`Āina Mauna Legacy Program

Department of Hawaiian Home Lands

Ho`okuleana LLC

... to take responsibility ...

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`Āina Mauna Legacy Program
Department of Hawaiian Home Lands

Ola ka `āina, ola ke kanaka
(Healthy/Living Land, Healthy/Living People)

The good of the land results in the good of the people.

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Executive Summary

In 1921, the federal government of the United States set aside as Hawaiian Homelands approximately 200,000-acres in the Territory of Hawai`i as a land trust for homesteading by native Hawaiians. The avowed purpose of the Hawaiian Homes Commission Act was returning native Hawaiians to the land in order to maintain traditional ties to the land.

The Hawai`i State Legislature in 1960 created the Department of Hawaiian Home Lands (DHHL) for the purposes of administering the Hawaiian home lands program and managing the Hawaiian home lands trust. The Department provides direct benefits to native Hawaiians in the form of homestead leases for residential, agricultural, or pastoral purposes. The intent of the homesteading program is to provide for economic self-sufficiency of native Hawaiians through the provision of land.

In turn, the mission of the DHHL Hawaiian Homes Commission as stated on its website is:

> "To manage the Hawaiian Home Lands trust effectively and to develop and deliver land to native Hawaiians. We will partner with others towards developing self-sufficient and healthy communities."

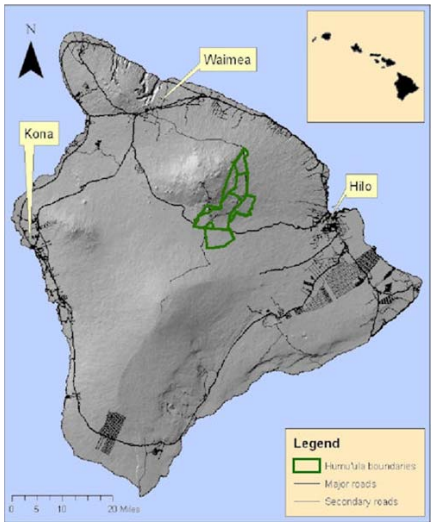
Enhancing the Legacy at Humu`ula/Pi`ihonua

DHHL is looking at its responsibility as a land manager not just to provide homes to its beneficiaries, but also to provide for the management and protection of native lands to support both cultural and resource management activities and create homesteading opportunities for the future.

DHHL seeks to restore portions of the Humu`ula/Pi`ihonua lands in perpetuity to conserve these native forests and natural habitats for future generations. In doing so the Department is looking beyond housing and into a more holistic approach for communities and land management.

DHHL believes that the Humu`ula/Pi`ihonua lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries, in perpetuity by linking traditional cultural knowledge and modern science.

Therefore, the `Āina Mauna Legacy Program is to be developed to take into consideration not only the immediate needs of the area, but also traditional cultural knowledge, and how best to manage the legacy for the area for future generations. By creating a sustainable plan for the area, the lands can be conserved and restored while also providing an economic resource for DHHL and its beneficiaries. The time commitment for the Legacy Program and restoration of the land is long term, essentially for the next 100-years and beyond.



`Āina Mauna Legacy Program Area

`Āina Mauna

`Āina mauna, or mountain lands, reflects a term used affectionately by elder Hawaiians to describe the upper regions of all mountain lands surrounding and including Mauna Kea.

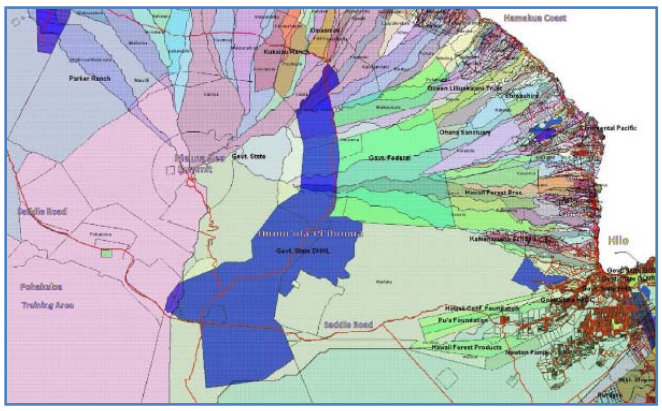
Native Hawaiian traditions and historical accounts describe the lands of Humu`ula and neighboring Ka`ohe - those areas extending from shore to around the 6,000-foot elevation - as having once been covered with dense forests, and frequented by native practitioners who gathered forest-plant resources, birds and food. The larger `āina mauna were frequented by individuals who were traveling to the upper regions of Mauna Kea to worship, gather stone, bury family members, or deposit the piko (umbilical cords of newborn children) in sacred and safe areas; and by those who were crossing from one region of the island to another.

Historically, uses of the Humu`ula/Pi`ihonua lands were limited to managed sheep and cattle grazing. The introduction of cattle, sheep, goats and the proliferation of wild dogs on the `āina mauna is believed to have started as early as the 1820s. By 1850, the cultural and natural landscape had been significantly altered by roving herds of wild ungulates. Ranching interest, having become formalized, began to establish ranching stations and operations on the mountain lands. Thus, areas once forested soon became open pasture lands.

Parker Ranch held the longest ranching lease to the property, from the early 1900s to 2002, and their lease extended around Mauna Kea to the Pu`uhuluhulu vicinity. Initially, Parker Ranch invested in sheep ranching and then focused on cattle operations until the end of their lease with DHHL in 2002. Since 2002, when existing cattle leases expired, most of these lands have been inactive. Efforts to restore the land's productivity via gorse eradication/control, native bird corridors and koa forest restoration have begun in priority areas.

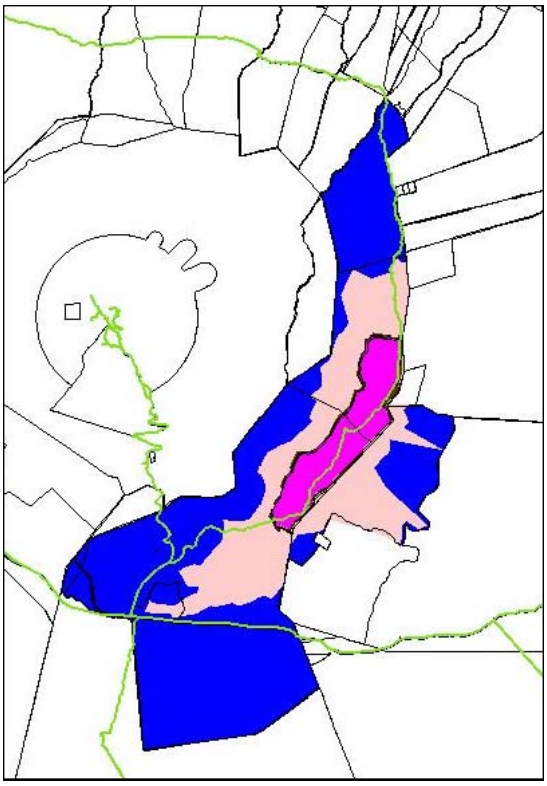
The Humu`ula/Pi`ihonua area is made up of approximately 56,200-acres owned by the Department of Hawaiian Home Lands located on the northeast slopes of Mauna Kea. The Humu`ula/Pi`ihonua lands are the largest contiguous parcel under jurisdiction of DHHL. The Humu`ula parcel is approximately 49,100-acres in size and the Pi`ihonua parcel, located adjacent to the eastern boundary of Humu`ula, is approximately 7,078-acres in size. `Āinahou, comprising approximately 11,124-acres, is the subsection of Humu`ula south of Saddle Road and is currently under license to the State of Hawai`i, Department of Land and Natural Resources.

The lands of Humu`ula are characterized by their isolation, high elevation, cool temperatures and lack of infrastructure (roads, potable water, telephone, power, etc.). The area is somewhat isolated with the closest public facilities (schools, hospitals, police and fire services) located in Hilo (25-miles and 40-minutes by car) and Waimea (30-miles and 55-minutes by car).



DHHL Humu`ula-Pi`ihonua Lands in the `Āina Mauna

With elevations ranging from approximately 4,500-to 9,000-feet mean sea level, the lands experience cooler temperatures ranging from an annual mean of 58 °F at the 5,000-foot elevation to 45 °F at the 9,000-foot elevation, with frost conditions occurring during the winter months. Rainfall varies greatly over various portions from an annual mean of 45-inches in the upper elevations to 120-inches in the lower elevations near the Saddle Road.



Map Noting Extent of Gorse Infestation
Blue – Humu`ula-Pi`ihonua Property
Salmon – Extent to gorse infestation
Pink – Gorse containment area

The vegetation is dominated by an understory of exotic pasture grasses over much of the lands with koa/`ōhi`a forest found in the lower portions of Pi`ihonua, especially in the lands adjacent to the Hakalau Forest National Wildlife Refuge. Scattered koa and māmane are found over the northern portions of Humu`ula with scattered māmane found in the upper elevations, especially adjacent to the Mauna Kea Forest Reserve. The vegetation on the `Āinahou lands generally consists of scattered scrub vegetation of `ōhi`a and native shrubs.

A significant vegetative feature on these lands is the gorse plant, a noxious weed which covers between 10,000 - 13,000-acres in the central portion of the Humu`ula lands. In high densities, this impenetrable shrub renders the land nearly useless. Because the gorse seeds remain viable in the soil for up to 70-years, the eradication strategy must be long-term and comprehensive in its approach. The need to eradicate gorse on the property cannot be overstated.

From a biological perspective the māmane forests are important in that they serve as a critical habitat for palila, an endangered native bird. Several endangered or threaten native bird species also are associated with the koa/`ōhi`a and koa/māmane forest areas. The `Āinahou lands, which serve as a public hunting and game reserve area, also serves as a refuge area for the Hawaiian goose (nēnē).

`Āina Mauna Legacy Program

The `Āina Mauna Legacy Program serves as a guide as DHHL moves forward in managing the Humu`ula/Pi`ihonua area to conserve its legacy for future generations while also serving as an economic resource. The Legacy Program is an extension of prior planning and activities at the site. Findings, recommendations, background information and other references from many of these prior documents are included and edited into this program.

The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. These lands provide a glimpse into the natural environment and native forests which are disappearing throughout the state. The area serves as valuable habitat to many native and endemic species. The area's proximity to Mauna Kea also makes it a valuable cultural resource. These lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries in perpetuity.

The `Āina Mauna Legacy Program incorporates prior planning efforts and serves as a policy framework related to the overall use and management of the property; the implementation process will occur after the Legacy Program is adopted. The following principles, areas of focus and goals serve as the foundation to the preparation and implementation of the `Āina Mauna Legacy Program.

<u>Legacy Program Mission</u>

The mission of the `Āina Mauna Legacy Program and its implementation is to protect approximately 56,000-acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community.

Goals

Initial goals for the `Āina Mauna Legacy Program include:

Goal 1: Develop an economically self-sustaining improvement and preservation program for the natural and cultural resources (invasive species eradication and native ecosystem restoration) and implementation strategy.

The focus of the `Āina Mauna Legacy Program shall be on:

- Restoration and enhancement of DHHL trust resources;
- Identify immediate and future opportunities for DHHL beneficiaries;
- Removal of invasive species - gorse, etc.;
- Conserve natural and cultural resources and endangered species;
- Address reforestation and restoration of the ecosystem;
- Develop revenue generation, reinvestment in land to sustain activities;
- Provide educational and cultural opportunities;
- Identify and secure partners to sustain activities;
- Identify opportunities for alternative/renewable energy projects; and
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model

Goal 2: Develop an outreach program to gain interest, participation, and support from the Hawaiian Homes Commission, DHHL Staff, beneficiaries groups, cultural practitioners, natural resource scientists, and the broader community for the Legacy Program and its implementation.

Summary of Priority Issues and Focus of the `Āina Mauna Legacy Program

The ultimate long term goal for DHHL is an economically-sustainable, healthy native forest ecosystem at Humu`ula/Pi`ihonua. In achieving this goal, the `Āina Mauna Legacy Program will serve as a guide for managing existing and future activities and uses and to ensure ongoing protection of DHHL's trust property. In preparing the Legacy Program many prior studies and reports dealing with the Humu`ula/Pi`ihonua region were reviewed and incorporated into the Legacy Program.

The `Āina Mauna Legacy Program is a "living document" that is intended to be flexible and is subject to change, as times and needs change. Therefore, the program should be re-examined on a periodic basis (possibly every 5-years) to ensure that it addresses DHHL's needs in the future. The following is a list of immediate actions.

Immediate/Short Term Actions – Summary Listing

1. Form the `Āina Mauna Legacy Program Implementation Advisory Council
    a. The implementation process will include the Council, Beneficiary and community involvement and participation in advising the Department and Commission
2. Initiate the first rural-development Homestead Area (on south-eastern part of property)
3. Initiate the Humu`ula Sheep Station Adaptive Reuse Plan
4. Initiate Expanded Ecotourism Opportunities
5. Initiate Use of Remote Accommodations
6. Initiate Gorse Eradication (consider all viable gorse eradication opportunities, with commercial timber appearing to be the most viable and beneficial to the Department)
    a. The activities are combined to highlight the actual benefit of forestry to fight gorse, restore the native forest and generate revenue
    b. Incorporate Carbon Credit opportunities to DHHL
    c. Use timber license/lease as DHHL implementation of the Hawai`i Clean Energy Initiative
    d. Consider a long-term agreement to accommodate multiple planting/harvesting rotations
    e. Require periodic native forest restoration (i.e. at 5-year intervals) on or outside of leased area

7. Investigate and implement additional areas for sustainable koa forestry opportunities. Allows for opportunities for revenue generation; allows for enhanced restoration of native forest
8. Initiate a set-aside of portions of the property for restoration and enhancement purposes
9. Pasture uses (focused on fire fuel mitigation, consistent with Fire Plan – additional acreage) around Keanakolu-Mana, Saddle and Mauna Kea Access Roads
10. Initiate unmanaged-ungulate eradication over entire property. Cattle and other ungulates are vectors for the spread of invasive species (including gorse) and have a negative influence on native forest restoration. Implementing unmanaged-ungulate eradication (primarily sheep, cattle and goats) and allowing management of pigs (so long as the resources are protected) will provide food for beneficiaries, reduce the impacts to the forest resources and generate revenue for the Trust
11. Initiate state, federal and private grant applications to support resource restoration
12. Initiate a Safe Harbor Agreement for threatened/endangered plants, birds and animals over entire site

Disposition of the respective commercial licenses, leases, etc. to implement these actions would be through a broad RFQ/RFP process to select the best qualified applicants (background, experience, financial capability, business plan, etc.) to conduct the respective activities – to the extent permitted by law, preference will be given to native Hawaiians. Homestead and Pasture agreements would be under the typical DHHL disposition process for these types of uses. Any required environmental review would be conducted by the applicant/selectee, based on the details of their specific proposal.

Forests and Forestry Uses on the Site

"Forest" and "Forestry" are used in various contexts in the Legacy Program. At various places, "Native Forest Restoration", "Commercial Timber to Fight Gorse" and "Sustainable Koa Forestry" are referenced. Each references different aspects of dealing with forests and forest products. After 150-years of sheep and cattle ranching, the formerly dense forest became significantly altered by these activities and the forest landscape was converted primarily to open pasture land.

Native Forest Restoration focuses on restoration and enhancement of portions of the Humu`ula/Pi`ihonua lands in perpetuity to conserve these native forests and natural habitats for future generations. This includes the koa/`ōhi`a forest ecosystems on the makai portion of the property and the māmane forest on mauka portions of the site.

Commercial Timber to Fight Gorse focuses on eliminating this invasive weed. Gorse is shade intolerant and DHHL field trials show that shade from trees inhibit the ability for gorse to grow and spread. It is anticipated that licensed commercial-scale timber planting (using eucalyptus, sugi, or other trees) will shade the gorse sufficiently to keep it from producing seeds and that each year some portion of the seed bank will be removed. Thus, timber planting can serve both as a gorse eradication mechanism, as well as an income generator.

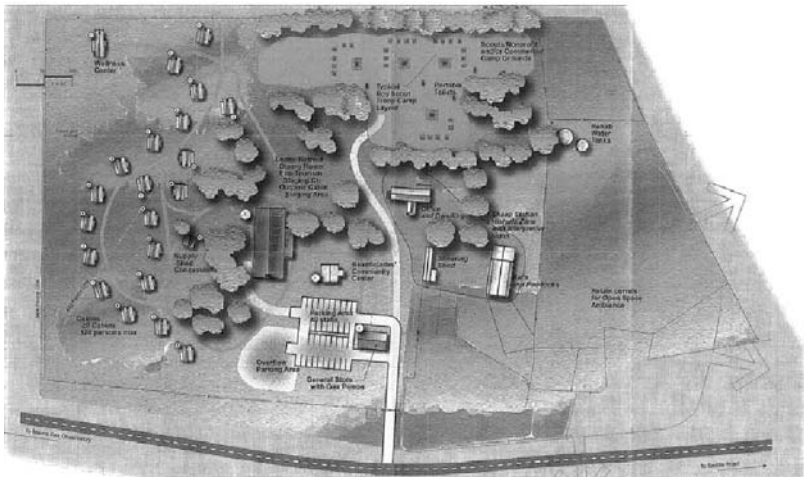
It is important to understand that all suggested crops other than koa are designed to initially eradicate and control the gorse, then support the eventual reforestation of the land back to a native koa forest. Eucalyptus and Sugi should be replaced with native koa where possible once it has been determined that the gorse, and its seed germination, is no longer a threat. Sustainable Koa Forestry approach suggests restoration of koa for future sustainable commercial sales. Koa is one of the predominant tree species found naturally in the Humu`ula/Pi`ihonua lands. It is presently the highest value timber crop in Hawai`i. It grows easily and well in this area if introduced ungulates are removed. Restoring the Humu`ula/Pi`ihonua lands to koa through carefully planned and managed reforestation is its highest and most compatible economic use.

Self-sustaining Funding with Reinvestment into the Property

One of the central focuses of the `Āina Mauna Legacy Program is that the activities and programs implemented need to be economically self-sustaining, with the goal to reinvest the revenue into the management of the property. In considering revenue generation, several opportunities exist:

- Use of Humu`ula Sheep Station – Commercial Activities

  The Humu`ula Sheep Station Adaptive Reuse Plan proposes a mix of land uses, wherein the property is divided into three principal sub-areas: Historic/ Community Center (5.5-to 6.0-acres); Open Campground (2.0-to 2.5-acres) and Commercial (7.0-to 8.0-acres), including commercial, retail, recreational, camping, cabins, lodge and restaurant activities appropriate to a transient or visitor market. Likewise, DHHL could use part of the property for its own administrative/accommodations needs.



- Forest Products and Biomass for alternative energy opportunities (liquid fuel and electricity.)

  Several forestry products and alternative energy producers have been identified as possible users of large scale areas for forestry development. Some of these have recently requested use and leasing of nearby State lands for these purposes. To fully implement this opportunity, it is important that timber operations at Humu`ula attempt to capture all possible value from planted trees, such as veneers, lumber, and/or wood chips, as well as fuels and carbon sequestration credits.

  Carbon Offsets/Credits are a key component of national and international emissions trading schemes that have been implemented to mitigate global warming. Credits can be exchanged between businesses or bought and sold in international markets at the prevailing prices.

- Ecotourism and Recreation Use

  Ecotourism and recreation related activities, a growing sector of the island's visitor industry, have great potential here due to the natural resources of these lands. Other than providing an area, such as the Humu`ula Sheep Station, to service and manage these activities, these uses and activities could be integrated and managed within other proposed economic uses. The Humu`ula Sheep Station may serve as a central site to stage and coordinate eco-tourism activities over the entire property.

  The potential uses and activities include (many of these are noted and discussed in the "Humu`ula Sheep Station Adaptive Reuse Plan"): Biking Tours, Bird Watching Tours, Lodge/Campsites, Hiking Tours, Horseback Tours, Wilderness Resort/Guest Ranch, Nature/Historical Tours, Volunteer "Service" Trips.

- State, Federal and Private Grant Opportunities

Comparison of Legacy Program Mission, Goals and Priorities with the Proposed Immediate Actions

- Restoration and enhancement of DHHL trust resources
- Preservation of Natural and Cultural Resources and Endangered Species
- Address reforestation and restoration of the ecosystem
    - Reinvest the revenue derived from property into management/restoration
    - Consider a term (i.e. 50-year) conservation encumbrance over portions of the property
    - Initiate additional areas for sustainable Koa Salvage opportunities
    - Require interim gorse-eradication timber operator to participate in native forest restoration
    - Incorporate "volun-tourism" (visitors volunteer) support into ecotourism activities
    - Pasture uses (focused on fire fuel mitigation, consistent with Fire Plan - additional acreage)
    - Initiate unmanaged-ungulate eradication over entire property
    - Initiate a Safe Harbor Agreement for threatened/endangered species over entire site
- Identify opportunities for DHHL Homesteading
    - Opportunities for homesteading across the entire landscape of Humu`ula/Pi`ihonua lands
    - Initiate the first rural-development Homestead Area
    - Forested areas also provide DHHL with an option for future homesteading
- Removal of invasive species - gorse, etc.
    - Initiate gorse eradication (consider viable options; commercial timber appears most beneficial)
        - Forestry fights gorse and restores the native forest – and, it generates revenue
        - Incorporate Carbon Credit opportunities to DHHL
        - Use timber as DHHL implementation of the Hawai`i Clean Energy Initiative
        - Consider a long-term agreement to address multiple harvesting rotations
        - Require periodic native forest restoration on or outside of leased/licensed area
    - Continue the `Ōiwi Lōkahi o ka Mokupuni o Keawe gorse to charcoal demonstration project
    - Initiate unmanaged-ungulate eradication over entire property
    - Pasture uses (focused on fire fuel mitigation, consistent with Fire Plan - additional acreage)
- Identify and secure partners to sustain activities
- Develop revenue generation with reinvestment in land to sustain activities
    - Initiate state, federal and private grant applications to support resource restoration
    - Initiate implementation of the Humu`ula Sheep Station Adaptive Reuse Plan
    - Initiate expansion of Ecotourism
    - Initiate process for Use of Remote Accommodations
    - Investigate and implement additional areas for sustainable koa forestry opportunities
    - Interim use of commercial scale timber operations (timber as tool to eradicate gorse)
    - Incorporate Carbon Credit opportunities in interim timber operation
    - Consider a term (i.e. 50-year) conservation encumbrance over portions of the property
    - Gorse-eradication timber operator native forest restoration could be "match" for grants
    - Volun-tourism efforts for native forest restoration could be "match" for grants
    - Initiate unmanaged-ungulate eradication over entire property
- Provide educational and cultural opportunities
    - Restored, healthy native forest provides a variety of opportunities for gathering, cultural practices and opportunities to see and understand native forest ecosystems
    - Humu`ula Sheep Station as gateway and staging area – campgrounds used by groups
- Identify opportunities for alternative/renewable energy projects
    - Rural-development homestead area; opportunity for photovoltaic, water catchment/reuse etc.
    - Interim use of commercial scale timber operations (biomass for alternative energy)
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model

In Fulfilling the Mission, Goals and Priority Issues, a Proper Balance is Required

We are reminded that the foundation of the `Āina Mauna Legacy Program is based on the HHC Mission Statement and the Legacy Program Mission, Goals and Priority Issues. The `Āina Mauna Legacy Program evaluates and balances conformance of competing uses with these overarching principles. Ultimately, and as an over-arching principle, the `Āina Mauna Legacy Program is about and for the Hawaiian Home Lands Trust, the Land and its Beneficiaries.

Homesteading for Beneficiaries

The `Āina Mauna Legacy Program incorporates several opportunities for homesteading across the entire landscape of the Humu`ula/Pi`ihonua lands. The bulk of the homestead opportunities are anticipated to be phased in once the land has been restored to productive use. This area includes the significant portions of the site that are proposed for sustainable koa restoration.

These forested areas also provide DHHL with an option for future homesteading. Once the koa restoration is accomplished, DHHL will have the opportunity to consider creation of agricultural homesteads using forestry for beneficiaries or homestead sites in the forest. The commercial koa forest management operations can continue, with the DHHL and beneficiaries benefitting directly from the commercial sale of koa.

Similar to many present-day homesteaders having ranches associated with their homesteads or area for agricultural use associated with homesteads, with the restoration and management of the forest here, future homesteaders may incorporate the management of koa forest into their agricultural homesteads.

Ultimately, decision-makers decades from now may decide whether this is appropriate or not – once the forest is restored. The suggestion is that the Legacy Program expands future options, opportunities and choices for homesteading.

A significant portion of the property (4,500-acres) is proposed for immediate homesteading, (with the first area of about 1,000-acres for 100-to 200-homesteads with consideration for alternative layouts.) Much of Humu`ula, however, is not ready to support a "self-sufficient and healthy community" of homesteaders, as the land's productivity has significantly declined over the past 150-years. 10,000 additional acres may be considered for future homesteading opportunities.

Since the property was not typically used for long term habitation, there are questions as to the demand for homesteads in this area. Humu`ula is a unique environment that historically has been minimally settled. It is important that beneficiaries are made aware and understand the advantages and disadvantages of living in this area. Given that the immediate homesteading area will be a rural development (cinder roads, catchment water, photovoltaic, septic/composting toilets, etc.) and the area is relatively isolated from employment, schools, shopping centers and other DHHL communities, it is not clear what the demand will be for these types of homesteads.

Pasture Use for Beneficiaries

Land reserved for future homesteads (1,000-acres), beyond the first area noted above, is available for interim pasture use. So, whether beneficiaries obtain a homestead or not, there is the opportunity for direct beneficiary benefit and use through additional acreage for pasture use or community pasture.

On the issue of pasture, other specific areas are also proposed for additional acreage for pasture use (consistent with the Fire Plan) – this, too, is proposed to be immediately available for beneficiary use.

This overall area is in the vicinity of 4,000-acres (these land areas are approximate references) - with about 2,000-acres designated for pasture along the Keanakolu-Mana Road and another 2,000-acres on the west side of the Mauna Kea Access Road (below the Radio Tower site and fronting Saddle Road and Mauna Kea Access Road.)

Wild bull with scattered gorse plants

Unmanaged-Ungulate Eradication

Another immediate action recommended in the Legacy Program is the eradication of the unmanaged-ungulates across the property. Cattle and other ungulates are vectors for the spread of invasive species (including gorse) and have negative impacts on the native forest ecosystems and reforestation efforts.

Allowing unmanaged-ungulate eradication (primarily sheep, cattle and goats) and management of pigs (so long as the resources are protected) have multiple benefits: (1) beneficiaries will put meat on their tables, (2) eliminating unmanaged-ungulates will reduce the impacts to the forest resources and (3) the trust will generate some income from the sale of the unmanaged-ungulates.

Forest Restoration and Management = Job Opportunities

Along with this, there are several recommendations dealing with native forest restoration and commercial koa forestry. With respect to restoring koa forests for future commercial opportunities, benefits to beneficiaries are immediate, as well as long-term.

Immediate direct and indirect opportunities are jobs related to the forest restoration, including on-the-ground work, supplying restoration needs and services (whether it is equipment, supplies or services to support the reforestation,) as well as the ongoing monitoring and research associated with the restoration efforts.

Commercial Forestry = Helping Fund Management Needs

Once the forest is restored, DHHL has several options that can directly benefit the beneficiaries and the Trust (beyond the benefit of ongoing forest management employment.)

As required in the Mission, commercial forestry will assist in proving necessary funding to help with the overall management of the property.

Reforestation Provides Beneficiary Opportunities for Gathering and Traditional Practices

The restored, healthy native forest provides a variety of benefits and opportunities to beneficiaries through gathering, cultural practices and opportunities to see and understand native forest ecosystems. Since the land is DHHL owned, beneficiaries will have significant benefit for the exercise of cultural traditions.

The site (with restoration to healthy native forest) provides beneficiaries cultural practices access as the only site of this type in the Hawaiian Home Lands Trust inventory.

Koa Wood Products for Beneficiaries

Other obvious benefits to beneficiaries are the opportunities relating to use of the koa wood products. With the restored and expanded forest, practitioners and crafters will have a wide range of (cultural and economic) opportunities for a variety of koa wood product production.

Ecotourism – Small Footprint and Limited Impact = Revenue Opportunities for Management

Other necessary components to fulfilling the Mission's mandate of economic self-sufficiency are the recommendations dealing with the adaptive reuse of the Sheep Station and eco-tourism opportunities. These items cover a small footprint on the overall landscape and have limited impact on the resources, but provide necessary funds for the self-sufficient operations of the Legacy Program. Here, too, beneficiaries have the opportunity to participate through direct and indirect jobs.

Associated with this, one beneficiary group, Hui Kako`o `Aina Ho`opulapula, has a vision for the adaptive reuse of Pu`u `Ō`ō Ranch headquarters. They have been actively involved in cleaning and clearing the area. The proposed future use of the site they suggest is consistent with the general recommendations for the "Remote Accommodations".

Gorse Eradication Critically Important – Otherwise Site is Useless

Likewise, another beneficiary group's (`Ōiwi Lōkahi o ka Mokupuni o Keawe) research project focusing on gorse to charcoal is consistent and compatible with the recommendations for gorse control.

The recommendation implementing the use of commercial-scale timber (such as eucalyptus, sugi, or other) to fight the gorse is consistent with recommendations from others (and demonstrated in DHHL's field trials) as an effective way to address gorse on a landscape scale. Other viable gorse eradication opportunities can also be considered.

Koa tree "skeletons" (evidence of former forest) engulfed by gorse

The need for eradicating gorse cannot be overstated. Until this destructive plant is removed, beneficiaries will not see or experience benefits from the property.

To date, gorse has been a nuisance and is expensive to control. The recommendations specifically target the removal of this invasive plant, while also generating revenue to the DHHL for management of the remainder of the land. Once the gorse eradication process is well underway, the recommendation is to revert the land back to koa forest and include it with the other commercial koa forest activities.

RFQ/RFP Process to Select the Best Qualified Applicants for Commercial Agreements

The suggestion of using a broad RFQ/RFP process in the procurement of services for the commercial enterprises does not in any way limit the opportunity for beneficiaries to be involved in the process. Likewise, as a State agency, DHHL is obligated to follow state procurement laws. DHHL has the responsibility to look for the best qualified applicants (background, experience, financial capability, business plan, etc.) that can fulfill the Trust's needs at a reasonable price. The RFQ/RFP process serves to produce that.

Consistent with the fundamental purposes of the Hawaiian Homes Commission Act, to the extent permitted by law, it is the goal of the `Āina Mauna Legacy Program to support economic development, maximize opportunities for beneficiaries and give preference for native Hawaiian beneficiary involvement at all stages of the program's implementation.

Disposition of Homestead and Pasture leases, licenses and/or RPs would be under the typical DHHL planning, funding, development and disposition processes for these types of uses.

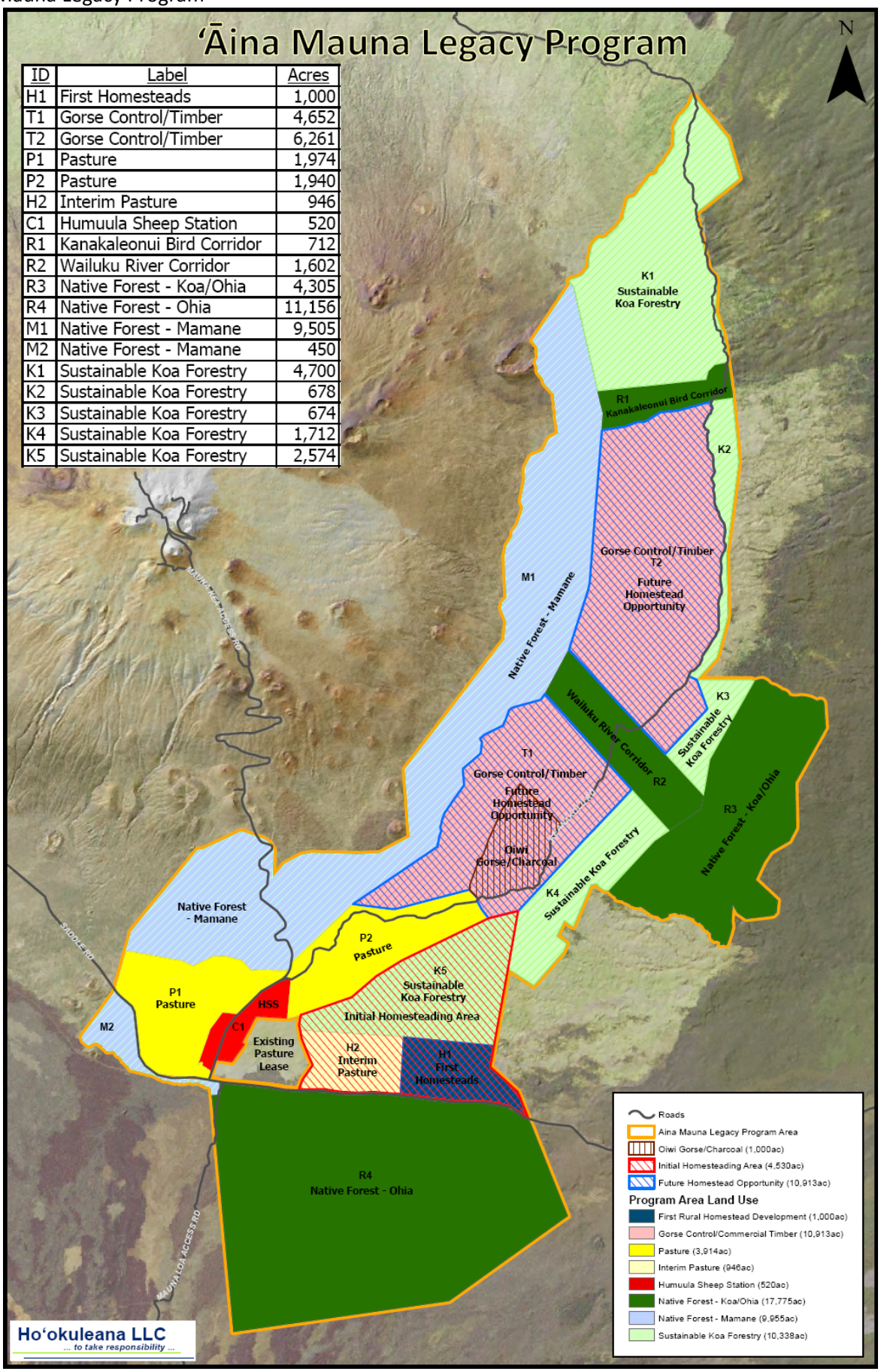
Opportunities for Beneficiaries to Participate and Benefit are Extensive and Diverse

As you can see, the opportunities for beneficiaries are extensive and diverse; and, there are opportunities for beneficiaries within each component of the recommendations, whether it is homesteading, pasture, unmanaged-ungulate eradication, native forest restoration, commercial timber, koa forestry, ecotourism or cultural practices. Some of the benefits are proposed to be relatively immediate, while others will necessarily take time for the real benefit to come to fruition. Additionally, the implementation process will include opportunities for Beneficiary and community involvement and participation at all stages of the process.

