a diameter greater than 16" at breast height (DBH). Cover type 2 has a "lower" stocking of koa, averaging 14 trees per acre.

Timber stand data were collected utilizing a line-plot method of survey. Circular plots were employed with a size of 0.20 acres (52.6 feet in radius). All plot trees larger than 16" dbh were tallied as merchantable koa. Every tally tree was assigned a crown vigor value. A determination was then made whether the tree contained merchantable wood, or was a cull. Cull trees contained less than 25% of their total volume as defect-free, or merchantable wood. Culls were often exceptionally crooked, rotten or had many branches, and were not considered to contain commercial quantities of wood. Table 1 shows the results of the timber inventory by stocking type.

Table 1: Timber Survey of Koa in the Piha Mauka Tract.

		Number of Trees per Acre			
	Diameter (dbh)	**Mean**	**Low**	**High**	**Net total volume (%)**
High Stocked	Koa > 16"	30	26	33	11
	Koa < 16"	11	8	14	31
	Non-koa	18	8	28	57
Low Stocked	Koa > 16"	14	11	17	19
	Koa < 16"	4	2	5	49
	Non-koa	6	4	9	42

The survey also used tree crown vigor to describe the health of existing koa stands. Three classes of tree crown vigor were defined as:

Class 1 – Vigorous, full crown with little or no branch die back
Class 2 – Crown average, some small to medium size branch die back
Class 3 – Sparse or clumpy crown, with large size branch die back

Table 2 shows the inventory results by crown class and forest type. These data indicate that koa resources in these tracts are in a state of decline and high annual mortality rates among remaining koa should be expected.

Table 2: Approximate Number of *Acacia koa* Trees per Acre Greater than 16" Diameter at Breast Height, By Tree Crown Vigor Class and Cover Type, Piha Mauka Forest Management Area.

Tree Crown Vigor Class	Cover Type 1 - High (trees/acre)	Cover Type 2 - Low (trees/acre)
1 (5%)	1.5	0.8
2 (47%)	14.1	5.7
3 (48%)	14.4	7.4
Total (100%)	30.0	13.9

Reserve koa trees left throughout the project area will include trees from each vigor class in an effort to emulate a natural stand which consists of healthy, dying, and dead koa. Due to their low numbers, all trees of Class 1 vigor will be retained to help stimulate the regeneration of a young, healthy forest. Remaining reserve trees will be designated from both Vigor Class 2 and 3 to provide ongoing and future wildlife habitat.

Other tree species observed and measured during the timber survey included kolea, mamane, ohia, and olapa. Most non-koa trees were small kolea and mamane, with typical dbh values ranging from 7-14 inches. Occasional ohia trees were observed with dbh values ranging from 14-20 inches. No volume analyses were conducted for these resources due to their small numbers and limited economic value. Tree species other than koa will not be harvested.

Table 3 displays Mueller-Dombois' estimates for koa trees and snags in a natural, unmanaged forest. Data has been estimated from Mueller-Dombois' published graphs and combined into three emergent size classes; 12" - 23" dbh, 24" - 39" dbh (minimum cavity nesting size for native birds); >40" (optimal cavity nesting size).

Table 3: Approximate Number of *Acacia koa* Trees and Snags per Acre in a Natural, Unmanaged Forest; Keauhou Ranch, Hawaii Island.

Diameter Breast Height (inches)	Trees Per Acre	Snags Per Acre	Total Stems Per Acre
Total	9.7	5.2	14.9

Vigor class 3 will provide the most snags per acre, therefore it is important to retain the sufficient numbers in this class to optimize native bird nesting habitat. Vigor class 2 has the most flexibility in providing reserve trees as some trees in this class recover from grazing pressures and others continue their decline. The low number of trees in Vigor class 1 necessitate their protection irregardless of size. Table 4 indicates the proportion of reserve trees to be designated in each vigor class, by cover type.

Table 4: Approximate Number and Percentage of *Acacia koa* Reserve Trees Greater Than 16" Diameter per Acre By Tree Crown Vigor Class and Cover Type, Piha Mauka Forest Management Area.

Tree Crown Vigor Class	Type 1 (trees/acre)	Type 2 (trees/acre)	Type 1 Retained (trees/acre) (%)	Type 2 Retained (trees/acre) (%)
1	1.5	0.8	1.5 (100%)	0.8 (100%)
2	14.1	5.7	3.3 (23%)	3.3 (58%)
3	14.4	7.4	5.2 (36%)	5.2 (70%)
Total	30.0	13.9	10.0 (33%)	9.3 (67%)

Irregardless of cover type, a sufficient number of snags, 5.2 trees per acre, in vigor class 3 would be retained. It is expected that this would provide wildlife habitat similar to that found at Keauhou and represented in Table 3.

Soil scarification resulting from salvage operations will help generate the next generation of seedlings and saplings from which the forest is expected to recover. A higher number (67%) of retained trees is required in Type 2, Low Stocked Koa stands to provide adequate seed source and cover. By harvesting up to 33% of the stand, however, it is expected that sufficient soil disturbance will result in natural regeneration in Type 2 stands.

2.1.4 Salvage Koa in the Piha Mauka Tract

All salvaging activities will be conducted in accordance with this management plan and a project plan prepared by the logging contractor and approved by DHHL. Salvage operations will be done in cutting blocks of 5 to 15 acres.

2.1.5 Long Term Forest Management

The type of potential forest community common to the tract is koa and mamane.[1] Extensive research at Keauhou Ranch by Mueller-Dombois, et., al., provides insight as to how reforestation might occur.[2] Mueller-Dombois describes koa as a species ready to take advantages of local disturbances in the forest. Since the project site is degraded compared to Keauhou and management funds are limited, initial reforestation efforts would rely on soil scarification and natural succession to regenerate a diverse native forest. Overstory components would be retained to provide forest bird habitat and foraging opportunities for native species and to continue the process of koa seed production on site.

The area will remain fenced to control cattle and the soil scarified to stimulate koa seedling growth from existing seed present in the soil. Following project completion, all temporary skid trails, and landings would be ripped to relieve compaction and encourage seedling establishment. It is expected that a viable stand of koa saplings could become established within a few years of the project's implementation. Natural regeneration will be monitored. If forest regeneration is inadequate following overstory

removal, planting from local seed sources at appropriate stocking levels will occur to assist forest recovery efforts. Inadequate regeneration is defined as koa salvage areas with openings greater than 1/10 acre in size or salvage areas which have less than 300 koa seedlings per acre, three years after salvage operations conclude.

Herbicide treatments on banana poka (*Passiflora mollissima*), competing grasses, and other undesirable vegetation will be used as necessary. Banana poka may invade the new area as cattle are withdrawn and the site is disturbed. Periodic control of banana poka may be required and appropriate control strategies employed. It is estimated that herbicide treatment may be required periodically to protect the regenerating forest from invasive species.

Fertilizer application is essential for satisfactory seedling survival and growth. During and after tree planting, commercial fertilizer applications may be applied manually as needed. Natural regeneration will not be fertilized. Weed and invasive species control may be required in newly planted stands to reduce seedling mortality and competition. Spraying herbicide will be carefully prescribed at levels to control the specific target populations. Only approved chemicals will be used in accordance with the manufacturer's labels.

The existing road network will be maintained for management activities including reforestation and fire mitigation. During extreme drought conditions, DHHL will monitor activities to mitigate the increased risk of fire.

2.2 Rationale for Proposed Action

2.2.1 Kanakaleonui Bird Corridor

Removing cattle, protecting existing overstory trees, and augmenting the forest via management tools such as soil scarification and tree plantings will help create a more viable wildlife corridor for native birds dependent on seasonal mauka to makai migration patterns on Mauna Kea.

2.2.2 Piha Mauka Tract

Removing cattle and salvaging dead and dying koa in the Piha Mauka Tract, Units 1, 2, and 3 is an action that will provide DHHL income to help finance the project site maintenance and start up costs. Additionally, the proposed project will create jobs in the community and provide the market with a source of high quality hardwood. Lastly, improving the long term health and diversity of the forest are keys to endowing the DHHL trust with a long term revenue stream to carry out our mission to "manage the trust effectively and to develop and deliver lands to native Hawaiians."

Removing cattle would allow existing trees to produce and maintain root shoots and basal sprouts, thereby increasing foliage and subsequent tree processes. The

remaining mature trees would most likely continue their current decline, but at a decelerated rate. Compaction of soil on and around surface roots from cattle would cease, allowing additional root growth and reversing current trends of root dieback. Compaction from logging equipment, however, would occur on skid trails and landings. Understory trees would continue to die, both from old age and from damage as a result of logging. Damage from logging would be of shorter duration than Alternative 3.1, the No Action Alternative, as directional falling and predefined skids trails were used.

Wildlife habitat, especially for forest birds, would be maintained as nesting cavities and roosts remained, but at levels less than Alternative 3.2, Fence Area and Remove Cattle. Organic material on the ground would be less than Alternatives 3.1 and 3.2, but would still be sufficient for other native plant regeneration as sub-merchantable material (<12" diameter) remained on site and was scattered. Fire hazard would decrease substantially as large fuels were removed, grass cover was reduced, and a young, healthy forest established itself. The young forest would be similar to that described in Alternative 3.2 but more extensive as dead and dying trees are removed from the site. Scarifying the soil via logging would temporarily reduce non-native grasses and should result in higher densities of koa seedlings within a few months. Within a few years, stands of koa saplings are expected on scarified sites that have an existing koa seed bank present.

2.3 Permits and Approvals Required

Section 204(2), HHCA, 1920, as amended, allows DHHL to manage its lands in accordance with Ch. 171, HRS. No permits are required for this project.

3. ALTERNATIVES TO THE PROPOSED ACTION

3.1 No Action Alternative

The No Action Alternative implies no deviation from the historic land use. Site impacts from ranching would continue and non-native grasses would continue to flourish. Existing tree cover would be reduced as old age and rot took their toll on mature trees. Organic material on the ground would build up substantially as trees fell or were blown over, then decline gradually once the entire overstory was gone. Understory trees would continue to die as well, both from old age and from damage as a result of the overstory falling on them. Fire hazard would increase slightly with the increase in fuels from fallen trees and branches, but would become relatively low as grazing kept grass and shrub fuels to a minimum.

Cattle browsing on new tree seedlings, however, would result in insufficient regeneration to replace existing trees. Over a lengthy period of time, perhaps fifty years, the current stock of viable tree seeds found in the soil would disappear from iterative sprouting and grazing. With no overstory to replenish tree seeds, and with grazing and foraging animals eliminating any new seedlings, a transition would occur. The proposed project site would change from a dead and dying overstory of trees with a

viable seed bank in the soil, to a pure grass pasture with little or no presence of tree seeds. The latter scenario would necessitate artificial planting if a forest was desired at some future date.

As tree cover disappeared, the site would be prone to greater variations in temperature and moisture extremes, such as frost or drought. It is anticipated that site productivity would gradually decline as a result. The loss of trees would also mean the loss of certain wildlife habitat, particularly forest bird habitat. The risk of invasive species, such as banana poka, occupying the site would be highest.

3.2 Remove Cattle

Cattle would be removed from within the proposed project area following an intensive grazing cycle to reduce grass cover to a minimum. Natural processes would be allowed to proceed with limited human intervention. Weed species such as banana poka would be monitored.

The existing mature forest would continue its current decline, but most likely at a reduced rate. Removing cattle would allow existing trees to produce and maintain root shoots and basal sprouts, thereby increasing foliage and subsequent tree processes. Compaction of soil on and around surface roots would cease, allowing additional root growth and reversing current trends of root dieback. Wildlife habitat, especially for forest birds, would be maintained as nesting cavities and roosts remained. Organic material on the ground would build up substantially as trees fell or were blown over, then decline gradually once the existing overstory was gone. Understory trees would continue to die, both from old age and from damage as a result of the overstory falling on them, but at a reduced rate from the No Action alternative. Sites for other native plant regeneration would increase with the increase in organic material. Fire hazard would increase substantially with the increase in fuels from ungrazed grass and fallen trees.

A young forest would slowly begin to grow as cattle grazing on seedlings was eliminated. With the presence of an existing seed bank, koa would reestablish itself throughout the parcel. As the koa attained sufficient height and density to shade out some grass species, conditions for other native plant growth would improve considerably. Other tree species such as ohia, kolea, mamane, and naio would appear. Understory plants might include natives such as ohelo (*Vaccinium calycinum*), native raspberry (*Rubus hawaiiensis*), kawau (*Ilex anomala*), and maile (*Alyxia oliviformis*).