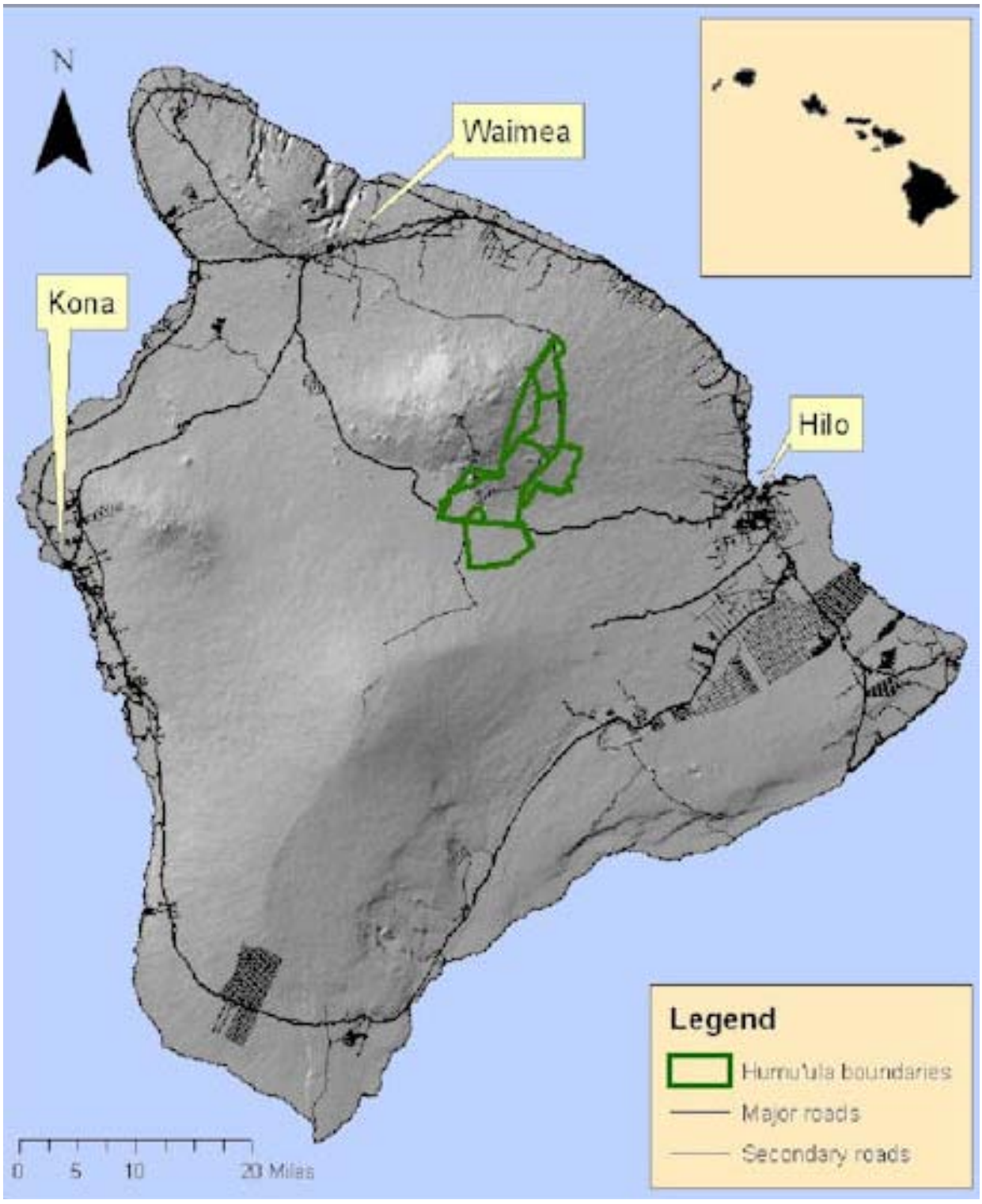
`Āina Mauna Legacy Program is All About the Trust, the Land and its Beneficiaries

Restoration of the land upon which native Hawaiians have always depended is key to the success of the beneficiaries. Over the past 150-years the land transformed away from a healthy, dense native forest. It will take generations to restore the land back to this healthy condition. Ultimately, and as an over-arching principle, the `Āina Mauna Legacy Program is about and for the Hawaiian Home Lands Trust, the Land and its Beneficiaries.

Ola ka `āina, ola ke kanaka
(Healthy/Living Land, Healthy/Living People)
The good of the land results in the good of the people.



ID	Label	Acres
H1	First Homesteads	1,000
T1	Gorse Control/Timber	4,652
T2	Gorse Control/Timber	6,261
P1	Pasture	1,974
P2	Pasture	1,940
H2	Interim Pasture	946
C1	Humuula Sheep Station	520
R1	Kanakaleonui Bird Corridor	712
R2	Wailuku River Corridor	1,602
R3	Native Forest - Koa/Ohia	4,305
R4	Native Forest - Ohia	11,156
M1	Native Forest - Mamane	9,505
M2	Native Forest - Mamane	450
K1	Sustainable Koa Forestry	4,700
K2	Sustainable Koa Forestry	678
K3	Sustainable Koa Forestry	674
K4	Sustainable Koa Forestry	1,712
K5	Sustainable Koa Forestry	2,574



Island of Hawai`i - `Āina Mauna Legacy Program Area

Brief Property Description

`Āina Mauna: Humu`ula, Pi`ihonua, Ka`ohe

The following is summarized from the "Humu`ula Rural Villages and Landscape Restoration Plan, Final Report" prepared by Townscape, Inc., for `Ōiwi Lōkahi o ka Mokupuni o Keawe, March 2005, except where noted.

The cultural and historical research conducted by Kumu Pono Associates documents descriptions of Ka`ohe, Humu`ula, and Pi`ihonua. The study provides readers with documentation pertaining to the traditional, cultural and historical setting of the `āina mauna on the Island of Hawai`i. It is concluded that the Hawaiian way of life was the product of strict land use management.

The historical record coupled with oral history interviews provide clues as to the types of sites, hence past land uses, that may be found at Humu`ula/Pi`ihonua: native trails (some overlaid by current access routes), stone mounds/land markers, altars and types of ceremonial sites, shelters and habitation caves, resource collection sites, ilina (burial features), later dated features (1800s) such as pens, walls, fence lines, stone and wooden houses, water collection and storage, bird hunting blinds, former garden plots, and support features.

`Āina mauna, or mountain lands, reflects a term used affectionately by elder Hawaiians to describe the upper regions of all mountain lands surrounding and including Mauna Kea.

Genealogical Accounts and Traditional Features

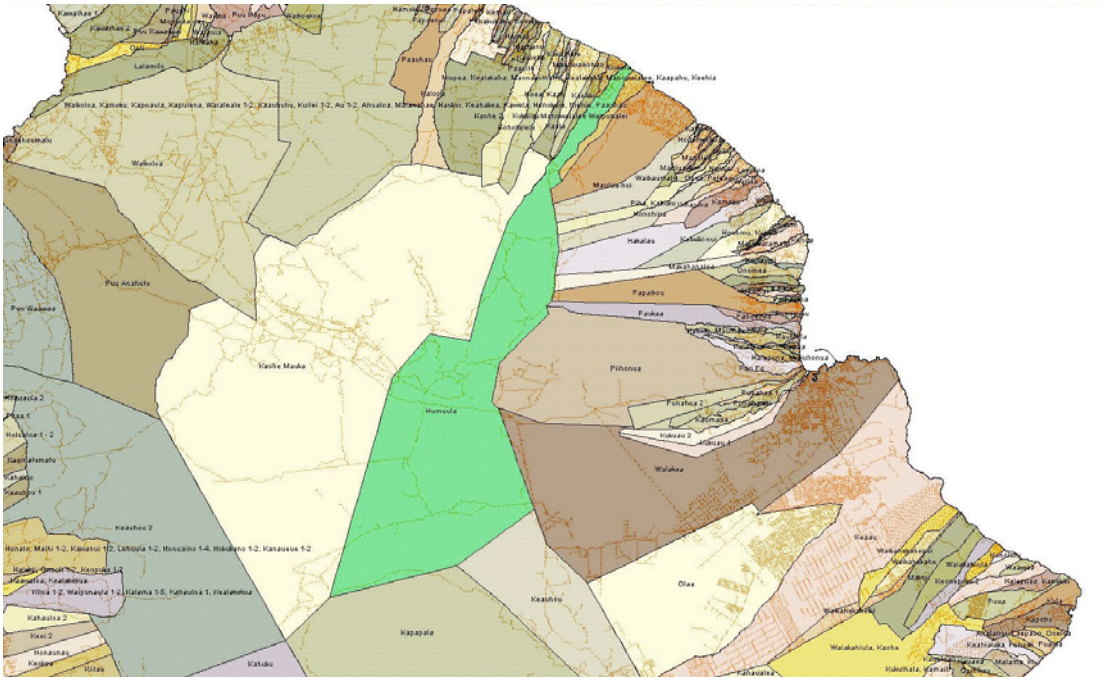
In Hawaiian culture, the natural and cultural resources are one and the same. Native traditions describe the birth of the islands and the life that exists on them in terms of genealogical accounts.

All natural forms of the environment are believed to be embodiments of gods and deities. From godly forces the Hawaiian Islands are born of Wākea (the expanse of the sky-father) and Papahānaumoku (Pāpā who gave birth to the islands). Wākea and Pāpā are credited for being the parents of the first man, Hāloa, the ancestor of all people. It is from this genealogical thread that Hawaiians address their environment and it forms the basis of the Hawaiian system of land use.

The generations that followed developed a refined system of land use and management. `Umi a Līloa, the ruler of Hawai`i, created land divisions according to a chiefly management system.

The island, or mokupuni, was divided into moku o loko, or districts. Hilo district contained Humu`ula, an ahupua`a. Subdivisions within a moku are `okana and kalana, both of these would contain several ahupua`a. Manageable parcels of land would typically run mauka to makai and would be marked with stone wall alignments. These parcels are known as: `ili, kō`ele, mahina `ai, māla and kīhāpai. Tenants cultivated smaller crops for family consumption, to supply the needs of chiefs, and provide tributes. Kapu were observed as a matter of resource and land management among other things. Access to resources was tied to residency and earned as a result of taking responsibility to steward the environment and supply the needs of ali`i. The social structure reinforced land management.

Native Hawaiian tradition and historical accounts portray the lands of Humu`ula, Pi`ihonua, and Ka`ohe as having been dense forests where native practitioners gathered forest resources, birds, and food. Humu`ula is named for a type of stone (red jasper) used to make ko`i or adze.



Map Noting Ahupua`a in the Region

The `āina mauna was also used by travelers making their way through the area. The area was frequented by native practitioners and contained a native and cultural landscape that provided among other things:

- Places to worship
- Places to gather stones
- Kanu iwi (places to bury human remains)
- Kanu piko (places to bury umbilical cords)
- Places to traverse, i.e. for those who were crossing from one region to another
- Places to gather food, and catch birds
- Sacred and safe areas

The final Environmental Assessment for the Koa Salvage-Reforestation and Gorse Containment Project prepared by DHHL in 2001, notes cultural practices and features in the area.

“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 “Wākea’s Mountain”. Wākea, also written and pronounced as Ākea and Kea, was the god-father of the Island of Hawai`i. The island child was born by Papa or Haumea, the goddess who gave birth to islands. The proposed project area was once heavily forested. Native Hawaiians viewed the mountain areas as the heavily forested zone (waoakua, forest of gods) where koa trees were cut for canoe hulls. Other traditional uses by pre-contact native Hawaiians were gathering medicinal plants and bird feathers.” (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 24)

Historic Features

The introduction of cattle, sheep, goats and the proliferation of wild dogs on the `āina mauna is believed to have started as early as the 1820s. Travelers accessing the mountain trails oftentimes found themselves under attack by the wild bullocks; a Scottish naturalist, for example, was killed by a wild bullock at Keahua-ai. By 1850, the cultural and natural landscape had been significantly altered by roving herds of wild ungulates. Ranching interest, having become formalized, began to establish ranching stations and operations on the mountain lands. Thus, areas once forested soon became open pasture lands.

Parker Ranch held the longest ranching lease to the property, from 1901 to 2002, and their lease extended around Mauna Kea to the Pu`uhuluhulu vicinity. Initially, Parker Ranch invested in sheep ranching and then focused on cattle operations until the end of their lease with DHHL in 2002. As well, portions of Pi`ihonua were leased to various native hunters during the middle 1860s.

Historic features include:

- Walls, pens, fence lines
- Stone and wooden houses
- Water collection and storage facilities
- Bird hunting blinds
- Former garden plots
- Kulaka “cattle pen”, 1850, oldest-named wall feature in Humu`ula
- Stone wall extending from Pu`uhuluhulu, enclosing `Ōma`okoili paddocks marking the boundary between Humu`ula and Ka`ohe

Archaeological Investigation

Based on a field inspection conducted in June 2004 by Cultural Surveys Hawai`i, it is predicted that there is a relatively low concentration of surface sites in the project area. Areas where site densities are likely to be significant include ahupua`a borders, pu`u (cinder cones), caves or lava tubes, traditional bird feeding habitats, the paleo-forest scrub transition area, traditional resource convergence areas (water, fuel, and shelter locations), and along trails and roads. The archaeological field reconnaissance indicated that historic and prehistoric sites may be present in the parcel, including: burial sites, temporary habitation sites, markers or historic sites, trails and roads, ritual sites, and camps and processing sites (relating to bird hunting and/or adze production).

Site Assessment

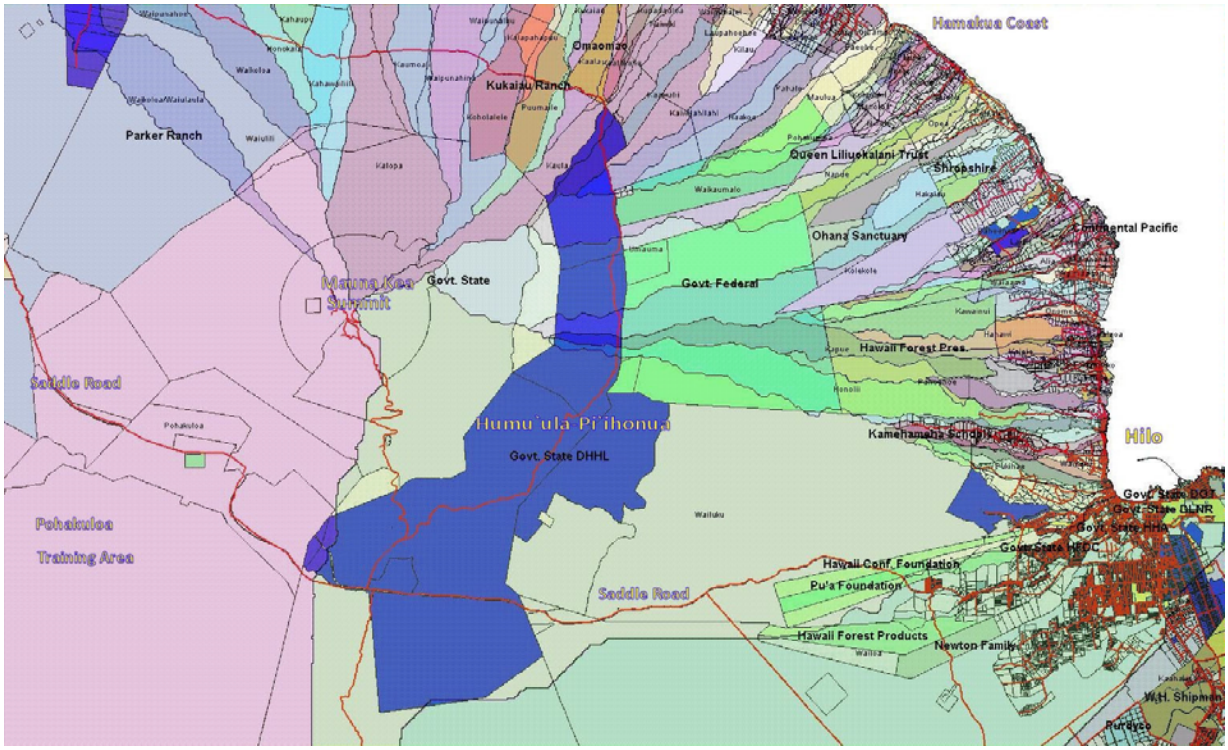
The 1997, “Humu`ula/Pi`ihonua Master Plan” developed by PBR Hawai`i for the Department of Hawaiian Home Lands gives a good assessment of the site. The following is taken from that Plan.

The Humu`ula/Pi`ihonua area is made up of approximately 56,200 acres owned by the Department of Hawaiian Home Lands located on the northeast slopes of Mauna Kea. The Humu`ula/Pi`ihonua lands are the largest contiguous parcel under jurisdiction of DHHL. The Humu`ula parcel is approximately 49,100 acres in size and the Pi`ihonua parcel, located adjacent to the eastern boundary of Humu`ula, is approximately 7,078 acres in size. `Āinahou, comprising approximately 11,124 acres, is the subsection of Humu`ula south of Saddle Road and is currently under license to the State of Hawai`i, Department of Land and Natural Resources.

The lands of Humu`ula are characterized by their isolation, high elevation, cool temperatures and lack of infrastructure (roads, potable water, telephone, power, etc.). The area is somewhat isolated with the closest public facilities (schools, hospitals, police and fire services) located in Hilo (25 miles and 40 minutes by car) and Waimea (30 miles and 55 minutes by car).

With elevations ranging from approximately 4,500 to 9,000 feet mean sea level, the lands experience cooler temperatures ranging from an annual mean of 58 °F at the 5,000 foot elevation to 45 °F at the 9,000 foot elevation, with frost conditions occurring during the winter months. Rainfall varies greatly over various portions from an annual mean of 45 inches in the upper elevations to 120 inches in the lower elevations near the Saddle Road.

The primary access to the site is from the Saddle Road, a paved highway connecting East and West Hawai`i, and the paved access road to the Mauna Kea Observatory and summit area. The Keanakolu (Mana) Road is a cinder/gravel road which extends from the Mauna Kea Summit Road through the property for approximately 19 miles. Other internal roadways leading from the Keanakolu Road are primarily 4-wheel drive dirt/cinder pasture roads used for fire breaks, gorse control, and other management activities. Other infrastructure systems (potable water, power, communication, etc.) are largely nonexistent. Power lines extend along the Saddle Road and Mauna Kea Access Road.



Map Noting Watersheds

Soil conditions are reflective of the environmental variations with sandy, rocky soils generally found in the upper and drier elevations; the better sandy loams in the mid-elevations, and poorly draining clay loams in the lower and wetter elevations, especially within Pi`ihonua. The `Āinahou lands south of the Saddle Road, are comprised almost entirely of pāhoehoe and a`ā lavas, the most recent of which includes portions of the 1935 lava flow.

The vegetation is dominated by an understory of exotic pasture grasses over much of the lands with koa/`ōhi`a forest found in the lower portions of Pi`ihonua, especially in the lands adjacent to the Hakalau Forest National Wildlife Refuge. Scattered koa and māmane are found over the northern portions of Humu`ula with scattered māmane found in the upper elevations, especially adjacent to the Mauna Kea Forest Reserve. The vegetation on the `Āinahou lands generally consists of scattered scrub vegetation of `ōhi`a and native shrubs.

A significant vegetative feature on these lands is the gorse plant, a noxious weed which covers between 10,000 -13,000 acres in the central portion of the Humu`ula lands. In high densities, this impenetrable shrub renders the land nearly useless. The area of infestation has nearly doubled since 1986. Because the gorse seeds remain viable in the soil for up to 70 years, the eradication strategy must be long-term and comprehensive in its approach.

From a biological perspective the māmane forests are important in that they serve as a critical habitat for palila, an endangered native bird. Several endangered or threaten native bird species also are associated with the koa/`ōhi`a and koa/māmane forest areas. The `Āinahou lands, which serve as a public hunting and game reserve area, also serves as a refuge area for the Hawaiian goose (nēnē).

Based on archaeological surveys conducted in the area, those known archaeological features within the parcel are predominately historical sites, and a relatively low concentration of archaeological sites are expected to be found. The gulches and pu`us, in addition to serving as possible refuge areas endangered plant species, would be among the likely areas where archaeological sites, if present, would be found.

Historically uses of the Humu`ula/Pi`ihonua lands were limited to managed sheep and cattle grazing. The majority of the subject lands had previously been occupied by, Parker Ranch, since at least 1909 when sheep grazing started. However, by 1963 the sheep operation was phased out due to a decline of wool prices caused by the depression, competition from foreign countries, and heavy losses from wild dogs and feral pigs. Parker Ranch then converted the land to a cattle operation. Gorse was used as a hedge to pen animals however, conversion from sheep to cattle gave way to the initial outbreak of gorse, which until that time had been effectively controlled by sheep grazing.

Since 2002, when existing cattle leases expired, most of these lands have been inactive. Efforts to restore the land’s productivity via gorse eradication/control, native bird corridors, and koa forest restoration have begun in priority areas.

Surrounding uses include the Hale Pōhaku Astronomical Facility, a support facility for the astronomical research on Mauna Kea, the Pōhakuloa Military Training Area, the Hakalau Forest National Wildlife Refuge and various State natural area and forest reserves.

`Āina Mauna Legacy Program

The `Āina Mauna Legacy Program serves as a guide as DHHL moves forward in managing the Humu`ula/Pi`ihonua area to conserve its legacy for future generations while also serving as an economic resource. The Legacy Program is an extension of prior planning and activities at the site. Findings, recommendations, background information and other references from many of these prior documents are included and edited into this program.

The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. These lands provide a glimpse into the natural environment and native forests which are disappearing throughout the state. The area serves as valuable habitat to many native and endemic species. The area's proximity to Mauna Kea also makes it a valuable cultural resource. These lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries in perpetuity.

The `Āina Mauna Legacy Program incorporates prior planning efforts and serves as a policy framework related to the overall use and management of the property; the implementation process will occur after the Legacy Program is adopted. The following principles, areas of focus and goals serve as the foundation to the preparation and implementation of the `Āina Mauna Legacy Program. In addition, following these are some background information and references of prior documents and activities that provide additional information about the property, its history and its opportunities.

Mission

The mission of the `Āina Mauna Legacy Program and its implementation is to protect approximately 56,000 acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community.

Goals

Initial goals for the `Āina Mauna Legacy Program include:

Goal 1: Develop an economically self-sustaining improvement and preservation program for the natural and cultural resources (invasive species eradication and native ecosystem restoration) and implementation strategy.

The focus of the `Āina Mauna Legacy Program shall be on:

- Restoration and enhancement of DHHL trust resources;
- Identify immediate and future opportunities for DHHL beneficiaries;
- Removal of invasive species - gorse, etc.;
- Conserve natural and cultural resources and endangered species;
- Address reforestation and restoration of the ecosystem;
- Develop revenue generation, reinvestment in land to sustain activities;
- Provide educational and cultural opportunities;
- Identify and secure partners to sustain activities;
- Identify opportunities for alternative/renewable energy projects; and
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model

Goal 2: Develop an outreach program to gain interest, participation, and support from the Hawaiian Homes Commission, DHHL Staff, beneficiaries groups, cultural practitioners, natural resource scientists, and the broader community for the Legacy Program and its implementation.

The `Āina Mauna Legacy Program is a "living document" that is intended to be flexible and is subject to change, as times and needs change. Therefore, the program should be re-examined on a periodic basis (possibly every 5-years) to ensure that it addresses DHHL's needs in the future.

Summary of Priority Issues and Focus of the `Āina Mauna Legacy Program

The ultimate long term goal for DHHL is an economically-sustainable, healthy native forest ecosystem at Humu`ula/Pi`ihonua. In achieving this goal, the `Āina Mauna Legacy Program will serve as a guide for managing existing and future activities and uses, and to ensure ongoing protection of DHHL's trust property in perpetuity by linking traditional cultural knowledge and modern science.

In preparing the Legacy Program many prior studies and reports dealing with the Humu`ula/Pi`ihonua region were reviewed and incorporated into the Legacy Program. In addition, several common issues, priorities and goals were recommended. The following priority issues and areas of focus should be considered:

- Restoration and enhancement of DHHL trust resources;
- Identify immediate and future opportunities for DHHL beneficiaries;
- Removal of invasive species - gorse, etc.;
- Conserve natural and cultural resources and endangered species;
- Address reforestation and restoration of the ecosystem;
- Develop revenue generation, reinvestment in land to sustain activities;
- Provide educational and cultural opportunities;
- Identify and secure partners to sustain activities;
- Identify opportunities for alternative/renewable energy projects; and
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model

Following is a summary of initial recommendations to implement the `Āina Mauna Legacy Program.

Administration

- Due to scope and scale of the Legacy Program, it is recommended that respective DHHL Divisions implement the Legacy Program under their existing structure, funding and procedures
- To complement existing DHHL staff, it is recommended that three new positions be added and formed within the Land Management Division for implementation and management of the Legacy Program - Program Coordinator; Contract Management, Compliance and Grant Specialist; and Field Worker
- Consideration should be given for the extension of contract services for implementation guidance and support
- Due to limitations in Federal regulations, Na Kupa`a O Kuhio should be considered to take advantage of Federal funding opportunities
- Initiate broad solicitation process to arrange contracts to implement portions of Program (gorse eradication/timber, eco-tourism, Humu`ula Sheep Station Adaptive Reuse, etc.)
    - To the extent permitted by law, native Hawaiians will be given preference in the selection process, other items being equal.
- The implementation process will include the Implementation Advisory Council, Beneficiary and community involvement and participation in advising the Department and Commission.
- The `Āina Mauna Legacy Program Implementation Advisory Council will be advisory only; the Department will have final decision-making authority.

Initial Immediate Actions

- Form the `Āina Mauna Legacy Program Implementation Advisory Council
- Initiate the first rural-development Homestead Area (on south-eastern part of property)
- Initiate the Humu`ula Sheep Station Adaptive Reuse Plan
- Initiate expanded Ecotourism opportunities
- Initiate use of Remote Accommodations
- Initiate Gorse Eradication (consider all viable gorse eradication opportunities, with commercial timber appearing to be the most viable and beneficial to the Department)
- Investigate and implement additional areas for sustainable koa forestry opportunities
- Initiate a set-aside of portions of the property for restoration and enhancement purposes
- Pasture uses (focused on fire fuel mitigation – additional acreage) around Keanakolu-Mana, Saddle and Mauna Kea Access Roads
- Initiate unmanaged-ungulate eradication over entire property
- Initiate state, federal and private grant applications to support resource restoration
- Initiate Safe Harbor Agreement to address endangered species over the entire property

Some background information, as well as areas of interest that are considered in the preparation of the `Āina Mauna Legacy Program and its implementation, follows:

Natural and Cultural Resources

As noted, the lands at Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. These lands provide a glimpse into the natural environment and native forests which are disappearing throughout the state.

Because of the historic use of the site for sheep and cattle pasture, the vegetation of Humu`ula/ Pi`ihonua is dominated by an understory of exotic pasture grasses over much of the lands. The area serves as valuable habitat to many native and endemic species. The area's proximity on Mauna Kea also makes it a valuable cultural resource.

Koa and `ōhi`a forests are found in the lower portions of Pi`ihonua, especially in the lands adjacent to the Hakalau Forest National Wildlife Refuge. Scattered koa and māmane are found over the northern portions of Humu`ula with scattered māmane found in the upper elevations, especially adjacent to the Mauna Kea Forest Reserve. The māmane forests serve as critical habitat for the palila. Additionally, the koa/`ōhi`a and koa/māmane forests provide habitat for several endangered and threatened native bird species.

In the preparation of the `Āina Mauna Legacy Program, care is taken to retain the focus on the protection, restoration and enhancement of the area's natural and cultural resources.

Rare and Endangered Flora/Fauna

The area is known to have rare and/or threatened flora and fauna. The planning and implementation process considers the habitat, as well as specific species of concern. Some issues of interest include:

- `Āhinahina (Silversword found on upper slopes of Mauna Kea)
- Palila habitat (Special attention is paid to past court cases and management plans that dictate not only management for the population but also on how the bird's habitat is affected.)
- Besides the Palila, the Hawai`i `Ākepa, Hawai`i Creeper, `Akiapōlā`au, `Io, Koloa, Nēnē, and Hawaiian Dark Rumpled Petrel are all found at Humu`ula/Pi`ihonua.
- Besides bird species, the area has the Hawaiian Hoary Bat and the Amastrid land snail
- Bird and habitat corridors have been established to help with habitat conservation.

Safe Harbor Agreements

Because the activities proposed in the `Āina Mauna Legacy Program could affect habitat for threatened and/or endangered plants, birds and animals, it is recommended that a blanket Safe Harbor Agreement be developed and incorporated into the Legacy Program. Since one of the goals of the `Āina Mauna Legacy Program is the restoration of habitat, as well as planting of trees that could attract native birds and bats, the Safe Harbor Agreement can protect DHHL from future impacts to the habitat and the species.

For the `Āina Mauna Legacy Program, Safe Harbor Agreements will be crucial in restoring native forests and in turn native bird populations. In particular the commercial forestry to eradicate gorse program will create an environment friendly to certain bird and bat species. Since the program's goal is to restore the area to native koa forest after the gorse has been eradicated, it is essential that the program be allowed to take proactive management steps which in some cases may cause a temporary loss of habitat for bird species.

Invasive Species Eradication

Hawai`i is in the midst of a growing invasive species crisis affecting the islands' endangered plants and animals, overall environmental and human health, and the viability of its tourism and agriculture based economy … and, our way of life. Fighting invasive species is a critically important priority because it is the single most-effective way to protect Hawai`i's natural resources. The two most critical invasive species to address in the Humu`ula/Pi`ihonua area are gorse and unmanaged-ungulates.

Prevent New Introductions and Control/Eradicate Existing Invasive Plant Species

- Fighting Invasive Species is a critically important priority because it is the single most-effective way to protect Hawai`i's natural resources.
- The control of alien species within the `Āina Mauna region is critical to maintaining the value of forest resources.
- Besides the highly invasive gorse, the `Āina Mauna lands also have unmanaged-ungulates, banana poka, fireweed, various invasive grasses, etc.
- There are several alternatives for Invasive Species Control
    - Physical
        - Grubbing
        - Mulching
    - Chemical
        - Aerial spraying
        - Hand spraying
    - Biological

- Invasive Species Control Maintenance
    - Assessment
    - Prioritization
    - Monitoring
        - Revise management strategy, as appropriate, based on monitoring results.

Gorse

Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. Gorse has become established in extensive stands on the eastern slope of Mauna Kea and the Humu`ula area has suffered from heavy infestations of gorse. The importance of eliminating this plant cannot be overstated.

Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands. Gorse has a life span of 30-40 years while the seed can remain viable in the soil for up to 70-years after that.

The non-profit organization, `Ōiwi Lōkahi o ka Mokupuni o Keawe, currently has a license on 1,000-acres at Humu`ula from DHHL for gorse control work. They have been working on a process in which burning harvested gorse produces carbon. Their studies and research are ongoing.

DHHL field trials and research projects have shown that shade from trees inhibit the ability for gorse to grown and spread. DHHL has planted portions of the perimeter of the Humu`ula/Pi`ihonua lands with trees to establish a boundary to limit the spread of the weed and has entered into various agreements for gorse control and management (chemical, mechanical and/or biological.)

It is anticipated that commercial-scale timber planting will shade the gorse sufficiently to keep it from producing seeds and perhaps kill it, depending on the tree species planted. With normal forestry operations, each year some portion of the seed bank will be removed. Thus, interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. Other viable gorse eradication opportunities can also be considered.

Eucalyptus and Sugi have been proposed because the initial development of these crops in the general area have given rise to increased investment in required infrastructure including marketing analysis and market development efforts by a number of private companies and government agencies. These market development efforts are currently on-going as is the basic supply/demand relationship for these forest crops. Planting trees to eradicate the gorse is a value-added land use - it eradicates the gorse and provides license/lease revenue in the process.

In addition to shading and eventual killing off the gorse, timber harvests can generate cash flow and open the ground for another round of gorse seed germination. Immediately after a timber harvest, gorse seedlings can be controlled with low volume herbicides, followed by another planting of timber. This cycle must be repeated until the majority of dormant gorse seed has germinated. The time estimated for gorse eradication is approximately 100 years due to the estimated 70-years gorse seed remains viable and the growth/harvest cycle of the eucalyptus and/or sugi.

Ultimately, after decades of this interim commercial forestry have effectively cleaned out the gorse and its seed bank, the property will be restored to a native forest. It is important to understand that all suggested tree crops other than koa are designed to initially eradicate and control the gorse then support the eventual reforestation of the land back to a native koa. Eucalyptus and Sugi should be replaced with koa once it has been determined that gorse seed germination is no longer a threat.

Unmanaged-Ungulates

Unmanaged-ungulates (hoofed mammals such as cattle, sheep, pigs, goats, etc.) introduced to Hawai`i are detrimental to Hawai`i's native ecosystems via the damage they inflict on both vegetation structure and composition. Unmanaged ungulates can impact native plants and ground cover, facilitating sediment run-off and the smothering of coral reefs. The soil disturbance caused by rooting ungulates also facilitates the introduction and expansion of invasive plants, and creates breeding grounds for mosquitoes that transmit avian disease to native forest birds. The invasion of non-native species poses one of the greatest threats to Hawai`i's native ecosystems and their inhabitants.

<u>Initiate Unmanaged-Ungulate Eradication over Entire Property</u>

- Unmanaged-ungulates (hoofed mammals such as cattle, sheep, pigs, goats, etc.) introduced to Hawai`i can be detrimental to Hawai`i's native ecosystems via the damage they can inflict on both vegetation structure and composition.
    - Ungulates impact native plants and ground cover, facilitating sediment run-off
    - Soil disturbance caused by rooting ungulates also facilitates the introduction and expansion of invasive plants and creates breeding grounds for mosquitoes that transmit avian disease to native forest birds.
    - Feral Ungulates can have high population growth rates.
    - Feral Ungulates are elusive and can jump or circumvent most existing fences.
- Four main components in successful unmanaged-ungulate population control (primarily sheep, cattle and goats)
    - Establishment of Barriers to Isolate Populations
    - Remove sufficient numbers of animals to prevent unacceptable damage to the land and its resources
    - Barrier Installation, Inspection and Maintenance
    - Vigilance in Monitoring of Animal Population Increase and Ingress
- Methods for Removal of Feral Cattle Populations
    - Given the various types of animals on the site, each type of cattle will need to be dealt with differently
        - New born and nursing mothers - These cattle would need to be kept together until weaned. They could be captured, held until weaned and then transferred to beneficiaries
        - Cattle suitable for ranching - These cattle could be captured and taken directly by beneficiaries for ranching
        - Elderly cattle - These cattle could be taken by beneficiaries and used for food
        - Rogue(un-capturable) cattle - These cattle may need to be shot, depending on their aggressiveness and/or threat to human harm
    - Beneficiaries Capture
    - Professional Capture
    - Professional Eradication
- Implementing unmanaged-ungulate eradication (primarily sheep, cattle and goats) and allowing management of pigs (so long as the resources are protected) will provide food for beneficiaries, reduce the impacts to the forest resources and generate revenue for the Trust
- Ultimately, additional Fencing is required to exclude ungulates from sensitive areas
- Additional Roadways will need to be added for access (also serving as beneficial fire breaks)

Feral ungulates can have high population growth rates, are elusive and can jump or circumvent most existing fences. Control and/or removal of these animals should be a high priority on all lands designated for reforestation in Hawai`i.

Native Hawaiian traditions and historical accounts describe the lands of Humu`ula and Ka`ohe-those areas extending from shore to around the 6,000 foot elevation as having once been covered with dense forests, and frequented by native practitioners who gathered forest-plant resources, birds, and food.

The larger `āina mauna were frequented by individuals who were traveling to the upper regions of Mauna Kea to worship, gather stone, bury family members, or deposit the piko (umbilical cords of new-born children) in sacred and safe areas; and by those who were crossing from one region of the island to another. Because hunting and subsequently ranching of bullocks, cattle and sheep became the primary historic activities on the mountain lands, areas once forested soon became open pasture land.

While the first formal lease of Humu`ula and Ka`ohe was issued in 1857 (Keoni Ana to F. Spencer), it was Samuel Parker and Parker Ranch that held the longest lease on the Humu`ula and Ka`ohe mountain lands.

Since cattle leases expired on these lands in 2002, about one third of the area has little or no cattle present. Important natural resources have begun to show significant recovery in these locations. This recovery is most evident in the mauka and certain makai areas of Humu`ula where feral cattle have been prevented from expanding their range. Giving this land “a rest” after more than 150 years of grazing is beneficial to the landscape by minimizing soil loss and allowing natural processes to recover the area’s productivity.

Mauka areas (7,600 - 8,000 ft elevation) are exhibiting a re-growth of the historic native Hawaiian ecosystem, including māmane, pūkiawe, and other species. Makai and gulch areas up to about the 7,000- foot elevation are seeing a resurgence of koa and natural regeneration of associated species.

Homesteading

The concept is to develop the first rural-development Homestead Area for DHHL beneficiaries in the south-eastern portion of the property. Preliminary design concepts call for a subdivision layout encompassing approximately 1,000-acres with a total of approximately 100 to 200-homesteads sites and other community uses.

<u>Layout</u>

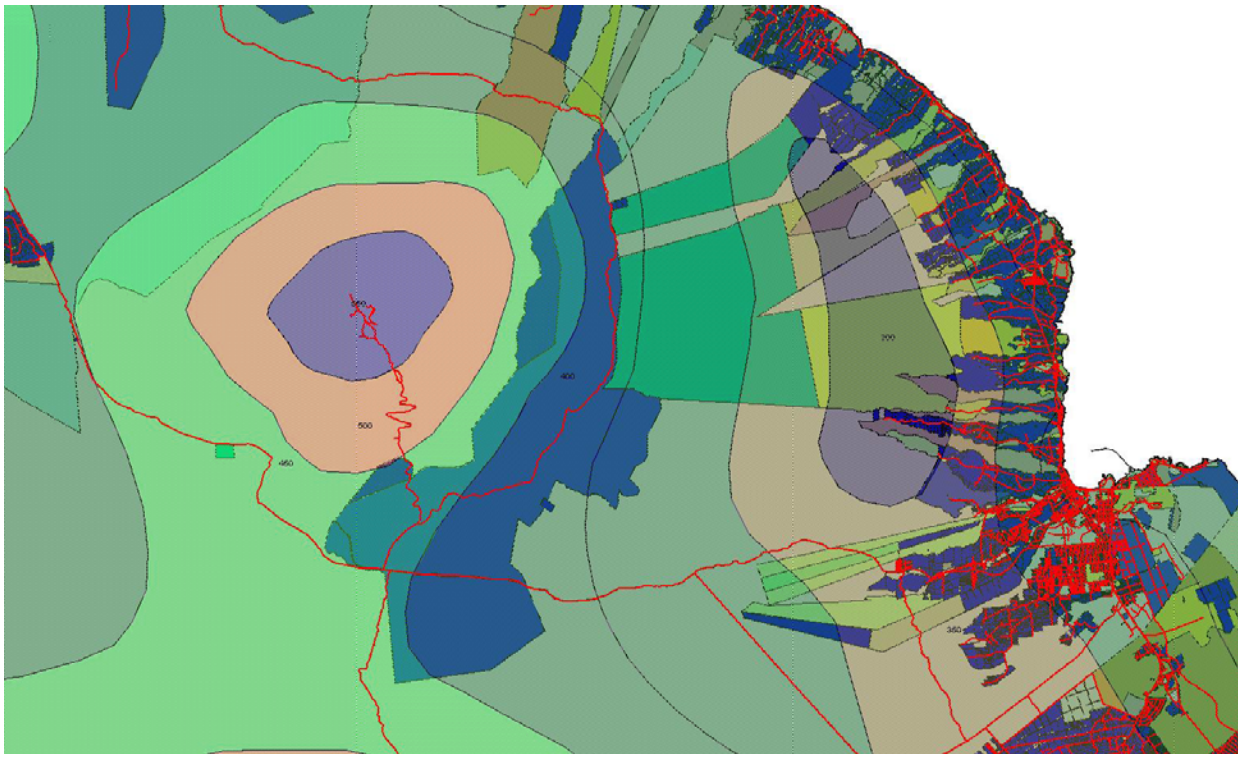
To take advantage of opportunities to further demonstrate the focus on efficient, self-sustainable communities, as well as provide for cost-effective development, the Legacy Program considers a variety of rural-development homestead layouts to address various beneficiary needs: Cluster homestead sites with separate agricultural/pasture lot, Cluster homestead sites with community agricultural/pasture, homestead lot subdivision or a Combination of alternatives.

It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming.

First Rural-Development Homesteads within Initial Homesteading Area

- The Initial Homesteading Area is situated on the south-eastern portion of property
- Approximately 4,500-acres are identified for homesteading in the Initial Homesteading Area, broken down as follows:
    - Approximately 1,000-acres are identified to be the First Rural-Development Homestead
    - An additional 1,000-acres are available for subsequent homesteading
        - This site is identified for interim pasture use prior to homesteading
    - An additional 2,500-acres are identified for subsequent homesteading
        - This site is identified for sustainable koa forestry prior to homesteading
- Characteristics of the First Rural-Development Homestead
    - A total of approximately 100 to 200-homesteads sites with a variety of possible development layouts:
        - Cluster homestead sites with separate agricultural/pasture lot
        - Cluster homestead sites with community agricultural/pasture
        - Homestead lot subdivision
        - Combination of alternatives
    - Limited overall slope on this portion of the site – it is relatively-level, compared to the balance of the property
    - The property has frontage/accessibility to Saddle Road
    - Accessibility from existing former ranch roads
    - Situated at the 80-inch mean annual rainfall contour
    - Situated within 400 – 450 Cal/cm2 solar radiation contour (4.6 – 5.2 peak sun hours)
- In order to make the development economically feasible, it is envisioned to be a rurally developed homestead area
    - Roads would remain unpaved (natural base, cinder surface)
    - Water source would be by catchment only
        - Fog drip catchment augmentation
    - Septic tanks, leach fields and/or, where appropriate, composting toilets for waste disposal
- Alternative Energy Component (Consistent with DHHL's Energy Policy)
    - Photovoltaic electrical power (with battery and generator back-up)
    - Solar hot water heating
    - Gray-water re-use
    - Water catchment
        - Fog drip catchment augmentation
    - Wind for electrical power, where appropriate
- Humu`ula is a unique environment that historically has had limited settlement. It is important that beneficiaries are made aware and understand the advantages and disadvantages of living in this area. It is not clear what the demand will be for these types of homesteads.
    - The homestead sites and area will be rurally-developed with limited infrastructure (cinder roads, catchment water, photovoltaic, septic/composting toilets, etc)
    - The area is relatively isolated from employment, schools, shopping and other DHHL communities
- Demand and interest for the first Rural-Development Homestead area and the availability of funds for needed infrastructure need to be taken into consideration.
- Subsequent homestead development may occur depending on demand, costs and policy relative to the overall use of the site.

In order to make the development economically feasible, it is envisioned to be a rurally-developed homestead area in which roads would remain unpaved (cinder), and water would be catchment only (DHHL has installed two catchments at Humu`ula and successfully tested this concept.) Septic systems and leach fields, and, where appropriate, composting toilets would be used for waste disposal. And basic electrical and telecommunications would be available.



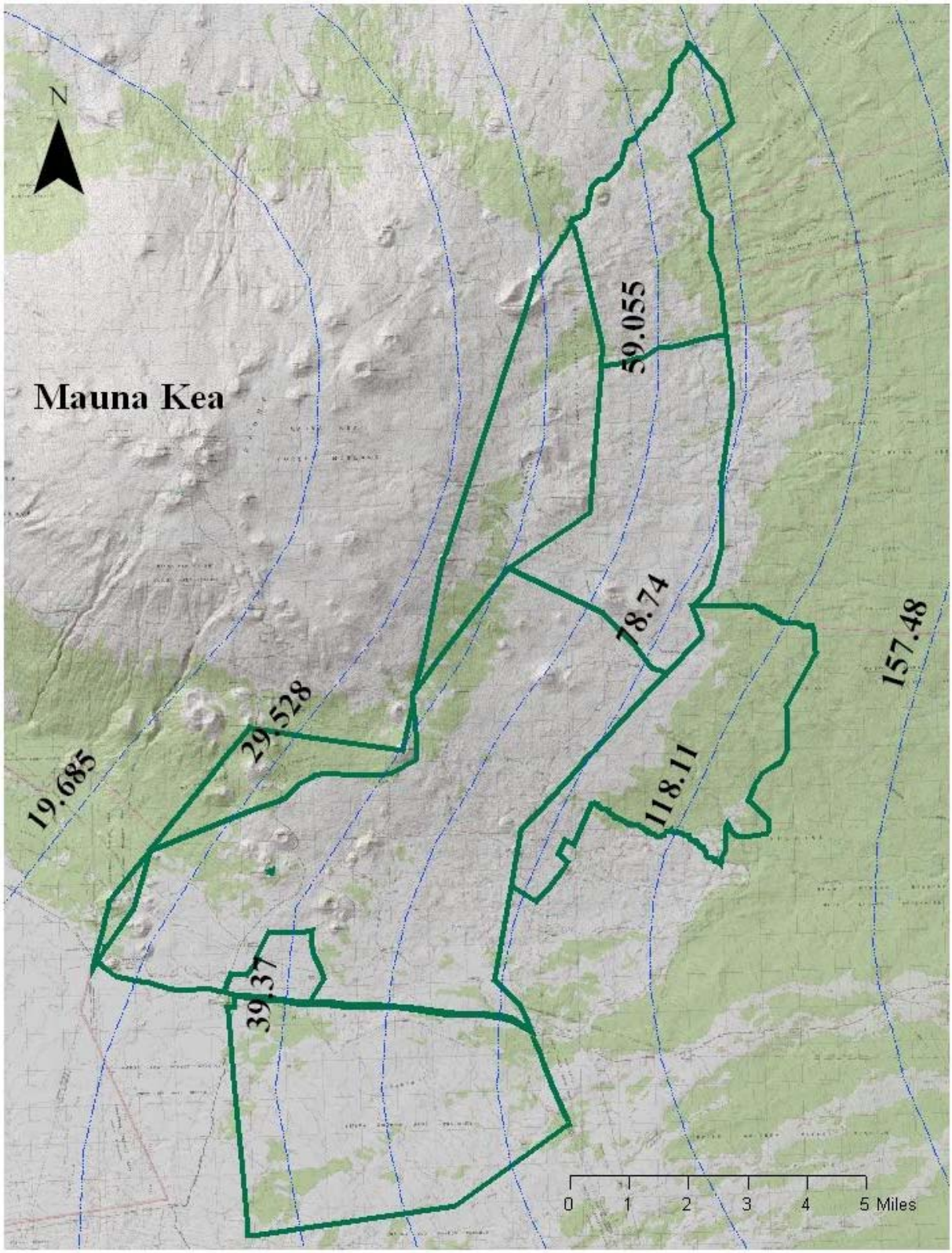
Solar Radiation Map of `Āina Mauna Region

Energy Unit Conversion Table

600	**calories per square centimeter**	**=**	**2200**	**Btu per square foot**	**=**	**7**	**peak sun hours**
550	calories per square centimeter	=	2000	Btu per square foot	=	6.4	peak sun hours
500	**calories per square centimeter**	**=**	**1800**	**Btu per square foot**	**=**	**5.8**	**peak sun hours**
450	calories per square centimeter	=	1700	Btu per square foot	=	5.2	peak sun hours
400	**calories per square centimeter**	**=**	**1500**	**Btu per square foot**	**=**	**4.6**	**peak sun hours**
350	calories per square centimeter	=	1300	Btu per square foot	=	4.1	peak sun hours
300	**calories per square centimeter**	**=**	**1100**	**Btu per square foot**	**=**	**3.5**	**peak sun hours**
250	calories per square centimeter	=	900	Btu per square foot	=	2.9	peak sun hours

Cal/cm2 times 3.688 gives Btu/ft2 . Cal/cm2 times 0.0116 gives peak sun hours.

The following map shows the property's opportunity for rainwater catchment.



Median Annual Rainfall Gradients (inches)

Although planning would begin immediately, full build out may not occur for several years. Additionally demand and interest for the agricultural homestead lots and the availability of funds for needed infrastructure would also need to be taken into consideration. Subsequent homestead development may occur depending on demand, costs and policy relative to the overall use of the site.

The `Āina Mauna Legacy Program incorporates several opportunities for homesteading across the entire landscape of the Humu`ula/Pi`ihonua lands. The bulk of the homestead opportunities are anticipated to be phased in once the land has been restored to productive use. This area includes the significant portions of the site that are proposed for sustainable koa restoration.

These forested areas also provide DHHL with an option for future agricultural homesteading. Once the koa restoration is accomplished, DHHL will have the opportunity to consider creation of agricultural homesteads using forestry for beneficiaries. The commercial koa forest management operations can continue, with the DHHL and beneficiaries benefitting directly from the commercial sale of koa or homesteads could be within the forested areas.

Similar to many present-day homesteaders having ranches associated with their homesteads or area for agricultural use associated with homesteads, with the restoration and management of the forest here, future homesteaders may incorporate the management of koa forest into their homesteads.

Ultimately, decision-makers decades from now may decide whether this is appropriate or not – once the forest is restored. The suggestion is that the Legacy Program expands future options, opportunities and choices for homesteading.

Pasture Uses (Consistent with Fire Plan – Additional Acreage)

A portion of the site could accommodate cattle; per the DHHL Fire Plan, cattle or other grazers may also be utilized as a cost effective way to reduce fuel load in approved areas and under strict management guidelines to avoid conversion from one undesirable fuel to another, e.g. tall grass to gorse.

Site evaluation indicates ideal grazing areas south of the gorse infestation and along Keanakolu Road where fuels would be reduced, gorse movement would be minimized, best animal units per year (AUY's) exist, and natural recovery of adjacent lands could continue.

Cattle can serve as beneficial tools in controlling fire fuels, particularly in areas where people frequent – primarily fronting and along roads. Recommended areas for the reintroduction of managed cattle is along the Saddle Road, Mauna Kea Access Road and Keanakolu Road.

Along these road corridors, therefore, are areas at greatest risk from heavy fuels being ignited by a careless visitor. The rest of Humu`ula/Pi`ihonua Mauka is much less at risk because of its limited access and DHHL's no hunting policy. In short, most fires are started by humans and the limited human presence at Humu`ula greatly reduces the risk.

Wildfire can quickly destroy important yet fragile assets of DHHL's lands. The Humu`ula and Pi`ihonua Mauka areas are especially vulnerable because of their remoteness, and the flammable fuel types found there. The closest public fire station is located in Hilo 25 miles away. The prevention of wildfires is of the upmost importance if homesteading is to take place in this area. Thus, one way to help control wildfire fuels is through pasturing in selected areas.

Pasture Uses around Keanakolu-Mana, Saddle and Mauna Kea Access Roads (Additional Acreage)

- Pasture Use - Interim Use
    - Interim pasture use is proposed in the Initial Homesteading Area (in the south-eastern portion of the property)
    - Approximately 1,000-acres are available for interim pasture use
    - This land is ultimately proposed for homesteading in the Initial Homesteading Area, however, while the homesteads are planned and awaiting development, in the interim, this land can be used as pasture
- Pasture Use
    - Approximately 4,000-acres are designated for additional acreage pasture use
    - Additional acreage pasture use is generally along portions of road ways (Saddle, Mauna Kea Access, Keanakolu/Mana)
    - Additional acreage pasture use could also be in the form of Community Pasture

Dispositions of Homestead and Pasture Leases, Licenses and/or RPs

- Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management.
- These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses
- While the Homestead lots will be rurally-developed because of the area's remote location and lack of traditional infrastructure, the cost of development is likely to be significant and beyond the scope and capacity for the remaining revenue-generating opportunities proposed on the property.

Forests and Forestry Uses on the Site

"Forest" and "Forestry" are used in various contexts in this report. At various places, "Native Forest Restoration", "Commercial Timber to Fight Gorse" and "Sustainable Koa Forestry" are referenced. Each references different aspects of dealing with forests and forest products.

The foundation of the `Āina Mauna Legacy Program is the protection and restoration of the DHHL lands at Humu`ula/Pi`ihonua for future generations. After 150-years of sheep and cattle ranching, the formerly dense forest became significantly altered by these activities and the forest landscape was converted primarily to open pasture land. In order to be consistent with the `Āina Mauna Legacy Program's Mission, Goals and Priority Issues, certain areas of the site need to be converted out of pasture and returned and restored to forest.

The forest restoration and enhancement can take on a variety of complementary focuses, including:

- Commercial non-native tree species (i.e. eucalyptus, sugi, etc.)
    - As noted previously, DHHL field trials have shown that shade from trees inhibit the ability for gorse to grow and spread. DHHL has planted portions of a gorse containment area perimeter with trees to establish a boundary for limiting the spread of gorse.
    - It is anticipated that commercial scale timber planting will shade the gorse sufficiently to keep it from producing seeds and that each year some portion of the seed bank will be

removed. Thus, timber planting can serve both as a gorse eradication mechanism, as well as an income generator.
    - The harvest of the timber in approximately 20-40 years would generate cash flow and open the ground for another round of gorse seed germination. The planting of eucalyptus/sugi seedlings immediately after harvest is recommended to reduce the possibility of a re-infestation of gorse. This cycle must be repeated until the majority of dormant gorse seed has germinated. The time estimated for gorse eradication is approximately 100 years due to the estimated 70-years gorse seed remains viable.
    - Ultimately, after decades of commercial forestry have effectively cleaned out the gorse and its seed bank, the property can be considered for restoration to a native forest.
    - It is important to understand that all suggested crops other than koa are designed to initially eradicate and control the gorse then support the eventual reforestation of the land back to a native koa. Eucalyptus and Sugi should be replaced with native koa where possible once it has been determined that gorse seed germination is no longer a threat.
    - Other viable gorse eradication opportunities can also be considered.

- Commercial and non-commercial native tree species (i.e. Koa)
    - DHHL has already implemented a koa salvage and reforestation program at Humu`ula. Likewise, DLNR has conducted a study on its neighboring land and is considering a like program. Each target dead and/or dying koa and allow contractors to enter the property and harvest the koa. The DHHL koa salvage and reforestation program seeks to:
        - Salvage koa trees before they are further reduced in value by weather, rot, and age, leaving certain trees for wildlife habitat and on-site seed production;
        - Promote forest-based economic opportunities in the community;
        - Generate income for DHHL;
        - Promote koa regeneration from existing seed present in the soil;
        - Provide a source of koa wood for Hawai`i's forest industry

The Legacy Program also considers an evaluation of the different forestry-related projects and project types which are currently interested in land at Humu`ula, as well as an evaluation method for assessing the pros and cons to each project type. Ultimately DHHL will need to evaluate which project best fits with the objectives and goals of the `Āina Mauna Legacy Program.

Native Forest Restoration

Due to the nature and condition of various portions of the property, certain areas are recommended for protection, restoration and enhancement as biodiverse, healthy native forests. The Native Forest is more than just trees; it includes the various ferns and other levels of understory, mosses, etc. making up a biodiverse ecosystem and habitat of various insects, plants and animals.

<u>Native Forest Restoration</u>

- The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust.
- Based on soil, elevation, and rainfall characteristics, there are an estimated 17,800-acres in Humu`ula and adjacent Pi`ihonua mauka that could be restored back to a healthy, diverse native koa and `ōhi`a forest ecosystem.

- Likewise, there are approximately 10,000-acres across the mauka portions of the property that can be restored to māmane forest, a critical Palila bird habitat.
- There are strong recommendations to enhance and restore various areas in the overall property because of their importance as habitat, biodiversity and condition (and ability to restore) as native forest.
- The setting aside, protection and restoration of these areas is critical for the protection, restoration and enhancement of `Āina Mauna.
- Wildlife corridors help provide a contiguous habitat from the lower koa forest to the higher elevation māmane forest to facilitate the migration of native forest birds between these habitats.
- Additional Fencing, excluding and removing ungulates, would allow existing trees to produce and maintain root shoots and basal sprouts, thereby increasing foliage and subsequent tree processes.
- Centralized plant propagation, staging and storage facilities will be located at Kanakaleonui Bird Corridor and north of Pu`u `Ō`ō. These propagation centers will be used for both the native forest restoration and sustainable koa forests.
    - These propagation centers will be used for both the native forest restoration and sustainable koa reforestation, as well as include structures for overnight accommodations, offices, laboratories and storage for workers.
- Develop seed stock for native forest restoration activities.
    - Partner with the DLNR Tree Nursery, U.S. Fish & Wildlife Service Hakalau Forest National Wildlife Refuge, and other native plant propagation centers.
- Replanting efforts would focus on a mosaic of 'islands' using combinations of native plants grouped together (for example, pūkiawe, pilo, `a`ali`i and `ohelo may be planted together) that will grow outward until they all connect into one diverse native forest.
    - Koa (makai areas) and māmane (mauka areas) trees would then be planted around the existing shrubs so that they can utilize the beneficial traits of the 'islands.'
- Herbicides are a useful tool for controlling the spread of weed and grass populations such as banana poka, gorse, and kikuyu grass.
- Continued research is necessary to effectively evaluate the various experimental methods of out planting. Experimental plots should be established to be used for this research.
- The restored, healthy native forest provides a variety of benefits and opportunities to beneficiaries through gathering, cultural practices and opportunities to see and understand native forest ecosystems.
- The site (with restoration to healthy native forest) provides beneficiaries cultural practices access as the only site of this type in the Hawaiian Home Lands Trust inventory.

The Biological and Vegetation Sensitivity Analysis Reports (included in the 1997 Humu`ula/Pi`ihonua Master Plan Appendices) delineate areas containing endemic faunal and botanical sensitivity within the Humu`ula/Pi`ihonua area. They were used to identify priority portions of Humu`ula and Pi`ihonua for restoration. The assessments give brief descriptions of each area and outline the endemic resources that should be factored into any programming of the area.

The areas for restoration and enhancement are:

- `Āinahou Young Lava Flows - Nēnē Habitat
- West of Mauna Kea Access Road - Māmane-Naio Forest -Palila Habitat
- Upper Pi`ihonua -`Ōhi`a-Koa Forest -Biodiverse Native Forest

- Kahinahina - Māmane Forest -Palila Habitat
- Kanakaleonui Bird Corridor - Koa-Māmane Forest -Native Bird Link to Forest Areas
- Keanakolu Māmane Forest
- Wailuku River headwaters and drainage

These strong recommendations to enhance and restore various areas of the overall property to Native Forest are made because of their importance as habitat, biodiversity and condition (and ability to restore) as native forest. The setting aside of these areas is critical for the protection, restoration and enhancement of the `Āina Mauna.

It is the intent of this recommendation that the areas conserved as Native Forest are not commercially harvested and are left as biodiverse habitat, areas for gathering and opportunities for ecosystem services: provisioning, such as the production of food and water; regulating, such as the control of climate and disease; supporting, such as nutrient cycles and crop pollination; cultural, such as spiritual and recreational benefits; and preserving, which includes guarding against uncertainty through the maintenance of diversity.

As a means to assist in the funding of the restoration and enhancement of these areas, the department may negotiate long term and/or permanent conservation easements and/or leases with various entities.

Gorse Eradication – Recommended Method Using Commercial Timber

DHHL field trials have shown that shade from certain trees inhibit the ability for gorse to grow and spread and DHHL has planted portions of the perimeter of the Humu`ula/Pi`ihonua lands with trees to establish a boundary (containment area) to limit the spread of gorse.

<u>Initiate Gorse Eradication Utilizing Commercial Timber</u>

- Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i
- Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands.
- Gorse has a life span of 30 to 40-years while the seed can remain viable in the soil for up to 70-years after that.
- DHHL field trials and research projects have shown that shade from trees inhibit the ability for gorse to grown and spread.
- It is anticipated that commercial-scale timber planting will shade the gorse sufficiently to keep it from producing seeds and perhaps kill it.
- With normal forestry operations, each year some portion of the seed bank will be removed.
- Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator.
- Eucalyptus and Sugi have been proposed because the initial development of these crops in the general area have given rise to increased investment in required infrastructure including marketing and market development efforts by a number of public and private entities and field trials have demonstrated their effectiveness.

- The recommendation is to solicit proposals for a timber license for the planting and harvesting of commercial non-native tree species (i.e. eucalyptus, sugi or other) that will first serve to fight the gorse, but will also provide valuable wood products for a variety of uses which can include:
    - Lumber
    - Wood chips
    - Veneer
    - Forest products
    - Biomass for alternative energy opportunities (liquid fuel and electricity)
- DHHL would retain rights to any Carbon Credit opportunities
- Eucalyptus, sugi or others trees as selected to control and eradicate the gorse; once the gorse eradication process is well underway, the area is to be reforested back to a native koa.
- Other viable gorse eradication opportunities can also be considered.

It is anticipated that commercial scale timber planting will shade the gorse sufficiently to keep it from producing seeds and that each year some portion of the seed bank will be removed. Thus, timber planting can serve both as a gorse eradication mechanism, as well as an income generator.

Unfortunately, native trees (such as koa and `ōhi`a) do not have sufficient canopy to effectively shade and kill the gorse. So, the planting of eucalyptus/sugi seedlings is recommended to assist in eliminating the gorse and reducing the possibility of a gorse re-infestation. Due to the estimated 70-years gorse seed remains viable, planting/harvesting rotations must be repeated until the majority of dormant gorse seed has germinated. The time estimated for gorse eradication is approximately 100 years.

It is important to understand that all suggested crops other than koa and `ōhi`a (i.e. eucalyptus and sugi) are designed to initially control and eradicate the gorse then support the eventual reforestation of the land back to native koa. Eucalyptus and Sugi should be replaced with koa once it has been determined that gorse seed germination is no longer a threat.

<u>`Ōiwi Lōkahi o ka Mokupuni o Keawe – Gorse to Charcoal Demonstration Project</u>

In addition to the proposed Gorse Eradication Utilizing Commercial Timber called for in this `Āina Mauna Legacy Program, there is another gorse eradication effort that has been initiated by `Ōiwi Lōkahi o ka Mokupuni o Keawe. It is expected that both activities will operate on the property, as each is distinct from the other, and there is no apparent conflict in both continuing.

The site involves a portion of Laumai`a II, a portion of Tax Map Key (3) 3-8-001-007 and contains an overall land area of one thousand (1,000) acres. According to the DHHL License Agreement, the Licensee may not use the premises for any purpose other than strictly to conduct a research and development project using the invasive gorse shrub. No other uses shall be permitted, including grazing rights to demonstrate gorse controlled by livestock. However, the uses may be modified from time to time with the approval of the Chairman of the Hawaiian Homes Commission.

As envisioned, a processing facility will be installed within the 256-acre demonstration area, which is part of the 1,082-acre Laumai`a II pasture paddock. Alternate strips of gorse, on contour and approximately 15 acres each in size, will be harvested to minimize erosion while providing enough gorse to demonstrate the feasibility of the project. If successful, the remaining strips will then be harvested when the grass has grown back. It is expected that up to 3 acres per day will be harvested, requiring about 49 working days, or 2 months to complete all initial harvest blocks.

According to the `Ōiwi initial request, there is no anticipated conflict between the `Ōiwi proposed activity and DHHL's gorse control and reforestation projects. Likewise, it is not anticipated that the `Ōiwi activities will negatively conflict with the proposed Gorse Eradication Utilizing Commercial Timber proposed in this `Āina Mauna Legacy Program.

Sustainable Koa Forestry

DHHL believes that the Humu`ula/Pi`ihonua lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries, in perpetuity.

Most have noted that the expanding commercial forestry industry on the Big Island requires a critical mass of forest production and processing, as well as the appropriate investment for forestry management. Another recommendation is the establishment of commercially sustainable koa forest management areas.

<u>Koa Reforestation – Sustainable Koa Forest</u>

- A restored sustainable koa forest provides several opportunities and options for future decision-making by DHHL.
    - A sustainable koa forest would provide jobs and generate income to the DHHL trust.
    - Once a sustainable koa forestry operation is in place, portions of the property could be considered for future agricultural (sustainable koa forested) homestead opportunities, affording homesteaders a sustainable koa forest as a part of their homestead.
- Koa is one of the predominant tree species found naturally in the Humu`ula/Pi`ihonua lands.
    - It is presently the highest value timber crop in Hawai`i.
    - It grows easily and well in this area if introduced ungulates are removed.
    - Restoring the Humu`ula/Pi`ihonua lands to koa through carefully planned and managed reforestation is its highest and most compatible economic use.
- Based on soil, elevation, and rainfall characteristics, there are an estimated 10,000 acres in Humu`ula and adjacent Pi`ihonua mauka that could be restored and managed under a sustainable koa forest harvesting regime.
- Sustainable Koa Forestry Opportunities can take on two distinct actions.
    - The first is the salvaging of current koa trees.
    - The other is the planting and harvesting of koa as a tree crop.
- At Humu`ula, from 2003 to 2005, approximately 100-acres of koa salvage harvest created five full time jobs, supplied enough koa wood to meet the annual needs of at least 60 woodworkers and generated an average of $3,500 per acre per year in trust revenues.
- Centralized plant propagation, staging and storage facilities will be located at Kanakaleonui Bird Corridor and north of Pu`u `Ō`ō. These propagation centers will be used for both the native forest restoration and sustainable koa forests.
    - These propagation centers will be used for both the native forest restoration and sustainable koa reforestation, as well as include structures for overnight accommodations, offices, laboratories and storage for workers.
- Develop koa seed stock for koa forest restoration activities.
    - Partner with the DLNR Tree Nursery, U.S. Fish & Wildlife Service Hakalau Forest National Wildlife Refuge, and other native plant propagation centers.

- Research in Hawai`i has shown that the exclusion of ungulates from native forest areas, in combination with viable and present seed sources, can result in the natural regeneration of several native species within a few years.
- Additional Fencing, excluding and removing ungulates would allow existing trees to produce and maintain root shoots and basal sprouts, thereby increasing foliage and subsequent tree processes.
- Herbicides are a useful tool for controlling the spread of weed and grass populations such as banana poka, gorse, and kikuyu grass.
- Continued research is necessary to effectively evaluate the various experimental methods of out planting. Experimental plots should be established to be used for this research.

Koa forest restoration, with the focus on sustainable commercial forestry management practices, can be very lucrative. Management of DHHL lands as koa forests combines high quality hardwood returns from the sale of koa wood, eco-tourist opportunities as the forest is restored, and cultural uses such as gathering, and canoe logs.

DHHL has already implemented a koa salvage and reforestation program at Humu`ula. Likewise, based on soil, elevation, and rainfall characteristics, there are an estimated 15,000 to 20,000-acres on the site that could be restored and managed as koa forest. Many of these lands are currently covered in gorse and would require a long term commitment to restoration and conversion of multiple rotations of eucalyptus and/or sugi prior to conversion to koa.

A sustainable koa reforestation program will: Promote forest-based economic opportunities in the community; Generate income for DHHL; Promote koa regeneration from existing seed present in the soil; and Provide a source of koa wood for Hawai`i's forest industry.

A restored sustainable koa forest provides several opportunities and options for future decision-making by DHHL. Portions could be restored to biodiverse Native Forest, large-scale commercial koa harvesting could take place, or portions of the property could be divided into homesteads, affording homesteaders the opportunity to include sustainable koa harvest as a part of their homestead.

Self-sustaining Funding with Reinvestment into the Property

One of the central focuses of the `Āina Mauna Legacy Program is that the activities and programs implemented need to be economically self-sustaining, with the goal to reinvest the revenue into the management of the property. In considering revenue generation, several opportunities exist:

<u>Use of Humu`ula Sheep Station – Commercial Activities</u>

Three alternatives were suggested for the Humu`ula site. The alternatives consider different phases (starting with a modest effort and expanding incrementally over time,) as well as different outcomes (i.e. an operator may choose to start with a highly capitalized project, rather than taking a more gradual approach.)

The `Āina Mauna Legacy Program takes into account its historical, architectural and cultural importance. The Reuse Plan also suggested the redevelopment of the property into a Lodge. Likewise, the facility could be considered for a variety of uses and serve as a base/focal point for ecotourism, events, education, staging, retreats, gatherings, meetings, etc.

Initiate the Humu`ula Sheep Station Adaptive Reuse Plan

- The objective of initiating the Humu`ula Sheep Station Adaptive Reuse Plan is to solicit qualifications and proposals from parties interested in leasing and redeveloping the Humu`ula Sheep Station (15+/- acres).
- The adaptive reuse plan proposes a mix of land uses, wherein the property is divided into three principal sub-areas:
    - Historic/Community Center (5.5 to 6.0-acres)
    - Open Campground (2.0 to 2.5-acres)
    - Commercial (7.0 to 8.0-acres), including retail, recreational, lodgings and restaurant activities appropriate to a transient or visitor market.
- Set-aside of a Staging Area for eco-tourism activities that occur over the remainder of the Humu`ula/Pi`ihonua site
- Base facility for Legacy Program implementation staff
    - Accommodations
    - Office
    - Storage
    - Possible field worker facility and related improvements/infrastructure

<u>Forest Products and Biomass for alternative energy opportunities (liquid fuel and electricity)</u>

Several forestry products and alternative energy producers have been identified as possible users of large scale areas for forestry development. Some of these have recently requested use and leasing of nearby State lands for these purposes. To fully implement this opportunity, it is important that forestry operations at Humu`ula attempt to capture all possible value from planted trees, such as veneers, lumber, wood chips, biomass for energy and carbon off-set/credits.

Carbon Offsets/Credits are a key component of national and international emissions trading schemes that have been implemented to mitigate global warming. Credits can be exchanged between businesses or bought and sold in international markets at the prevailing prices.