The continuing presence of non-native grasses, however, would slow the natural restoration process significantly. Research in the late 1970's at Keauhou, for example, showed that after 3 years of excluding cattle, an average of only 4 seedlings per acre could be found in and among the dense kikuyu grass. This is in contrast to scarified sites at the same location with koa stocking densities averaging 8,000 seedlings per acre at 6 months.

Given the proximity of banana poka in the area, slow establishment of koa could significantly increase the cost of re-establishing a native forest on the proposed project site. Banana poka can easily invade a formerly grazed area within 5 years and would jeopardize any new seedlings that were not tall enough to withstand the initial competition of banana poka. Saplings and young trees, on the other hand, while still requiring protection from banana poka to survive, would require less periodic maintenance. Banana poka treatments may be required annually and would include hand pulling of young plants and spraying of older plants. It is DHHL's goal to treat all invasive weeds shortly after they are encountered to minimize their spread in the project area.

Although gorse is not prevalent in the immediate vicinity, it is close enough to present a concern to future management efforts. Gorse is shade intolerant and can die out in denser shade. Under this alternative, the risk of a gorse invasion and subsequent control costs are high as cattle are removed and overstory establishment is slowed by grass competition. Operating and maintenance costs would be funded from off-site sources.

3.3 Remove Cattle and Harvest All Koa

Cattle would be removed from within the proposed project area following an intensive grazing cycle to reduce grass cover to a minimum and reduce fuel loading. A complete harvest of all overstory koa trees would then be conducted. The soil would be scarified to begin the forest restoration process.

Following harvest, natural regeneration would be monitored to ensure complete reforestation of the project area. If openings greater than one acre persisted a few years following overstory removal, plantings of koa from local seed sources would occur. Weed species would be managed. This would include control of invasive species.

By harvesting all of the remaining mature forest, its current use as wildlife habitat would cease. Removing cattle would allow regeneration of forest and competing grasses to occur, and compaction of soil would cease. Compaction from logging equipment, however, would occur on skid trails and landings. Understory trees would continue to die, both from old age and from damage as a result of logging. Logging damage would be more than Alternative 3.1.

Wildlife habitat, especially for forest birds, would not be maintained. Organic material on the ground would be less than Alternatives 3.1 and 3.2, but would still be sufficient for other native plant regeneration as sub-merchantable material (<12" diameter) remained on site and scattered. Fire hazard would decrease substantially as large fuels were removed, grass cover was reduced, and a young, healthy forest established itself. The young forest would be similar to that described in Alternative 3.2. Scarifying the

soil via logging would reduce non-native grasses and should result in high densities of koa seedlings within a few months. Within a few years, a stand of saplings is expected.

Banana poka would probably invade the new area as described in Alternative 3.1, and similar maintenance would be required. Gorse might be less of a serious problem than Alternative 3.1, as a denser canopy of young koa seedlings and saplings would be expected.

4. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

4.1 Physical Site Characteristics

Elevation in the tract is between 5,440 and 7,880 feet. Average annual rainfall is 20 to 40 inches per year. Most areas have less than 20% slopes. In the gulches, slopes average less than 40%.

4.1.1 Soil

Existing Conditions. The Hanipoe Series consists of well drained silt-loams that formed in volcanic ash. Soils in the tract are classified as Hanipoe very stony loam, 12 to 20 percent slopes (HCD).[3] Hanipoe soils are used for pasture, woodland, and wildlife habitat. HCD soils are 20 to 30 inches deep over fragmental a'a lava. Runoff is slow and the erosion hazard is slight. Estimated growth potential is about 400 to 600 board feet per acre per year.

Potential Impacts and Mitigation Measures. Impact on soils in the project area will be short term in nature, especially in the A B horizons. Soil structure will be temporarily disrupted during logging and the scarification process as new stands are established. As the forest reestablishes itself, soils will stabilize and improve over time. Management objectives for the long term productivity and sustainability of Humuula's potential forest resources require the protection of the soil onsite. Applicable law will be followed to minimize soil movement, erosion, and compaction during salvaging operations, road improvement and maintenance, and site preparation.

Salvage operations will require the construction of temporary skid trails and landings. Salvage operations have the potential to cause soil disturbance when trees are felled and logs are skidded to landings, decked, and later loaded onto trucks. Soil resources will be protected by the design and location of permanent roads if any, skid trails, and landings. Compaction would be mitigated by not harvesting or scarifying during or immediately following heavy rains. After harvest of a given area, temporary skid trails and landings would be ripped to relieve compaction and encourage seedling establishment. Soils are expected to improve and erosion will decrease as the area becomes reforested.

Herbicides, fertilizers, and vehicle fuel and oil, may be stored in specified areas. Any chemical spills will be removed according to applicable hazardous material handling procedures.

4.1.2 Water

Existing Conditions. There are no streams or wells within the management area.

Potential Impacts and Mitigation Measures. The project should have little or no significant impact on water quality. The major sources of water quality degradation from forest management activities are sediment, nutrients, herbicides, and debris. To minimize nonpoint source pollution from sediments, the required practices include avoiding disruption of natural drainage, preventing excessive soil displacement, providing drainage in case of slope instability, and providing culverts, dips, water bars, and cross drainage on roads and skid trails to minimize erosion. To minimize water quality degradation from nutrients and herbicides, practices include efficient and safe application of chemicals according to manufacturer's label. Chemicals will not be applied in rainy conditions to avoid or minimize chemical runoff. It is anticipated that reforestation will improve water percolation into the soil by catching fog drip and that soil erosion will decrease over time.

Site preparation may involve the use of herbicide. Applicable law will be followed regarding the selection, use and storage of chemicals for forest management activities. DHHL will report violations to the Occupational Safety and Health Administration regarding the improper use of chemicals in the project area.

4.2 Biological Resources

4.2.1 Flora

Existing Conditions. The project area can be considered a mixed forest/woodland with significant grassy and rocky openings. Wagner's, et. al. descriptions of a koa-ohia montane mesic forest seem most appropriate for the lowest elevations of the project site, whereas a koa-mamane montane dry forest appears at highest elevations. Gradation between the two types occurs where moisture is influenced by topography and where pockets of soil differ in structure. At lower elevations koa forest cover is more contiguous, with occasional scattered grass openings. As elevation increases the extent of koa is reduced, the prevalence of mamane increases, and pockets of forest are interspersed by grassed or rocky openings ranging in size from 1 acre to dozens of acres. At about 7,000 feet, the koa forest gradates entirely into mamane woodland and contiguous forest cover is greatly reduced.

Ungulate grazing and fence post cutting have reduced the canopy and understory covers to a remnant community. Factors such as over-maturity, root compaction from cattle, and disease have caused many trees to break or rot, and many others to die.

Though the condition of the remnant koa is poor, many living and dead trees still contain sound wood volume which could represent a valuable resource in a timber salvage operation. Mamane stands are depleted and unhealthy, but should be capable of restoring themselves if grazing and harvesting pressure is removed. Tree inventory data is shown in Section 2.1, indicating the current condition of existing koa stands.

Non-native grass cover throughout the stand is dense and healthy. No threatened or endangered plants were observed during field visits to the site. There is little evidence of erosion except in a few areas of existing roads. This latter erosion is minimal.

Potential Impacts and Mitigation Measures. Understory damage from logging is a contributor to stand deterioration, loss of diversity and age structure, and introduction of insect and disease attack on weakened trees. Directional falling of crop trees is an important tool in controlling damage to remaining understory. Harvested trees should be felled to avoid pockets of understory trees, especially mamane. A Project Plan, consistent with this management plan, prepared by the logging contractor and approved by DHHL, would be required prior to entry. This plan would map landings, temporary roads, skid trails, and storage sites for needed materials. The plan would also outline the order in which areas would be harvested and the rate at which they were harvested. A fire protection plan would be a component of the Project Plan as well.

If koa did not reestablish itself in sufficient quantities throughout the tract to constitute a viable stand, supplemental planting could occur. Inadequate regeneration is defined as koa salvage areas with openings greater than 1/10 acre in size or salvage areas which have less than 300 koa seedlings per acre, three years after salvage operations conclude. Seed will be collected onsite or nearby, germinated and grown into dibble stock nursery seedlings and outplanted at appropriate stocking levels.

The response of koa to salvaging, soil scarification, and herbicide treatments on invasive species or competing grasses will be monitored. Natural regeneration will be monitored. If openings greater than 1/10 acre persist three years following overstory removal, planting of koa from local seed sources could occur, especially in the vicinity of overstory trees.

Feral sheep and cattle would be controlled as necessary to ensure regeneration of the native forest. Mamane natural regeneration would be monitored and augmented with plantings if necessary and if funding could be procured.

4.2.2 Fauna

Existing Conditions. Several species of mammals and birds may be found in the vicinity of the project area. See Table 5. Twenty three species of birds have been documented as occurring in the vicinity of the project area.[4] Fourteen of these are introduced and eleven are native. Several species of endangered forest birds are associated with koa-mamane forest communities. They are the 'Akiapola'au, the Hawaii

Creeper, Akepa, Palila, and 'Io or Hawaiian Hawk. The endangered Hawaiian hoary bat may occur seasonally in the tract.

Larger mammals include domesticated cattle (*Bos taurus*) and feral sheep and pigs. Feral dogs (*Canis familiaris*), feral cats (*Felis catus*), the Indian mongoose (*Herpestes auropunctatus*), and two species of rodents; the black or roof rat (*Rattus rattus*) and the European house mouse (*Mus domesticus*), have been known to occur within the adjacent Hilo Forest Reserve.

While there is a general lack of biological information on the role of native and non-native invertebrates in nutrient cycling, food webs, and pollination, no detailed survey of the project area's insect fauna has been conducted. Invertebrates appear to be particularly sensitive to changes in the microclimate. Many insects have evolved specialized habitat and require one or a very few native plant species to complete their life cycle. Previous land uses such as ranching have probably contributed to a change in the invertebrate communities.

Potential Impacts and Mitigation Measures. Given the proximity of other forested areas and the current condition of the project area, the salvage project is expected to have minimal impact on the native bird populations. No nests were found in the project area. If any roosting trees or active nests of rare, threatened or endangered species are encountered, a no-harvest zone (250 foot radius) will be established around each site. The project could have a positive long term impact on the use of the area by native birds. In the short term, koa salvage operations may decrease a portion of their insect forage supply, but in a few years standing dead and fallen trees may attract insects, replenishing the forage supply. Endangered species such as the 'Akiapola'au rely on ohia trees for nesting. The few ohia found in the project area will not be harvested. Koa reforestation, especially in higher elevation areas, may contribute to the survival and recovery of the 'Akiapola'au. Koa is an important foraging substrate for the 'Akiapola'au as well as for other native Hawaii creepers.

Hawaii creeper and Akepa rely on koa for insect larvae foraging substrate. Minimum diameter size for nesting sites for the has been given as 24" dbh, although 40" dbh or greater is believed to be "ideal". Although ideal habitat for these species is closed canopy, diverse forest, the project site could offer some habitat while it is recovering.

Mamane provide food resources for the endangered palila. Forest protection and enhancement activities should improve year round palila foraging opportunities along an elevational gradient.

Koa and native tree corridors that bridge between the neighboring lower elevation mixed koa-ohia forest and higher elevation mamane forests are crucial migration corridors between seasonal food sources for native forest birds. Establishing the Kanakaleonui bird corridor will have a positive effect on native bird habitat and food resources.

The tract is between 5,400 – 7,880 feet. Hawaiian hoary bat breeding generally occurs below 4,000 feet from April to October. From November to April, bats tend to be found at 4,000 to 7,500 feet. A bat survey, using DLNR's Division of Forestry and Wildlife's existing protocol will be conducted prior to harvesting activity to determine the time of least impact to bat habitat and activity.

Table 5: Fauna Which May Be Found in the Tract.

Native Birds	
'Akiapola'au	*Hemignathus monroi*
Akepa	*Loxops coccineus coccineus*
Apapane	*Himatione sanguinea*
Common Amakihi	*Hemignathus virens*
Elepaio	*Chasiempis sandwichensis*
Hawaii Creeper	*Oreomystis mana*
Hawaiian Hawk (Io)	*Buteo solitarius*
Iiwi	*Vestiaria coccinea*
Omao	*Myadestes obscurus*
Palila	*Loxioides bailleui*
Short-eared Owl (Pueo)	*Asio flammeus sandwichensis*
Alien Birds	
Chukar	*Alectoris chukar*
Common Myna	*Acridotheres tristis*
Erckels Francolin	*Francolinus erkelii*
Eurasian Skylark	*Alauda arvensis*
House Finch	*Carpodacus mexicanus*
Japanese White-Eye	*Zosterops japonica*
Kalij Pheasant	*Lophura leucomelana*
Melodius Laughing-Thrush	*Garrulax canorus*
Northern Cardinal	*Cardinalis cardinalis*
Nutmeg Mannikin	*Lonchura punctulata*
Red-Billed Leiothrix	*Leiothrix lutea*
Ring-necked Pheasant	*Phasianus colchicus*
Spotted Dove	*Streptopelia chinensis*
Wild Turkey	*Meleagris gallopavo*
Other Animals	
Black Rat	*Rattus rattus*
Feral Cat	*Felis catus*
Feral Cow	*Bos taurus*
Feral Dog	*Canis familiaris*
Feral Pig	*Sus scrofa*
Field Mouse	*Mus domesticus*
Hawaiian hoary bat	*Lasiurus cinereus semotus*
Indian Mongoose	*Herpestes auropunctatus*

4.3 Cultural and Social Resources

4.3.1 Public Land Use

Existing Conditions. The project site is unencumbered. Access to the tract may be granted by DHHL on a case by case basis.

Potential Impacts and Mitigation Measures. The project will not change public uses of DHHL lands.

4.3.2 Education and Research

Existing Conditions. None.

Potential Impacts and Mitigation Measures. The tract may provide educational opportunities for organizations and institutions for the study of reforestation of koa and mamane forest communities at the higher elevations. Institutions and organizations such as the U.S. Fish and Wildlife Service, U.S. Forest Service and students of tropical forestry have used DHHL and other State owned forests to conduct field research. Some of the research projects have included microbial communities, nutrient cycling, watershed quality of native forest plant communities, and wood properties of native tree species.

4.3.3 Historical and Archeological Resources

Existing Conditions. The management area lies within the northern end of the Humuula ahupuaa. The general area was used for collecting bird feathers, medicinal plants, and canoe logs during the pre-contact era[5] and hunting and ranching during the post-contact era.

Mauna Kea may be literally interpreted as "white mountain" because during the winters, the summit is covered in snow. Mauna Kea may also be translated as "Wakea's Mountain." Wakea, also written and pronounced as Akea and Kea, was the god-father of the island of Hawaii. The island child was born by Papa or Haumea, the goddess who gave birth to islands.

Humuula is defined in the Hawaiian dictionary as red jasper stone, as used for adze. There is an adze quarry located near the summit of Mauna Kea and the area may have been traversed as a route to the quarry. Kanakaleonui translates as a loud voiced man. Puu Kanakaleonui is located mauka of the project area. Nearby Hakalau translates as the "place of many perches".

A cross-island trail generally forms the boundaries between the Humuula ahupuaa and makai side ahupuaa. In the 19th century, it was called the Laumai'a Road, but it likely originated in earlier times. The present Mana-Keanakolu Road roughly follows the

Laumai'a alignment. Cordy describes a trail on the east flank of Mauna Kea that connected Kohala, Waimea, and Hamakua with Hilo.[6] This could be the trail that was used by the high chief 'Umi in his conquest of Hilo.[7] Roads described in Boundary Commission testimonies generally follow the ahupuaa boundaries, any remains of such features would fall within a fairly well delimited corridor, and might also be identifiable by natural features such as ridges or gullies. It is also likely that habitation shelters would be found in close proximity to trails.

The Civilian Conservation Corps (CCC), established by the federal government in the 1930's, constructed fences to control an estimated 40,000 feral sheep that were impacting native forests, primarily mamane.[8] The CCC had numerous camps along the fencelines and Mana-Keanakolu Road was greatly improved by the CCC.[9] The CCC also participated in tree planting, trail construction, and maintenance.

Cattle were introduced to Hawaii in 1793 by Captain George Vancouver. Kamehameha immediately instituted a kapu on the animals for a period of ten years. The animals soon became a problem in the forested areas. By the 1820's, cattle hunting was an industry, as salted and barreled beef was a valuable commodity in the provisioning trade related to whaling. Bullock hunters supplied the market. Two westerners who practiced this trade were Ned Gurney and A. Simmons. Gurney was thought to be a former convict from Australia's Botany Bay and lived with his Hawaiian wife in the upland forest just north of the Hakalau Forest.[10] Simmons' "hut" is used as a locator in the Boundary Commission survey for Paukaa and Humuula.[11] The location of Simmons' hut may be obscured by dense gorse vegetation.

During the 1800's, wild cattle were in great numbers and fairly wide ranging across the slopes of Mauna Kea. To deliver hides and barrels of salted beef to ports at Hilo and Kawaihae, bullock hunters focussed their efforts along relatively easy transportation routes. One method of capturing cattle in the region was bullock pits. It is likely that bullock pits, as described below, were located along the Mana-Keanakolu Road.[12]

> A hole is dug large enough for a bullock to fall into. This is concealed and covered with fresh hay, the sweet scent attracts the wild animals which fall in to be afterwards raised alive and placed in enclosures or killed and exported as may happen to be required.

The David Douglas monument, testimony to the famous naturalist's demise in a Big Island bull pit in 1835, is about one-quarter mile east of Unit 2. Douglas, a botanist and namesake of Douglas fir and many other plant species, was travelling alone along the mountain road between Waimea and Hilo (probably Mana-Keanakolu Road) when he presumable fell into a bullock pit. His body was found trampled and gored by a bullock that had either been in the pit already or had fallen in after Douglas. The bullock hunter Ned Gurney was accused of having murdered Douglas for his money. In 1934, a stone cairn memorial was erected near the place where Douglas' body was found.

By the 1830's, cattle ranching, as opposed to hunting, came to the area. While the initial stock of cattle came from the wild, cattle were later imported to improve the herd. By the end of the century, there were two major ranches in the area, Kukaiau Ranch, located northeast of Unit 1 and Puu Oo Ranch located southeast of the Kanakaleonui Bird Corridor. Later, Parker Ranch occupied most of the Humuula ahupuaa.

While the Humuula forest may have been too far to supply firewood for sugar plantations along the Hamakua coast, sheep and cattle ranching, and their wild counterparts probably accounted for most of the depletion of the timber resources. Trees were also used as fence posts for the ranching industry.

Hopuwai, makai of Kanakaleonui, once had a hut and waterhole.[13] There is no present pond in the mapped location, although there is a natural depression that may once have served that function. Pua Akala Ranch, located southeast of the management area on Hakalau NWR lands consists of a complex of ranch buildings focused around a one-story koa wood-framed cabin built in the late 1800's by D.H. and E.G. Hitchcock. Other historic resources located in and around the project area include old corrals, walls, and fences.

Three surveyors who crossed through the nearby Hakalau Forest area were H.M. Lyman (1852-1853), D.H. Hitchcock (1874) and C.J. Lyons (1870's-1890's). Each left documented marks at survey points, either cairns or scratched marks in boulders or outcrops. The Boundary Certificate for Piha had, along the land of Humuula, an old ahu in the midst of a sand flat as the boundary between Piha and Maulua. A previous search for this cairn showed that the area had been impacted by cattle ranching as no cairn was found.[14]

Bird catchers, canoe and tool makers, bullock hunters, scientists, travelers, surveyors, and others have passed through the upland forest of Hilo and Hamakua. Except for a few, they have in common a short-term, temporary occupation of Humuula. Pukui and Emory do not mention any shelters for canoe makers, only that a ceremonial meal preceded both the cutting and hauling of the tree.[15] Emerson says only that bird catchers "erects the necessary huts for himself and family."[16] The upland forests may also have been traveled by individuals going from the coast to the upper slopes or summit of Mauna Kea. Cross island travel may have followed the long-standing trail (Mana-Keanakolu Road) that followed the Humuula ahupuaa. These transitory activities would likely have left neither a substantial nor easily recognized archeological record. Given their temporary nature, they probably did not leave well-preserved nor highly visible physical remains, possibly only scattered charcoal from cooking or heating fires. Glass, metal, and ceramic may occur as midden in these sites.

The origin of charcoal on nearby lands is unknown, but a cultural origin is possible. Fires could be set by man and therefore indirectly represent human occupation in the area. Forest fires, perhaps from prehistoric lava flows may be one explanation, fires in

the last 20 years have been routinely set to control gorse in the area. Charcoal's apparent widespread occurrence however, suggests natural rather than cultural causes.

McEldowney discusses the possibility of shrines and other religious structures in the upper Mauna Kea area.[17] She emphasizes that there was tremendous variability in the manner in which, not only classes of people (i.e., commoners, chiefs, men, and women), but individuals themselves addressed their gods, also prayer and ritual in any particular location were inseparable from the non-ritual activities that occurred there as well. Shrines could be related to a request for safe passage, abundance in natural resources, and for help to ensure success in a particular occupation such as bird catching and canoe making. The implication for site identification is that the physical manifestation of shrines or places of worship could range from natural features to simple stones to elaborate structures, and could be found in any number of locations, along trails, next to trees that had been cut for canoes, or anywhere in the forest that a bird catcher happened to call to his 'aumakua. Any interpretation of religious use for any identified feature or structure would have to be made on a case-specific basis, depending on location, structure characteristics, or ethnographic or historical reference.

In summary, in pre-contact times, only bird catchers, canoe and tool makers traveled through Humuula. In post-contact times, birds, adzes, and canoes gave way to wild cattle and ranching. While individual canoe-trees became less important, the forest as a whole became more important as a watershed and resulted in the establishment of the Hilo Forest Reserve. While there are few archeological resources, the place names of the area as recorded in Boundary Commission testimonies and maps are many.

Potential Impacts and Mitigation Measures. There are no known historic or archaeological sites in the project area. If historic and/or archaeological sites are found, operations in the area will be halted and DLNR's Historic Preservation Division will be notified for further evaluation.

4.3.4 Sensitive and Significant Areas

Existing Conditions. Sensitive areas include flood plains, tsunami zones, beaches, streams, rivers, oceans, estuaries, anchialine ponds, fresh or coastal waters, erosion prone areas and geologically hazardous land. The tract is not located in or nearby sensitive areas.

Potential Impacts and Mitigation Measures. Applicable law will be followed to minimize soil erosion and compaction during salvaging operations, road improvement and maintenance, and site preparation.

4.3.5 Cultural Practices and Features

Existing Conditions. Portions of the project area were once more heavily forested. Native Hawaiians viewed the mountain areas as the forested zone (waoakua, forest of

gods) where koa trees may be cut for canoe hulls. Other uses are gathering medicinal plants and bird watching. A mele associated with Kanakaleonui, Kaula 'Ili, refers to the hanging of an innocent man as described below:[18]

Ho`omakaukau ko kaula `ili	Make ready your lariat
I luna o ka pu'u kanaka leo nui	Put it over the throat, of the man with the big voice
Ho`olohe i ke kani o nä manu	Heed the cry of birds
O never mind ua hina pü ua hiki nö	Never mind, you will fall, it is done
O never mind ua hina pü ua hiki nö	Never mind, you will fall, it is done
O `oe ka i huia ihola	You are the one who was met
Ka mana`o e pua pua`i `ala	My constantly recurring thought
Eia o pu`u o hulu	Here is a group of special people
Ulu nö wau ua hiki nö	I am inspired, it is done
Ulu nö wau ua hiki nö	I am inspired, it is done

By the early 1800's, wild cattle were hunted in the area for meat and hides. By 1930, the area had been fenced and commercial ranching had begun. Historic logging, ranching, and erosion contributed to the alteration of forest cover to woodlands and savannas on windward Mauna Kea. Hunting is available to the public on adjacent lands.

Potential Impacts and Mitigation Measures. The project could have a positive effect on gathering and/or other traditional uses as the forest and understory grows back. Hunting opportunities on nearby lands where it is permitted would not be reduced under this proposal. Scarification as a method of koa reforestation could impact possible transitory structures described above. Scarification routes, skid trails, and landings would be reviewed prior to heavy equipment operations.

Raw materials for cultural use may be made available in exchange for site preparation, replanting, and/or other forest-based activities. Stewardship opportunities would be evaluated on a case by case basis.

4.4 Economic Resources

Existing Conditions. In 1991, the forest industry in Hawaii contributed approximately $29 million and 736 jobs to the State's economy and at the time koa was the main resource.[19] The forest industry payroll exceeded $21 million and the average salary was over $14 per hour. The ratio of value to land area for koa forest land is one of the highest of all rural/agricultural land uses. Sustainable forest practices can bring economic diversity and employment for our beneficiaries, enhance the environment, while retaining the rural character of the islands. DHHL's forested lands on the island of Hawaii are well placed to contribute to and support the forest industry with a range of value-added opportunities.