<u>Ecotourism and Recreation Use</u>

Ecotourism and recreation related activities, a growing sector of the island's visitor industry, have great potential here due to the natural resources of these lands. Other than providing an area, such as the Humu`ula Sheep Station, to service and manage these activities, these uses and activities could be integrated and managed within other proposed economic uses. The Humu`ula Sheep Station may serve as a central site to coordinate eco-tourism activities over the property.

Initiate Expanded Ecotourism Opportunities

- Ecotourism and recreation related activities, a growing sector of the island's visitor industry, have great potential due to the natural resources of these lands.
- Eco-tourism uses typically have a small footprint and limited impact
    - Ecotourism can provide a valuable economic use for an area, which, until now, has not been utilized to its full potential and which do not require permanent structures or impact.

- Other than providing a staging area, such as the Sheep Station area to service and manage these activities, these uses and activities could be integrated and managed across the remainder of the landscape and within other proposed uses.
- The potential eco-tourism uses and activities include:
    - Biking Tours
    - Bird Watching Tours
    - Camping
    - Lodge
    - Hiking Tours
    - Horseback Tours
    - Wilderness Resort
    - Guest Ranch
    - Historical Tours
    - Nature Tours
    - Volunteer "Service" Trips
- In order to help assure that the activities are respectful, careful and safe, operators will have to:
    - Adhere to required procedures/equipment protocols
    - Include volunteer "service" trip components to augment the reforestation and invasive species control activities
    - Incorporate cultural, natural resources and safety briefing to guests
    - Incorporate cultural, natural resources and safety employee/volunteer training program

Initiate Use of Remote Accommodations

- The property has existing and can accommodate additional ranch houses, cabins and other Remote Accommodations
- Use of Remote Accommodations cover a small footprint on the overall landscape and have limited impact on the resources, but provide opportunities for necessary funds for the self-sufficient operations of the Legacy Program.
- The former Pu`u `Ō`ō ranch headquarters and the Kanakaleonui cabin (or others that could be constructed), can provide a series of locations for overnight accommodations, retreat, ecotourism uses, etc.
    - One option is to solicit operators to lease a package that includes a staging area at the Humu`ula Sheep Station with one or more remote sites.
        - These sites would be especially attractive if developed in conjunction with existing and new trails for hikers, bicyclists and/or horseback riders who could then travel from cabin to cabin.

Disposition of Commercial Licenses/Leases Based on Broad Request for Proposal Process

- One of the central focuses of the `Āina Mauna Legacy Program is that the activities and programs implemented need to be economically self-sustaining, with the goal to reinvest the revenue into the management of the property.
- In considering revenue generation, several opportunities exist:
    - Forest Products
    - Biomass for alternative energy opportunities (liquid fuel and electricity)
    - Sustainable koa harvest

  - Reservation of carbon offsets/credits for the benefit of DHHL
  - Use of Humu`ula Sheep Station – Commercial Activities
  - Ecotourism and Recreational Use
- Since many of the recommended activities are commercial in nature (i.e. not for the individual benefit of a particular beneficiary,) it is recommended that DHHL implement these activities through a broad Request for Qualifications (RFQ) and Request for Proposals (RFP) process.
  - DHHL has the responsibility to look for the best qualified applicants (background, experience, financial capability, business plan, etc.) that can fulfill the Trust's needs at a reasonable price.
  - Likewise, as a State agency, DHHL is obligated to follow state procurement laws.
  - The suggestion of using a broad RFQ/RFP process in the procurement of services for the commercial enterprises does not in any way limit the opportunity for beneficiaries to be involved in the process.
  - To the extent permitted by law, native Hawaiians will be given preference in the selection process, other items being equal.

State and Federal Grant Opportunities

- Initial, preliminary listing of possible options for funding:
  - Conservation Resource Enhancement Program (CREP)
  - Partners for Fish and Wildlife
  - Wildlife Habitat Incentives Program (WHIP)
  - State Forest Stewardship Program (FSP)
  - Watershed Partnership Program (Mauna Kea Watershed Alliance)
  - Army Compatible Use Buffers Program
- Due to limitations in Federal regulations, Na Kupa`a O Kuhio should be considered to take advantage of Federal funding opportunities
- Seek separate earmarked funds through State and Federal funding sources

Education and Research Opportunities

The implementation of the `Āina Mauna Legacy Program offers the opportunity for others to visit and experience the natural and cultural resources of the Humu`ula/Pi`ihonua region and provide formal and informal educational opportunities for children and adults to:

- Connect people with the world around them
- Have hand's on experiences in a healthy Hawai`i native forest
- Foster awareness, appreciation and understanding of Hawai`i and its natural and cultural environment
- Encourage wise stewardship of precious Island ecosystems
- Provide a unique and educational experience for visitors to the Islands
- Document the successes and failures of land management activities via formal research

The educational programs consider involvement and participation with native Hawaiian immersion charter schools, other organized public and private educational entities, as well as partnerships with existing private non-profit entities such as Tropical Reforestation and Ecosystems Education (TREE), The Nature Center, and Hawai`i Forest Institute (HFI).

Education

- Mandatory `Āina Mauna Cultural, Natural Resources and Safety Briefings for all guests and contractors
- Separate Employee Training on Cultural, Natural Resources and Safety concerns
- Separate Volunteer Training on Cultural, Natural Resources and Safety concerns
- Invasive Species Control Program
- Educational Materials/Outreach
- Through Extensive Outreach efforts, Generate Community Awareness and Support
- Creation and maintenance of `Āina Mauna Legacy Program Website
- Incorporate Beneficiary involvement and participation in outreach and education efforts

`Āina Mauna Legacy Program Implementation Advisory Council

As an integral part of the implementation of the `Āina Mauna Legacy Program, the Legacy Program includes the formation of an Implementation Advisory Council (`Āina Mauna Legacy Program Implementation Advisory Council) to provide advice and recommendations to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands regarding the implementation of the `Āina Mauna Legacy Program.

`Āina Mauna Legacy Program Implementation Advisory Council Membership

- Thirteen Council members: (consensus discussion/decision making)
    - Three DHHL beneficiary lessees, licensees or permit holders from Hawai`i Island
    - Three native Hawaiian representatives (including at least one kupuna) with experience or knowledge regarding native Hawaiian subsistence, cultural, religious or other activities
    - One DHHL beneficiary representative presently on the applicant waiting list
    - Two representatives from the science community with experience specific to forest management, native flora and fauna, and/or any other scientific discipline
    - Two representatives from environmental and/or conservation organizations
    - One representative from the eco-tourism industry
    - One representative from the community with experience in education and outreach
- Three facilitator/commission members:
    - The Legacy Program implementation facilitator who shall also serve as the Convener and Chair of the Council
    - The East Hawai`i and West Hawai`i Commissioners on the Hawaiian Homes Commission
- The implementation process will include the Council, Beneficiary and community involvement and participation in advising the Department and Commission.
- The `Āina Mauna Legacy Program Implementation Advisory Council will be advisory only; the Department will have final decision making authority.

The Council can draw on the expertise of its members and other sources in order to provide advice. Council members shall serve as liaisons between their constituents and/or communities, keeping the Hawaiian Homes Commission and the Department of Hawaiian Home Lands informed of issues and concerns, as well as performing outreach to their respective communities on behalf of the `Āina Mauna Legacy Program.

The Council may serve as a forum for consultation and deliberation among its members and as a source of consensus advice to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands. Such consensus advice shall fairly represent the collective and individual views of the Council members.

The Council does not have the authority to perform operational or management functions, or to make decisions on behalf of Hawaiian Homes Commission and/or the Department of Hawaiian Home Lands. The Council will be advisory only; the Department will have final decision making authority.

Leader and Model

The effort of preparing and implementing the `Āina Mauna Legacy Program can serve as a model to others for appropriate ecosystem restoration and enhancement, involvement of partnerships and self-sustaining approaches to land management. The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. These lands provide a glimpse into the natural environment and native forests which are disappearing throughout the state.

The area serves as valuable habitat to many native and endemic species. The area's proximity to Mauna Kea also makes it a valuable cultural resource. These lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries in perpetuity.

There is a commitment to restore the site to a natural, healthy state; it is a process that will take considerable effort, time and money to complete. Accomplishing this, the Legacy Program and its implementation may serve as a leader and model to others across the State of Hawai`i.

`Āina Mauna Legacy Program Outreach Activities

Hawaiian Homes Commission Informational Workshops (public meeting):

Kona on June 22, 2009
Waimea on September 21, 2009

Beneficiary Consultations (public meeting):

Waimea on September 23, 2009
Hilo on September 25, 2009 (Hilo High School)
Hilo on October 14, 2009 (Keaukaha Elementary School)

(Invitation letters were sent to over 5,000 Hawai`i Island beneficiaries by mail; postcards were mailed to Hilo addresses for the second Hilo meeting)

On September 14, 2009, HHC Chairperson Kaulana Park and Peter Young (Ho`okuleana LLC) participated in a statewide OHA radio program with Jonathan Scheuer and discussed the `Āina Mauna Legacy Program.

On October 28, 2009, the OHA Beneficiary Advocacy and Empowerment Committee (which includes all OHA Trustees) was given a briefing on the `Āina Mauna Legacy Program.

`Āina Mauna Legacy Program Advisory Group

The Advisory Group was formed to provide advice and recommendations in identifying the optimum land use, infrastructure patterns, best management practices and estimated financial requirements to achieve the goals of the `Āina Mauna Legacy Program.

Advisory Group members served as liaisons between their constituents and communities, as well as helped with outreach to their respective communities on behalf of the `Āina Mauna Legacy Program. An Advisory Group site visit of the area was held on June 30, 2009 and video conferences with the group were held on August 19, 2009 and November 2, 2009. Advisory Group members were e-mailed multiple drafts of portions of and the entire Legacy Program document throughout the process.

Advisory Group members include:
George Applegate, Dr. Sam Gon, Dr. Jim Jacobi, Guy Kaniho, Duke Kapuniai, Kanani Kapuniai, John Kekua, Julie Leialoha, Sheri Mann, Kapua Sproat and Ed Stevens

The `Āina Mauna Legacy Program informational documents were posted on the DHHL website and sent to numerous Hawaiian, environmental, government and non-profit agencies for comments and feedback. Responses to comments from the various beneficiary consultation meetings are posted on the DHHL website, as are the Pre-final Executive Summary and full document.

Acknowledgements

A special thanks to all who have made the `Āina Mauna Legacy Program possible. We would especially like to thank members of the Hawaiian Homes Commission: Chairperson Kaulana Park, Commissioner Alapaki Nahale-a, Commissioner Malia P. Kamaka, Commissioner Perry O. Artantes, Commissioner Donald Chang, Commissioner Stuart K. Hanchett, Commissioner Francis K. Lum, Commissioner Trisha Morikawa, and Commissioner Henry K. Tancayo.

This program would not be possible without the assistance and collaboration of Department of Hawaiian Home Lands Staff: Linda Chinn, Darrell Yagodich, Bob Freitas Jr., Bill Davis, Mike Robinson, Jim Dupont, Lani Hoomana and Kay Ahina.

The `Āina Mauna Legacy Program would not have been possible without the thoughtful insight and input from the `Āina Mauna Legacy Program Advisory Group. Advisory Group members included: George Applegate, Dr. Sam Gon, Dr. Jim Jacobi, Guy Kaniho, Duke Kapuniai, Kanani Kapuniai, John Kekua, Julie Leialoha, Sheri Mann, Kapua Sproat and Ed Stevens.

Finally, and most importantly, we want to acknowledge and thank Micah Kane, former Chairperson of the Hawaiian Homes Commission and Director of the Department of Hawaiian Home Lands, for his vision that is the foundation of the `Āina Mauna Legacy Program, motivated us throughout the development of the program and stands as the legacy of these `āina mauna lands for future generations.

Initial Immediate Actions

`Āina Mauna, or mountain lands, reflects a term used affectionately by elder Hawaiians to describe the upper regions of all mountain lands surrounding and including Mauna Kea. The following principles, areas of focus and goals serve as the foundation to the preparation and implementation of the `Āina Mauna Legacy Program.

Mission

The mission of the `Āina Mauna Legacy Program and its implementation is to protect approximately 56,000 acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community.

Goals

Initial goals for the `Āina Mauna Legacy Program include:

Goal 1: Develop an economically self-sustaining improvement and preservation program for the natural and cultural resources (invasive species eradication and native ecosystem restoration) and implementation strategy.

The focus of the `Āina Mauna Legacy Program shall be on:

- Restoration and enhancement of DHHL trust resources;
- Identify immediate and future opportunities for DHHL beneficiaries;
- Removal of invasive species - gorse, etc.;
- Conserve natural and cultural resources and endangered species;
- Address reforestation and restoration of the ecosystem;
- Develop revenue generation, reinvestment in land to sustain activities;
- Provide educational and cultural opportunities;
- Identify and secure partners to sustain activities;
- Identify opportunities for alternative/renewable energy projects; and
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model

Goal 2: Develop an outreach program to gain interest, participation, and support from the Hawaiian Homes Commission, DHHL Staff, beneficiaries groups, cultural practitioners, natural resource scientists, and the broader community for the Legacy Program and its implementation.

The `Āina Mauna Legacy Program serves as a guide as DHHL moves forward in managing the Humu`ula/ Pi`ihonua area to conserve its legacy for future generations while also serving as an economic resource. The Legacy Program is an extension of prior planning and activities at the site. Findings, recommendations, background information and other references from many of these prior documents become part of the overall planning and implementation process.

The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. These lands provide a glimpse into the natural environment and native forests which are disappearing throughout the state. The area serves as valuable habitat to many native and endemic species. The area's proximity to Mauna Kea also makes it a valuable cultural resource. These lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries in perpetuity.

The following are immediate actions to initiate the implementation of the `Āina Mauna Legacy Program.

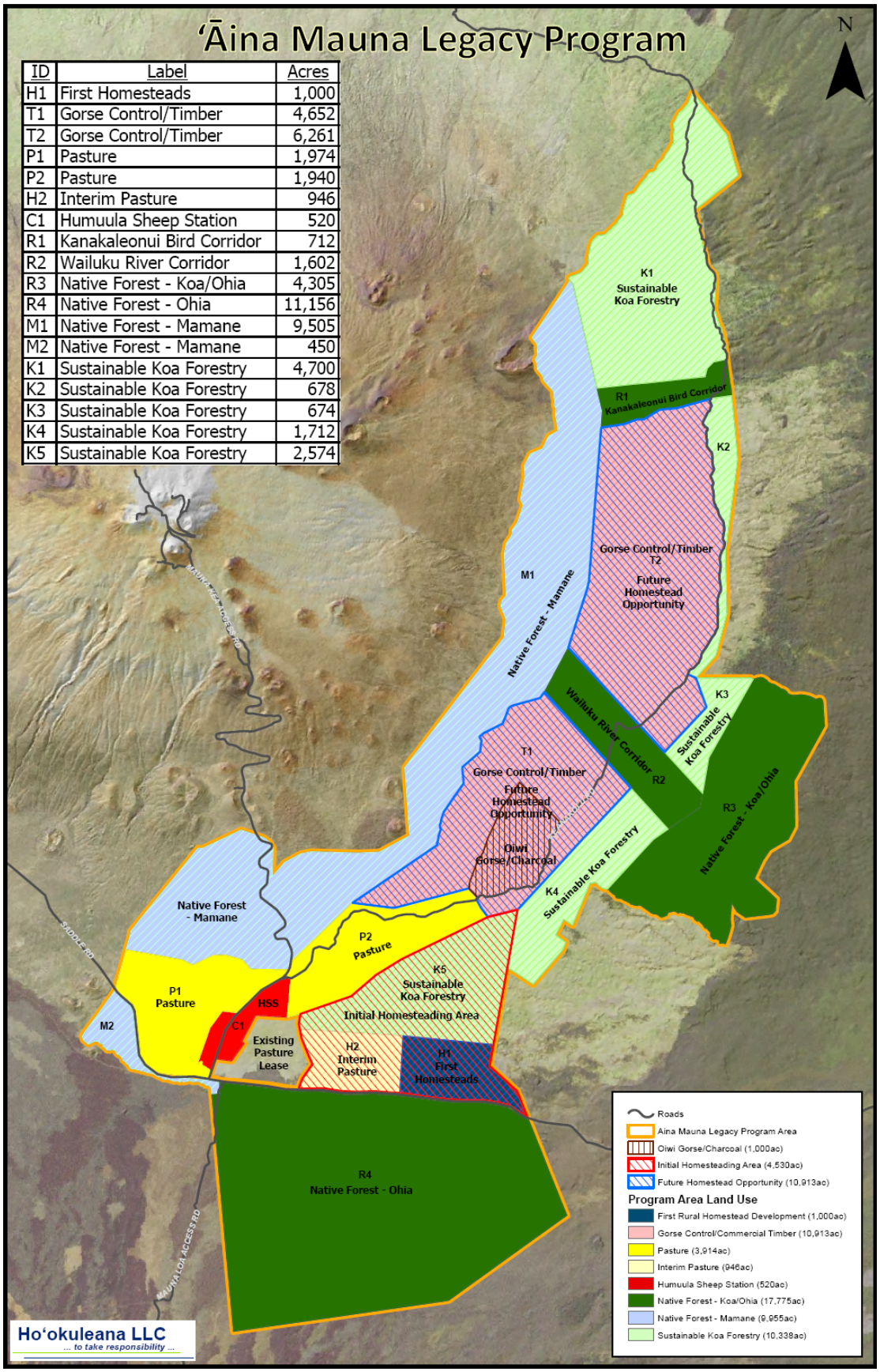
Immediate/Short Term Actions – Summary Listing

1. Form the `Āina Mauna Legacy Program Implementation Advisory Council
    a. The implementation process will include the Council, Beneficiary and community involvement and participation in advising the Department and Commission.
2. Initiate the first rural-development Homestead Area (on south-eastern part of property)
3. Initiate the Humu`ula Sheep Station Adaptive Reuse Plan
4. Initiate expanded Ecotourism opportunities
5. Initiate use of Remote Accommodations
6. Initiate Gorse Eradication (consider all viable gorse eradication opportunities, with commercial timber appearing to be the most viable and beneficial to the Department)
    a. The activities are combined to highlight the actual benefit of forestry to fight gorse, restore the native forest and generate revenue
    b. Incorporate Carbon Credit opportunities to DHHL
    c. Use timber license/lease as DHHL implementation of Hawai`i Clean Energy Initiative
    d. Consider a long-term agreement to accommodate multiple planting/harvesting rotations
    e. Require periodic native forest restoration (i.e. at 5-year intervals) on or outside of leased area
7. Investigate and implement additional areas for sustainable koa forestry opportunities. Allows for opportunities for revenue generation; allows for enhanced restoration of native forest
8. Initiate a set-aside of portions of the property for restoration and enhancement purposes
9. Pasture uses (focused on fire fuel mitigation, consistent with Fire Plan – Additional Acreage) around Keanakolu-Mana, Saddle and Mauna Kea Access Roads
10. Initiate unmanaged-ungulate eradication over entire property. Cattle and other ungulates are vectors for the spread of invasive species (including gorse) and have a negative influence on native forest restoration. Implementing unmanaged-ungulate eradication (primarily sheep, cattle and goats) and allowing management of pigs (so long as the resources are protected) will provide food for beneficiaries, reduce the impacts to the forest resources and generate revenue for the Trust
11. Initiate state, federal and private grant applications to support resource restoration
12. Initiate a Safe Harbor Agreement for threatened/endangered species over entire site

Disposition of the respective licenses, leases, etc. to implement these actions would be through a broad RFQ/RFP process to select the best qualified applicants (background, experience, financial capability, business plan, etc.) to conduct the respective activities. Homestead and Past agreements would be under the typical DHHL disposition process for these types of uses. Any required environmental review would be conducted by the applicant/selectee, based on the details of their specific proposal.

Comparison of Legacy Program Mission, Goals and Priorities with the Proposed Immediate Actions

- Restoration and enhancement of DHHL trust resources
- Preservation of Natural and Cultural Resources and Endangered Species
- Address reforestation and restoration of the ecosystem
    - Reinvest the revenue derived from property into management/restoration
    - Consider a term (i.e. 50-year) conservation encumbrance over portions of the property
    - Initiate additional areas for sustainable Koa Salvage opportunities
    - Require interim gorse-eradication timber operator to participate in native forest restoration
    - Incorporate "volun-tourism" (visitors volunteer) support into ecotourism activities
    - Pasture uses (focused on fire fuel mitigation, consistent with Fire Plan - additional acreage)
    - Initiate unmanaged-ungulate eradication over entire property
    - Initiate a Safe Harbor Agreement for threatened/endangered species over entire site
- Identify opportunities for DHHL Homesteading
    - Opportunities for homesteading across the entire landscape of Humu`ula/Pi`ihonua lands
    - Initiate the first rural-development Homestead Area
    - Forested areas also provide DHHL with an option for future homesteading
- Removal of invasive species - gorse, etc.
    - Initiate gorse removal (consider viable options; commercial timber appears most beneficial)
        - Forestry fights gorse and restores the native forest – and, it generates revenue
        - Incorporate Carbon Credit opportunities to DHHL
        - Use timber as DHHL implementation of the Hawai`i Clean Energy Initiative
        - Consider a long-term agreement to address multiple harvesting rotations
        - Require periodic native forest restoration on or outside of leased/licensed area
    - Continue the `Ōiwi Lōkahi o ka Mokupuni o Keawe gorse to charcoal demonstration project
    - Initiate unmanaged-ungulate eradication over entire property
    - Pasture uses (focused on fire fuel mitigation, consistent with Fire Plan - additional acreage)
- Identify and secure partners to sustain activities
- Develop revenue generation with reinvestment in land to sustain activities
    - Initiate state, federal and private grant applications to support resource restoration
    - Initiate implementation of the Humu`ula Sheep Station Adaptive Reuse Plan
    - Initiate expansion of Ecotourism
    - Initiate process for Use of Remote Accommodations
    - Investigate and implement additional areas for sustainable koa forestry opportunities
    - Interim use of commercial scale timber operations (timber as tool to eradicate gorse)
    - Incorporate Carbon Credit opportunities in interim timber operation
    - Consider a term (i.e. 50-year) conservation encumbrance over portions of the property
    - Gorse-eradication timber operator native forest restoration could be "match" for grants
    - Volun-tourism efforts for native forest restoration could be "match" for grants
    - Initiate unmanaged-ungulate eradication over entire property
- Provide educational and cultural opportunities
    - Restored, healthy native forest provides a variety of opportunities for gathering, cultural practices and opportunities to see and understand native forest ecosystems
    - Humu`ula Sheep Station as gateway and staging area – campgrounds used by groups
- Identify opportunities for alternative/renewable energy projects
    - Rural-development homestead; opportunity for photovoltaic, water catchment/reuse etc.
    - Interim use of commercial scale timber operations (biomass for alternative energy)
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model


ʻĀina Mauna Legacy Program
N
ID | Label | Acres
H1 | First Homesteads | 1,000
T1 | Gorse Control/Timber | 4,652
T2 | Gorse Control/Timber | 6,261
P1 | Pasture | 1,974
P2 | Pasture | 1,940
H2 | Interim Pasture | 946
C1 | Humuula Sheep Station | 520
R1 | Kanakaleonui Bird Corridor | 712
R2 | Wailuku River Corridor | 1,602
R3 | Native Forest - Koa/Ohia | 4,305
R4 | Native Forest - Ohia | 11,156
M1 | Native Forest - Mamane | 9,505
M2 | Native Forest - Mamane | 450
K1 | Sustainable Koa Forestry | 4,700
K2 | Sustainable Koa Forestry | 678
K3 | Sustainable Koa Forestry | 674
K4 | Sustainable Koa Forestry | 1,712
K5 | Sustainable Koa Forestry | 2,574
K1 Sustainable Koa Forestry
R1 Kanakaleonui Bird Corridor
K2
Gorse Control/Timber T2
Future Homestead Opportunity
M1 Native Forest - Mamane
Wailuku River Corridor R2
K3 Sustainable Koa Forestry
R3 Native Forest - Koa/Ohia
T1 Gorse Control/Timber
Future Homestead Opportunity
Oiwi Gorse/Charcoal
K4 Sustainable Koa Forestry
Native Forest - Mamane
P2 Pasture
K5 Sustainable Koa Forestry
Initial Homesteading Area
P1 Pasture
HSS
C1
M2
Existing Pasture Lease
H2 Interim Pasture
H1 First Homesteads
R4 Native Forest - Ohia
MAUNA KEA ACCESS RD
SADDLE RD
Roads
Aina Mauna Legacy Program Area
Oiwi Gorse/Charcoal (1,000ac)
Initial Homesteading Area (4,530ac)
Future Homestead Opportunity (10,913ac)
Program Area Land Use
First Rural Homestead Development (1,000ac)
Gorse Control/Commercial Timber (10,913ac)
Pasture (3,914ac)
Interim Pasture (946ac)
Humuula Sheep Station (520ac)
Native Forest - Koa/Ohia (17,775ac)
Native Forest - Mamane (9,955ac)
Sustainable Koa Forestry (10,338ac)
Ho'okuleana LLC
... to take responsibility ...

1. **Form the `Āina Mauna Legacy Program Implementation Advisory Council (Council)**

As an integral part of the implementation of the `Āina Mauna Legacy Program, it is suggested that the process include the formation of an advisory council (`Āina Mauna Legacy Program Implementation Advisory Council) to provide advice and recommendations to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands regarding the implementation of the `Āina Mauna Legacy Program.

The Council can draw on the expertise of its members and other sources in order to provide advice. Council members shall serve as liaisons between their constituents and/or communities, keeping the Hawaiian Homes Commission and the Department of Hawaiian Home Lands informed of issues and concerns, as well as performing outreach to their respective communities on behalf of the `Āina Mauna Legacy Program.

The Council may serve as a forum for consultation and deliberation among its members and as a source of consensus advice to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands. Such consensus advice shall fairly represent the collective and individual views of the Council members.

The Council does not have the authority to perform operational or management functions or to make decisions on behalf of the Hawaiian Homes Commission and/or the Department of Hawaiian Home Lands. The Council will be advisory only. The Department will have final decision making authority.

The Council should consist of consensus decision-making members who shall be appointed by the Chairperson. Members in consensus decision-making from the following representative groups:

- DHHL beneficiary lessees, licensees or permit holders from Hawai`i Island
- Native Hawaiian representatives (including at least one kupuna) with experience or knowledge regarding native Hawaiian subsistence, cultural, religious or other activities
- DHHL beneficiary representative presently on the applicant waiting list
- Science community with experience specific to forest management, native flora and fauna, and/or any other scientific discipline the Chairperson determines to be appropriate
- Environmental and/or conservation organizations
- Eco-tourism industry
- Community with experience in education and outreach

The membership is designed to be balanced in terms of points of view represented; geographic diversity and advisory functions the Council will perform.

The implementation process will include the Implementation Advisory Council, Beneficiary and community involvement and participation in advising the Department and Commission.

2. **Initiate the First Rural-Development Homestead Area (homesteads on south-eastern portion of property)**

The Department's initial enabling legislation declares the objective of Congress and the State of Hawai`i, to be to enable native Hawaiians to return to their lands. Therefore the role of the Department of Hawaiian Home Lands has been seen as providing land for native Hawaiians. It is therefore appropriate to have homesteading as one component of this `Āina Mauna Legacy Program.

The concept is to develop the first rural-development homestead area for DHHL beneficiaries in the south-eastern portion of the property. Preliminary design concepts call for a subdivision layout encompassing approximately 1,000-acres with a total of approximately 100 to 200-homesteads sites and other community uses.

To take advantage of opportunities to further demonstrate the focus on efficient, self-sustainable communities, as well as provide for cost-effective development, the Legacy Program considers a variety of homestead development layouts to address various beneficiary needs: Cluster homestead sites with separate agricultural/pasture lot, Cluster homestead sites with community agricultural/pasture, Homestead lot subdivision or a Combination of alternatives.

It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming.

However, a large scale development proposal may be too ambitious and large at this time. The intent is to start with a single cluster of homesteads, plus a system of landscape restoration and management of adjacent lands.

In order to make the development economically feasible, it is envisioned to be a rurally-developed homestead area in which roads would remain unpaved (cinder), and water would be catchment only (possible fog drip catchment augmentation). Septic tanks and leach fields, and, where appropriate, composting toilets and gray water reuse would be used for waste disposal. Solar/photovoltaic and consideration for low wind speed generators would also be made for basic electrical needs.

Although planning would begin immediately, full build out may not occur for several years. Additionally, demand and interest for the homestead lots and the availability of funds for needed infrastructure would also need to be taken into consideration. Subsequent homestead development may occur depending on demand, costs and policy relative to the overall use of the site.

For the disposition of Homesteads it is recommended that DHHL follow its typical internal disposition process, using existing staff, resources and structure to plan, fund and develop the homesteading component of the `Āina Mauna Legacy Program.

The `Āina Mauna Legacy Program incorporates several opportunities for homesteading across the entire landscape of the Humu`ula/Pi`ihonua lands. The bulk of the homestead opportunities are anticipated to be phased in once the land has been restored to productive use. This area includes the significant portions of the site that are proposed for sustainable koa restoration.

These forested areas also provide DHHL with an option for future agricultural homesteading. Once the koa restoration is accomplished, DHHL will have the opportunity to consider creation of agricultural homesteads using forestry for beneficiaries. The commercial koa forest management operations can continue, with the DHHL and beneficiaries benefitting directly from the commercial sale of koa.

Similar to many present-day homesteaders having ranches associated with their homesteads or area for agricultural use associated with homesteads, with the restoration and management of the forest here, future homesteaders may incorporate the management of koa forest into their agricultural homesteads.

Ultimately, decision-makers decades from now may decide whether this is appropriate or not – once the forest is restored. The suggestion is that the Legacy Program expands future options, opportunities and choices for homesteading.

3. Initiate the Humu`ula Sheep Station Adaptive Reuse Plan

In March 2004, Kimura International prepared the report "Humu`ula Sheep Station Adaptive Reuse Plan" for DHHL. The Humu`ula Sheep Station Adaptive Reuse Plan proposes a mix of land uses, wherein the property is divided into three principal sub-areas: Historic/Community Center (5.5 to 6.0 acres); Open Campground (2.0 to 2.5 acres) and Commercial (7.0 to 8.0 acres), including retail, recreational, lodgings and restaurant activities appropriate to a transient or visitor market.

Three alternatives were developed for the Humu`ula site. The alternatives consider different phases (starting with a modest effort and expanding incrementally over time,) as well as different outcomes (i.e. an operator may choose to start with a highly capitalized project, rather than taking a more gradual approach.)

Alternative 1: Low Intensity Development

The focal activity is a campground where users are largely self-sufficient. "Improvements" consist primarily of demolishing unused structures, removing debris and clearing overgrown landscaping, and erecting fences around the remaining historic buildings).

Low Intensity Development - Development Components: Campground; Continued use of picnic area by a private eco-tour operator; and Homesteaders association headquarters/community center.

Alternative 2: Medium Intensity Development

This alternative involves one or more businesses that have regular hours of operation, thus, requiring permanent, probably full-time, employees. However, capital investment is still relatively limited and development can occur incrementally, whether it is the number of cabins erected, types of eco-tourism activities staged on site, and/or the range of goods and services offered at the rest stop.

Medium Intensity Development - Development Components: Construction of Cabins; Eco-tourism/adventure tourism staging area; Rest stop with food concession(s) and/or handicraft sales; Campground; Existing cottage converted into the beneficiaries' community center; and Interpretive signs and walkways in the historic zone.

Alternative 3: High Intensity Development

The high intensity alternative represents a more sophisticated level of development. With a greater outlay of capital, this alternative will need sustained market demand. Alternative 3 offers the greatest variety of visitor amenities and could become a destination of potentially enormous appeal. The addition of a lodge could significantly alter the visitor experience by providing more congenial settings in which to socialize, for example, a dining room/restaurant, seminar rooms for meetings, spa/fitness facilities and/or lounge with the iconic roaring fireplace.

High Intensity Development - Development Components: Construction of cabins; Lodge with restaurant; Eco-tourism staging center; Wellness center, retreat, seminar rooms; General store (with or without gas pumps); Rest stop; Campground and Stabilization of buildings in the historic zone for long-term conservation.

The Humu`ula Sheep Station Adaptive Reuse Plan is intended to allow for entrepreneurial flexibility; however, some uses are distinctly incompatible, including: Warehousing; Baseyard for transportation or construction operations or for utility companies; Manufacturing or repair services; Residential, except in a bed-breakfast or caretaker type of situation; Commercial agriculture; and Large-scale institutional or eleemosynary use or campus.

4. Initiate Expanded Ecotourism Opportunities

Ecotourism and recreation related activities, a growing sector of the island's visitor industry, have great potential here due to the natural resources of these lands. Other than providing an area, such as the Sheep Station area, to service and manage these activities, these uses and activities could be integrated and managed within other proposed economic uses. The Humu`ula Sheep Station may serve as a central site to coordinate the eco-tourism activities over the property.

The potential uses and activities include (many of these are noted and discussed in the Humu`ula Sheep Station Adaptive Reuse Plan):

- Biking Tours
- Hiking Tours
- Bird Watching Tours
- Lodge
- Wilderness Resort
- Guest Ranch
- Horseback Tours
- Volunteer “Service” Trips
- Historical Tours
- Nature Tours
- Camping

Support facilities that may be needed could include a gas station, rest stop, convenience store, outfitters facility, eco-business incubator space and various types of lodging facilities.

Likewise, portions of the site may be used by DHHL Land Management staff for office, housing, storage, etc.

5. Initiate Use of Remote Accommodations

The former Pu`u `Ō`ō Ranch headquarters, and former cowboy huts, such as Kanakaleonui cabin (or others that could be constructed), can provide a series of locations for overnight accommodations, retreat, ecotourism uses, etc. One option is to offer a lease package that includes a staging area at the sheep station with one or more remote sites. These sites would be especially attractive if developed in conjunction with existing and new trails for hikers, bicyclists, and/or horseback riders who could then travel from cabin to cabin.

6. Initiate Gorse Eradication (consider all viable gorse eradication opportunities, with commercial timber appearing to be the most viable and beneficial to the Department)

The forest restoration and enhancement can take on a variety of complementary focuses, including:

- Commercial non-native tree species (i.e. eucalyptus, sugi, etc.)
    - As noted previously, DHHL field trials have shown that shade from trees inhibit the

ability for gorse to grow and spread. DHHL has planted portions of a gorse containment area perimeter with trees to establish a boundary for limiting the spread of gorse.

- It is anticipated that commercial scale timber planting will shade the gorse sufficiently to keep it from producing seeds and that each year some portion of the seed bank will be removed. Thus, timber planting can serve both as a gorse eradication mechanism, as well as an income generator.
- The harvest of the timber in approximately 20-40 years would generate cash flow and open the ground for another round of gorse seed germination. The planting of eucalyptus/sugi seedlings immediately after harvest is recommended to reduce the possibility of a re-infestation of gorse. This cycle must be repeated until the majority of dormant gorse seed has germinated. The time estimated for gorse eradication is approximately 100 years due to the estimated 70-years gorse seed remains viable.
- Ultimately, after decades of commercial forestry have effectively cleaned out the gorse and its seed bank, the property can be considered for restoration to a native forest.
- It is important to understand that all suggested crops other than koa are designed to initially control and eradicate the gorse then support the eventual reforestation of the land back to a native koa. Eucalyptus and Sugi should be replaced with native koa where possible once it has been determined that gorse seed germination is no longer a threat.
- Other viable gorse eradication opportunities can also be considered.