The types of jobs supporting the forest industry are blue-collar and white collar jobs including seedling production, field workers, heavy equipment operators, harvesters, millers, woodworkers, marketing, sales, and accountants, among others.

Removing dead and dying koa from the proposed project site would generate an estimated two to four direct forestry jobs per 200 acres over a period of about three years. Because Hawaii's current forest industry extensively uses koa as a natural resource, and because that industry is value-adding, it is worth considering potential indirect jobs which could result from this project. Indirect jobs are difficult to estimate, but a 1985 study of Hawaii's forest industry reported that "for every $1,000 increase in output in the forestry sector [general] employment will increase by 1.3 jobs".

Potential Impacts and Mitigation Measures. The proposed project could have a positive impact to Hawaii's economy. Presently, the demand for koa exceeds the available supply. This has resulted in shortages and significant increases in koa prices. Koa stumpage (value in the forest) has increased from an average of $0.40/board foot in 1986 to $2.50/board foot in 2002, while finished koa lumber sells in the range of $10-$35/board foot - a higher value than most timber species. These high prices could make sustainable koa management a viable option for many landowners.

4.5 Fire Potential and Safety Risks

Existing Conditions. Fire has been used on adjacent land to control gorse. Though wildfires are rare, there is a potential for wildfires to occur. As grazing is reduced, fire hazard will increase as on site biomass increases. Road networks are currently maintained allowing access to the area and helicopters can operate at this elevation.

Trees that lean on adjacent trees may pose safety hazards to the unwary. Strong winds in the area may knock over dead and dying trees causing them to fall.

Potential Impacts and Mitigation Measures. Operations within the tract will follow applicable law to insure the control and prevention of possible fire hazards, as well as, herbicide application and site preparation in the gorse project area. A fire plan will be required of all logging contractors, and appropriate fire equipment will be on site at all times.

Telecommunications are possible throughout most of the project area and will be maintained regularly to minimize safety issues. Public access to the tract may be limited during salvage and reforestation activities.

4.6 Access Roads

Existing Conditions. Access is provided via the Mana-Keanakolu Road, which is maintained by the County of Hawaii as a public road. Within the project area several existing ranch road segments provide adequate access for management activities.

Potential Impacts and Mitigation Measures. The contracted logger will be required to maintain and restore any DHHL roads to their original condition as determined by DHHL. Temporary skid trails and landings will be scarified after salvaging is complete in each salvage unit.

Although dependent on the contracted logger's operation, it is estimated that about two trucks per week may be hauling logs and/or milled lumber, or about 9,000 board feet per month for the term of the license. Primary milling may also be conducted onsite. Products may be hauled over Saddle Road or through Waimea toward processing facilities in Hamakua or Hilo.

5. RELATIONSHIP TO PLANS AND POLICIES

5.1 *Hawaiian Homes Commission Act*

In 1921, Congress passed the Hawaiian Homes Commission Act (HHCA) of 1920, 42 Stat. 108, as amended, which set aside certain lands within the Territory of Hawaii for the benefit of native Hawaiians. This project implements section 204(2), HHCA by developing tracts of land not under homestead lease as determined by section 207(a), HHCA.

5.1.1 Hawaii Island Plan

The Hawaii Island Plan identifies the area as a special district. While not formally adopted by the Hawaiian Homes Commission, special district is identified as areas requiring special attention because of unusual opportunities and/or constraints. Specific types of uses and the means for developing and managing areas and facilities to be determined when preparing development plans, homestead community plans, or individual project plans.

5.2 Hawaii State Plan

The Hawaii State Plan, Chapter 226, HRS, serves as a guide for future development. In general, its goals are to achieve a strong economy, a desired physical environment, and physical, social, and economic well-being that nourishes a sense of community responsibility. The proposed project is consistent with the objectives and policies of the Hawaii State Plan in the following areas:

§226-6, HRS: Objectives and policies for the economy.

The project will increase employment opportunities and will add to the growth of the forest industry on the island of Hawaii.

§226-7, HRS: Objectives and policies for the agriculture.

The project is consistent with the state's objective to diversify the agricultural industry.

§226-10, HRS: Objectives and policies for the economy - potential growth activities.

The project will add to diversification to the agricultural industry though employment opportunities in research, education, production and manufacturing.

§226-11, HRS: Objectives and policies for the physical environment - land based, shoreline, and marine resources.

The project exercises a conservation ethic in the use of natural resources and serves to protect Hawaii's unique and fragile environmental resources.

§226-13, HRS: Objectives and policies for the physical environment - land, air, and water quality.

The project will improve the quality of Hawaii's land, air, and water resources by re-establishing a natural forest; minimize erosion and enhance water catchment through reforestation; and improve air quality through carbon sequestration.

§226-21, HRS: Objectives and policies for the socio-cultural advancement - education.

The project will enhance understanding of Hawaii's cultural heritage through reforestation. The project will provide employment training programs and other related educational opportunities.

5.3 State Land Use Law

Chapter 205, HRS, relating to the Land Use Commission, establishes four major land use districts into which all lands of the State are placed. The districts are designated Urban, Rural, Agricultural, and Conservation. The koa salvage units and adjacent areas are in the State agricultural district and County zoned Ag-40a. The Kanakaleonui Bird Corridor is in the State agricultural district and County-zoned Ag-40a. Koa salvage and reforestation and other forestry activities are a permitted use within the Agricultural District.

5.4 Coastal Zone Management

The Hawaii Coastal Zone Management Program, Chapter 205A, HRS, establishes objectives and policies for the preservation, protection, and restoration of natural resources of Hawaii's coastal zone. The proposed project is consistent with the objectives and policies of the Coastal Zone Management Program in the following areas:

§205A-2(b)(4), HRS: Coastal Ecosystems

The project protects coastal ecosystems, including reefs and streams, by limiting the use of herbicides and minimizes soil erosion by reforestation.

§205A-2(b)(5), HRS: Economic Uses

Harvesting and reforestation is an appropriate economic use of the State's upland areas.

§205A-2(b)(10), HRS: Marine Resources

The project exercises a conservation ethic which serves to protect marine and coastal resources by protecting the upland areas through reforestation.

5.5 State Environmental Policy

The State Environmental Policy, Chapter 344, HRS, generally promotes efforts to prevent or eliminate damage to the environment and enrich the understanding of the ecological systems and natural resources important to the people of Hawaii. The proposed project is consistent with the objectives of State Environmental Policy in the following areas:

§344-3(1), HRS: Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaii;

§344-3(2)(B), HRS: Creating opportunities for the residents of Hawaii to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments;

§344-3(2)(C), HRS: Establishing communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment which is uniquely Hawaiian; and

§344-3(2)(D), HRS: Establishing a commitment on the part of each person to protect and enhance Hawaii's environment and reduce the drain on nonrenewable resources.

The project encourages management practices which conserve and protect watersheds and water sources, forest, and open space areas; protects endangered species of indigenous plants and animals by improving their habitat; fosters the planting of native as trees to enhance our environment.

5.6 General Plan of the County of Hawaii

The koa salvage units and adjacent areas are County zoned Ag-40a. The Kanakaleonui Bird Corridor is County-zoned Ag-40a. Koa salvage and reforestation and other forestry activities are a permitted use within the Agricultural District. The General Plan Land Use Pattern Allocation Guide Map designation for the project area is Extensive Agriculture.

6. DETERMINATION

This environmental assessment has examined the environmental and socio-economic impact associated with DHHL's proposal to salvage and reforest a 1,455 acre parcel with koa. Pursuant to Section 11-200-12, HAR, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria listed below. The expected determination of the project will be a **Finding of No Significant Impact**. Every phase of the proposed action, including the expected primary and secondary consequences, short and long term, and the cumulative effects were considered.

The analysis reports that the project should not result in significant environmental impacts to natural and cultural resources on the site or in the immediate area. Public infrastructure including roadways are adequate to serve the project and will not be significantly impacted by the project. The proposed project will enhance public view corridors and the visual character of the site and its immediate environs.

The koa salvage units and adjacent areas are in the State agricultural district and County zoning is Ag-40a. The Kanakaleonui Bird Corridor is in the State agricultural district and County-zoned Ag-40a. Koa salvage and reforestation and other forestry activities are a permitted use within the Agricultural District. Therefore, the proposed project is in conformance with State and County land use plans and policies including chapter 205A, HRS, as well as the Hawaiian Homes Commission Act of 1920, as amended.

1. The proposed project does not involve irrevocable commitment to loss or destruction of any natural or cultural resource.

The proposed project is not expected to have any significant long term negative impact on native plant species in the area. Although both native and non-native plants may be damaged and/or killed during salvaging, site preparation for reforestation, road construction and maintenance, most will grow back naturally. It is expected that a

viable stand of koa saplings could become established within a few years of the project's implementation. Natural regeneration will be monitored. If forest regeneration is inadequate following overstory removal, planting from local seed sources at appropriate stocking levels may occur to assist forest recovery efforts. Inadequate regeneration is defined as koa salvage areas with openings greater than 1/10 acre in size or salvage areas which have less than 300 koa seedlings per acre, three years after salvage operations conclude. Forestry operations may create a temporary disturbance in the area. Because operations will be implemented in a manner sensitive to the surrounding environment, the proposed project will have little to no impact on other resources or values in the project area and its nearby surroundings.

Forest disturbance will temporarily reduce the use of the area by animal species. Insect and bird populations will stabilize or improve as the disturbed areas reestablish themselves. Standing dead and fallen trees may attract insects, providing new forage opportunities (insects) for bird populations in the area, and could benefit native birds.

Applicable law will be followed to minimize soil erosion and compaction during salvaging, road construction and maintenance, site preparation and replanting. Soil resources will be protected by the design and location of roads, skid trails, and landings, and by not operating during periods of excessive rain. No permanent roads or skid trails will be built for this project, therefore there will be minimal impact on soil resources.

The proposed project will have little or no significant negative impact on water quality. To minimize nonpoint source pollution from sediments, the required practices include avoiding any disruption of natural drainage, preventing excessive soil displacement, providing drainage in case of slope instability, and providing culverts, dips, water bars, and cross drainage to minimize erosion. To minimize water quality degradation from nutrients and herbicides, practices include efficient and safe chemical use according to manufacturer's label.

There are no known historic or archaeological sites in the project area. If evidence of historic and/or archaeological sites are found, then operations will be halted and findings will be reported to DLNR's Historic Preservation Division.

2. The proposed project does not curtail the range of beneficial uses of the environment.

Opportunities for outdoor recreation activities will improve within the tract. Gathering plant material may also improve as the forest reestablishes itself. Access may be limited during salvaging operations. There may be increased opportunities for field studies within the tract.

3. The proposed project does not conflict 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 project will have minimal impact on the existing environment and at the same time improve the growth potential of koa resources. The restoration of Hawaii's native koa forests is one of many forest management goals of DHHL. The project serves to enhance the environmental quality of the area and provide cultural and economic opportunities for DHHL beneficiaries.

4. The proposed project does not substantially affect the economic or social welfare of the community or state.

Removing dead and dying koa from the proposed project site may generate an estimated two to four direct forestry jobs per 200 acres over a period of about three years. Indirect jobs are difficult to estimate, but a 1985 study of Hawaii's forest industry reported that "for every $1,000 increase in output in the forestry sector [general] employment will increase by 1.3 jobs".

An important goal of this project is to improve the economic and social welfare of DHHL beneficiaries. Through active management, DHHL intends to restore its koa forests and ecosystems, create jobs in the community, provide Hawaii's wood products market with a source of high quality hardwood, and endow the DHHL trust fund with a long term revenue stream to support our mission to "manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians."

This project will also provide valuable information for future koa stand management. The potential information that will be obtained could have significant benefits to the forest industry and community.

5. The proposed project does not substantially affect public health.

Safety and health laws during salvage operations will be strictly enforced. DHHL will report violations to the Occupational Safety and Health Administration if chemicals are improperly used in the tract.

6. The proposed project does not involve substantial secondary impacts, such as population changes or effects on public facilities.

The main secondary impact is the increased use of access roads in the area, but these impacts are temporary. The general public has limited access to the tract.

7. The proposed project does not involve a substantial degradation of environmental quality.

Sound forest management of sustainable, long term productivity will insure that there will not be a significant degradation of the forest resources in the tract. Koa salvaging will decrease the current density of biological resources, but the impact will be temporary and will lead to a healthier forest community.

8. The proposed project does not have considerable cumulative adverse effects.

Cumulative effects of the project are expected to be positive. A primary short term benefit of the koa salvage is the creation of logging and processing jobs. Other long range benefits will be forestry as a land use alternative and as forests increase the land's value for watershed, wildlife, recreation, aesthetics, and carbon sequestration.

9. The proposed project does not substantially affect rare, threatened, or endangered species, or their habitat.

There are no known threatened and endangered plant species presently growing in the tract. If rare, threatened or endangered plant species are encountered, DLNR will be informed and the appropriate action taken.

Impacts on bird populations in the tract is expected to be temporary and minimal. If any roosting trees or active nests of rare, threatened or endangered species are encountered, a no-harvest zone (250 foot radius) will be established around each site. The endangered Hawaiian hoary bat may occur seasonally in the tract. Impacts to bat populations are expected to be temporary and minimal.

10. The proposed project does not detrimentally affect air or water quality or ambient noise levels.

There will be little or no significant impact on air quality in the tract. There will be little or no significant impact on water quality in the tract. To minimize nonpoint source pollution from sediments, the required practices include avoiding any disruption of natural drainage, preventing excessive soil displacement, providing drainage in case of slope instability, and providing culverts, dips, water bars, and cross drainage to minimize erosion. To minimize water quality degradation from nutrients and herbicides, if applied, practices include efficient and safe application of chemicals according to manufacturer's label. Chemicals will not be applied in rainy conditions to avoid or minimize chemical runoff. The proposed project is in a remote location. There should be no outside detection of noise during tree salvaging or scarification operations.

11. The proposed project does not affect nor is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The tract is not located in or near the above mentioned sensitive areas. The application of herbicide may be used to control invasive species if required. The manufacturer's label will be followed regarding use around bodies of water.

12. The proposed project does not affect scenic vistas or viewplanes identified in county or state plans or studies.

The project area is not identified as a scenic vista or viewplane. Visual impacts will be minimal due to the relatively remote location and small size of the proposed project area.

13. The proposed project does not require substantial energy consumption.

Petroleum fuels will be used in the tract. Fuel consumption will be minimal.

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Appendix A

Public Comments and DHHL Responses Regarding the Draft Environmental Assessment

LINDA LINGLE
GOVERNOR

DEPT. OF HAWAIIAN HOME LANDS
DEC 23 8 19 AM '03

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

DEC 19 2003

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
LINDEN H. JOESTING
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:
HWY-PS
2.2689

TO: MICAH A. KANE, DIRECTOR
DEPARTMENT OF HAWAII HOMELANDS

ATTN: MIKE MCELROY

FROM: for RODNEY K. HARAGA
DIRECTOR OF TRANSPORTATION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT, PIHA MAUKA FOREST MANAGEMENT PLAN, HUMUULA, HAWAII

The proposed activities, including limited logging, described in the Forest Management Plan will not impact our State highway facilities.

If you have any questions, please contact Ronald F. Tsuzuki, Head Planning Engineer, Highways Division, at 587-1830. Please reference file review number: 03-356 in all contacts and correspondence regarding these comments.

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

January 30, 2004

To: Ronald Suzuki, Head Planning Engineer
Department of Transportation

From: Linda Chinn, Acting Administrator
Department of Hawaiian Home Lands

Subject: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your letter, dated December 19, 2003, stating that the proposed logging activities will not impact our State highway facilities.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. If needed, corrections and clarifications have been made in the document. We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

From: "Roger Imoto" <rimoto@dofawha.org>
Date: Wed, 31 Dec 2003 09:32:35 -1000
To: "Michael Robinson" <merobi@hilo.net>
Cc: "Nelson Ayers" <nelson_l_ayers@exec.state.hi.us>
Subject: Piha Mauka Forest Management Plan

Mike,

These are the comments I have from the Hawaii Branch for DOFAW.

* DHHL is doing a great job on being proactive and not reactive in management of the lands
* The maps and photos could use improvement, but will do.
* Be aware that the Piha, Laupahoehoe and Humuula boundaries are not on the existing fence lines. These boundaries will need to be identified so activities do not occur within the forest reserves.
* Page 1, paragraph 3. This native bird corridor, as mentioned throughout the text, could provide a corridor for troublesome competitive species and maybe an avenue for pox infected birds as well. Such contingencies should be mentioned in the "Plan" along with whatever benefits to wildlife may be imagined from the corridor.
* Page 1, paragraph 6. Feral pigs and their control would be appropriately mentioned here. Include control measures, (hunting, trapping, snares, etc with humane considerations described and what will be done to keep pigs from reoccurring without diminishing hunting opportunities in adjacent public hunting areas).
* Page 16, paragraph 1. Banana poka treatments should be described in some detail. Birds are attracted to poka and would be susceptible to herbicides.
* Page 20, paragraph 6. Harvesting activity would be less of a problem for bats if done when there are no babies. Confirm this before harvesting.
* Page 27, section 4.6 Access Roads. Mana-Keanakolu Road is maintained by the County with taxes. Assurances must be made here that DHHL does in fact pay taxes in maintenance of this public road which will be heavily used.

The project looks good and is a great step in the direction of maintaining the koa forest for generations to enjoy.

Roger H. Imoto
Hawaii Branch Manager
Division of Forestry and Wildlife
19 E. Kawili Street
Hilo, Hawaii 96720
Ph.(808)974-4220 Fax(808)974-4226
rimoto@dofawha.org

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

January 30, 2004

To: Roger Imoto, Hawaii Branch Manager
Department of Land and Natural Resources

From: Linda Chinn, Acting Administrator
Department of Hawaiian Home Lands

Subject: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your e-mail, dated December 31, 2003, during the public comment phase of the subject project. We offer the following responses in the respective order of your comments.

1. Maps and photos. We intend to improve the maps and photos in the final Environmental Assessment (EA) as you suggest.

2. Forest Reserve and Wildlife Refuge Boundaries. All harvest activities are planned for mauka of the Keanakolu Road. If other activities, such as weed control or tree planting, occur close to the existing fence lines or makai of the road, we will consult with your Division and seek approval prior to implementation.

3. Bird Corridor Issues. The bird corridor, as discussed in the plan, is currently forested with sufficient koa to provide flyways for any birds, native or non-native to an elevation of about 7,000 feet. At that elevation, however, the koa forest gradates into a historic area of mamane forest, much of which has been cut for fence posts or has died out as a result of grazing pressure. It is the Department of Hawaiian Home Lands' (DHHL) plan to eventually restore and maintain this mamane forest as well, thereby completing an unbroken mauka/makai flight path for birds. Although it is beyond DHHL's control to determine what species of birds, if any, use this flyway, it is anticipated that native birds with traditional

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Date: Wed, 31 Dec 2003 09:32:35 -1000
To: "Michael Robinson" <merobi@hilo.net>
Cc: "Nelson Ayers" <nelson_l_ayers@exec.state.hi.us>
Subject: Piha Mauka Forest Management Plan

Mike,

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Roger H. Imoto
Hawaii Branch Manager
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mauka/makai migration patterns will benefit the most from this action.

4. Feral Pigs. Public hunting is currently not allowed on DHHL lands. Game management strategies consistent with DHHL policies will be used to control pigs.

5. Banana Poka. Currently there is only one known area of banana poka on the entire project site. This is a very small patch only several yards across in an area inaccessible to cattle, hence its presence. We anticipate a significant human presence in the next decade, from salvage logging and site monitoring, to locate and eradicate this and future locations of banana poka. We hope to control banana poka periodically before it becomes established, thereby minimizing adverse impacts on birds from control methods such as application of herbicide.

6. Hawaiian Hoary Bats. As stated in Section 4.2.2, page 20 of the DEA, "a bat survey will be conducted prior to harvesting activity to determine the time of least impact to bat habitat and activity". DHHL will use the Department of Land and Natural Resources bat survey protocol to conduct these surveys before, during and after the project has been implemented.

7. Keanakolu Access Road Maintenance. The primary access road to the project site is, as you have noted, a County Road. DHHL is but one user of this public road, as are other government agencies and the public in general. It is anticipated that road use by contractors on this project will approximate one flatbed load of timber products daily and occasional personal vehicle trips. It is assumed that owners of each vehicle, like all road users, will legally pay an assortment of taxes on licenses, gasoline, and registration. Part or all of these funds are then used to maintain public roadways, including Keanakolu Road.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. If needed, corrections and clarifications have been made in the document.

We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

January 7, 2004

Micah Kane
Department of Hawaiian Home Lands
PO Box 1879
Honolulu, Hawaii 96805

Attn: Linda Chinn

Dear Mr. Kane:

Subject: Draft environmental assessment (EA), **Piha Mauka Forest Management Plan**

We have the following comments to offer:

Two-sided pages: In order to reduce bulk and save on paper, please print on both sides of the pages in the final EA.

Funding: The total project cost is not given. Please disclose all state or county funds involved, including any federal funds flowing through the state or county.

Correspondence: In the final EA be sure to enclose copies of all correspondence made during the pre-consultation phase as well as the draft EA comment period.

Contacts: Will hunters be affected by this project? If so, consult with the local hunting association.

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

mauka/makai migration patterns will benefit the most from this action.

4. Feral Pigs. Public hunting is currently not allowed on DHHL lands. Game management strategies consistent with DHHL policies will be used to control pigs.

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We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

January 30, 2004

To: Genevieve Salmonson, Director
Office of Environmental Quality Control

From: Linda Chinn, Acting Administrator
Department of Hawaiian Home Lands

Subject: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your letter, dated January 7, 2004, during the public comment phase of the subject project. We offer the following responses in the respective order of your comments.

1. Two-sided pages. The final Environmental Assessment (EA) will be printed on two sides.

2. Funding. There are no new costs as part of the project. However, there may be repair and maintenance expenses on existing fencelines in the project area.

3. Correspondence. Copies of all correspondence will be put in the final EA.

4. Contacts. Public hunting is not allowed on Department lands. Therefore, hunters will not be affected by this project.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. If needed, corrections and clarifications have been made in the document. We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

United States Department of Agriculture
Forest Service
Institute of Pacific Islands Forestry
1151 Punchbowl St, Suite 323
Honolulu HI 96813
telephone: 808 522 8230 facsimile: 808 522 8236

7 January 2004

Ms. Linda Chinn, Administrator
Land Management Division
Department of Hawaiian Homelands
[via fax to 808 586 3923]

Dear Ms. Chinn:

REF: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humu`ula, Hawaii

Thank you for the opportunity to comment on the draft environmental assessment referenced above. Three of our forestry professionals have read the assessment. We emphasize that we strongly endorse the reversion of once-forested rangelands to productive, sustainable native forest. This seems to be the main thrust of the processes outlined in your draft EA. The main difficulty identified independently by all three of the professional foresters on our staff who reviewed the draft EA is its ambiguity. It is not specific concerning actions or monitoring results that will trigger responses. The draft EA is packed with qualifying words – might, could, may – that provide no guarantee that necessary actions will occur. Thus, the draft EA is replete with words indicating good intentions, while having so many escape clauses that it could easily lead to non-sustainable harvest rates.

The remarks below are a summary of our reviews.

Of the 1,455 acres included in this project, one 525 acre tract will be set aside as a corridor for birds linking lower elevation koa-ohia forest to the upper elevation koa and mamane forests near Hakalau NWR. In addition, two non-adjacent tracts totaling 600 acres will be harvested for overmature koa. The fate of a fourth tract of 330 acres is somewhat ambiguous. (In the proposal summary it is described as open pasture and thus not included in the acreage to be harvested. However, in the proposal itself it is described as representative of the koa forest, in general, and subject to the same "salvage" cutting as the other 600 acres.) The proposal describes the general salvage approach (*e.g.*, leaving the most vigorous trees, harvesting only a proportion of koa trees >16 inches dbh) and regeneration strategy (*e.g.*, soil scarification through salvage harvesting, herbicide and supplemental planting if necessary, fencing and ungulate control). In addition, the proposal considers alternative management approaches (*e.g.*, no action; remove cattle but no koa salvage; remove cattle and harvest all koa) and compares the expected outcomes with the proposed salvage operations.

The proposed forest management plan touches on many issues of relevance to conservation-minded forest management in Hawaii (and elsewhere). These include habitat conservation and amelioration for native bird species, low-impact logging, green-tree retention, and regeneration of native tree species. However, the forest management plan, as proposed, has problems that require rectification if it is to be successful.