- Commercial and non-commercial native tree species (i.e. Koa)
  - DHHL has already implemented a koa salvage and reforestation program at Humu`ula. Likewise, DLNR has conducted a study on its neighboring land and is considering a like program. Each target dead and/or dying koa and allow contractors to enter the property and harvest the koa. The DHHL koa salvage and reforestation program seeks to:
    - Salvage koa trees before they are further reduced in value by weather, rot, and age, leaving certain trees for wildlife habitat and on-site seed production;
    - Promote forest-based economic opportunities in the community;
    - Generate income for DHHL;
    - Promote koa regeneration from existing seed present in the soil;
    - Provide a source of koa wood for Hawai`i's forest industry

Most have noted that the fledgling commercial forestry industry in the Big Island needs the critical mass of forest production and processing, as well as the appropriate investment for forestry management.

<u>Carbon Offsets -Global Warming and Climate Change</u>

An added opportunity to enhance revenue opportunities is to consider carbon offsets. The world mostly agrees that something needs to be done about global warming and climate change. With global warming on the increase and species and their habitats on the decrease, chances for ecosystems to adapt naturally are diminishing. Many are agreed that climate change may be one of the greatest threats facing the planet.

Carbon offset can best be described as an act of paying a third party for reducing ("offsetting") greenhouse gas emissions when one is unable or unwilling to reduce one's own emissions. Some countries (or companies) seek to trade emission rights in carbon emission markets, purchasing the unused carbon emission allowances of others.

Hawai`i Clean Energy Initiative

In addition, an opportunity exists to incorporate other state initiatives in the Legacy Program. On behalf of the State of Hawai`i, Governor Lingle and the U.S. Department of Energy (DOE) entered into a Memorandum of Understanding (MOU) to establish the Hawai`i Clean Energy Initiative, a long-term partnership designed to accelerate the transformation of Hawai`i into one of the world's first economies based primarily on clean energy resources. Opportunities may exist to include activities related to the Clean Energy Initiative with the property at Humu`ula/Pi`ihonua.

7. Investigate and Implement Additional Areas for Sustainable Koa Forestry Opportunities

DHHL has already implemented a koa salvage and reforestation program at Humu`ula. Likewise, DLNR has conducted a study on its neighboring land and is implementing a like program. Each target dead and/or dying koa and allow contractors to enter the property and harvest the koa. The koa salvage and reforestation program seeks to:

- Salvage koa trees before they are further reduced in value by weather, rot, and age, leaving certain trees for wildlife habitat and on-site seed production;
- Promote forest-based economic opportunities in the community;
- Generate income for DHHL;
- Promote koa regeneration from existing seed present in the soil;
- Provide a source of koa wood for Hawai`i's forest industry

A restored sustainable koa forest provides several opportunities and options for future decision-making by DHHL. Portions could be restored to biodiverse Native Forest, large-scale commercial koa harvesting could take place or portions of the property could be divided into homesteads, affording homesteaders the opportunity to include sustainable koa harvest as a part of their homestead.

8. Initiate a Set-Aside of Portions of the Property for Restoration and Enhancement Purposes

The foundation of the `Āina Mauna Legacy Program is the protection and restoration of the DHHL lands at Humu`ula/Pi`ihonua for future generations. After 150-years of sheep and cattle ranching, the formerly dense forest became significantly altered by these activities and the forest landscape was converted primarily to open pasture land. In order to be consistent with the `Āina Mauna Legacy Program's Mission, Goals and Priority Issues (listed above), certain areas of the site need to be converted out of pasture and returned and restored to native forest.

Simply put, the forest is critically important to everyone in Hawai`i. Virtually all our fresh water comes from the forest. Also clean air, recreation areas, habitat for native species found only in Hawai`i, plants for cultural practices, and woods for fine arts are among the thousands of forest benefits. Perhaps the most serious challenge is the lack of funds for proactive management and protection of our native Hawaiian forests. The lands of Humu`ula and Pi`ihonua provide a glimpse into the natural environment and native forests which are disappearing throughout the state.

The area serves as valuable habitat to many native and endemic species. The area's proximity to Mauna Kea also makes it a valuable cultural resource. DHHL seeks to restore and enhance portions of the Humu`ula/Pi`ihonua lands in perpetuity to conserve these native forests and natural habitats for future generations.

The Biological and Vegetation Sensitivity Analysis Reports (included in the 1997 Humu`ula/Pi`ihonua Master Plan Appendices) delineate areas containing endemic faunal and botanical sensitivity within the Humu`ula/Pi`ihonua area. They were used to identify priority portions of Humu`ula and Pi`ihonua for restoration. The assessments give brief descriptions of each area and outline the endemic resources that should be factored into any programming of the area.

The areas for restoration and enhancement are:

- `Āinahou Young Lava Flows -Nēnē Habitat
- West of Mauna Kea Access Road – Māmane-Naio Forest – Palila Habitat
- Upper Pi`ihonua -`Ōhi`a-Koa Forest – Biodiverse Native Forest
- Kahinahina - Māmane Forest – Palila Habitat
- Kanakaleonui Bird Corridor - Koa-Māmane Forest – Native Bird Link to Forest Areas
- Keanakolu - Māmane Forest
- Wailuku River headwaters and drainage

As noted in these analyses, these include strong recommendations to enhance and restore various areas in the overall property because of their importance as habitat, biodiversity and condition (and ability to restore) as native forest. The setting aside of these areas is critical for the protection, restoration and enhancement of the `Āina Mauna. As a means to assist in the funding of the restoration and enhancement of these areas, the department may negotiate long term and/or permanent conservation easements and/ or leases with various entities.

9. <u>Pasture Uses (focused on fire fuel mitigation, consistent with Fire Plan – Additional Acreage) around Keanakolu-Mana, Saddle and Mauna Kea Access Roads</u>

A portion of the site could accommodate cattle; per the DHHL Fire Plan, cattle or other grazers may also be utilized as a cost effective way to reduce fuel load in approved areas and under strict management guidelines to avoid conversion from one undesirable fuel to another, e.g. tall grass to gorse. Site evaluation indicates ideal grazing areas south of the gorse infestation and along Keanakolu Road where fuels would be reduced, gorse movement would be minimized, best AUY's exist, and natural recovery of adjacent lands could continue. Pasture lands would be in the form of additional acreage pasture with the possibility of community pasture as well.

Cattle can serve as beneficial tools in controlling fire fuels, particularly in areas where people frequent – primarily fronting and along roads. Recommended areas for the reintroduction of cattle is along the Saddle Road, Mauna Kea Access Road and Keanakolu Road.

Along these road corridors, therefore, are areas at greatest risk from heavy fuels being ignited by a careless visitor. The rest of Humu`ula/Pi`ihonua Mauka is much less at risk because of its limited access and DHHL's no hunting policy. In short, most fires are started by humans and the limited human presence at Humu`ula greatly reduces the risk.

Wildfire can quickly destroy important yet fragile assets of DHHL's lands. The Humu`ula and Pi`ihonua Mauka areas are especially vulnerable because of their remoteness, and the flammable fuel types found there. The closest public fire station is located in Hilo 25 miles away. The prevention of wildfires is of the upmost importance if homesteading is to take place in this area. Thus, one way to help control wildfire fuels is through pasturing in selected areas.

10. Initiate Unmanaged-Ungulate Eradication Over Entire Property

Cattle and other ungulates are vectors for the spread of invasive species (including gorse) and have a negative influence on native forest restoration. Implementing unmanaged-ungulate eradication (primarily sheep, cattle and goats) and allowing management of pigs (so long as the resources are protected) will provide food for beneficiaries, reduce the impacts to the forest resources and generate revenue for the Trust.

Feral ungulates can have high population growth rates, are elusive and can jump or circumvent most existing fences. Control and/or removal of these animals should be a high priority on all lands designated for reforestation in Hawai`i.

This action should begin immediately. The eradication of unmanaged-ungulates will take time and thus, the faster the program can begin, the faster unmanaged-ungulates can be removed from the area, and restoration activities begin.

Successful control of unmanaged-ungulate populations involves:

1) Removal of populations,
2) Establishment of barriers to isolate populations,
3) Barrier inspection and maintenance, and
4) Vigilance in monitoring of animal population increase and ingress

An unmanaged-ungulate eradication program could be initiated with unmanaged-ungulates being eradicated by either beneficiaries or professional contractors.

11. Initiate State, Federal and Private Grant Applications to Support Resource Restoration

The `Āina Mauna program intends to be self-sustaining. Thus, grants and other types of outside funding will be a critical part of the program. Initial applications may include (partial list): Forest Stewardship, Forest Legacy, Army Compatible Use Buffers, Clean Water Act, Watershed Partnership Program, Conservation Resource Enhancement Program (CREP), Wildlife Habitat Incentive Program (WHIP), Partners for Fish and Wildlife, Landowner Incentive Program (LIP), Western Wildland Urban Interface Grant Program, Water Resources Development Program (USACE), and Environmental Quality Incentives Program (USDA).

12. Initiate a Safe Harbor Agreement for threatened/endangered species over entire site

Because the activities proposed in the `Āina Mauna Legacy Program could affect habitat for threatened and/or endangered plants, birds and animals, it is recommended that a blanket (plants, birds and animals) Safe Harbor Agreement be developed over the entire property and incorporated into the Legacy Program. Since one of the goals of the `Āina Mauna Legacy Program is the restoration of habitat, as well as planting of trees that could attract native birds and bats, the Safe Harbor Agreement can protect DHHL from future impacts to the habitat and the species.

Organizational Structure of DHHL

DHHL is organized under the following structure:

Homestead Services Division

The Homestead Services Division is involved in the direct servicing of homestead lessees and applicants for homestead leases. Its three branches are:

(1) the District Operations Branch, which provides direct services to lessees and applicants on a statewide basis through its six district offices of East Hawai`i, West Hawai`i, Maui, Moloka`i, O`ahu, and Kaua`i, and manages the homestead areas and projects on those islands;
(2) the Homestead Applications Branch, which receives and processes applications for homesteads and maintains and updates waiting lists; and
(3) the Loan Services Branch, which provides financial services for financing for new home construction, replacement homes, home repairs, farming, and ranching; provides access to other loan sources through its loan guaranty program; and undertakes collection activities to obtain payments.

Land Development Division

The Land Development Division is responsible for developing Hawaiian home lands for homesteading and income-producing purposes. Its three branches are:

(1) Design and Construction Branch, which designs and constructs on-site and off-site improvements for the development of residential, farm, and pastoral lots for homesteading purposes;
(2) Housing Project Branch, which provides turn-key homes in in-fill project areas to applicants and assists lessees of vacant lots in arranging financing and in contracting with a builder; and
(3) Master-Planned Community Branch, which prepares plans for entire communities with homes, businesses, services, open space, and recreational and cultural amenities.

Land Management Division

The Land Management Division is responsible for management of the Department`s non-homestead land, maximizing returns from existing and potential income properties, enforcement activities, and development of a comprehensive land inventory. Its three branches are:

(1) Technical Services Branch, which provides the Division with appraisal preparations and documentation of license and easement agreements, as well as computerization of DHHL's land inventory;
(2) Land Management Branch, which manages the Department's lands that are not currently under homestead lease, maintaining those lands, and working with general lessees and licensees; and
(3) Income Property Branch, which is charged with developing some of DHHL's lands for income purposes. When completed, the lands will be turned over to the Land Management Branch for management.

Administrative Services, Fiscal, Information and Community Relations, and Planning Offices

The Administrative Services Office provides support services to the Department in the areas of personnel, budgeting, program evaluation, information and communication systems, and internal

management assistance. The Fiscal Office is responsible for providing accounting, fiscal services, and internal control systems for the Department, including collecting lease and loan payments and other activities. The Information and Community Relations Office plans, organizes, and carries out public information and community relations programs and projects. The Planning Office prepares preliminary studies required for future land development, water resource development, and the proper consideration of archaeological, historical, and environmental concerns. Functions of the Trust Resolution Project have been transferred to this Office.

Strategic Plan 2007–2011 - Department of Hawaiian Home Lands

The following highlights portions of the DHHL Strategic Plan 2007-2011. Consistent with the provisions of the HHCA, development and disposition of homestead uses are priorities for the Department and conducted by staff within the department. The recommendations for these uses are consistent with the Strategic Plan and these activities are noted as priority activities of the Department.

`Ekahi Goal 1

Provide every qualified native Hawaiian beneficiary on the waiting list with an opportunity for homeownership or land stewardship on homestead lands. Over the next five years, deliver (5,000) homestead awards through the development of various award programs.

Objective 1: Complete construction of accelerated lot and undivided interest awards and continue to offer more awards on every island.

Activities:

- *Obtain funding to construct infrastructure for existing undivided interest projects.*
- *Identify vacant unimproved lots for homestead awards.*
- *Offer awards to applicants and begin island-phased project infrastructure improvements.*
- *Complete planning, design, and construction phases.*
- *Convert awards into leases.*
- *Obtain funding to complete the remaining accelerated award projects.*
- *Develop water master plans, as needed, to facilitate development of Hawaiian home lands tracts.*

Objective 2**:** Implement rural homestead lot awards in selected areas on the neighbor islands.

Activities:

- *Create rural homestead dispositions and explore rural lands available.*
- *Develop land specifications for rural homesteads.*
- *Identify and prioritize projects by island.*
- *Complete planning, design, and construction phases.*

Objective 3**:** Continue to offer turnkey, vacant lot, and self-help housing awards.

Activities:

- *Identify and prioritize projects by island.*
- *Procure engineering and construction services.*
- *Complete planning, design, and construction phases.*

Objective 4**:** Acquire additional land through strategic public & private land acquisitions and exchanges that result in the long term awarding of 1,000 leases per annum.

Activities:

- *Partner with public and private sector to identify and explore housing stock opportunities.*
- *Identify and prioritize projects by island.*

Objective 5**:** Seek partnerships with Federal, State, County, and private agencies to share in the cost of infrastructure development and home construction.

Activities:

- *Utilize statewide regional plans as the vehicle to develop collaboration of projects within homestead areas and the surrounding community.*
- *Explore alternative housing opportunities such as multi-family housing.*
- *Utilize a non-profit organization to leverage federal funding for water system projects.*
- *Explore alternative strategies to finance the construction of infrastructure, reduce costs, and accelerate development.*

DHHL Homestead, Pastoral and Agricultural Leasing

Pursuant to provisions of the Hawaiian Homes Commission Act (HHCA), the Department provides direct benefits to native Hawaiians in the form of ninety-nine-year homestead leases at an annual rental of $1. In 1990, the Legislature authorized the Department to extend leases for an aggregate term not to exceed 199 years (Act 305, Session Laws of Hawai`i 1990; section 208, HHCA).

Homestead leases are for residential, agricultural, or pastoral purposes. Aquacultural leases are also authorized, but none has been awarded to date. The intent of the homesteading program is to provide for economic self-sufficiency of native Hawaiians through the provision of land.

Other benefits provided by the HHCA include financial assistance through direct loans or loan guarantees for home construction, replacement, or repair, and for the development of farms and ranches; technical assistance to farmers and ranchers; and the operation of water systems.

Eligibility Requirements

To be eligible to apply for a Hawaiian home lands homestead lease, you must meet two requirements:

- You must be at least 18 years of age; and
- You must be a native Hawaiian, defined as "any descendant of not less than one-half part of the blood of the races inhabiting the Hawaiian Islands previous to 1778." This means, you must have a blood quantum of at least 50 percent Hawaiian. This requirement remains unchanged since the HHCA's passage in 1921.

Types of Homestead Leases

There are three kinds of homestead leases: residential, agricultural, and pastoral.
Eligible beneficiaries may apply for one of the following:

- One residential lot;
- One agricultural lot;

- One pastoral lot;
- One residential lot and one agricultural lot; OR
- One residential lot and one pastoral lot.

Eligible beneficiaries may not apply for all three types of homestead leases. Nor may they apply for both an agricultural lot and a pastoral lot.

Although eligible beneficiaries may apply for leases on separate islands, they cannot hold leases on separate islands. Say, for example, the first lease obtained is for a residential lot on O`ahu and they also applied for agricultural land on Maui. At the time the beneficiary is offered the agricultural lot on Maui, he will have to decide which island he is going to homestead, because beneficiaries cannot have leases on two islands.

Available Residential Awards

The homestead program offers a range of residential awards that include, but are not limited to:

- Fully improved lots with new homes on them.
- Fully improved vacant lots.
- Vacant lots with minimal improvements.

DHHL recognizes that beneficiaries come from diverse financial backgrounds. As a result, DHHL has formed cooperative partnerships with several nonprofit and governmental organizations to provide beneficiaries with as many housing options as possible. For example, both self-help housing and Habitat for Humanity homes have been constructed on Hawaiian home lands.

What is the difference between residential, agricultural and pastoral leases?

- A residential lease is for the home that you live in.
- An agricultural lease is primarily for farming.
- A pastoral lease is for ranching.

Lessees may also build a house on an agricultural or pastoral lot. However, if they already have a house on a residential lot and they want to build a house on an agricultural or pastoral lot, they must surrender or transfer one of the two leases because they may only have one residence.

Benefits of a Hawaiian Home Lands Homestead Lease

The advantages of being a Hawaiian homestead lessee include, among the many benefits:

- Annual lease rent of $1.00 per year;
- 99-year lease;
- Lease term which can be extended for an additional 100 years, allowing lessees to pass their homestead from generation to generation;
- Seven-year exemption from real property tax;
- Complete exemption of tax on land;
- Minimal real property tax after the first seven years (applies only to County of Kaua`i and City and County of Honolulu, O`ahu);
- Taxing of assessed value of improvements on property (Hawai`i and Maui counties only);
- Homeowner's exemption (to be filed with respective county’s real property tax office);
- Low interest government loans (contact DHHL for more information); and
- Ability to use the equity in your property to obtain loans (contact DHHL for more information).

Leases to Hawaiians, licenses

(a) The department (DHHL) is authorized to lease to native Hawaiians the right to the use and occupancy of a tract or tracts of Hawaiian home lands within the following acreage limits per each lessee:

- not more than forty acres of agriculture lands or lands used for aquaculture purposes; or
- not more than one hundred acres of irrigated pastoral lands and not more than one thousand acres of other pastoral lands; or
- not more than one acre of any class of land to be used as a residence lot;

provided further that a lease granted to any lessee may include two detached farm lots or aquaculture lots, as the case may be, located on the same island and within a reasonable distance of each other, one of which, to be designated by the department, shall be occupied by the lessee as the lessee's home, the gross acreage of both lots not to exceed the maximum acreage of an agricultural, pastoral, or aquaculture lot, as the case may be, as provided in this section.

The method of disposition, as well as the terms, conditions, covenants, and restrictions as to the use and occupancy of such multifamily units shall be prescribed by rules adopted by the department pursuant to chapter 91.

Hawaiian Homes Commission Settlement Concerning Pastoral Leases

The following recaps the November 15, 2005, Hawaiian Homes Commission submittal concerning the settlement agreement between the "Aged Hawaiians" and the Hawaiian Homes Commission.

In 1952, the Commission withdrew 18,000-acres of pastoral land, including portions of Pu`ukapu on the Big Island of Hawai`i, from general leasing to be used for homesteading. The Commission then selected 187-out of-427 original applicants as the "best qualified" potential pastoral lessees (i.e., those with the maximum chance of success at commercial ranching) and placed them on a waiting list. Forty-eight pastoral homestead lots ranging in size from 200 to 300-acres were awarded to those at the top of that waiting list. The Commission decided not to award lots on the remaining portions of the Pu`ukapu homestead lands "until it [could] be determined whether the rainfall in the vicinity [could] support individual small ranches."

Eventually, as part of its 1987 Raw Lands Acceleration Program, the Commission adopted a policy to award pastoral lots of no more than 100-acres based on a "subsistence ranching" concept designed to enable native Hawaiian homesteaders to supplement their family needs. Although no awards were made under this subsistence ranching policy, which formally expired at the end of 1987, the Commission continued to analyze possible future pastoral awards based on this policy.

On July 25, 1988, James Akiona submitted a petition to the Commission seeking a contested case hearing. He hoped to (1) "present evidence of [his] desire and capability to engage in commercial ranching activities at Pu`ukapu" and (2) challenge the potential issuance of subsistence ranching leases because such awards would be inconsistent with HHCA -207 and 219.1.

On December 20, 1988, while Akiona's request was pending, the Commission adopted "ten premises" or guidelines for its pastoral development program. On February 21, 1989, the Commission notified Akiona that it had denied his contested case hearing request. The Commission determined that there was no basis for granting the request because (1) the Commission had not yet initiated any action on Akiona's application for a pastoral homestead lease, (2) there was no substance to support the petition, and (3) a contested case hearing would be inappropriate. Later, the Commission proposed to offer 195-lots (ranging in size from 5 to 20-acres) on 3,000-acres of Pu`ukapu lands, which were to be awarded in early summer 1989 in accordance with the Commission's "ten premises" rule.

On July 17, 1989, Akiona and the Aged Hawaiians filed a complaint for declaratory and injunctive relief in the third circuit court. On August 31, 1989, Akiona and the Aged Hawaiians moved for partial summary judgment on their claim that the "premises" were rules requiring compliance with the official notice¬and-comment provisions of HRS chapter 91. The motion was granted on October 4, 1989, and the trial court issued an order enjoining future pastoral lot awards until the Commission complied with chapter 91.

On January 30, 1990, the circuit court denied a motion by Akiona and the Aged Hawaiians dated December 26, 1989, in which they sought summary judgment and a permanent injunction with respect to their remaining claims. On the same day, the circuit court also denied their December 28, 1989 motion seeking certification as a class action on behalf of all qualified beneficiaries "who seek a pastoral homestead lot large enough to allow them to become economically self-sufficient by ranching."

On July 31, 1990, the Commission adopted its 1990 pastoral lot size plan (1990 Plan). The Commission took this action without consulting the Aged Hawaiians or Akiona. The plan modified the 1989 proposal by adding 8, 100-acre and 8, 200-acre lots at Pu`ukapu, plus 22-unimproved homestead lots at Ka`ū (17-lots at 25-acres each) and Humu`ula (5-lots at 100-acres each). The larger lots were not created as "economic units," but as "good faith responses" to the desires of those beneficiaries who sought commercial ranching opportunities.

On August 23, 1990, Akiona and the Aged Hawaiians filed two motions: (1) seeking a preliminary injunction to prevent DHHL from awarding subsistence pastoral lots under the 1990 Plan, and (2) seeking to amend their complaint. In denying the motion for preliminary injunction, the circuit court held that the Aged Hawaiians' members would not be irreparably harmed [because] their priority status [assures] that they will be offered lots and they will still be able to litigate the remaining issues in this case. The case was appealed to the Hawai`i Supreme Court.

On March 14, 1995 the Hawai`i Supreme Court decided the APPEAL FROM THE THIRD CIRCUIT COURT (CIV. NO. 89-244). It said native Hawaiian beneficiaries of the federal-state compact, which is contained in the Hawai`i Admission Act and incorporates HHCA trust obligations, may pursue claims under - 1983 based upon either the asserted violation of rights under these acts or the due process clause of the fourteenth amendment to the United States Constitution. The Court held that: (1) the circuit court's order granting summary judgment in favor of the Appellees and dismissing the Aged Hawaiians' - 1983 claims was erroneous because genuine issues of material fact remain to be decided with respect to the Aged Hawaiians' claim that the 1990 lot awards violated their rights under the HHCA; and (2) the Aged Hawaiians are entitled as a matter of law to summary judgment on their claim that the Commission violated their due process rights when it failed to adequately consider their members' acknowledged desire for land sufficient to engage in commercial ranching. Although HHCA beneficiaries on the pastoral wait list are not entitled to "economic units" per se, these individuals must be given an opportunity to seek such an award prior to the implementation of a pastoral homestead lot award plan. Accordingly, we reverse that part of the circuit court's order dismissing the Aged Hawaiians' constitutional due process claims under -1983, vacate that portion of the order concerning their breach of trust claims under -1983, and remand for further proceedings consistent with this opinion.

In 2004 DHHL and NHLC worked to reach a settlement in the case and the HHC Ratified the Settlement Agreement on February 15, 2005.

The settlement agreement required that lands in the Honokaia area be withdrawn and offered to qualified applicants on the Waimea pastoral waiting list under an undivided interest award program. On October 1, 2005 the Honokaia lands were returned to DHHL. In 2004, 74-applicants with application dates ranging from 6/11/52 to 8/8/77 were invited to select a pastoral award for the Honokaia land. Nine applicants decided to select an award and became Honokaia Lessees.

The agreement provided that additional land be offered to Pu`ukapu lessees who selected lots during the 1990 award period and the new Honokaia lessees. It was agreed that the determination of the award for additional land to expand their ranching operations would be based on a ranch plan review process conducted independently by the University of Hawai`i, College of Tropical Agriculture, Cooperative Extension Service Ranch Plan Review Panel. This panel was composed of Ranching experts who currently assist other ranchers on the Island of Hawai`i and included an expert familiar with the Hawaiian Homes Commission Act.

Starting in July 2005, 186-Pu`ukapu and Honokaia lessees were notified by mail regarding the opportunity to expand their ranching operations pursuant to the settlement agreement. They were given one month to decide whether they wanted to participate by completing a standard letter of interest response form. Seventy lessees formally confirmed their interest and agreed to participate in the Ranch plan training program and review process held during the months of August and September 2005. Participants were involved in classroom like training sessions, received personal assistance via telephone, fax and personal interviews necessary to assist them in preparing their personal ranch plans. Participants were notified that there were no guarantees that they would each receive additional acreage by participating in the settlement program.

The independent Cooperative Extension Service (CES) Ranch Plan Review Panel was composed of 5-CES agents who received the 42-ranch plans in October 2005. The plans were reviewed and scored by each agent and the group met to discuss the ranking of the plans. There were three categories considered, 1) Meets Expectation, 2) May meet expectation and 3) Needs major work. In addition a total overall points system was used based on an individual review of the applicant's personal knowledge, human and financial resources and feasibility of the ranch expansion.

The selection system was based on five points similar to an A-F system. All plans receiving 3 or higher were considered as passing and those plans receiving 1 or 2 were considered as non-passing.

Eleven of the 42-plan proposals received a 3 or better score and were recommended for consideration to select additional acreage consistent with their plan and each individual score received. Numbers were placed next to the names delineating the maximum number of acres that their plan could support. Approximately 1,700-acres were required and it was recommended that the applicants be allowed to select parcels at Honokaia that did not exceed their qualified amount. Note that all of these individuals had a primary homestead pastoral lot and these lands were awarded to expand their current ranch operations. The individual ranch plans were also used to determine the individual's compliance with their lease conditions and could be used to reassign the additional acreage if non-compliance issues arise in the future.

Thirty one of the 42-plan proposals received a 2 or lower score and were notified that their plans did not pass. They were encouraged to re-apply for additional acreage pursuant to the current regulations.

Based on preliminary data contained in the ranch plans and considering the acreage requirements of the 11-Honokaia Lessees, which includes Mr. Akiona as a relocated Honokaia homesteader approximately 300-acres will be required for the small scale ranches and 1,700 to 2,000-acres will be required for the additional acreage requirements to expand the current ranch operations.

According to DHHL Planning staff, there are 6,555-agricultural applicants and 1,778-ranch applicants waiting for land on Hawai`i Island. Currently there are 505-agricultural lessees and 303-ranch lessees already on Hawai`i Island.

DHHL Energy Policy

DHHL seeks to restore portions of the Humu`ula/Pi`ihonua lands in perpetuity to conserve these native forests and natural habitats for future generations. In doing so the Department is looking beyond housing and into a more holistic approach for communities and land management.

This section covers DHHL's Energy Policy "Ho`omaluō", which the Hawaiian Homes Commission formally adopted, on January 27, 2009.

Ho`omaluō's Policy Statement is as follows:

> "To enable native Hawaiians and the broader community working together to lead Hawai`i's effort to achieve energy self-sufficiency and sustainability"

For more than 2,000 years Hawaiians effectively managed their energy resources through the Ahupua'a system enabling the continued survival of the native Hawaiian people. Prince Kūhiō understood that self-sufficiency would insure the survival of the native Hawaiian people on Hawaiian Home Lands.

The DHHL Energy Policy is also in line with the State of Hawai`i's Energy Policy which states:

> "Hawai`i's energy policy seeks to ensure dependable, efficient, and economical energy; increased energy self-sufficiency; greater energy security; and reduction of greenhouse gas emissions"

The `Āina Mauna Legacy Program implementation is consistent with the objectives of the DHHL Energy Policy including (There are five objectives that address various components of the Department's operations that are incorporated into the policy):

Objective 1 - Mālama `āina: Respect and protect our native home lands:

- protection, restoration and enhancement of DHHL's forest lands
    - The Legacy Program seeks to restore portions of the Humu`ula/Pi`ihonua lands in perpetuity to conserve these native forests and natural habitats for future generations
- potential for carbon sequestration
    - Legacy Program incorporates several long-term forestry approaches that could be considered to implement carbon sequestration; native forest restoration, timber to fight gorse, and sustainable koa forestry
    - There will be a reservation for any opportunities for carbon credits to DHHL
- energy self-sufficiency and sustainability
    - The Legacy Program considers a variety of homestead development layouts to minimize development costs as well as incorporate a variety of alternative/renewable energy opportunities
        - Solar/photovoltaic
        - Catchment
        - Fog drip catchment augmentation
        - Gray water reuse
        - Composting toilets
        - Consideration for low wind speed generators

Objective 2 - Ko`o: Facilitate the use of diverse renewable energy resources:

- renewable energy projects

    - For commercial timber to eradicate gorse RFQ/RFP proposers will be required to incorporate some sort of bio-fuel (for electrical generation or bio-diesel)
- encourage future general lessees and licensees to design and build their facilities so that they are energy and resource efficient
    - Humu`ula Sheep Station Adaptive Reuse, Eco-tourism and other RFQ/RFPs will incorporate requirements for alternative/renewable energy components

Objective 3 - Kūkulu pono: Design and build homes and communities that are energy efficient, self-sufficient and sustainable:

- designing and building of new energy and resource efficient homes in Hawai`i
- energy efficient homes generate lower electricity and home maintenance costs
    - The Legacy Program considers a variety of homestead development layouts to minimize development costs as well as incorporate a variety of alternative/renewable energy opportunities. Homes to include:
        - Solar/photovoltaic
        - Catchment
        - Fog drip catchment augmentation
        - Gray water reuse
        - Composting toilets
        - Consideration for low wind speed generators
- cost effective approach and standard for creating healthy, affordable, and environmentally responsible homes and communities
    - The Legacy Program considers a variety of homestead development layouts to minimize development costs as well as incorporate a variety of alternative/renewable energy opportunities

Objective 4 - Kōkua nō inā kahu: Provide energy efficiency, self-sufficiency, and sustainability opportunities to existing homesteaders and their communities:

- community renewable energy projects that could also generate revenue for their respective regional plan projects
    - For commercial timber to eradicate gorse RFQ/RFP proposers will be required to incorporate some sort of bio-fuel (for electrical generation or bio-diesel)

Objective 5 - Ho`ona`auao: Prepare and equip beneficiaries to promote a green, energy efficient lifestyle in and around communities:

- live a self-sufficient and sustainable, greener lifestyle
- reduce, reuse, and recycle resources
    - The Legacy Program considers a variety of homestead development layouts to minimize development costs as well as incorporate a variety of alternative/renewable energy opportunities. Homes to include:
        - Solar/photovoltaic
        - Catchment
        - Fog drip catchment augmentation
        - Gray water reuse
        - Composting toilets
        - Consideration for low wind speed generators

Ho`omaluō's Five Objectives – Expanded Discussion of Energy Policy

Objective 1 - Mālama `āina: Respect and protect our native home lands - DHHL's land stewardship responsibilities of its sensitive environmental lands is based on the ahupua`a land management system to insure that the land will be managed on a self-sufficient and sustainable basis for future generations.

Activities:

- Develop a comprehensive strategic plan for the protection, restoration and enhancement of DHHL's forest lands. (An appropriate plan that incorporates the conservation of values, traditions, and culture of native Hawaiians that restores balance, harmony, and sustainability of the forest lands for future generations.)
- Develop a comprehensive strategic plan for the protection, restoration and enhancement of DHHL's other lands-lands other than forest lands, lands for homesteading and lands for general lease.
- Identify properties in DHHL land inventory that have potential for carbon sequestration and determine if carbon sequestration is a viable use of DHHL lands.
- Evaluate each Regional Plan to determine if energy self-sufficiency and sustainability goals and objectives should be incorporated into the regions. (The regions contained within the Regional Plans can serve as today's "ahupua`a" -the past Hawaiian land-management system of self-sufficiency for future generations.)
- Develop, implement, and maintain plans to reduce DHHL's carbon footprint (reduce greenhouse gas emission).

Objective 2 - Ko`o**:** Facilitate the use of diverse renewable energy resources - Development of renewable energy resources will insure that the Hawaiian Home Lands Trust continues to be financially self-sufficient and sustainable well into the future.

Activities:

- Identify properties in DHHL's land inventory that have potential for renewable energy projects.
- Pursue the leasing of those lands that are identified as suitable for renewable energy projects. (First priority should be given to entities that would provide "firm" renewable energy power such as garbage-to-energy (mass-burn), geothermal, pump-storage hydropower, solar-thermal and second priority to "as-available" renewable energy power such as wind, solar-photovoltaic, and wave.)
- Encourage existing and future general lessees and licensees of DHHL's properties to design and build their facilities so that they are energy and resource efficient.
- Seek partnerships for the development of renewable energy resources. In this connection, build relationships that could assist DHHL on non-energy related issues.
- Evaluate DHHL's available authorities/powers that could expedite renewable energy projects for the state of Hawai`i.
- Seek innovative processes to provide reliable electricity, by assisting electric utilities (in a world where energy is an essential but very limited resource) to reduce Hawai`i's dependency on fossil fuels.

Objective 3 - Kūkulu pono**:** Design and build homes and communities that are energy efficient, self-sufficient and sustainable - Encourage the building of new "green" homes and communities for homesteaders based on the ahupua`a concept.