- **Harvest rate is exceedingly aggressive.** The plan proposes to harvest 6-15 trees per acre from 930 acres over a three-year period, which amounts to an extraction rate of 5-13 large koa trees per day, every day, for three years. There are several potential issues that arise from such a harvest rate. First, removing koa from 100% of the harvestable acres in three years and waiting another 40-60 years for the subsequent regeneration to reach merchantable size is not "sustainable" forest management in any sense of the word nor will it provide a "long-term revenue stream" to DHHL. It will provide a short-term influx of revenues followed by a long period of low or no returns. Typically, if a landowner has 900 acres and the rotation length for the average stand is 50 years, a sustainable level of harvesting would be approximately 18 acres per year. The proposed extraction rate is 1500% higher than the sustainable rate. While many trees in the forest may be senescent, there is no evidence presented for impending catastrophic mortality that might warrant such an aggressive harvest. Second, it is unlikely that the local logging community has sufficient spare capacity to harvest so much koa in such a short period. Consequently, either local contractors will have to make significant capital investments in logging machinery (which means most of the timber revenues will go to banks that provide short-term loans for such equipment and the loggers' bottom line will be driven by a payment schedule, providing little incentive for quality work) or off-island contractors will be required. Third, the amount of koa wood generated by such an intense harvest (5,500-14,000 koa trees in three years) would far exceed the utilization capacity of local artisans and woodworkers. As such, either the local woodworking community would have to make large capital expenditures to stockpile the excess wood for future use (which again leads to many of the revenues going to the banks and not the local community) or, more likely, the koa would be put in containers and shipped to the mainland, meaning that much of the local economic value derived from value-added processing within the state would be lost. Furthermore, such a large volume of trees flooding the market would have the potential to substantially lower the commodity price, further undermining the sustainability of the local logging and woodworking communities. Fourth, koa is a high-quality hardwood—indeed, it is one of the most valuable hardwoods in the world. Each piece of wood has a distinctive figure, grain, and color. Much of the value of koa comes from careful examination of the wood during the milling process. At the proposed harvest rate, it is extremely unlikely that the logging contractors will have the time or inclination for such detailed evaluations. This will lead to lower sale prices for the milled wood and represent a potentially significant financial loss to DHHL.

- **Management plan fails to describe or anticipate forest management operations beyond the details of the koa harvest.** Future management operations are either extremely vague or completely ignored. In the few cases in which post-harvest operations are considered, the descriptions are so vague that they provide no indication of what, when, how, (or even if) operations will occur. For example, supplemental planting to augment areas of poor regeneration is listed as a potential post-harvest management operation (see *pp.*12-13): "Natural regeneration will be monitored. If forest regeneration is inadequate following overstory removal, planting from local seed sources at appropriate stocking levels *may* [our italics] occur to assist forest recovery efforts". There is (1) no description of or basis for a regeneration monitoring protocol, (2) no definition of adequate levels of regeneration, (3) no attempt to define appropriate stocking levels, and (4) no guarantee that planting would occur even if the regeneration was assessed to be insufficient. More seriously, however, there is no attempt to define future stand conditions

and, consequently, no consideration of the potential silvicultural operations, such as thinning, that may be required to meet the desired conditions. Without careful examination of these issues it is not possible to make a defensible assessment of the impacts to the environment at Humu'ula of koa forest management, let alone the costs in time, labor, and money that they will potentially incur.

- **No financial mechanism is described to guarantee that proceeds from the koa salvaging would be reinvested in forest management activities.** The underlying premise of the proposal is that revenues derived from salvaging dead and dying koa will be used to restore native forest through forest management activities. There is no discussion, however, of where or how much of the timber receipts will be set aside for future management operations. For example, will revenues generated from koa salvage in 2005 be available for fence maintenance, thinning, and ungulate control in 2045? Without such a mechanism explicitly defined and created, there is a very real possibility that harvest revenues could disappear into a general departmental fund and be unavailable for future management needs at Humu'ula.

In addition, the comparison of the proposed management with alternative management approaches is not critical, consistent, or complete in its evaluation of the potential impacts of koa harvesting and future management at Humu'ula. In considering alternative scenarios much of the assessment amounts to speculative narrative—some of which may be correct, but none of which is substantiated.

The draft EA indicates that DHHL is committed to fund and carry out the following:

1. Contract for one bat survey before salvage logging commences
2. Contract with a logger to harvest koa from units 1-3 between 2004-2008
3. Review and approve the salvage logging "Project Plan" prepared by the logging contractor
4. Determine the abundance and distribution of koa and mamane regeneration in units 1-3 three years after scarification and in the Kanakaleonui bird corridor as a means of assessing adequacy of regeneration (unclear if the work will be done in-house or by contract)
5. Maintain existing fences to minimize re-introduction of cattle and feral sheep (unclear if the work will be done in-house or by contract)
6. Monitor invasions of undesirable plant species (unclear if the work will be done in-house or by contract)

Activities listed as possible management options, but subject to procuring outside funds (alternative sources of outside funds are not listed) include the following:

1. Scarifying selected areas of the Kanakaleonui bird corridor to reduce competing grass cover and stimulate koa regeneration
2. Growing and planting koa and mamane seedlings wherever regeneration fails to reach acceptable levels, which are not defined
3. Purchasing and applying fertilizer to planted koa and mamane seedlings
4. Removing cattle and feral sheep that get into the management areas
5. Reducing fire hazards

6. Control of competing vegetation
7. Control of invasive plant species

If sustainable forest management is to be achieved, DHHL will have to commit to the items on both lists, not only the first of the two lists. For example, without implementation of item no. 4 on the second list (ungulate removal), there is an extremely high likelihood of project failure.

I emphasize again our support for a sustainable forestry initiative at Humu'ula. The draft EA is a step in the right direction, and we hope that it will be modified and improved in ways that ensure its successful implementation.

Sincerely yours,

J. Boone Kauffman
Institute Director

P.S. also consider road & sediment impacts to aquatic environments.

Caring for the Land and Serving People

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

January 30, 2004

Mr. J. Boone Kauffman
Institute of Pacific Islands Forestry
U.S. Department of Agriculture
1151 Punchbowl Street, Room 323
Honolulu, Hawaii 96813

Dear Mr. Kauffman:

Subject: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your letter, dated January 7, 2004, during the public comment phase of the subject project. We offer the following responses in the respective order of your comments.

Total and Harvested Acreage's. The summary discussion of the project area, in which the size of the area and its individual units is discussed, has created confusion for you and your staff. We will re-write this section in the final environmental assessment (EA) to be more clear. As you have stated correctly, the project area totals 1,455 acres in size. Within this total area are three proposed "units" and one native bird corridor. The correct size of each unit and the bird corridor is shown on page 3, figure 1 of the Draft Environmental Assessment (DEA). Each unit contains both koa forest and unforested grass areas with no little or no tree cover. Units were created as potentially independent, viable salvage sales, each having sufficient volume and road access to support a commercial operation. This was done to address your second issue of aggressive harvest rates, but we will defer that discussion to later in this response. Unit boundaries were based to some extent on road locations, and not purely on vegetation cover. Figures 2, 3 ,and 4 in the DEA are aerial photos of units 1, 2, and 3. They may help you see the extent of forest cover in each unit.

In the summary discussion on page 1, we propose to "salvage koa on about 600 acres". That is accurate, however, the koa acreage is spread among all three units. We also refer to a "remaining 300+ acres" of open pasture. That also is accurate and it too is spread among all three units. The fact that two of the proposed units add up to almost 600 acres may have misled your staff into thinking that two units are forested and one is not. Again, all units contain both forest and grassland.

Aggressive Harvest Rates. We use the term "sustainable" not in the sense of sustainable yield, as calculated by your staff to be 18 acres per year for 50 years, but more in the sense of sustainable goals which require a perpetual forest cover. These goals include not only periodic timber harvests, but other goals such as the availability of forest based wildlife habitat and cultural resources. Given the condition of the existing forest, however, it is critical that appropriate management activities are conducted as soon as possible if perpetuation of this forest is to be realized.

Figure 5 on page 7 graphically depicts the deteriorating forest found within the project area. Other areas are much worse, with total mortality of all standing trees occurring. A forest inventory of the area, conducted by the Department of Land and Natural Resources' Division of Forestry and Wildlife crews in 1998, stated that "50% of the trees had sparse or poor crowns", that "many of the koa trees are living culls", and that "high annual mortality rates among remaining koa trees should be expected". The Department of Hawaiian Home Lands (DHHL) has recent experience which validates these comments. We have been administering a salvage sale operation in this area for the past 12 months which is similar to that being proposed under this EA. The defect rate in all scaled logs for the past year averaged 42%. Each month one or more trees fall down or large, rotting branches break off, most often away from ongoing salvage operations and therefore unrelated to management activities. Safety conscious loggers harvest only when there is little or no wind on site. Given the similar condition of existing trees in the proposed project area and the visible evidence on the ground of what this forest once was, DHHL is very concerned that any delay in rejuvenating this forest will convert more of this land to grassland, thereby significantly raising the cost of

reforestation and perhaps even making it impracticable at higher elevations.

The adverse economic impacts you depict from excessive koa harvesting are duly noted and as stated before, were a guiding force in creating three separate units for this project. Given our current koa salvage experience, it is DHHL's intent to manage each unit consecutively, not concurrently. Separate units allows for separate contracts and would avoid DHHL's concern that an aggressive contractor could acquire rights to the entire project area and commit enough resources to harvest the entire area in a very short period of time. Instead, we hope to spread the harvesting of 600 acres over a period of 4 years, from 2004 to 2008, with three separate contracts. This is the equivalent of 150 acres per year. Our current sale will harvest 130 acres in about one year. To date we are unaware that our current sale has created the conditions you depict, i.e. excessive capacity, flooded markets, reduced prices, or mainland containers full of koa. Given that the proposed project will harvest less trees per acre than the current sale and tends to have smaller trees with lesser volumes, we expect that salvaging 150 acres per year will not adversely impact Hawaii's forest industry. Finally, DHHL is selling its wood as log scale, not as mill run like much of the private sector in Hawaii. Because the purchaser has already paid for each log before it is milled, it is in his best interest to salvage as much wood as possible from each log. The current contractor validates this theory by selling not only lumber, but bowl stock, and even sawdust to local markets. As these markets become more fully developed, DHHL expects to see a corresponding increase in purchase bids for our koa.

Forest Management Descriptions. Future management operations as described in the DEA are intended to allow flexibility as the new forest evolves. DHHL believes there is enough research and experience on managing koa forests in Hawaii to proceed with this project as planned. We know, for example, that salvaging koa scarifies the soil and regenerates koa seedlings at high densities. If weeds and ungulates are controlled, those seedlings can become saplings. These actions are described on pages 12 and 13, Sections 2.1.4 and 2.1.5 of the DEA.

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Forest Management Descriptions. Future management operations as described in the DEA are intended to allow flexibility as the new forest evolves. DHHL believes there is enough research and experience on managing koa forests in Hawaii to proceed with this project as planned. We know, for example, that salvaging koa scarifies the soil and regenerates koa seedlings at high densities. If weeds and ungulates are controlled, those seedlings can become saplings. These actions are described on pages 12 and 13, Sections 2.1.4 and 2.1.5 of the DEA.

At the same time, however, it is difficult to project how many trees per acre will be present on this particular site in the next decade and whether they will need thinning or not. For years, professional foresters in Hawaii debated the issue of thinning koa stands and only recently have begun advocating such a practice under certain situations. DHHL would prefer to delay future stand management commitments such as thinning to when an actual forest has been re-established in the project area. At that point "careful examination of these issues" can be conducted and appropriate actions taken.

We agree, however, that a target stocking level of koa seedlings should be included in the final EA. "Adequate regeneration" will be defined as a stocking level of not less than 300 seedlings per acre, combined with openings not greater than 1/10 acre in salvaged areas, within three years following harvest. Logged or scarified areas not meeting these standards would then be planted with koa seedlings. Stand structure following harvest will include a diversity of age, size, and vigor. Table 4 on page 12 of the DEA describes the number and condition of overstory trees in managed areas that will be retained. Although speculative at this point, a discussion of how the forest is expected to evolve may prove helpful. Existing trees left on site will be augmented by high densities of new seedlings and saplings where scarification has been successful, and by a continuing presence of non-native grasses. For about 10 years following salvage, more native plants are expected to appear on the site, especially ferns and shrubs such as ohelo (*Vaccinium sp.*) and pukiawe (*Styphelia sp.*). At around 10 to 15 years a host of koa seedlings and root sprouts are expected to proliferate the areas between existing koa trees and fully occupy the site, thus hastening the full recovery of a native koa forest. This scenario represents actual events that have been occurring at one of the few other existing high elevation koa sites - Magnetic Hill. We have every reason to believe that given enough time, this process will reoccur throughout this project site as well. Long term goals for stand structure would emulate what nature has shown possible on this site, i.e. 14 to 30 mature trees of merchantable size per acre, hopefully within 45 years.