Activities:

- Promote, design, and build new affordable homes (that minimize lifestyle and visual impacts) using the "Hawai`i BuiltGreen" and "ENERGY STAR" programs. (These programs ensure the designing and building of new energy and resource efficient homes in Hawai`i.)
- Strive to plan, design, and build new communities utilizing the "ahupua`a" concept and the "Green Communities" program. (The Green Communities program's criteria are designed to provide a cost effective approach and standard for creating healthy, affordable, and environmentally responsible homes and communities.)
- Assist beneficiaries to utilize energy efficiency rebates, financial assistance, tax credits and other incentives offered by utility companies and federal, state and county governments.
- Promote the benefits of hybrid electric vehicles to help reduce beneficiaries' transportation (gasoline) costs. (70% of Hawai`i's imported fossil fuel is used for transportation that must be use efficiently or conserved.)
- Assist beneficiaries to obtain mortgages under the "Energy Efficient Mortgage" program. (The program can help beneficiaries save money and, reduce their loan qualifying income requirements.)
- Seek partnerships with federal agencies like with the U.S. Department of Energy that provide access to current state-of-the-art technical advancements in energy.
- Seek partnerships that provide grants and other financial assistance for the developments of state-of the-art net zero energy homes.
- Join with electric utilities and the Public Benefits Administration as partners to advocate, communicate and educate the public on state-of-the-art energy initiatives.
- Energy efficient homes generate lower electricity and home maintenance costs that would help beneficiaries qualify for a higher home mortgage or increase their purchasing/savings power.

Objective 4 - Kōkua nō inā kahu**:** Provide energy efficiency, self-sufficiency, and sustainability opportunities to existing homesteaders and their communities - Help existing individual homesteaders to retrofit their homes to achieve energy efficiency and together the homestead community will achieve more energy self-sufficiency and sustainability.

Activities:

- Identify effective energy efficiency and conservation retrofit applications and develop a plan to assist homesteaders with the retrofitting of their homes. (Retrofit applications may include: solar hot water heating system, insulation/radiant barriers, low-flow toilet and shower head, photovoltaic system, CFL bulbs, ENERGY STAR appliances, energy efficient windows, clothes line, ventilation techniques, and roof/attic vents.)
- Assist homestead communities to achieve potential energy self-sufficiency by identifying properties near existing homesteads that could be utilized for community renewable energy projects that could also generate revenue for their respective regional plan projects.
- Seek partnerships to assist homesteaders with retrofit applications and energy self-sufficiency projects.
- Help homesteaders lower their monthly electricity and maintenance costs that would increase their purchasing/ savings power and generate revenue for their respective Regional Plan projects.

Objective 5 - Ho`ona`auao**:** Prepare and equip beneficiaries to promote a green, energy efficient lifestyle in and around communities - DHHL's energy outreach effort is like the DHHL Home Ownership Assistance Program (HOAP) for energy self-sufficiency and sustainability.

Activities:

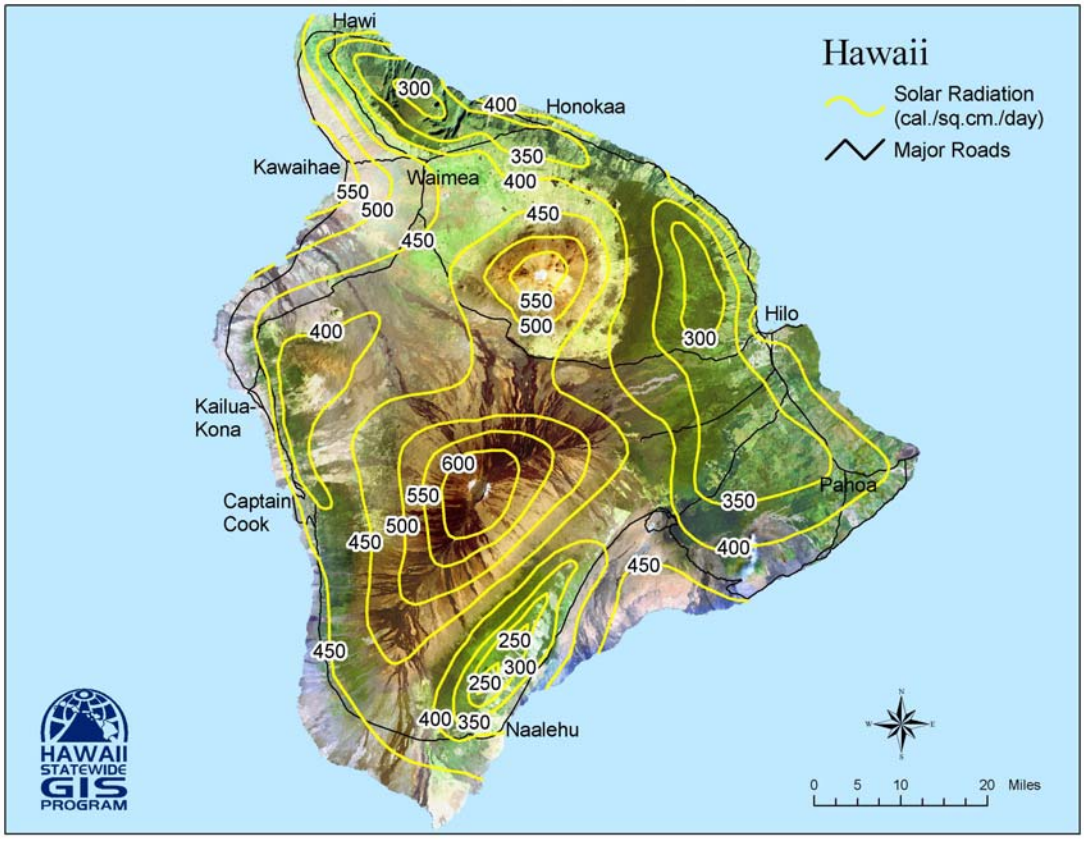
- Seek partnerships that provide opportunities to learn how to live a self-sufficient and sustainable, greener lifestyle.
- Develop and implement resource efficiency programs for beneficiaries to reduce, reuse, and recycle resources. These resources include construction and demolition materials, household items, yard waste, and other items which might be sent to landfills or incineration.
- Assist homestead communities to become more aware of their energy use and carbon footprint.

Hawai`i Clean Energy Initiative

In January 2008, Governor Lingle signed a Memorandum of Understanding with the U. S. Department of Energy to establish the Hawai`i Clean Energy Initiative to accelerate the transformation of Hawai`i into one of the world's first economies based primarily on clean energy resources. The goal of the initiative is to use renewable energy resources to supply 70% of Hawai`i's energy needs by 2030.

The Hawai`i Clean Energy Initiative will transform Hawai`i into one of the world's first economies based primarily on clean energy resources. DHHL Beneficiaries will be impacted by the Clean Energy Initiative. In the future Energy Self-Sufficient Homestead Communities utilizing alternative renewable energy sources will be developed, but they will be uniquely Hawaiian evolving out of the ahupua`a concept and extending Prince Kūhiō's vision of Energy Self-Sufficiency and Sustainability for the Hawaiian Homesteads.

The following map shows the property's opportunity to capture solar radiation (note that it has similar characteristics to the Kona Coast.)



Hawai`i Island Solar Radiation Map

Homestead, Pasture and Commercial Dispositions in the `Āina Mauna Legacy Program

There are two processes for disposition of the various agreements covering the two basic types of uses (commercial and homestead/pasture) recommended through the Legacy Program. Given the organizational structure, activities of various divisions and experience within the department, it is recommended that the disposition of various recommended activities be handled in two separate ways.

Disposition of Homestead and Pasture (non-homestead) Leases, Licenses and/or RPs

Some of the recommendations closely-follow existing practice of DHHL (i.e. homestead and pasture uses). For the disposition of Homestead and Pasture leases, licenses and/or RPs for beneficiary use, it is recommend that DHHL follow its typical internal disposition process, using existing staff and resources.

DHHL has the experience, knowledge, capacity and existing process for the homesteading and pasture lease portion of the `Āina Mauna Legacy Program which involves the disposition of homestead lots, agricultural uses and pasture uses.

The entire process of disposition of the rural-development homesteading component and the limited pasture use to mitigate fire hazards (short and long-term) as recommended in the Legacy Program will be conducted through DHHL's Land Development and Homestead Services divisions.

The department will follow their typical practices and procedures, rules and regulations in regard to the awarding of these homestead and pasture agreements. Traditionally, vacant lot homestead awards (such as proposed in the Legacy Program) give beneficiaries the opportunity to design and build their own homes, with the infrastructure provided and funded by DHHL. The steps for this process as described by DHHL are as follows:

Step 1 – Ho`omākaukau **-** *to prepare, make ready*

- DHHL notifies eligible applicants on the wait list of an upcoming vacant lot award.
- An orientation meeting is held to provide information on the lots to be awarded and the lot selection process.
- Applicants pre-qualify for a home construction loan. The amount pre-qualified for determines the overall construction price of the home.
- Applicant obtains a construction proposal

Step 2 – Ho`olālā - *to lay out, plan*

- A lot selection meeting is held. At this meeting, applicants are invited to select a homestead lot.
- Plans and specifications are provided to the lender, who then processes the applicant's loan application. The home construction loan is approved.
- The lease and loan documents are signed. The applicant is now a lessee.
- House plans and building specifications are submitted to DHHL and the County.
- Once approved, construction of the home may commence with a contractor of the lessee's choice.

Step 3 – Ho`opa`a `āina - *to occupy, become established on the land*

- The contractor completes the lessee's home.
- Home is insured.
- After final inspection, the lessee moves in.

Since homesteading and pasture use are the typical and conventional disposition activities for direct benefit to beneficiaries of DHHL, it is reasonable for the proposed uses at Humu`ula/Pi`ihonua come under existing DHHL development, disposition and management. These proposed uses can fit in the "queue" for its overall development scheduling and disposition.

While the homestead lots will be rurally-developed because of the areas remote location and lack of traditional infrastructure availability, the cost of development is likely to be significant and beyond the scope and capacity for the remaining revenue-generating opportunities proposed on the property.

Disposition of Commercial Agreements - RFQ and RFP

Because many of the recommendations in the Legacy Program represent new ventures for the department in the scale of the program, large land area and amount of resources it entails, DHHL does not have the capacity to do the restoration and enhancement work themselves. Much of the activity will need to be conducted by others.

Since many of the recommended activities are commercial in nature (i.e. not for the individual benefit of a particular beneficiary,) it is recommended that DHHL implement these activities through a broad Request for Qualifications (RFQ) and Request for Proposals (RFP) process.

DHHL has the responsibility to look for the best qualified applicants (background, experience, financial capability, business plan, etc.) that can fulfill the Trust's needs at a reasonable price. The RFQ/RFP process serves to produce that.

Likewise, as a State agency, DHHL is obligated to follow state procurement laws.

The suggestion of using a broad RFQ/RFP process in the procurement of services for the commercial enterprises does not in any way limit the opportunity for beneficiaries to be involved in the process. Presently, the RFP process is being used with success in selecting the operator for the various DHHL koa salvaging operations. The present koa salvage operator is a native Hawaiian.

Consistent with the fundamental purposes of the Hawaiian Homes Commission Act, to the extent permitted by law, it is the goal of the `Āina Mauna Legacy Program to support economic development, maximize opportunities for beneficiaries and give preference for native Hawaiian beneficiary involvement at all stages of the program's implementation.

One of the central focuses of the `Āina Mauna Legacy Program is that the activities and programs implemented need to be economically self-sustaining, with the goal to reinvest the revenue into the management of the property. In considering revenue generation, several opportunities exist:

- Use of Humu`ula Sheep Station – Commercial Activities
- Forest Products and Biomass for alternative energy opportunities (liquid fuel and electricity.)
- Carbon Offsets/Credits
- Ecotourism and Recreational Use

Disposition of the respective commercial licenses, leases, etc. to implement these actions would be through a broad RFQ/RFP process to select the best qualified applicants to conduct the respective activities.

The purpose of the RFQ/RFP process is to solicit and select a qualified private entity to enter into an agreement with DHHL to conduct the commercially-related activity. To be eligible for consideration in the RFQ/RFP process, interested parties must first complete and submit an Application and Notice of Intent. After submittal of the Application and Notice of Intent, Applicants will be allowed to participate in the RFQ/RFP process. The following is a general description of the two-step RFQ/RFP process.

> Step 1: Request for Qualifications (RFQ). The RFQ will request the submittal of Statements of Qualifications ("SOQs") from interested parties detailing their relevant experience, financial capabilities and management expertise. DHHL will review the SOQs and determine which applicants meet DHHL's qualification criteria. DHHL may, at its sole discretion, form a short list of the most qualified applicants. The qualified applicants (or short list of the most qualified applicants, if applicable) will then be invited to participate in the RFP process.
>
> Step 2: Request for Proposals (RFP). The RFP will solicit detailed proposals for the Subject Property from the invited qualified applicants. DHHL will review the proposals and will recommend to the Hawaiian Homes Commission ("Commission") the applicant whose proposal best satisfies DHHL's objectives and selection criteria. If approved by the Commission, the selected applicant and DHHL will commence exclusive negotiations of a lease agreement.

The RFQ/RFP process will state that awardees are responsible for complying with all requirements and mandates of HRS Chapter 343 as it relates to their proposed activity. Likewise, the selectee will be responsible for adhering to all County, State, and Federal laws, rules and regulations, including Best Management Practices.

Each proposal will be evaluated in relation to its conformance with the weighted criteria below (totaling 100%). The goal of the comparative proposal evaluation process is to select the "best" proposal based on a set of defined criteria. The criteria to be used in the comparative proposal evaluation process are divided into the following groups:

- Experience / Qualifications
- Management Proposal and Management Plan
- Business Plan and Economic Proposal
- Economic Benefits to DHHL
- Other Benefits to DHHL

A DHHL Evaluation Committee will make all recommendations regarding the evaluation. The Evaluation Committee may be assisted by other staff that could include officers, employees, and agents of DHHL. DHHL will select the applicants whose proposals best meet DHHL's objectives and RFP selection criteria. Evaluations will be based on the proposals overall benefit to DHHL, compatibility with other uses in the area, experience and financial capability.

Any required environmental review would be conducted by the applicant/selectee, based on the details of their specific proposal.

On-going - Long-Term Actions

In addition the above immediate actions to initiate the implementation of the `Āina Mauna Legacy Program, the management of the property includes the regular and on-going activities, such as:

General Administrative Activities

Due to the scope, scale and diversity of uses, in order to oversee the implementation of the `Āina Mauna Legacy Program, the Department will need to dedicate staff positions to the program. The day to day operations will need to be overseen by a manager. In addition, other administrative activities/positions will include:

- Fiscal management and oversight
- Contract compliance
- Other "office" duties
- Field crew and management
- Seeking additional partnerships
- Seeking additional grant funding

Unmanaged-Ungulate Eradication

Reduce the impact of unmanaged-ungulates to a level that prevents further degradation of the native ecosystems, allows the greatest possible recovery of native species and benefits for beneficiaries.

- Eradicate unmanaged-ungulates through hunting (and/or other capture techniques).
- Control unmanaged-ungulates with fences.

Non-native Plant Control

To limit the spread and, where feasible, eradicate non-native plant species that are or may become invasive weeds in the `Āina Mauna.

- Control certain priority weeds before they become widely established.
- Set up monitoring transects to locate other incipient populations of priority weed species.
- Management measures would include integrated pest management (IPM) tools, including selective use of approved herbicides or manual removal with hand tools.

Monitoring

Monitor the effectiveness of management projects and track significant ecological changes through long-term scientific monitoring.

- Establish systematic monitoring programs for unmanaged-ungulate damage, non-native weed invasion, native vegetation recovery, and status of rare species.
- Increase monitoring intensity for select problems and areas as needed.

Public Education and Volunteer Support

Build public understanding and support for the site in the local community. Educational opportunities will be provided for interested groups. Volunteer labor to help staff in management activities will be procured.

- Maintain community outreach program to give public presentations, provide informational material, and utilize concerned volunteer groups.
- Inform the general public about resources within the property and management activities through television, newspaper, and other local media outlets.
- Present PowerPoint shows and talks to community groups.

Enforcement

Enforcement will be a very important element of the `Āina Mauna Legacy Program. Enforcement for the area will be multi leveled including:

- Enforcement of rules and regulations
- Enforcement against illegal activities and inappropriate behavior

Water Development

Water is a significant and critical limiting factor for use of the site. Some of the immediate actions noted above require expanded water source and distribution improvements.

To date, catchment systems supply water to existing users and water is also hauled from outside supply sources (primarily to Pōhakuloa Military Training Area and Mauna Kea Science Reserve.) There are a few water tanks on the parcel, as well as several water reservoirs and springs.

Expanded Catchment

In addition to conventional catchment systems (involving water tanks and reservoirs,) part of the on-going activity to expand water sources and distribution will be the use of systems that are designed to capture cloud and fog drip in and around the storage systems. This could include the installation of nets and/or other devises that are designed to intercept additional moisture as the clouds/fog roll across the property. Given the location and nature of the proposed rural-development homestead area, it is anticipated that this enhanced water capturing approach would be used in the homestead development.

Alternatives are underway to investigate and test maximum capture of cloud and fog drip into catchment systems. While restoration of the forest can enhance water capture of the cloud and fog drip for the landscape, alternatives need to be explored to enhance water capture for homestead use. Alternatives will continue to be investigated.

Springs Restoration

Additional water resources may also come from springs located on the property. Historic records indicate that springs are located on the property in the vicinity of the Pu`u `Ō`ō Ranch section of the site.

Follow-up work needs to be done to verify the condition of the springs and to rehabilitate them to provide water to the overall property. The reported condition noted below are based on a review conducted 10-years ago.

The first spring is located near the ranch camp. Apparently, the spring is in need of repair and no longer is able to provide water; the spring tunnel has caved in and will need to be cleaned up and dirt material removed. The holding tanks are leaking badly; they will need to be repaired or replaced to provide water for use.

The second spring is located midway through the ranch, next to the Waiama Gulch. This spring used to be the main water source for the ranch. The water was piped to different areas for cattle to drink. Records show that even in times of drought, this water source was still providing water. The waterbox area is filled with dirt and rocks. The large water pond that this spring used to service has dried up and the bottom has grass and cracks in it; this pond needs to be restored to enable use of this paddock.

A third spring is reported to also be on the site.

Deep Well

Presently, the Army is negotiating the drilling of a well for the Pōhakuloa Training Area. Preliminary discussions with the consultant working with the Army (Don Thomas from the University of Hawai`i) notes that a similar well on DHHL property could be in the neighborhood of $3-million. The situation on well development will be monitored through ongoing discussions with the Army, Don Thomas and others.

First Rural-Development Homestead

In order to implement the first rural-development homestead, planning, design, engineering and ultimate construction of the development will be conducted in cooperation with the DHHL homestead development staff. Given the nature and scale of the development, and costs associated with it, alternative sources of funding for the development will also be explored.

On-going Invasive Species Control/Removal

Present gorse and other invasive species eradication and control are addressed from several fronts. Aerial and hand-spraying, mulching and other efforts will continue to contain, control and eradicate gorse outside of the containment area and throughout commercial timber areas of the property. Additionally, other viable gorse eradication opportunities can also be considered.

Reforestation

Another on-going program is the reforestation of remnant forest areas (including māmane, koa and `ōhi`a).

Native Hawaiian tradition and historical accounts portray the lands of Humu`ula, Pi`ihonua, and Ka`ohe as having been dense forests where native practitioners gathered forest resources, birds and food. 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, `ōhi`a and māmane forests and ecosystems, create jobs in the community, provide Hawai`i'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 the mission to "manage the Hawaiian Home Lands trust effectively and to develop and deliver lands to native Hawaiians."

Restoration of primarily former pasture land to a diverse native forest will be an ongoing process. Research in Hawai`i 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.

Extensive research at Keauhou Ranch by Mueller-Dombois, et., al., provides insight as to how reforestation might occur. Mueller-Dombois describes koa as a species ready to take advantages of local disturbances in the 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 program involves construction and maintenance of fences to remove and control cattle and other unmanaged-ungulates. 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.

Reforestation will be conducted through soil scarification and planting of seedlings. 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.

Natural regeneration will be monitored. If forest regeneration is inadequate, planting from local seed sources at appropriate stocking levels will occur to assist forest recovery efforts.

Sustainable forest practices can bring economic diversity and employment for DHHL beneficiaries, enhance the environment, while retaining the rural character of the islands. DHHL's forested lands on the island of Hawai`i are well placed to contribute to and support the forest industry with a range of value-added opportunities.

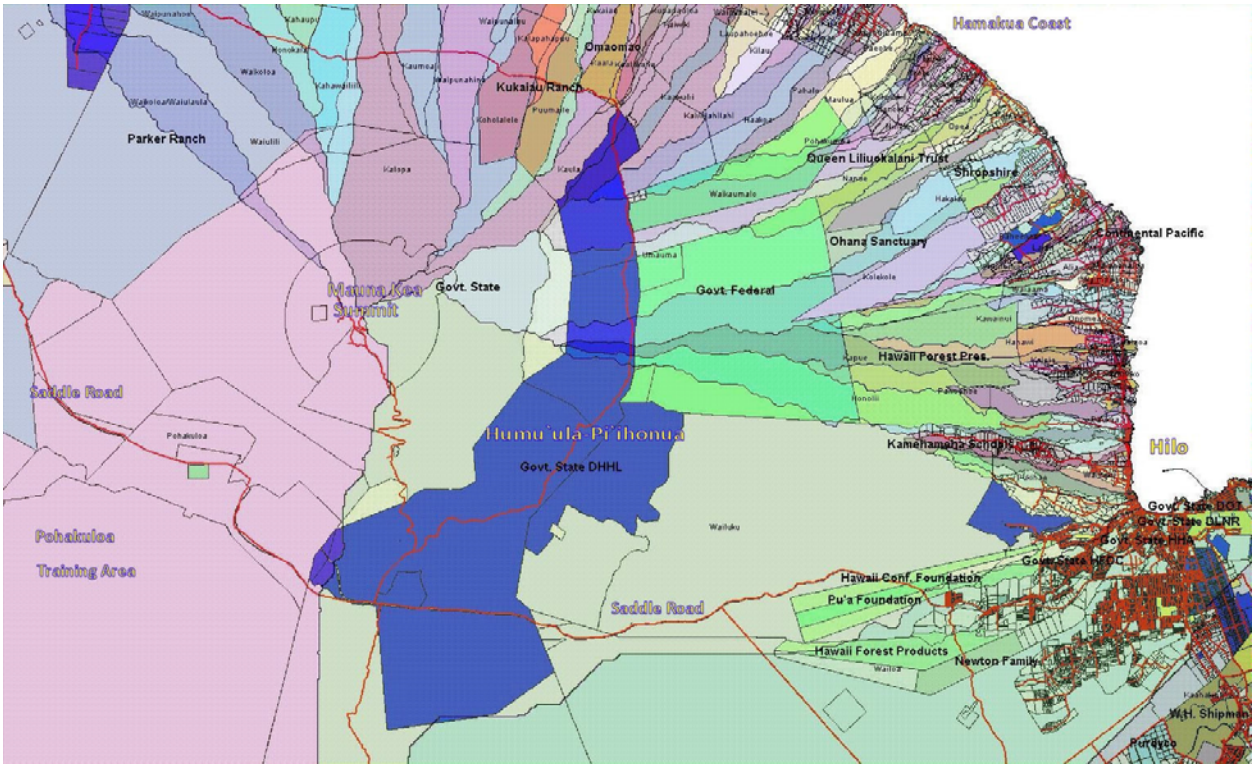
Site Background

The 1997, Humu`ula/Pi`ihonua Master Plan, developed by PBR, Hawai`i for the Department of Hawaiian Home lands gives a good historical assessment of the site. The following is taken from that Plan, except where noted.

Location

The Humu`ula/Pi`ihonua area is made up of approximately 56,200 acres owned by the Department of Hawaiian Home Lands located on the northeast slopes of Mauna Kea. The Humu`ula/Pi`ihonua lands are the largest contiguous parcel under jurisdiction of DHHL. The Humu`ula parcel is approximately 49,100 acres in size and the Pi`ihonua parcel, located adjacent to the eastern boundary of Humu`ula, is approximately 7,078 acres in size. `Āinahou, comprising approximately 11,124 acres, is the subsection of Humu`ula south of Saddle Road and is currently under license to the State of Hawai`i, Department of Land and Natural Resources.

The land parcel is further identified by its subsections. The Pi`ihonua parcel is one subsection (approximately 7,078 acres). The north Humu`ula subsection is the area north of Nauhi Gulch (approximately 5,290 acres), the middle subsection of Humu`ula encompasses the approximate area from Nauhi Gulch to the Wailuku River (approximately 7,513 acres), the south subsection of Humu`ula encompasses the approximate area from the Wailuku River to Saddle Road (approximately 20,377 acres), and `Āinahou is the subsection of Humu`ula south of Saddle Road (approximately 11,124 acres).



Map Noting Watersheds

Climate

The lands of Humu`ula are characterized by their isolation, high elevation, cool temperatures and lack of infrastructure (roads, potable water, telephone, power, etc.). The area is somewhat isolated with the closest public facilities (schools, hospitals, police and fire services) located in Hilo (25 miles and 40 minutes by car) and Waimea (30 miles and 55 minutes by car).

With elevations ranging from approximately 4,500 to 9,000 feet mean sea level, the lands experience cooler temperatures ranging from annual mean of 58 °F at the 5,000 foot elevations to 45 °F at the 9,000 foot elevations, with frost conditions occurring during the winter months.

The average rainfall varies dramatically over various areas of the parcel. In the northern portions (north of Pu`u `Ō`ō) the average annual rainfall ranges from 120 inches in the lower elevations, to 45 inches in the upper elevations. However, in the upper elevations (above 7,000 feet) high evaporation rates create extremely dry conditions during most the year, as evidenced by the sparse vegetation in these areas. In the western portions, generally southwest of Pu`u `Ō`ō, the mean annual rainfall decreases from 80 inches near Pu`u `Ō`ō to less than 40 inches near the Humu`ula Sheep Station adjacent to the Mauna Kea Access Road. The land parcel generally receives the prevailing northeasterly trade winds.

Major Geographic and Geologic Features

Lava flows of 1843, 1855, and 1880 underlie portions of this area. These areas are designated within the Volcanic Hazard Zone 2, defined as areas which generally have had 15 to 25 percent of the area covered with lava since 1800. The balance of the site is categorized in Lava Hazard Zone 7, which reflects areas where only 20 percent of the area was covered with lava over 3,500 years ago.

The land parcel has the following pu`us within its boundaries: Pu`u Nēnē, Pu`u `Ō`ō, Pu`u Loa, Pu`u Kahinahina, Pu`u Kaiwiiwi, and Pu`u Palaolelo.

The pu`u or cinder cones are probably the most characteristic feature of the project area. These pu`u add scenic value to the landscape and may offer other resources, such as cinder material or vantage points for antennas. However, these features, as well as gullies, gulches or sink holes, may be refuges for endangered or other native plants. In general, these features are somewhat protected from heavy grazing. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-18)

Soils

The land parcel contains several soil types. Soil conditions are reflective of the environmental variations with sandy, rocky soils generally found in the upper and drier elevations; the better sandy loams in the mid-elevations, and poorly draining clay loams in the lower and wetter elevations, especially within Pi`ihonua.

Pi`ihonua primarily consists of two soil types: PND and PUC. PND is from the Pi`ihonua soil series. This series consists of well drained silty clay loams formed in layers of volcanic ash. The PND has 6 to 20 percent slopes on elevations ranging from 4,500 to 6,500 feet and receive from 90 to 150 inches of rainfall annually. This soil dehydrates irreversibly into fine gravel size aggregates and is extremely stony in places. Permeability is rapid, runoff is slow, and the erosion hazard is slight.


LEGEND
Gorse
Soils With Highest Potential
Lava/Stony Land
Soils With Poor Drainage
Paved Road
Unpaved Road
Proposed Road
Feature/Place
Puu
Natural Community/ Endangered Flora & Fauna
FIGURE 3
GENERAL SOIL CHARACTERISTICS
HUMUULA/PIIHONUA
MASTER PLAN
FEET
PBR HAWAII


LEGEND
PAVED
UNPAVED
ROADS
Trail/4WD
FOREST RESERVE
PASTURE LEASE
BOUNDARIES
Gulch/Intermittent Stream
Perennial Stream
Rock Wall
Fence
Electrical Line
Water Line
Puu
Feature/Place
Reservoir/Water Tank
FIGURE 2
PHYSICAL AND
HISTORIC FEATURES
HUMUULA/PIIHONUA
MASTER PLAN
FEET
PBR HAWAII
PARCEL 1
PARCEL 2
PARCEL 3
PIIHONUA
AINAHOU
FOREST RESERVE

PUC is from the Pu`u `Ō`ō soil series consisting of well drained silt loams formed from volcanic ash. It ranges from 6 to 12 percent slopes at elevations ranging from 5,000 to 6,500 feet and receives from 65 to 100 inches of rainfall annually. The subsoil dehydrates irreversibly into fine sand size aggregates. Permeability is moderately rapid, runoff is slow, and the erosion hazard is slight. Pu`u `Ō`ō soils are used for pasture.

The north Humu`ula subsection consists primarily of three soil types: ASD, HDD, and HCD. ASD is from the Apakuie series which consists of well-drained very fine sandy loams formed from volcanic ash, sand, and cinders. It has 12 to 20 percent slopes at elevations ranging from 5,000 to 8,000 feet and receives from 20 to 35 inches of rainfall annually. In some years it is covered by snow for a few days. Permeability is rapid, and runoff is slow. The hazard of soil blowing is moderate. This soil is used for pasture and wildlife habitat.

HDD and HCD are from the Hanipoe soil series which consist of well-drained silt loams formed from volcanic ash. They have 12 to 20 percent slopes at elevations ranging from 5,000 to 6,500 feet. They receive from 30 to 50 inches of rainfall annually, runoff is slow, and the erosion hazard is slight. In places this soil is very rocky. These soils are used for pasture, woodland, and for wildlife habitat.

The middle Humu`ula subsection consists primarily of five soil types: LAD, LUC, AFD, ASD and HDD. HDD is described above. The AFD and ASD soils are from the Apakuie series which is described above. LAC and LUC are from the Laumai`a soil series which consists of well drained silt loams formed from volcanic ash. These soils are on 6 to 20 percent slopes at an elevation ranging from 5,500 to 8,000 feet. They receive from 35 to 70 inches of rainfall annually, permeability is moderately rapid, runoff is slow to medium, and the erosion hazard is slight to moderate. The surface is extremely stony in places, covering 3 to 15 percent of the surface. Laumai`a soils are used for pasture.

The south Humu`ula subsection consists of primarily six soil types: ASD, AFD, LAD, LUC, KZD and rLV. ASD, AFD, LAD and LUC are described above. KZD is from the Kilohana soil series with somewhat excessively drained loamy fine sands formed from volcanic ash, sand, and cinders. This soil is on slopes of 12 to 20 percent at elevations ranging from 5,000 to 6,500 feet. They receive from 20 to 40 inches of rain fall annually, permeability is rapid, runoff is slow, and the erosion hazard is slight. Kilohana soils are used for pasture, wildlife habitat, and recreation areas.

rLV is from the a`ā soil series which is a lava flow. rLV is located at elevations ranging from near sea level to 13,000 feet and receives from 10 to 250 inches of rainfall annually. In areas of high rainfall, it contributes substantially to the underground water supply and is used for watershed. It has practically no soil covering.

The `Āinahou lands south of the Saddle Road, are comprised almost entirely of pāhoehoe and a`ā lavas, the most recent of which includes portions of the 1935 lava flow. `Āinahou consists primarily of two soil types, both lava flows: rLV and rLW. rLV is described above. rLW is from the Pāhoehoe soil series. The rLW is located at elevations ranging from sea level to 13,000 feet and receives from 10 to 250 inches of rainfall annually and contributes to the ground water supply. It has no soil covering.

The Humu`ula/Pi`ihonua land parcels also has several scattered areas rCL (Cinder Land) which consists of bedded cinders, pumice, and ash. Cinder land commonly supports some grass, but it is not good pasture land because of its loose consistency and poor trafficablility. This land is a source of material for surfacing roads.

Vegetation

The vegetation is dominated by an understory of exotic pasture grasses over much of the lands with koa/`ōhi`a forest found in the lower portions of Pi`ihonua, especially in the lands adjacent to the Hakalau Forest National Wildlife Refuge. Scattered koa and māmane are found over the northern portions of Humu`ula with scattered māmane found in the upper elevations, especially adjacent to the Mauna Kea Forest Reserve. The vegetation on the `Āinahou lands generally consists of scattered scrub vegetation of `ōhi`a and native shrubs.

According to the U.S. Geological Service (USGS) vegetative mapping program, entitled "The Hawai`i Forest Bird Survey (HFBS) Vegetation Classification System", 62 prominent vegetative habitats can be found on the land parcel. These vegetative habitats (referred to as vegetative types) are coded in the level 1 symbols of the HFBS Vegetation Classification System. Each level 1 type identifies six different characteristics: 1) tree canopy cover, 2) tree canopy height, 3) dominant tree species composition, 4) species association type, 5) dominant understory species composition, and 6) other information pertinent to the map unit.

Pi`ihonua contains primarily three vegetative types. The three types consist of scattered, open, and closed canopies (ranging from 5% to over 10% cover) of koa trees over 10 meters in height, in a moist habitat with `ōhi`a, scrub native trees, native shrubs, and introduced grasses, sedges, or rushes.

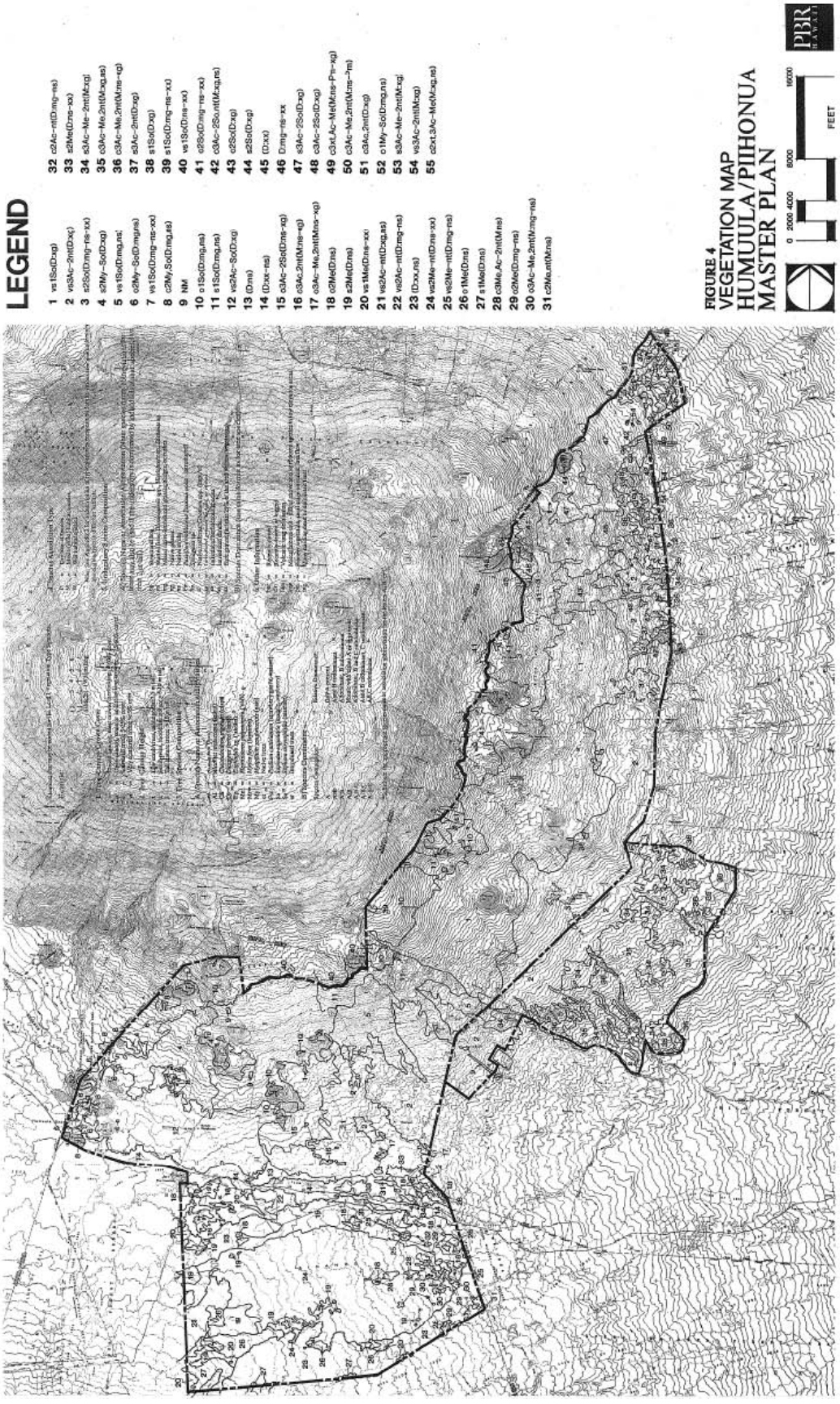
The north Humu`ula subsection contains primarily five vegetative types consisting of the following: scattered to open canopy (5 -60% cover) koa trees over 10 meters in height and māmane of moderate height (5 -10 meters), in a dry habitat with mixed native-introduced grasses, sedges, or rushes; open canopy 25 -60% māmane of moderate height in a dry habitat with mixed native introduced grasses, sedges, and rushes; and scattered scrub trees and māmane in a dry habitat with introduced grasses, sedges, or rushes.