Financial Mechanisms. DHHL Land Management Division staff have committed to managing this land as koa forest via this

proposed project. Prior to any action, approval of this project will be required of the Hawaiian Homes Commission, the duly authorized decision making body of DHHL. If this project is approved as proposed, it is a very strong commitment by DHHL to maintain this area as a koa forest. Revenues from this sale will not necessarily be committed to future management on this site as such a mechanism does not currently exist within DHHL. Until it does, management funding will continue to be appropriated from DHHL's general budget like any other DHHL project.

Road and Sediment Impacts. Pages 17 and 18 discuss the potential impacts and mitigation measures for soils and water resources.

Final Comments. We concur that the activities presented on your first list are all necessary if this project is to succeed. We would like to add that DHHL is committed to items 4 (removing cattle and feral sheep) and 7 (controlling invasive species) on your second list as well. The remaining items on the second list are desirable management activities which we hope to implement. If DHHL cannot commit these dollars, then we will pursue outside funding in the form of grants. Sources could include the US Fish and Wildlife Service, University grants, community grants, and perhaps your organization as well. We appreciate your "support for a sustainable forestry initiative at Humuula" and we encourage the discussion of any partnership you may propose to help us do the best job possible.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. If needed, corrections and clarifications have been made in the document. We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

Aloha and mahalo,

Linda Chinn, Acting Administrator
Land Management Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Hakalau Forest National Wildlife Refuge
32 Kinoole Street, Suite 101
Hilo, Hawaii 96720

January 8, 2004

Mike McElroy, Administrator
Land Management Division
State of Hawaii, Department of Hawaiian Homelands
P.O. Box 1879
Honolulu. HI 96805

Re: Piha Mauka Forest Management Plan and Environmental Assessment, Humu`ula, Island of Hawai`i

Dear Mr. McElroy:

The Hakalau Forest National Wildlife Refuge staff, U.S. Fish and Wildlife Service has reviewed the above-referenced draft Environmental Assessment (DEA) prepared by the Department of Hawaiian Home Lands, Land Management Division (DHHL). My letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 [16 U.S.C. 1531 et seq.; 87 Stat. 884], and other authorities mandating Service concern for environmental values. We offer the following comments for your consideration.

SPECIFIC COMMENTS

1. Introduction and Summary, 1.1 Forest-Based Sustainable Development Goals. The Refuge disagrees with the statement that the forest in the action area "would continue its current decline" if it was fenced and cattle removed, with no other management. The forest would likely recover if the area were fenced and the cattle removed, although weed management and soil scarification may be needed to assist in forest recovery.

a) The DEA does not adequately describe the condition and extent of exisiting fences in the project area. The quality of these fences will directly affect reestablishment of koa forest following cattle (and presumably sheep) removal. An estimate on the relative abundance of cattle and other feral ungulates within the project area should be described. Please provide more detailed information on DHHL's long-term plan for controlling cattle, sheep, and other ungulates within the project area.

b) The Refuge believes that removing mature trees from the overstory will likely affect seedling survivorship by creating microclimate changes in the understory. Work conducted at Hakalau Forest NWR has shown that seedlings planted in areas with an overstory have better survivorship and are

less prone to frost, drought, and wind damage than those growing in exposed environments. Retaining old growth trees will also promote a more complex forest structure that likely will benefit a greater diversity of wildlife resources in the near term resulting in higher quality forest habitat for native species in the future.

1.2 Project Site and Surrounding Area. Maps are incorrectly labled and location names are misleading to the reader. We recommend Units be renamed to more accurately represent the ahupuaa they lie "mauka" of (e.g. Unit 1, rename to Laupahoehoe Mauka Tract, Unit 2, rename to Maulua Mauka Tract, Unit 3, rename to Piha Mauka Tract). The Hakalau Forest NWR boundary should be labeled. Maps of existing fences around all units should also be provided.

a) A more detailed map of the Kanakaleonui Bird Corridor should be included. Will Nauhi gulch be protected? It does not appear that the corridor directly abuts the State Piha State GMA leaving an uprotected break in the corridor of approximately 100-250 meters and contiguous forest makai. We suggest extending the protected bird corridor makai of Keanakolu road.

2.1.1 Remove Cattle. Please elaborate on the condition of existing fences. Can existing fences also be used for excluding sheep? The refuge recommends that all feral ungulates be removed from the bird corridor. In order for koa to reestablish in the koa salvage units it is also necessary that cattle and sheep (pigs if possible) be actively excluded/eliminated from the area.

2.1.2. Kanakaleonui Bird Corridor. It is not clear whether koa thinning is planned for the bird corridor now or in the future? We believe no thinning should ever occur within the corridor and recommend that be stated in the DEA.

2.1.3. Reserve Trees in the Piha Mauka Tract. Leaving more Vigor Class 2 koa trees will result in greater density of seed producing koa trees per acre and maintain a more shaded micro-climate at higher elevations reducing frost, drought, and wind caused mortality to koa seedlings.

2.1.5 Long Term Forest Management.
a) How will forest management be funded for the Kanakaleonui bird corridor? Will it be scarified or left to naturally regenerate? The DEA should detail the types of management to be employed and methods for monitoring results of management.

b).In the future does DHHL intend to harvest "leave" trees within the management area, including Kanakaleonui corridor? If so, please describe the method of harvest anticipated and the proposed schedule for harvest rotation.

c) Is the complete removal of cattle from the proposed units anticipated? If so, that should be clearly stated. We recommend an ungulate proof fence around the perimeter of the bird corridor. Cattle and sheep should also be excluded from salvage units to protect koa saplings from browsing.

d) What has DHHL's recent experience been regarding koa regeneration in koa-salvage operations at lower elevations in Humuula? Has recruitment been hindered by grasses, cattle, or other factors? What is anticipated in the higher elevation units based on this information?

2.2 Rationale for Proposed Action. 2.2.1 Kanakaleonui Bird Corridor. Specific management actions should be defined. A management plan for the bird corridor needs to be developed in detail.

4. Description of the Existing Environment, Potential Impacts and Mitigation Measures. A more detailed fire management plan is needed.

4.2 Biological Resources

4.2.1 Flora, Existing Conditions. "No threatened or endangered plants were observed during field visits to the site". The Refuge recommends a survey by qualified botanists be conducted prior to any salvage operations.

4.2.2 Fauna, Existing conditions

a) The Refuge recommends surveying for Hawaiian hoary bats and Hawaiian hawks prior to conducting salvage operations. Potential impacts to bats and mitigation for these impacts should be addressed in the DEA. A "No Harvest" period between the 4,000 - 7,500 ft. elevation during winter months would be effective mitigation for possible impacts to bats. A minimum of 2-3 bat surveys, conducted at dusk, should be be done over a period of several weeks prior to harvest in order to effectively detect roosting locations.

b) To avoid harming or harassing `Io, we recommend that surveys be conducted for `Io nests prior to salvage operations. If a nest is found, operations should be halted until the end of `Io breeding season (between February and October). The nest tree, of course, should not be harvested because `Io pairs use the same nest for several years.

Thank you for providing us with the opportunity to comment on the proposed project. If you have any questions or comments, please contact me by telephone at (808) 933-6915 or by facsimile transmission at (808) 933-6917.

Sincerely,

Richard C Wass

Richard C. Wass, Refuge Manager

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

January 30, 2004

Mr. Richard C. Wass, Refuge Manager
Hakalau Forest National Wildlife Refuge
USDI Fish and Wildlife Service
32 Kinoole Street, Suite 101
Hilo, Hawaii 96720

Dear Mr. Wass:

Subject: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your letter, dated January 8, 2004, during the public comment phase of the subject project. We offer the following responses in the respective order of your comments.

1.1 Forest Based Sustainable Development Goals. Our references to a declining forest are most specific to the existing mature trees found in the area. We agree that over a long period of time, a new native forest may establish itself, but only if weeds are controlled. Scarification will hasten the recovery of koa on site. Under the "Alternative to the Proposed Action, Remove Cattle, section 3.2, the Draft Environmental Statement (DEA) states that the "existing mature forest would continue its decline, but at a reduced rate". Given that this discussion is part of an alternative which does not allow for any other management such as weed control and/or scarification, we believe the "declining forest" assumption is reasonable.

a. Condition and extent of fences in the project area. Several fences are in place as the project area has been intensively managed for cattle until recently. Most of the fencelines are in good repair, some portions will need to be repaired. Hundreds of cattle have been removed from the proposed project site and its surrounding area in the past 12 months. An estimated 30 head of cattle remain in the vicinity of Unit 1, and another 50 head remain in the vicinity of units 2, 3, and

the Kanakaleonui Bird Corridor (KBC). An existing fence separates these remaining populations of cattle. It is the Department of Hawaiian Home Lands' (DHHL) intent to remove any existing cattle. Known sheep populations in the area are small and transient at this time. Monitoring of sheep will continue and if they are found to have a significant impact on forest restoration activities, removal will occur as necessary. Existing pig populations at this time are also relatively small, but are expected to increase if no hunting pressure is applied. Animal control measures consistent with DHHL policies will be used to control excessive animal populations.

b. Removal of mature trees. We agree that a complex overstory component helps increase seedling survivorship and provides higher quality wildlife habitat. It is for this reason that DHHL is not clearcutting the area and is leaving at least one third of all mature trees on site for seed production and wildlife habitat. Leave trees will be a mix of live, dead, and dying trees, as well as a variety of stem diameters to create the desired complexity of age, height, and vigor diversity.

1.2 Project Site and Surrounding Area (maps). We appreciate your suggestions regarding map nomenclature, however, DHHL has chosen to track its forest management activities by project area. The name Piha Mauka was chosen to represent this project because over 70% of the area is located mauka of the Piha ahupuaa.

a. KBC detailed map. Maps will be improved to show existing fence lines and the KBC area's proximity to Nauhi Gulch. This gulch is included in the bird corridor and will be protected as such. Page 2 of the DEA, section 1.2, describes the management area as bounded by the "Hilo Forest Reserve on the makai side". The Department of Land and Natural Resource's (DLNR) Piha Game Management Area is a part of this forest. The KBC is intended to be adjacent to this area managed by DLNR, Division of Forestry and Wildlife. Revised maps will show this more clearly.

2.1.1 Remove Cattle. As stated above in the discussion of 1.1a, DHHL intends to remove all cattle from the area and maintain fences to keep cattle out. Existing fences cannot control sheep. Therefore, game management strategies consistent with DHHL policies will be used to control sheep and pigs.

2.1.2 Kanakaleonui Bird Corridor (KBC). Koa salvage will not occur in the KBC. Page 9, section 2.1.2 of the DEA states that "existing koa and mamane" will be protected.

2.1.3 Reserve Trees in the Piha Mauka Tract. It is expected that the number of leave trees in vigor classes 1 and 2 will ensure a viable on-site seed source and provide an adequate micro-climate for seedling survival. This number has been balanced with the need to scarify the site via salvage operations while leaving sufficient room between leave trees so as to not damage their root systems. Spacing between leave trees as planned will be approximately 60 to 70 feet, depending on leave tree crown diameter. Additional reductions in forest gaps will occur from existing mamane, ohia, and other native trees that will be protected during salvage and scarification operations.

2.1.5 Long Term Forest Management. DHHL currently has limited funds budgeted to manage the KBC. These funds will be primarily used to control weeds such as banana poka, which have been found in the near vicinity of KBC and to maintain fences and keep ungulates under control. Initially the KBC will be left to regenerate naturally. Periodic walk-throughs will be scheduled to monitor progress. In the event that regeneration is insufficient or untimely, additional funding will be sought for more aggressive management such as scarification or planting to assist in the restoration process.

b. "Leave" tree harvest. In a foreseeable future of at least 10 years or when a new forest becomes established, DHHL does not intend to harvest leave trees in any portion of the management area, including the KBC. DHHL has a primary mission, however, of homesteading its lands. If at some future date, these lands are homesteaded, the current policy for leave trees may be changed by future decision-makers.

c. Complete removal of cattle. Yes, complete cattle removal is anticipated.

d. DHHL's recent experiences. DHHL's existing koa salvage at Waipunalei Mauka has given us valuable insight as to what can be expected from this proposed project. Seedling regeneration on scarified sites has occurred as predicted. Grass and cattle do

hinder seedling development and koa regeneration occurs much faster if grass and cattle are excluded. At the higher elevation project area, a significant reduction in cattle over the past six months has already yielded koa root suckers and occasional seedlings on ridge tops where grass is less prevalent. These young seedlings appear to be surviving this winter's conditions, as are the lower elevation seedlings at Waipunalei Mauka. It is anticipated that salvage operations, which scarify the project area, combined with a less aggressive harvest and therefore higher retention of overstory trees at this elevation, will produce sufficient koa seedlings to regenerate the site.