The middle Humu`ula subsection contains primarily three vegetative types. The first type is very scattered (<5% cover) low scrub trees and māmane, in a dry habitat with introduced grasses, sedges, or rushes. The second type is very scattered koa trees over 10 meters in height and native trees of moderate height, in a dry habitat with introduced grasses, sedges, or rushes. The third type is scattered māmane of moderate height, in a dry habitat with native and introduced grasses, sedges, or rushes, as well as areas of bare ground.

The south Humu`ula subsection contains primarily seven vegetative types. Two types are the same as the first two types described for the middle subsection above. The remaining types include very scattered koa, māmane, naio, and native trees of moderate height, in a dry habitat with native shrubs and introduced grasses, sedges, or rushes.

`Āinahou contains primarily two vegetative types. The types consist of very scattered `ōhi`a and native trees of moderate height, in a dry habitat with native shrubs and areas of bare ground.

The nuisance shrub, gorse, covers about 20 percent of the entire site (11,000 acres). Patches or individual plants can be found across another 10,000 acres. Gorse (Ulex europaeus) is a member of the legume family, native to Europe and introduced to Hawai`i as a hedge plant. The shrub grows thickly to heights of 6 to 10 feet and produces sharp, three inch thorns covered with a thick, waxy substance.


LEGEND
1 vs1Sd(Dxg)
2 vs3Ac-2ntt(Dxg)
3 s2Sd(Dmg-ns-xx)
4 s2My-Sd(Dxg)
5 vs1Sd(Dmg,ns)
6 o2My-Sd(Dmg,ns)
7 vs1Sd(Dmg-ns-xx)
8 c2My,Sd(Dmg,ns)
9 NM
10 o1Sd(Dmg,ns)
11 s1Sd(Dmg,ns)
12 vs2Ac-Sd(Dxg)
13 (D,ns)
14 (D:xx-ns)
15 o3Ac-2Sd(Dms-xg)
16 o3Ac2ntt(Mns-xg)
17 o3Ac-Me,2ntt(Mns-xg)
18 o2Md(Dns)
19 s2Md(Dns)
20 vs1Md(Dns-xx)
21 vs2Ac-ntt(Dxg,as)
22 vs2Ac-ntt(Dmg-ns)
23 (Dxx,ns)
24 vs2Ac-ntt(Dns-xx)
25 vs2Ac-ntt(Dmg-ns)
26 o1Md(Dns)
27 s1Md(Dns)
28 o3Ac-2ntt(Mns)
29 o2Md(Dmg-ns)
30 o3Ac-Me,2ntt(Mmg-ns)
31 c2Ac,ntt(Mns)
32 o2Ac-ntt(Dmg-ns)
33 s2Md(Dns-xx)
34 s3Ac-Ac-2ntt(Mxg)
35 o3Ac-Me,2ntt(Mxg,as)
36 o3Ac-Me,2ntt(Mns-xg)
37 s2Ac-2ntt(Dxg)
38 s1Sd(Dxg)
39 s1Sd(Dmg-ns-xx)
40 vs1Sd(Dns-xx)
41 o2Sd(Dmg-ns-xx)
42 o3Ac-2Sd,ntt(Mxg,ns)
43 o2Sd(Dxg)
44 s2Sd(Dxg)
45 (D:xx)
46 Dmg-ns-xx
47 s3Ac-2Sd(Dxg)
48 o3Ac-2Sd(Dxg)
49 o3xtAc-Md(Mns-Pns-xg)
50 o3Ac-Me,2ntt(Mns-?ns)
51 o3Ac,2ntt(Dxg)
52 o1My-Sd(Dmg,ns)
53 s3Ac-Me-2ntt(Mxg)
54 vs3Ac-2ntt(Mxg)
55 o2xt,3Ac-Md(Mxg,ns)
FIGURE 4
VEGETATION MAP
HUMUULA/PIIHONUA
MASTER PLAN
0 2000 4000 8000 16000
FEET
PBR HAWAII

The seeds of the gorse plant can lie dormant for 50 to 70 years. Heat tends to trigger seed germination, and each plant propagates thousands of seeds. Over 25,000 acres of gorse occur on the island of Hawai`i, and over 20,000 acres of the Pi`ihonua/Humu`ula lands are infested. Gorse interferes with reforestation and is suspected of causing ecological upsets by acidifying certain types of soil. The dense wax covered thorns are flammable and even in moist conditions can support intense brush fires.

The continued dominance of gorse could potentially eliminate any productive use in areas covered by the plant and render the land unsuitable as habitat of any kind, including native birds and forests, cattle pasture, or other agricultural use.

There are several areas of significant koa growth and dying and fallen koa. Healthy koa trees play an important role in maintaining good pastures by supplying nitrogen and organic material to the soil, preventing excessive soil and water run-off, providing protection to animals during storms and allowing water from fog to trickle down to understory vegetation.

Cattle, sheep and goats feed on seedling koa and have effectively stifled reproduction except in areas that are fenced off or are inaccessible. Older koa trees could be harvested and reforestation initiated in protected areas. The prime areas for initiating salvage and reforestation are located in the Humu`ula subsection and lower portions of Pi`ihonua.

The existing koa stands support several endangered native bird species, many of which are found in the adjacent Hakalau Forest National Wildlife Refuge and Hilo Forest Reserve. Any use of the existing koa resources, therefore, will need to address the requirements of the Federal Endangered Species Act.

Vegetation Sensitivity Analysis

Based on existing vegetation maps and known information presence of listed endangered or threatened species, areas of potential botanical and biological sensitivity have been identified through preliminary sensitivity studies.

The Vegetation Sensitively Analysis, which is part of the 1997 Humu`ula/Pi`ihonua Master Plan Appendices, delineates vegetative sensitivity zones which were drawn to include core groups of vegetation units with similar scores. The zones may include smaller vegetation units with lower or higher scores. Native plant communities marked for 'Special Attention' were grouped with communities with higher scores.

The sensitivity zones were drawn primarily from the scores, with the adjustments already noted. Some deviations of zone boundaries were made to follow or include topographic features, especially pu`u (cinder cones). Slight deviations were also made to enhance compactness and integrity of the zones.
The following high, medium and low sensitivity zones were designated:

High Sensitivity Zone - `Āinahou Young Lava Flows
In most of `Āinahou plant growth is strongly controlled by the very poorly developed soils on the young Mauna Loa lava flows. The vegetation is mostly native shrub land, in places with scattered native trees. With the exception of a small area in the northeast corner, these are raw lava lands that do not support pasture grasses. Young lava flows in the Saddle Road area have been found to be resistant to invasion by alien plants, the noxious fountain grass (Pennisetum setaceum) being a possible exception.

`Āinahou is designated as a high sensitivity area because the understory is not dominated by alien grasses and the shrub land communities are strongly native in character. Many species of endangered plants grow in similar communities nearby in the Pōhakuloa Training Area. A few small kīpuka in the east support a diverse, closed `ōhi`a forest and warrant strong protection from disturbance. Although the early succession communities of `Āinahou often contain considerable areas of bare lava, this is their natural state, and they are an important part of the Humu`ula Saddle ecosystem.

High Sensitivity Zone - Humu`ula Māmane-Naio Forest
The Māmane-Naio dry forest community occurs only at high elevations on Hawai`i at Haleakalā, Maui, and is among the most endangered ecosystems in Hawai`i. In Humu`ula, It has been subjected to some grazing and alien grasses grow here, but they do not dominate the understory. The low rainfall and sandy soil combine to keep plant productivity low. This zone contains both open and closed forests of māmane and naio. Like `Āinahou, this area is similar to parts of Pōhakuloa Training Area where endangered plants are found. This zone is contiguous with part of the Mauna Kea Forest Reserve (state) that is designated critical habitat for Palila.

High Sensitivity Zone - Pi`ihonua `Ōhi`a-Koa Forest
As has already been stated, Pi`ihonua is the wettest part of the project area and can support diverse native rain forest. This vegetation, heavily impacted by grazing, is the interface between the Humu`ula pastures upslope and the forests of the neighboring Hilo Forest Reserve and Hakalau Forest National Wildlife Refuge. Several species of endangered plants, may occur here.

Medium Sensitivity Zone - Keanakolu Māmane Forest
Near Keanakolu there is some cover of native trees and shrubs. Being somewhat drier than Pi`ihonua, the dominant tree species are koa and māmane rather than `ōhi`a. `Ōhi`a does occur as a co-dominant species below 5,600 feet in part of this area. The native forest cover in this area may be indicative of bullock hunting pressure in the mid-1800s, followed by less formal grazing due to poor soils. The ground cover is alien pasture grasses, sometimes co-dominant with the occasional native shrubs. This area borders the Hilo Forest Reserve.

Medium Sensitivity Zone - North and South Mauna Kea Māmane Shrub Land
These zones are mostly high elevation with very scattered māmane trees and a dominant layer of native shrubs. Most of these zones are above the 8,000 foot contour, receiving about 40 inches or less rain annually. Sandy soils also contribute to the dryness of these areas. The western end extends nearly to the Saddle Road to incorporate a chain of cinder cone and neighboring open koa forests. Alien pasture grasses occur only in the extreme southern portions and around the cinder cones.

Low Sensitivity Zone - Humu`ula Pastures
These pastures include scattered or very scattered native trees but are dominated by the alien pasture grasses and gorse. For years, grazing has prevented or reduced tree regeneration. Native trees or shrubs only occur in rugged areas that are obstacles to cattle, such as cinder cones or gullies. Large patches of gorse also occur in this zone. The combination of rainfall and fine-texture soil have made this the most productive rangeland in the project area. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Pages G-11-17)

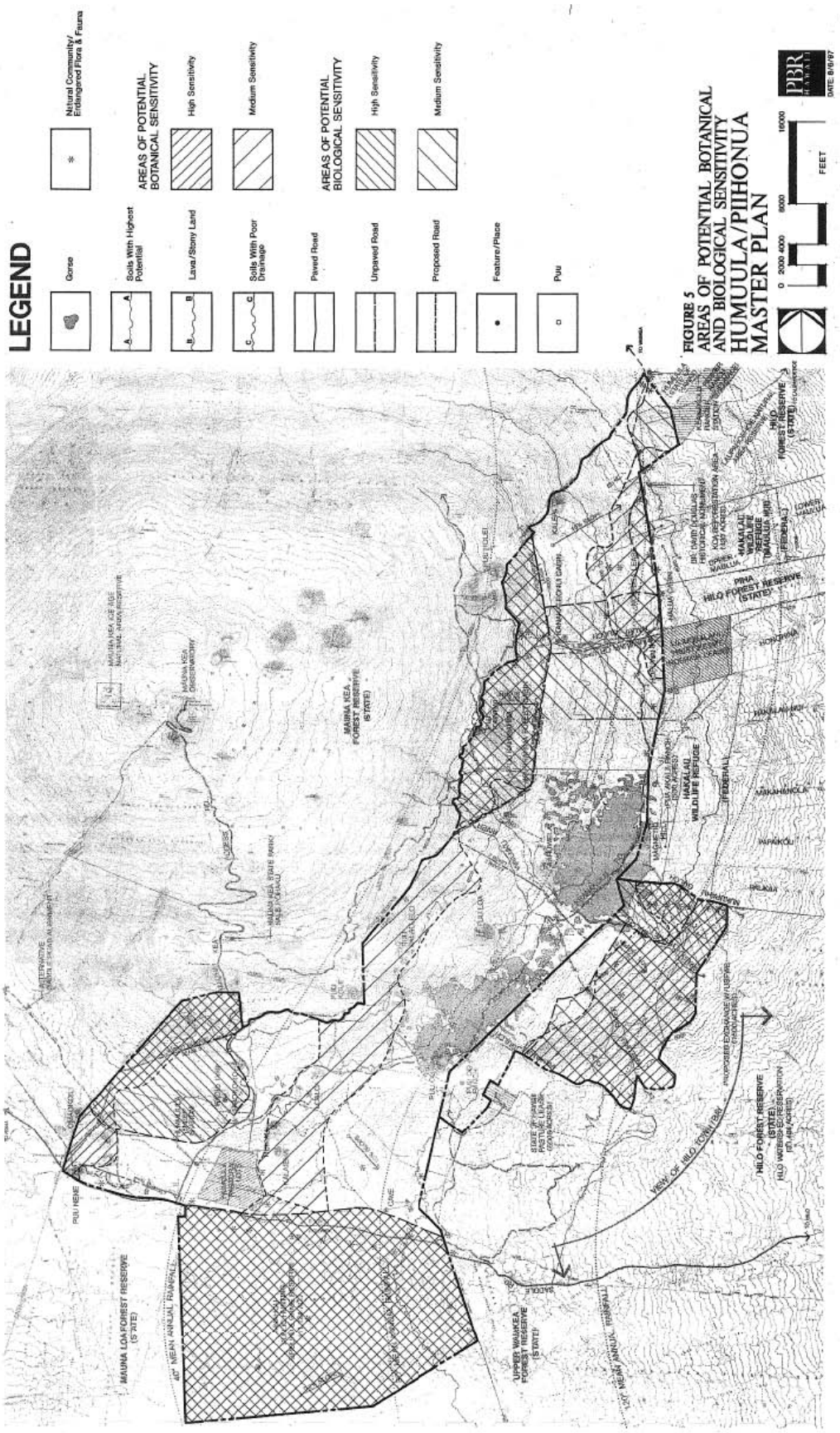


FIGURE 5
AREAS OF POTENTIAL BOTANICAL AND BIOLOGICAL SENSITIVITY
HUMUULA/PIIHONUA MASTER PLAN

Endangered and Threatened Species

The Vegetation Sensitivity Analysis contained within the Master Plan, discusses the probable occurrence of protected plant species. Although none of these lands are designated as critical habitat, data base analysis has shown that legally protected plants were found within the project area in the past and probably grow there now. Exact locations of endangered plant species cannot effectively be shown on a base map. The Vegetation Sensitivity Analysis lists four species of listed endangered plants and two species of concern reported to grow within the project area. Four of these species are reported from more than one location.

Species of listed endangered plants and species of concern reported to grow within the project area				
Common Name	**Scientific Name**	**Status**	**Area**	**Year of observation**
fern	*Asplenium fragile var insulare*	Listed Endangered	Keanakolu	1957
			Pu`u `Ō`ō	1935
`ōhā, `ōhā wai	*Clermontia lindseyana*	Listed Endangered	Pu`u `Ō`ō	1957
`ōhā, `ōhā wai	*Clermontia pyrularia*	Listed Endangered	Keanakolu	1978
			Pu`u Akala	1992
laukahi kuahiwi	*Plantago hawaiiensis*	Listed Endangered	Pu`u `Ō`ō	1979
na`ena`e	*Dubautia arborea*	Species of Concern	Pu`u `Ō`ō	1935
			Keanakolu	1935
makou	*Ranunculus hawaiiensis*	Species of Concern	Mauna Kea	1990
			Pu`u `Ō`ō	1979

Additionally, there are records of five other such species outside, but near the boundaries of the project area. Silverswords are known to grow slightly above the elevation of project area in the vicinity of the Wailuku River and Waipāhoehoe Gulch. Data base records show that in the past the silverswords grew as low as 8,000 feet elevation, well within the project area.

Species of listed endangered plants and species of concern reported to grow outside, but near the boundaries of the project area				
Common Name	**Scientific Name**	**Status**	**Area**	**Year of observation**
`āhinahina, silversword	*Argyroxiphium sandwicense*	Listed Endangered	Mauna Kea	1991
pōpolo kū mai	*Solanum incompletum*	Listed Endangered	Pu`u `Ō`ō	1949
fescue	*Festuca hawaiiensis*	Species of Concern	Pu`u `Ō`ō	1916
`ākala, `ākalakala	*Rubus macraei*	Species of Concern	Upper Pi`ihonua	1991
`ānunu	*Sicyos macrophyllus*	Species of Concern	Pu`u `Ō`ō	1985

Flora and fauna on the land parcel has been mapped from information documented by the Federal Status and Heritage Global Ranks of the official U.S. Fish & Wildlife Service Endangered Species Act. All flora and fauna identified on these lands and described below are either endangered or threatened.

The Pi`ihonua parcel contains several endangered or threatened vertebrate species: the koa-`ōhi`a forest below the 6,000 foot level is significant from both an avian and botanical perspective. It is extremely good habitat for at least four endangered avian species: Hawai`i `Ākepa, Hawai`i Creeper, `Akiapōlā`au, and Hawaiian Hawk (`Io) as well as breeding habitat for at least five other endemic species.

The north Humu`ula subsection has the following vertebrates: Hawaiian Creeper, `Io, Hawaiian Hoary Bat, Palila, `Akiapōlā`au and Hawaiian Duck (Koloa). Also found in this subsection are the na`ena`e and `ōhā wai plant species and the natural communities of māmane subalpine dry forest and koa/māmane montane dry forest. The māmane forest is an important resource for the Palila.

The middle Humu`ula subsection has the following vertebrates: `Io, Koloa, Hawaiian Creeper, Hawaiian `Ākepa, Hawaiian Goose (Nēnē), Hawaiian Hoary Bat, and Palila. Also found in this subsection is the natural communities of koa/māmane montane dry forest and māmane subalpine dry forest at the upper elevations, adjacent to the Mauna Kea Forest Reserve.

The south Humu`ula subsection has the following vertebrates: Nēnē, `Akiapōlā`au, `Io, Palila, and Hawaiian Dark Rumpled Petrel. Also found in this subsection is the na`ena`e and `ōhā wai plants and the natural communities of koa/māmane montane dry forest and the māmane subalpine dry forest.

The Māmane forest at the western boundary of the south Humu`ula subsection represents a significant resource for the endangered Palila. From recent research it appears that one of the most important resources for supporting Palila is a māmane forest with a large latitudinal range similar to that found in this area. This allows the birds to move up and down slope following the bloom and pod set of the forest which occurs over a latitudinal cline. The south Humu`ula subsection is also the only location of the land parcel that has an invertebrate species, the Amastrid Land Snail. Both Amastrid Land Snail and Dark Rumpled Petrel have been documented near Saddle Road.

`Āinahou has the following vertebrates: Hawaiian Creeper, `Io, `Akiapōlā`au, Nēnē, and Palila. Also found in the `Āinahou section is the Makou plant and the natural communities of deschampsia nubigena, subalpine mesic, and grassland. The `Āinahou subsection is unique from both a biological and botanical perspective in that it consists of shrub land community that is strongly native in character with a few small kīpuka of closed `ōhi`a forests in the eastern portion. It supports several endangered avian species, including the Nēnē. Additionally, many endangered plants and animal species are found in the adjacent west Pōhakuloa Training Area.

From a biological perspective the māmane forests are important in that they serve as a critical habitat for palila, an endangered native bird. Several endangered or threaten native bird species also are associated with the koa/`ōhi`a and koa/māmane forest areas. The `Āinahou lands, which serve as a public hunting and game reserve area, also serves as a refuge area for the nēnē.

Unlike topographic features, plants and plant populations may disappear locally or expand existing populations, or even sprout in completely new areas. This analysis can only list locations of endangered plants known at the time the data were collected. These species could spread to new locations at any time. Furthermore, the Humu`ula/Pi`ihonua project area is vast and would require an inordinate amount of time to actually search in entirety for endangered plants. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-12)

These difficulties make the use of vegetation analysis and maps invaluable. These tools can show where it is most probable that endangered plants may grow. Use of the Vegetation Sensitivity Map may be used to guide master planning, subject to the following considerations:

1. In general, endangered species are more likely to occur in native plant communities that have received less disturbance rather than in the more heavily grazed parts of the project area.
2. Secondarily, topographic features that make grazing difficult, such as steep pu`u, gullies, or lava tube entrances, may be plant refuges harboring remnants of native vegetation not shown on maps. Endangered species may persist in these kinds of sites.
3. Finally, although the probability is low, endangered plants may grow anywhere, even in heavily grazed pastures. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-12)

Biological Sensitivity Analysis

The Biological Sensitivity Analysis which is part of the Master Plan Appendix delineates areas containing endemic faunal sensitivity within the Humu`ula/Pi`ihonua area. The assessment gives a brief description of each area and outlines the endemic vertebrate resources that should be factored into any master planning of the areas delineated.

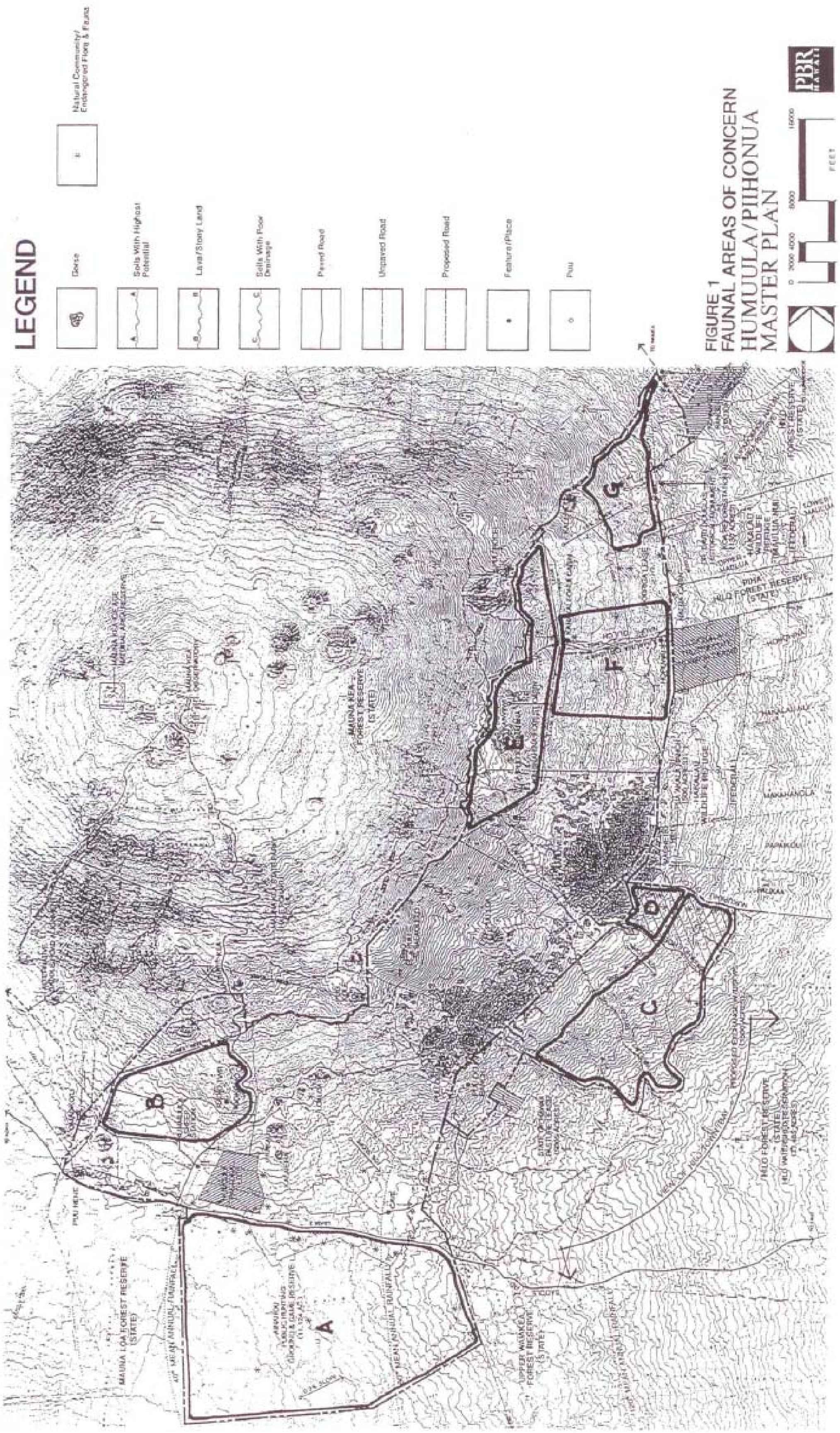
(A) `Āinahou Young Lava Flows -Nēnē Habitat:
This area probably has little commercial agribusiness potential but represents a significant area of emergent native vegetation which supports several endemic avian species, including Nēnē (Branta sandvicensis) -albeit in extremely small numbers. It is possible that there are several extremely rare and possibly a few listed botanical species.

(B) West of Mauna Kea Access Road – Māmane-Naio Forest – Palila Habitat:
This area should not be further grazed -the Māmane (Sophora chrysophylla) forest represents a significant resource for the endangered Palila (Loxioides balleui). If this area was further restored it would greatly enhance the habitat available for further restoration of this species.

From recent research it appears that one of the most important resources for supporting Palila is a māmane forest with a large altitudinal range, similar to that found in the Pu`u La`au area. This allows the birds to move up and down slope following the bloom and pod set of the forest which occurs over an altitudinal cline.

Much of the māmane forest within PTA on the other side of the HHL fence in this area has been severely impacted by the incursion of naio (Myoporum sandwicense) which has out-competed māmane due in part to the pressure from feral sheep (Ovis aries) and mouflon (Ovis musimon) which prefer māmane to naio as a foraging resource - thus, giving the naio an unfair advantage. Naio cannot support Palila, it also is extremely attractive to rats and creates a significant fuel load within the ecosystem.

(C) Pi`ihonua Mauka -`Ōhi`a-Koa Forest – Biodiverse Endangered Endemic Forest Bird Habitat:
The forest below the 6,000 foot level is significant from both an avian and botanical perspective. It is extremely good habitat for at least four endangered endemic avian species: Hawai`i `Ākepa (Loxops coccineus coccineus), Hawai`i Creeper (Oreomystis mana), `Akiapōlā`au (Hemignathus munroi), and `Io (Buteo solitarius) as well as breeding habitat for at least five other endemic species.


LEGEND
Gorse
Soils With Highest Potential
Lava/Stony Land
Soils With Poor Drainage
Paved Road
Unpaved Road
Proposed Road
Feature/Place
Puu
Natural Community/ Endangered Flora & Fauna
FIGURE 1
FAUNAL AREAS OF CONCERN
HUMUULA/PIIHONUA
MASTER PLAN
FEET
PBR HAWAII
A
B
C
D
E
F
G
MAUNA LOA FOREST RESERVE (STATE)
MAUNA KEA FOREST RESERVE (STATE)
HILO FOREST RESERVE (STATE)
UPPER WAIAKEA FOREST RESERVE (STATE)
PIHA
MAKAHANALA
PAPAIKOU
PAUKAA
HONOMU

(D) Upper Pi`ihonua Mauka -`Ōhi`a-Koa Forest – Biodiverse Native Forest:
As mentioned in the previous account, this area contains the highest elevation rain forest left in this district if not the whole windward side of the island. It is used as both a foraging and breeding area by many of the endangered and other endemic avian species found in the Hakalau Forest National Wildlife Refuge located immediately to the north of this area.

(E) Kahinahina -Māmane Forest – Palila Habitat:
With restoration, this area can support populations of `Akiapōlā`au and Palila. The Māmane remaining in this area is significant for both species. Encouraging māmane regeneration should be one of the management objectives for this area.

(F) Kanakaleonui Bird Corridor -Koa-Māmane Forest – Native Bird Link to Forest Areas:
The 514-acre Kanakaleonui Bird Corridor (KBC) restoration project represents a collaborative multi-organizational effort to reestablish and maintain wildlife habitat for native bird populations. The Department of Hawaiian Home Lands is working with the US Forest Service, the U.S. Fish & Wildlife Service (USFWS), the University of Hawai`i campuses at Hilo and Manoa, and other organizations in an effort to create wildlife habitat connecting the down slope Piha Forest Reserve and Hakalau Forest National Wildlife Refuge with the upslope Mauna Kea Forest Reserve.

The primary goal of this project is to "help create a more viable wildlife corridor for native birds dependent on seasonal mauka to makai migration patterns on Mauna Kea." This goal would be achieved by restoring the KBC's native forest habitat to that which existed before European contact with Hawai`i.

In 2007 the USFWS provided funding to fence the 514-acre Corridor in an effort to keep feral ungulates; cattle, and pigs from causing further damage. In 2008, the first research and permanent monitoring plots were established throughout the Corridor with assistance from the U.S. Forest Service, the USFWS, UH Manoa and UH Hilo campuses, and the Hawai`i Community College.

(G) Keanakolu Māmane Forest:
This area has been degraded and has quantities of Banana Poka (PassifIora mollissima) and other pestiferous plant species. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document H-Biological Sensitivity Analysis, Pages H-1 & 2)

The remaining large un-demarcated area has by in large been severely degraded by a combination of logging, grazing, and recently the ever expanding gorse (Ulex europaeus) scourge. In general, from an avian perspective, encouraging koa and other forest building ventures adjacent to the southern boundaries of the main parcel and the northern part of Area C would be beneficial to endemic avian species.

Gorse represents a major threat to resource management. It all but chokes out any other vegetation and has minimal value from an endemic species perspective. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document H-Biological Sensitivity Analysis, Page H-2)

<u>Safe Harbor Agreements</u>

Many endangered species of plants are known from the general region that includes the slopes of Mauna Kea and the Saddle area. Some of these are found in habitats similar to those within the project area and may have once occurred, or may now occur, within the project area.

Because the activities proposed in the `Āina Mauna Legacy Program could affect habitat for threatened and/or endangered plants, birds and animals, it is recommended that a blanket Safe Harbor Agreement be developed and incorporated into the Legacy Program. Since part of the goals include restoration of habitat, as well as planting of trees that could attract native birds and bats, the Safe Harbor Agreement can protect DHHL from future impacts to the habitat and the species.

The Safe Harbor program encourages proactive natural resource management to benefit endangered and threatened species by providing regulatory assurances that future property-use restrictions will not be imposed if those efforts attract endangered or threatened species to their enrolled property or result in increased numbers or distributions of listed species already present.

Safe Harbor Agreements were forged in response to some unexpected consequences of the federal Endangered Species Act. Some of the law's provisions prevent private landowners from doing anything on their land that would damage the habitat of endangered plants, birds or animals. And in some cases, the law also discouraged landowners from doing things that would actually help the very animals the Endangered Species Act was supposed to protect.

These agreements, actually contracts incorporated in a permit from the U.S. Fish & Wildlife Service, ensure that if landowners take specific actions to encourage endangered species onto their land -- by creating wetlands or planting certain kinds of trees, for example -- they won't be hit later with new restrictions because of the wildlife that moves in.

That, in turn, allows landowners to develop their land as they wish once the Safe Harbor Agreement -- often lasting 20 years -- has expired. The agreements also include escape clauses that would let landowners make changes if they run into unexpected circumstances -- a financial emergency, for example.

The Safe Harbor Program is underlined in the Hawai`i Revised Statute (HRS Section 195D-22), and is sponsored by the State of Hawai`i Department of Land & Natural Resources - Division of Fish & Wildlife (DLNR-DOFAW).

Safe Harbor Agreements already in place in Hawai`i include the following:

Safe Harbor Agreement with Chevron Products Company, Hawai`i Refinery at James Campbell Industrial Park, O`ahu: Finalized in July, 2005, this Safe Harbor Agreement is for the management of nesting and foraging habitat for endangered Hawaiian Stilt and Hawaiian Coot at the Chevron Refinery Hawai`i at the James Campbell Industrial Park on O`ahu. The Agreement has a term of 6 years and during that period Chevron will maintain 6 acres of stilt nesting habitat and 5 acres of habitat for stilt and coot foraging. Chevron will manage the water level and vegetation in a basin known as Rowland's Pond to maximize nesting habitat and conduct predator control around Rowland's Pond and several other ponded areas within the refinery to provide additional foraging habitat. Chevron has committed to monitor the stilts and coots occurring on their property and implement adaptive management strategies should current management activities appear ineffective. In addition, Chevron will conduct an education program for its employees and contractors about the Hawaiian stilt and coot at the refinery.

**Safe Harbor Agreement for the Reintroduction of the Nēnē to Pi`iholo Ranch, Maui:** Under this Agreement, finalized in August, 2004, Pi`iholo Ranch will maintain or improve approximately 600 acres of nēnē habitat on the Ranch for a period of 10 years by continuing cattle ranching operations, thereby

maintaining open, short-grass habitat; establish and maintain a nēnē release pen; control predators around breeding and release sites; and outplant native plant species known to be nēnē food sources. DLNR will conduct the actual reintroduction of nēnē raised at the Maui Bird Conservation Center and Ranch staff will provide food and water to the nēnē while they are in the release pen and assist DLNR in monitoring the population on the Ranch.

Programmatic Safe Harbor Agreement for the Nēnē on the Island of Moloka`i, Hawai`i: Finalized in April, 2003, this is the first "programmatic" Safe Harbor Agreement in the state, such that DOFAW is the permittee and individual landowners ("Cooperators") enroll through Cooperative Agreements with DOFAW and are covered under DOFAW's Agreement and Permit. Landowners can voluntarily enroll by signing a Cooperative Agreement with the State which commits them to make appropriate habitat on their land available to nēnē for a period of 10 years, and in return the landowner receives assurances from both the state and federal agencies that they will not be held responsible if nēnē should be accidentally harmed or killed on their property for the duration of the permit, which expires in 2053.