2.2 Rationale for Proposed Action, 2.2.1 KBC. Specific management actions for the KBC are included in this plan and environmental assessment. Stated actions include the removal of cattle from the KBC, protecting existing overstory trees in the KBC by not including them in planned salvage operations, monitoring the natural recovery of the forest, and augmenting the recovering forest as necessary via scarification and outplantings. Augmentation will be deemed necessary if during the three years following project implementation natural regeneration is considered insufficient. Sufficient regeneration will be a koa seedling density of not less than 300 trees per acre and openings not greater than 1/10 acre in salvaged areas. If augmentation is determined to be necessary, then funding for additional management activities in the KBC will be sought.

4. Description of Existing Environment (Fire Plan). All salvage sale contractors are required to submit a DHHL approved fire plan prior to any forest activity. Elements of the plan include a contractual obligation to "prevent, control, and extinguish fires on the premises and immediate vicinity". Weekly inspections of salvage sale areas include the monitoring of contractor readiness to fulfill their fire plan responsibilities. All other DHHL lands are protected by the County of Hawaii Fire Department.

4.2.1 Flora, Existing Conditions, Observation of Threatened or Endangered Species. Cattle have intensively grazed the project area for at least 25 years, with a history of cattle in the area for over 170 years. As a result, any remaining koa overstory areas where ground disturbance will occur have a dense understory of non-native grasses. The entire area has been

traversed on foot several times by DHHL staff, and will be traversed several more times if the project is approved as planned. As stated in the DEA, no Threatened or Endangered (T&E) plant species have been observed during this time. There may be a potential for T&E plants to be found in the few gulches which bisect the project area and which are inaccessible to feral ungulates. As a "Best Management" requirement of all DHHL salvage sales, no activity is planned within these gulch areas. Therefore, if any T&E species do exist in these gulches, they will not be effected. As part of its ongoing monitoring, DHHL will continue to observe the evolution of this forest and its potential components such as T&E species with trained professionals, including qualified botanists.

4.2.2 Fauna, Existing conditions, a. bat surveys. Page 20 of the DEA states that "a bat survey will be conducted prior to harvesting activity". The bat survey done for the Waipunalei Mauka salvage sale utilized the DLNR protocol. It was conducted at dusk, over a period of several weeks, in a variety of habitat types to ascertain the presence of bats. The same type of survey is planned for the Piha Mauka Salvage Sale.

b. 'Io harming and harassing. Surveys of 'Io and other native bird nests are an on-going effort in the project area and will continue after koa salvage efforts are complete. In the event that a nest is discovered, a protection zone of 250 feet radius around and including the nest tree will be established, per page 20 of the DEA.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. If needed, corrections and clarifications have been made in the document. We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

Aloha and mahalo,

Linda Chinn, Acting Administrator
Land Management Division

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hawaii.forest@verizon.net

8 January 2004

Mr. Mike McElroy, Administrator
Land Management Division
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96804

Re: Draft Piha Mauka Forest Management Plan and Environmental Assessment

Dear Mr. McElroy,

The Hawai'i Forest Industry Association (HFIA) appreciates receiving a copy of the draft EA for Piha Mauka. We commend DHHL for its integrated approach to improving forest health through careful harvesting, reforestation, and proper management.

The Environmental Assessment recognizes the value of active management to restore koa forests and ecosystems, and addresses many linked goals of job creation, avian habitat enhancement, and hardwood marketing. HFIA concurs with the anticipated determination of no significant impact, as we expect that the environment in the affected acreage will improve as a result of this project.

HFIA acknowledges the worthy project goals addressed by such activities as establishing a makai-mauka flyway for native birds. Our comments, however, will focus on the timber production and forest management aspects of the EA.

We completely agree that reforesting the area, currently in decadent forest and pasture, will improve soil health, enhance watershed values, provide better habitat for native flora and fauna, and in general result in environmental benefits. We also agree that the "no action alternative" and "remove cattle" alternative described on pages 14 through 16 would result in fewer environmental and economic benefits.

The selective harvest described, which leaves all of the healthiest trees standing, will certainly impact the economic benefits of the project. No projections of the volume of merchantable wood are provided, although approximate numbers of reserve trees in the various vigor classes are presented. It appears that only damaged, decadent and dead koa will be harvested. This contradicts the stated goal of developing a revenue stream, as there will be significantly less merchantable wood in unhealthy trees. We question whether the income from these poor quality trees will, indeed, be sufficient to finance the project site maintenance and startup costs, as specified on page 13. It certainly will not meet the stated project goal of providing high quality hardwood to the marketplace (pages 1 and 10) in the near future. We are hopeful, however, that the

long-term management of the forest, as described in this EA, will indeed provide high quality koa to future generations.

The selection of trees for harvest based on the presumed nesting of birds in snags is questionable, given the information provided in the EA. Not only does the EA state on page 20 that no nests were found in the project area, despite the apparent abundance of dead trees and snags, but on the same page the statement is made that the ideal habitat for the Hawaii creeper and the akepa is a closed canopy, diverse forest, implying that decadent forest and pasture land with many snags is not appealing to these species. Also on page 20 is the statement that 'akiapola'au rely on 'ohi'a trees for nesting. No species requiring snags for nesting cavities are mentioned.

The measures described for post-harvest forest management, including the exclusion of ungulates and the control of invasive weeds, are in accordance with responsible forestry and established, effective practice.

Mahalo again for the opportunity to review this draft Environmental Assessment.

Aloha,

Andrea T. Gill
Executive Director

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

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EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

January 30, 2004

Ms. Andrea Gill
Hawaii Forest Industry Association
P.O. Box 10216
Hilo, Hawaii 96721

Dear Ms. Gill:

Subject: Draft Environmental Assessment (DEA) for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your letter, dated January 8, 2004, during the public comment phase of the subject project. We offer the following responses in the respective order of your comments.

1. Economic Impacts of Selective Harvest. Section 1.1, page 1 of the DEA lists four goals of DHHL as it actively manages "its koa forests". Three of these goals are economical in nature - creating jobs, supplying markets with wood, and providing long term revenue to DHHL. Balancing these goals with the first goal listed - restoring "koa forests and ecosystems" - necessitates less than optimal economical benefits. In an effort to regenerate a healthier, more productive forest for the future, DHHL has forgone some economic benefits in this rotation, but not all. Your concern that no "healthy" trees will be harvested is noted. Less than 5% of all merchantable koa trees found on the site are classified as "healthy", however. Any additional volume, therefore, that healthy trees on this site may yield is relatively insignificant. The value of healthy trees on this project is much higher as sources of seed and longer term overstory components. It is for these reasons that DHHL will not harvest healthy trees, and will only harvest a portion of the dead and dying trees on site.

2. Merchantable wood volume projects. Tree volumes for the project area are not included in the DEA because DHHL considers this information to be proprietary. Potential

contractors are expected to do their own volume estimations prior to bidding on the site. Although it is difficult to predict a tree's true volume until it has actually been cut down and the log scaled, recent experience by DHHL and others in this area demonstrate that such a salvage sale can be profitable. Section 2.2.2 on page 13 states that the salvaging of koa in this area "will provide income to help finance the project site maintenance and start up costs. "Help" is the key word in this passage. DHHL anticipates that each successive rotation of koa off of this managed site will yield more volume, more profits, and ultimately achieve DHHL's stated goals of "a long term revenue stream".

3. Bird Nesting in Snags. There are no known bird nests in the area because the habitat is currently severely degraded. We believe you are correct in stating that "decadent forest and pasture land with many snags is not" ideal for most native birds. Table 3 in Section 2.1.3, on page 11 of the DEA, shows the approximate ratio of live trees to snags in a natural unmanaged koa forest (2:1). This project over time will attempt to emulate that ratio by removing enough snags and dying trees to make room for twice as many live trees at some point in the future. Over time, DHHL expects an increase in on-site bird nesting as the forest recovers and begins to approximate a diverse, healthier native ecosystem.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

Aloha and mahalo,

Linda Chinn, Acting Administrator
Land Management Division

Harry Kim
Mayor

Christopher J. Yuen
Director

Roy R. Takemoto
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
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January 12, 2004

Mr. Mike McElroy, Administrator
Land Management Division
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu HI 96805

Dear Mr. McElroy:

Draft Environmental Assessment
Subject: Piha Mauka Forest Management Plan
TMK: 3-8-1:Portion of 9, Humuula, North Hilo, Hawaii

This is in response to your letter dated November 24, 2003 requesting our comments on the Draft Environmental Assessment for the Piha Mauka Forest Management Plan.

The Pihi Mauka Forest Management Plan proposes a 525 acre area in Kanakaleonui as a mauka to makai bird corridor connecting Hakalau National Wildlife Refuge on the southeast and makai side to the Mauna Kea Forest Reserve on the mauka side. It also proposes a koa salvage/reforestation project on approximately 600 acres of nearby former pasture lands. Total project acreage is about 1,455 acres.

The subject 5,290 acre parcel is zoned Agricultural (A-40a) by the County and designated Agricultural by the State Land Use Commission. According to the General Plan Land Use Pattern Allocation Guide Map, the majority of the parcel is designated Extensive Agriculture. The remaining section along the length of the western property line is designated Conservation. However, only a portion of the bird corridor is located within this Conservation area.

According to the Hawaii County Zoning Code, Chapter 25, Section 25-5-72(a)(12), forestry is a permitted use in the Agricultural district. Further according to Section 25-5-72(a)(2), agricultural products processing, major is allowed. Agricultural products processing, major is defined as "activities involving a variety of operations on crops or livestock which may generate dust, noise, odors, pollutants or visual impacts that could adversely affect adjacent properties. These uses include, but are not limited to, slaughterhouse, mills, refineries, canneries and milk processing plants."

The proposed fencing, exclusion of cattle, and scarification can definitely produce a vigorous growth of koa trees. In the long run, the restoration of the koa forest will have considerable ecological benefits, and will also produce greater economic benefit than continued grazing. It is essential that the fencing and removal of cattle be implemented, not just the salvage harvesting.

Umikoa Ranch has been conducting a similar restoration project nearby, but at a slightly lower elevation, using DLNR Forest Stewardship funds. DHHL should contact them to see what their experience might suggest.

If you have questions, please feel free to contact Esther Imamura or Larry Brown of this office at 961-8288.

Sincerely,

CHRISTOPHER J. YUEN
Planning Director

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HONOLULU, HAWAII 96805

January 30, 2004

The Honorable Christopher J. Yuen
Planning Director
County of Hawaii
25 Aupuni Street, Room 109
Hilo, Hawaii 96720

Dear Mr. Yuen:

Subject: Draft Environmental Assessment for the Piha Mauka Forest Management Plan, Humuula, Hawaii

Thank you for your letter, dated January 7, 2004, during the public comment phase of the subject project. We offer the following responses in the respective order of your comments.

1. Conservation District. The establishment of a bird corridor in the area designated Conservation is compatible with that land use designation. A review of the conservation district maps, however, indicates that DHHL's proposed Kanakaleonui Bird Corridor extends mauka to the boundary of the Conservation area, but does not enter it.

2. Fencing and removal of cattle. DHHL is committed to removing cattle from this area as the forest is regenerated, per Section 2.1.1 "Remove Cattle" on page 9 of the draft EA.

3. Umikoa Ranch example. DHHL staff are familiar with the efforts being conducted by Umikoa Ranch. Like Umikoa, DHHL will use commonly known management techniques such as cattle removal and soil scarification to restore its forests. Unlike Umikoa, however, DHHL has chosen to retain more mature koa trees on site as a seed source and as wildlife habitat.

Your letter, along with this response, will be incorporated in the forthcoming Final Environmental Assessment. If needed, corrections and clarifications have been made in the document.

We appreciate your interest and participation in this phase of the project. If you have any questions, please contact Mike Robinson at 1-888-943-4335.

Aloha and mahalo,

Linda Chinn, Acting Administrator
Land Management Division