Safe Harbor Agreement and Habitat Management Plan for Koloa (Hawaiian Duck) and Nēnē (Hawaiian Goose) on Umikoa Ranch, Island of Hawai`i: Under this Agreement, finalized in December, 2001, Umikoa Ranch will create and fence 152 acres of new wetland and associated upland habitat, improve nēnē and koloa breeding success in new habitats by controlling mammalian predators there, and maintain additional foraging and wetland habitat that is already present on the Ranch.

Safe Harbor Agreement for Nēnē Introduction to Pu`u O Hoku Ranch, Moloka`i: Under the first Safe Harbor Agreement in the State, finalized in September, 2001, Pu`u O Hoku Ranch agreed to maintain or improve significant amounts of nēnē habitat for a period of 7 years by continuing cattle ranching operations, thereby maintaining open, short grass habitat; assist DLNR to establish and maintain release sites and assist DLNR to control predators around breeding and release sites.

For the `Āina Mauna Legacy Program, Safe Harbor Agreements will be crucial in restoring native forests and in turn brining back native birds populations. A Safe Harbor Agreement will need to be done over the entire property. In particular the commercial forestry to eradicate gorse program will create an environment friendly to certain bird species. Since the program's goal is to restore the area to native koa forest after the gorse has been eradicated, it is essential that the program be allowed to take proactive management steps which in some cases may cause a temporary loss of habitat for bird species.

Invasive Species

Hawai`i is in the midst of a growing invasive species crisis affecting the islands' endangered plants and animals, overall environmental and human health, and the viability of its tourism and agriculture based economy … and, our way of life. Fighting Invasive Species is a critically important priority because it is the single most-effective way to protect Hawai`i's natural resources.

The control of alien species within these lands is critical to maintaining the value of forest resources and needs to be included as part of an overall management plan. Besides the highly invasive gorse grass, the `Āina Mauna lands also have banana poka, fireweed, various non-native invasive grasses and feral ungulates.

In Humu`ula, there are several remnant patches of high elevation native forests (koa/`ōhi`a, pūkiawe, and high elevation māmane/naio) scattered amongst primarily introduced grasses and shrubs. The introduced species in the area are the product of a long history of grazing and subsequent land conversion from high elevation native forest ecosystems to pasture lands. The dominant introduced species are non-native grasses, primarily composed of kikuyu grass, sweet vernal grass and narrow-leaved carpet grass, the invasive shrub gorse and timber trees that have been planted for research and as windbreaks. (Wildland Fire Management Plan Humu`ula/Pi`ihonua Mauka, Page 7)

Natural resources are still found in abundance at Pi`ihonua mauka in the form of extensive `ōhi`a and koa tree cover and native fauna. These resources are at risk, however, from invasive species such as gorse, banana poka, and non-native holly. Hundreds of feral cattle represent a continued impact on forest cover by preventing regeneration, damaging roots, and contributing to soil erosion. (Pi`ihonua Mauka Conservation Management Proposal, Page 1)

Gorse

Gorse is classified as a noxious weed under Hawai`i Administrative Rules Chapter 68. It forces out competing plants, shades out grasses, is inedible to cattle, can be spread easily, and is a fire hazard. The nuisance shrub is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. Gorse infestations have become established in extensive stands on agriculture and conservation lands on the southeastern slope of Mauna Kea and Humu`ula area continues to suffer from heavy infestations of gorse. (Humu`ula/Pi`ihonua Master Plan, Page 4)

Gorse – Tree "Skeletons" Indicate Area was Once Forested

Gorse is native to Northwest Europe but has become a major pest species in various parts of the world, including New Zealand. There is a long history of gorse in Hawai`i. It was apparently brought to Hawai`i in the 19th century as a hedge plant by a Scottish immigrant, and possibly utilized in the previous sheep operation at Humu`ula. It was first collected wild by J. R. Rock on Maui in 1910. On the island of Hawai`i it is found in pasture and scattered forest lands on Mauna Kea at elevations between 2,000 and 7,000 feet. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document F-Gorse Assessment Report, Page 1)

The shrub grows thickly to heights of 6 to 10 feet and produces sharp, three-inch spines covered with a thick waxy cuticle. Gorse has a life span of 20 -30 years. Each plant can produce thousands of seeds, which can lie dormant for 40 or more years and remain viable in the soil. Heat will trigger seed germination. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document F-Gorse Assessment Report, Page 1)

Gorse is rapidly expanding its range throughout and beyond its original foothold. Gorse has infested thousands of acres on Mauna Kea, much of it in the DHHL Humu`ula and Pi`ihonua tracts. It appears to be spreading laterally across contours and down gulches, where it has been found as low as 2,000 feet in the rocky Wailuku banks. Land managers and agencies have become convinced that eradication of gorse is the key to successful restoration of native habitat. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document F-Gorse Assessment Report, Page 1)

Gorse control currently consists of aerial spraying, ground spraying, and burning. Spraying and burning has had limited success in controlling gorse unless repeated for several cycles. Several bio-control agents have established following release, but only recently have they begun to show signs of affecting the gorse infestation. As burning of large acreages within the gorse containment area has ceased since 2003, the gorse habitat for these biological controls has improved. Concurrently, annual increases in bio-control populations have been observed with corresponding adverse impacts on the gorse infestation.

The non-profit organization, `Ōiwi Lōkahi o ka Mokupuni o Keawe, currently has a license on 1,000-acres at Humu`ula from DHHL for gorse control work. They have been working on a process in which burning the gorse produces carbon. Their studies and research are ongoing.

A most promising tool to eradicate gorse is through shading. Gorse is shade intolerant. Therefore, reforestation can limit seed production and gorse regeneration. A tree planting on Maui has shown promising results in its ability to limit gorse growth and expansion.

Additionally, DHHL field and research trials have shown that heavy shade from trees inhibits the ability for gorse to grow and spread. Heaviest shade under a dense tree canopy such as sugi appears to have the ability to kill mature gorse.

Tree plantings and reforestation can limit seed production and gorse regeneration. Timber plantings shade the gorse sufficiently to keep it from producing seeds and thus, each year some portion of the seed bank is removed. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Pages 2 & 3)

Thus, timber planting can serve both as an income generator and as a gorse eradication mechanism. Other viable gorse eradication opportunities can also be considered.

Aerial Image of Planting of Portion of Gorse Containment Area

DHHL has planted portions of a gorse containment perimeter within the Humu`ula/Pi`ihonua lands with trees to establish a boundary to limit the spread of the weed. However, adjacent lands outside the containment area will also require intensive efforts to control the further spread of gorse. It is likely that the long-term eradication of gorse will require significant financial resources that may need to be subsidized by other economic uses. This makes timber planting as a gorse eradication mechanism so attractive. It can serve as both a gorse eradicator and income generator.

The Humu`ula/Pi`ihonua Master Plan proposed establishment of a Gorse Management Area that could be managed with forestry. The following is taken from the Master Plan write up.

The area of gorse infestation is identified as the gorse management area and a long-term management and eradication program proposed. This program involves the combination of chemical and mechanical means to initially control the infested area. Those portions where the gorse plant is brought under control would then be planted in sugi to shade the areas. Efforts to control gorse on other islands of Hawai`i and the Pacific have found this strategy to be the most effective means of gorse eradication. (Humu`ula/Pi`ihonua Master Plan, Page v)

The eradication of gorse has been identified as one of the top priorities in the management of these lands. The proposed gorse management strategy includes; the use of mechanical and chemical means to initially contain the area of infestation, continued monitoring and treatment outside the area of infestation, and the systematic clearing of areas with the use of chemical and mechanical means to prepare areas for planting trees. The recommended tree species for this area is sugi, due to its suitability

to the site and market potential as a lumber product. Once established, the sugi trees will outgrow the gorse, shade the area, and prevent the gorse from reestablishing itself. (Humu`ula/Pi`ihonua Master Plan, Page 56)

Because gorse seeds can remain viable in the soil for up to 70 years, the ongoing monitoring and management of the surrounding lands will need to be an integral component of the long-term management program. Selective harvesting of the trees could take place once the trees reach maturity, which is estimated to take approximately 35 years. Harvesting of the trees, however, should be immediately followed with a reforestation effort to protect against the re-emersion of the gorse plants in these areas. Although long-term, once established the sugi resources can provide a significant income source to offset some of the ongoing program costs. Following several harvests, the threat of gorse re-infestation should be eliminated and alternate uses for the gorse management area could be considered. (Humu`ula/Pi`ihonua Master Plan, Page 57)

Gorse Has Taken Over the Landscape

The previously introduced and newly tested bio-controls may prove to be an important adjunct to long-term control of gorse, especially over the broader landscape beyond the gorse management area, and should be integrated as a component of the overall gorse management program.

Eradication of this noxious plant, that has already rendered approximately thousands of acres useless, is an essential component in any land use and management plan for these lands. As previously discussed, the ongoing gorse eradication and management activities must be continued and more aggressive measures need to be considered to eradicate this plant so that these lands can be returned to their natural environment. (Humu`ula/Pi`ihonua Master Plan, Page viii)

<u>Unmanaged-Ungulates</u>

Unmanaged-Ungulates (hoofed mammals such as sheep, pigs, goats, cattle, etc.) introduced to Hawai`i are detrimental to Hawai`i's native ecosystems via the damage they inflict on both vegetation structure

and composition. Ungulates impact native plants and ground cover, facilitating sediment run-off and the smothering of coral reefs.

The soil disturbance caused by rooting ungulates also facilitates the introduction and expansion of invasive plants, and creates breeding grounds for mosquitoes that transmit avian disease to native forest birds.

Unmanaged-Ungulates have high population growth rates, are elusive and can jump or circumvent most existing ungulate fences. Control and/or removal of these animals should be a high priority on all lands designated for protection of native biodiversity in Hawai`i.

To reestablish structure and composition close to a pre-disturbance landscape (including rare and ungulate sensitive species) complete unmanaged-ungulate removal is required.

Controlling Unmanaged-Ungulate Populations in Native Eco-systems in Hawai`i

The Hawai`i Conservation Alliance produced the position paper "Controlling Ungulate Populations in native ecosystems in Hawai`i". The following section on ungulate control methods is taken from that paper.

Ungulates impede the progress of conservation and restoration of native Hawaiian ecosystems. Ungulate removal, in conjunction with other management actions, is necessary to ensure the success of native Hawaiian ecosystem restoration.

It is firmly established that the conservation and restoration of native Hawaiian ecosystems is unsuccessful in the presence of ungulates. Controlling ungulate populations, specifically goat, pig, cattle, and sheep is the vital first step; dramatic and otherwise unaided ecosystem recovery has been documented when it has been accomplished.

Despite demonstrated success of eradication and in certain circumstances reduction and control of ungulates, some public groups strongly oppose ungulate population control. Clearly, there is a need to effect the control in the most efficient ecological, social, and humane manner possible. Finding the right balance between these needs is critical in preserving our ethical integrity as well as in preserving both the cultural and natural aspects of Hawai`i's rich heritage.

Hawaiian ecosystems are vulnerable to unmanaged-ungulate presence

Hawai`i's economy and the health and quality of life of Hawai`i's people depend upon the richness of Hawai`i's natural resources. Isolated for millions of years, the Hawaiian Islands harbor tremendous biological diversity and incredible life forms found nowhere else on this planet. The few species that managed to wash up onto Hawaiian shores, or that got carried over by wind or wings evolved into thousands of new species in dramatic displays of adaptive radiation. Ungulates were not among these initial colonizers, and our endemic life forms evolved without need to compete with or defend against them.

Unmanaged-Ungulates impact native plants and ground cover, facilitating sediment run-off and the smothering of coral reefs. The soil disturbance caused by rooting ungulates also facilitates the introduction and expansion of invasive plants, and creates breeding grounds for mosquitoes that

transmit avian disease to native forest birds. The invasion of non-native species poses one of the greatest threats to Hawai`i's native ecosystems and their inhabitants. Already nearly three quarters of the extinctions in the United States have occurred in Hawai`i, and nearly forty percent of the endangered species in the United States are Hawaiian species. Although many species continue to decline in number, some species are on their way to recovery as a result of habitat protection and management efforts. Continued progress toward recovery will require the application of good science to natural resource management and policy decisions.

Components of unmanaged-ungulate removal

There are several areas in Hawai`i where goat, sheep and cattle populations are successfully kept at zero population levels over large areas. In these cases successful control of ungulate populations involved: 1) establishment of barriers to isolate populations, 2) Remove sufficient numbers of animals to prevent unacceptable damage to the land and its resources, 3) Inspecting and maintaining barriers, and 4) vigilance in monitoring of animal population increase and ingress.

Four main components in successful unmanaged-ungulate population control

1) **Ungulate barriers** to isolate populations usually consist of fences, sometimes abutting against barren, inaccessible habitat to form management units. Currently 4-foot high hog-wire with no gaps at the ground is used to deal with goats, cattle, and domestic sheep. Since sheep are jumpers, 6- foot high hog wire is used (with the realization that some animals will still be able to penetrate the barrier). The size of the units in some instances are as large as 10,000 acres, but must be smaller if managers are not able to reliably remove an acceptable percent of the population each year.

2) **Remove sufficient numbers of animals to prevent unacceptable damage to the land and its resources.** This requires taking more than a third of the remaining goat (or sheep) population each year. Before 1970, management staff at Hawai`i Volcanoes National Park were removing 2,000 goats per year without any effect on the remaining goat population. With a goat population numbering about 15,000 and an annual increment capable of reaching 5,000 per year, taking just 2,000 a year from this population was meaningless. As populations are squeezed, the remaining animals become extremely wary. One hypothesis is that it requires an equal cost or energy input to cut a population from 100 down to 50 as it did to cut the 1,000 population down to 500. Careful records of number, sex, age and reproductive status of removed animals form the basis for reviewing control progress and refining strategy through adaptive management.

3) **Inspecting and maintaining barriers** such as fencing never ends. Failure to mend fences and to remove the annual increment of animals or those that leaked through will result in the negation of all previous labor, costs, and ecosystem recovery gains. Monitoring both barrier fences and animal populations are integral to controlling ungulate populations.

4) **Vigilance in monitoring** and removing any animal population increase and ingress, like fencing, never ends if an area is to be kept ungulate free. Monitoring animal populations is integral to controlling ungulate populations. To achieve a sizable area free of ungulates where they were previously numerous is so difficult, and so rarely accomplished, that it is unconscionable to neglect monitoring and thus enable populations to rebound to former levels. A tiny goat population, left undetected, can recover to 90% of its former levels in only four years. Years of ecosystem recovery can be reversed in a few short months of renewed feral ungulate

depredation. Most monitoring involves regular helicopter transect inspections, and ground transect analyses to detect 'sign' or browsing. Judas goat searches are very effective in monitoring goat-free areas.

Present Control Strategies (in sequence) by Species

Goats

- Fence management unit (4' hogwire with no gaps at ground; can be 10,000 acres)
- If not remote, public/volunteer shooters may make initial population reduction.
- Specially recruited, trained, and supervised volunteers remove initial numbers of animals.
- Release Judas goats.
- Professional shooters kill most remaining population, aided by Judas goats.
- Professional shooters from helicopter mop up remnant individuals along cliffs.
- Fences are routinely mended; Judas goats are left to help professional hunters monitor and shoot any strays or new entries.

Pigs

- Allow for management and capture of feral pigs, so long as the resources are protected.
- Fence management unit (4' hogwire with no gaps at ground; can be 2,000 acres), sometimes including one-way gates and traps.
- If not remote, public/volunteer shooters may make initial population reduction.
- Professional shooters with dogs kill most remaining population.
- Baiting with papaya helps concentrate pigs for shooting and/or snaring.
- Professional technicians set snares (ratcheted Kelly snare) to mop up pig populations.
- Snares are used to take any strays and to monitor for new entries.
- Keep fences mended.

Cattle

- Fence management unit (4' hogwire; can be 10,000 acres)
- Perform cattle drives using cowboys, dogs and helicopters.
- Install one-way gates.
- Set trap corrals, baited molasses and with water. Harvest or kill captured animals or seek cooperation from adjacent ranch to remove animals from trap.
- If not remote, public/volunteer shooters may make initial population reduction.
- Keep fences mended.

Sheep

- There is still much to be learned about removing mouflon sheep populations.
- Fence management unit (6' hogwire; can be 5,000 acres)
- If not remote, public/volunteer shooters may make initial population reduction.
- Professional shooters with dogs kill most remaining population. (Combining professional shooters with dogs, and helicopter search and shooting is effective).
- Experiment with Judas mouflon as aid to monitoring strays or new entries. (Mouflon sheep socialize in small groups and, if lucky, collared animals may help occasionally.)
- Run helicopter King Index surveys to monitor strays and new entries.
- Keep fences mended.

Tools for ungulate control in natural areas

Public acceptance is often crucial to the success of restoration plans on public lands. Ungulate population control has met with criticism regarding the economic practicality of fencing. Arguments are made that the high construction, installation and sustained maintenance costs of fence barriers to ungulate movement are prohibitively expensive. However, experience indicates that fences are the cheapest way to achieve ungulate control goals. For example, Hawai`i Volcanoes National Park removed goats (at a rate of up to 5,000/year at times) for a half century without any effect whatsoever upon the remaining goat population. After resorting to fences, the park zeroed out its goat population within a decade. Despite the daunting upfront costs incurred with fencing, this investment in natural resource conservation is key to maintaining the tourism industry upon which Hawai`i's economy relies.

Some observe that 100% ungulate removal is not the only way to improve conservation resources in certain specific degraded ecological systems. They maintain that the goal and degree of restoration needs to be taken into account. To reestablish structure and composition close to a pre-disturbance landscape (including rare and ungulate sensitive species) complete ungulate removal is required. Anecdotal observation suggests, in severely degraded native ecosystems (for example, chronically grazed forested pasture) removal of the majority of ungulates may lead to partial recovery of composition and structure.

Cattle

The following history of cattle in Hawai`i was taken from Kumu Pono Associates LLC documents and the website HawaiiHistory.org, except where noted.

Ancient Hawai`i boasted no large land mammals, but with the arrival of Western ships, new plants and animals soon found their way to the Islands. The simple-seeming gift of a few cattle given to Kamehameha I by Captain George Vancouver in 1793 made a major impact on the Hawai`i's economy and ecosystem. It also spawned a rich tradition of cowboy and ranch culture that is still visible today.

Spaniards introduced the first cattle to Veracruz, Mexico in 1521. Vancouver picked up descendents of these animals from the Spanish mission in Monterey, California when he set off across the Pacific, intending to use them as food and gifts. The first cows and bulls given the Hawaiians fared poorly, either falling ill and dying or quickly killed and eaten.

Cattle were not the only animals introduced to Hawai`i during this period. In 1778, Captain Cook had left both goats and pigs with natives. In 1803, American Richard Cleveland presented horses - a stallion and a mare - to Kamehameha. British introduced sheep in the 1790s and they soon damaged the native forests of Mauna Kea and Hualālai at the same time failing as an economic crop. When Vancouver landed additional cattle at Kealakekua in 1794, he strongly encouraged Kamehameha to place a 10-year kapu on them to allow the herd to grow.

Grow they did, into a huge problem. In the following decades - the kapu was not lifted until 1830 -cattle flourished and turned into a dangerous nuisance. By 1846, 25,000 wild cattle roamed at will and an additional 10,000 semi-domesticated cattle lived alongside humans. A wild bull or cow could weigh 1,200 to 1,500 pounds and had a six-foot horn spread. Vast herds destroyed natives' crops, ate the thatching on houses, and hurt, attacked and sometimes killed people.

In addition to causing erosion damage to the land, these animals also affected what foreign plants were brought to the Islands. While native koa, ` ōhi`a, uhiuhi, ēlama, kauila, halapepe, `aiea, māmane and `iliahi began to disappear, other non-native species were planted as cattle feed. Ranchers introduced fountain grass, native to North Africa, and mullein. After 1905, they introduced kiawe as another cattle feed, a shallow-rooted, thorny tree that is now ubiquitous.

By the time of Kamehameha III's reign (1824-1854), something had to be done. After the kapu was lifted in 1830, the hunting of wild cattle was encouraged. The king hired bullock hunters from overseas to help in the effort. Many of these were former convicts from Botany Bay in Australia.

Hunting sometimes ended in inadvertent tragedy. In 1834, the trampled dead body of Scottish botanist David Douglas, for whom the Douglas Fir is named, was discovered in a bullock pit on Mauna Kea. Though suspicious head wounds and a quantity of missing cash also implied murder, bullock traps caught unsuspecting humans with alarming frequency.

As early as the 1820s, introduced cattle, sheep, goats, and wild dogs had made their way up to the mountain lands, and were bothersome to those who traveled the `āina mauna. Hawai`i's wild cattle population needed to be controlled for safety reasons, but the arrival of bullock hunters and Mexican vaquero also happened to coincide with an economic opportunity.

In the early 1830s, trade in sandalwood slowed down as island forests became depleted. At about the same time, whaling ships hunting in the north Pacific began wintering in Hawaiian waters. Ships reprovisioning in Hawai`i ports provided a market for salt beef in addition to hides and tallow. With the economic nudge of the whaling industry, ranching became a commercial enterprise worth pursuing.

By 1850, the natural-cultural landscape of the `āina mauna was being significantly altered by the roving herds of wild bullocks, sheep and other ungulates, and ranching interests were being formalized in the region.

In 1857, the Crown and Government mountain lands of Humu`ula and Ka`ohe, including the summit of Mauna Kea, were leased to Francis Spencer and the Waimea Grazing and Agricultural Company, which established ranching stations and operations around the mountain lands. Portions of the land of Pi`ihonua were leased to native bird hunters in the middle 1860s, and subsequently to native and foreign bullock hunters. As a result, Humu`ula and the larger `āina mauna have been intensively ranched for more than 150 years.

Because hunting, and subsequently ranching of bullocks, cattle and sheep became the primary historic activities on the mountain lands, areas once forested soon became open pasture land. While the first formal lease of Humu`ula and Ka`ohe was issued in 1857 (Keoni Ana to F. Spencer), it was Samuel Parker and Parker Ranch that held the longest lease on the Humu`ula and Ka`ohe mountain lands.

Between 1900 and 2002, their leases extended around Mauna Kea to the Pu`uhuluhulu vicinity, and for a period, the leases also included portions of the `Āinahou lands. The Parker Ranch interests initially focused on sheep ranching in the Humu`ula-Kalai`eha section, but in 1964, the ranch terminated its sheep program. Cattle operations were maintained till the end of the Parker lease in August, 2002.

Since cattle leases expired on these lands in 2002, some areas have little or no cattle present and important natural resources at Humu`ula have begun to show significant recovery. This recovery is most

evident in the mauka and certain makai areas of Humu`ula where water and/or feed is limited and feral cattle have been excluded. Giving this land "a rest" after more than 150 years of grazing is beneficial to the landscape by minimizing soil loss and allowing natural processes to recover the area's productivity. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Mauka areas (7,600 – 8,000 ft elevation) are exhibiting a re-growth of the historic native Hawaiian ecosystem, including māmane, pūkiawe, and other species. Makai and gulch areas up to about the 7,000 foot elevation are seeing a resurgence of koa natural regeneration. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Cattle – Curse and Blessing

Cattle pose a curse and blessing to the DHHL Humu`ula-Pi`ihonua lands. It is reported that approximately 2,000-head of wild cattle roam the property. After 150-years of sheep and cattle ranching, the formerly dense forest became significantly altered by these activities and the forest landscape was converted primarily to open pasture land. Because of the historic use of the site for sheep and cattle pasture, the vegetation of Humu`ula/ Pi`ihonua is dominated by an understory of exotic pasture grasses over much of the lands. The area serves as valuable habitat to many native and endemic species. The area's proximity on Mauna Kea also makes it a valuable cultural resource. Reintroducing cattle to these recovering areas would be a setback for the natural resources.

Use of Cattle as Fire Mitigation, Controlling Fuels

However, cattle can serve as beneficial tools in controlling fire fuels, particularly in areas where people frequent – primarily fronting and along roads. Recommended areas for the reintroduction of cattle are along the Saddle Road, Mauna Kea Access Road and Keanakolu Road.

Along these road corridors, therefore, are areas at greatest risk from heavy fuels being ignited by a careless visitor. The rest of Humu`ula/Pi`ihonua Mauka is much less at risk because of its limited access and DHHL's no hunting policy. In short, most fires are started by humans and the limited human presence at Humu`ula greatly reduces the risk. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Control of fuels along the Keanakolu Road corridor is further complicated, however, by the presence of heavy gorse infestations in certain areas along the corridor. The presence of cattle in areas of medium to heavy gorse should be avoided as cattle easily spread gorse.

Alternatively, in areas of light gorse infestations cattle can act as a tool for revealing isolated, young gorse plants so eradication strategies can be fully employed. Careful coordination of limited ranching and gorse eradication efforts are needed.

For example, cattle should not be grazed in light gorse infestation areas while gorse plants are actively seeding. Cattle can pick up gorse seed pods in their hair and tails and move it far distances in a short period of time. If the spread of gorse is to be minimized, cattle should not be grazed in the gorse containment area or its grassed buffer as the risk of moving gorse seed outside through the sale or escape of cattle is high. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Banana Poka

Banana poka (Passiflora mollisima) is an alien vine that infests some forests in and near Humu`ula, especially near Keanokolu. This vine forms a dense canopy that shades the trees and other native vegetation, greatly degrading the forest. Cooperation with other state agencies in controlling this pest may help maintain the value of forest resources. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-18)

Herbicide treatments are the most wildly used treatments to manage on banana poka. Banana poka may invade the new area as cattle are withdrawn and the site disturbed. Periodic control of banana poka may be required and appropriate control strategies employed. 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. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 13)

Non-native Grasses/Weeds

Non-native grasses, including kikuyu grass (Pennisetum clandestinum), velvet grass (Holcus lanatus), orchard grass (Dactylis glomerata), and sweet vernal (Anthoxanthum odoratum) are abundant in the `Āina Mauna region.

The most prevalent is the African savannah grass commonly known as kikuyu (Pennisetum clandestinum). Kikuyu grass was introduced to Mauna Kea as a source of forage for cattle and has since spread extensively.

Another major introduced grass is Yorkshire fog (Holcus lanatus). Like kikuyu grass, Yorkshire fog was introduced for ranching purposes.

Fountain grass (Pennisetum setaceum), a fire-promoting grass, is one of the most aggressive and potentially damaging introduced plants in Hawai`i. It has already become the dominant ground cover in large areas of Kona and the area between Mauna Kea, Mauna Loa, and Hualālai; colonies have also become established on the southern and western slopes of Mauna Kea. (Revised Recovery Plan for Hawaiian Forest Birds, Page 2-64)

The continuing presence of non-native grasses slows the natural restoration process of the area. Research in the late 1970s 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.

Fireweed

While gorse infestation remains a problem, there is a growing concern for fireweed in areas proposed for ranching. Fireweed is infesting large portions of acreage directly above the Kaniho lease area.

Fireweed (Senecio madagascariensis), also known as the Madagascar ragwort is considered very invasive and is on the Hawai`i State Noxious Weed List. The daisy-like herb grows upright and branched, and can get up to 20 inches high. Its yellow flowers each have 13 petals and look like small daisies which mature into white thistle balls.

Native to Madagascar, its introduction history in Hawai`i unknown. It was discovered in the early 1980s in pastures in Kohala on the Big Island, and new populations have been introduced to Kaua`i and O`ahu. Each plant can produce 30,000 seeds per year that spread by wind, hiking boots, vehicles or by animals when moved from infested to non-infested areas. (Hawai`i's High Profile Invasive Species, Fireweed)

Chemical suppression is the most common control. However, resting pastures is reported to control fireweed as well as grazing by sheep and goats. However, too high a diet of fireweed will cause slow growth, illness, liver-malfunction and even death in severe cases. There are promising, potential bio-control agents of fireweed however, none have been widely used. (Hawai`i's High Profile Invasive Species, Fireweed)

DHHL provided Mr. Kaniho with a 10-year license for 1,000 acres for pasture use and a fireweed control program. He is working with funding from the University of Hawai`i, Agricultural Extension Program to try to control the weed. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 29)

Historic and Cultural Resources

Based on preliminary archaeological surveys conducted in the area, known archaeological features within the parcel are limited to predominately historical sites. These include paths, trails, roads and the Humu`ula sheep station. Additionally a variety of historic and prehistoric sites may be present in the parcel including burial sites, temporary habitation sites, markers or historical sites, communication routes (trails and roads), ritual sites, and camps and processing sites (relating to bird hunting and/or adze production).

Overall, it is predicted that a relatively low concentration of surface sites would be found throughout the parcel. Those areas where site densities are likely to be highest include: ahupua`a borders, cinder cones (pu`u) caves or lave tubes, traditional bird feeding habitats, the paleo-forest scrub transition area, traditional resource convergence area (water, fuel and shelter locations), and along communication routes (roads and trails). The gulches and pu`us, in addition to serving as possible refuge areas endangered plant species, would be among the likely areas where archaeological sites, if present, would be found.

Historically commercial uses of the Humu`ula/Pi`ihonua lands were limited to managed sheep and cattle grazing. The majority of the subject lands had previously been occupied by, Parker Ranch, since at least 1909 when sheep grazing started. However, by 1963 the sheep operation was phased out due to a decline of wool prices caused by the depression and competition from foreign countries and Parker Ranch converted the land to a cattle operation. Gorse was used a hedge to pen the animals, however, conversion from sheep to cattle gave way to the initial outbreak of gorse, which until that time had been effectively controlled by sheep grazing.

Throughout the property there are several ponds, trails, fences, and rock walls which are in various states of repair, which were put in place for ranching infrastructure. Additionally there are two cabins located on the property, the Kanakaleonui cabin and, reportedly, the Kahinahina forest cabin.

The known historic and cultural resources on the land parcel are as follows:

Keanakolu/Mana Road - This road is located in Humu`ula and was built in 1870 to connect Hilo and Waimea. It is of historical interest because it developed a more efficient route for transportation between Hilo and Waimea and opened up land for grazing and sugar cane. The road was surveyed by Mr. D. H. Hitchcock in 1870.

Humu`ula Sheep Station - The Humu`uIa Sheep Station Company chartered by the Hawaiian Government in 1883, was an operation of H. Hackfeld and Company. By 1894 the company had erected large and extensive paddocks at Kalaieha and also had a station at Keanakolu. Ownership of the station came under Parker Ranch and operations continued for years, often little know by Hawai`i residents due to its comparatively isolated location.

It has historical and architectural interest because sheep raising was one of the oldest introduced agricultural pursuits in Hawai`i and while never a major industry it was carried on until the last large flock in the Islands located at Humu`ula was phased out in 1963. Humu`ula`s relationship to Parker Ranch and to the general agricultural history of Hawai`i is significant.

The Mauna Kea-Humu`ula Trail - This trail was first plotted by Alexander in 1892, and is shown on two later maps, the U.S. Coast and Geodetic Survey 1925-1926 and U.S. Geological Survey 1956. In 1936 the Civilian Conservation Corps made improvements to what is believed to have been a section of the old Mauna Kea-Humu`ula Trail from near the Humu`ula Sheep Station at Kalaieha to the summit.

Surrounding Land Uses

Surrounding uses include the Hale Pōhaku Astronomical Facility, a support facility for the astronomical research on Mauna Kea, the Pōhakuloa Military Training Area, the Hakalau Forest National Wildlife Refuge and various State forest and natural area reserves.

Hale Pōhaku is located on the Mauna Kea Access Road west of the Humu`ula land parcel at approximately the 9,200 foot elevation. Hale Pōhaku has been used as a construction camp/astronomical research support facility to house people working on the summit for acclimatization purposes. There are several buildings and stone cabins in the area.

The Mauna Kea Science Reserve is located at the summit of Mauna Kea and includes the Mauna Kea Observatory.

Located adjacent to the westernmost boundary of the parcel within the Mauna Kea Forest Reserve, is the Pōhakuloa Military Training Area.

The Hakalau Forest National Wildlife Refuge is located east of the land parcel, the refuge permits pig hunting and is one of the last remaining places where a number of native Hawaiian forest birds are found.

Mauna Kea Ice Age Natural Area Reserve is located west of the Humu`ula land parcel between the elevations of 10,400 and 13,200 feet. The Pōhakuloa Gulch (formed by glacial melt water), Lake Waiau (one of the highest lakes in the United States), and the Keanakako`i Adze Quarry, are all features of the Reserve.

Numerous forest reserves owned and managed by DLNR are located adjacent to or near the subject parcels. The Hilo Forest Reserve is located adjacent to the eastern boundary of the land parcel. The Upper Waiākea Forest Reserve is located outside of the property boundaries, adjacent to the southeastern boundary. The Mauna Loa Forest Reserve is located adjacent to the southwestern portion of the land parcel. And the Mauna Kea Forest Reserve is located within the western portion of the property on the higher elevations.

Road Infrastructure

The primary access to the site is from the Saddle Road, a paved two-lane highway connecting East and West Hawai`i, and the paved access road to the Mauna Kea Observatories and summit area. The Keanakolu (Mana) Road is a cinder/gravel road which extends from the Mauna Kea Summit Road through the property for approximately 19 miles.

Other internal roadways leading from the Keanakolu Road are primarily 4-wheel drive dirt/cinder pasture roads used for fire management and gorse ceradication operations. Other infrastructure systems (potable water, power, communication, etc.) are largely nonexistent. Power lines extend along the Saddle Road and Mauna Kea Access Road.

Maintenance of the Keanakolu/Mana road is under dispute as varying legal opinions place the responsibility with State and the County. At present, the County is maintaining the road with appropriations from the State. Most recently Duke Kapuniai has improved and maintained the road to the `Ōiwi gorse-to-charcoal site.

Trails

A few trails are located at the northern most point of the land parcel near the Keanakolu ranger station. The Ka`ali`ali trail runs along the higher elevations near the western boundary of Humu`ula. The Kahinahina trail extends from the western boundary to a forest cabin near the Waipāhoehoe gulch and on to Laumai`a Corral near the Pi`ihonua boundary. Another trail follows the Nauhi gulch and provides access to the Kanakaleonui cabin. Several other trails exist in Humu`ula as well.

Power and Communications

There is an electronics site located on the land parcel, an electrical line along Saddle Road and the Mauna Kea Access Road, and an electrical line running east-west, north of Saddle Road. The nearest electrical substation is located approximately five miles to the west, near the Pōhakuloa Training Area.

Water

The land parcel is within the Big Island's hydrographic area that is most abundant in water supply (Area II which includes the North and South Hilo districts and portions of the Ka`ii and Puna districts). In that groundwater sources have been located on Hawai`i at the 5,000 foot level (the Waiki`i Ranch area), it is suggested that water source potential be investigated in the portion of the land parcel at the elevation of approximately 4,700 feet. Since the area has been characterized as having poor drainage, there is a possibility that a perched groundwater source could be located and developed economically.

Drainage

The entire parcel is naturally drained. There are five major gulches/streams within the land parcel, the Nauhi, Waiaama, Waipāhoehoe, Honohina and Nukupahu. The gulches run mauka-makai.

The Wailuku River runs through Humu`ula and there are several streams throughout the parcel including the `Āwehi, Hakulau, and Kapue. There is no known flood hazard in the area. Over $1 million has been spent “hardening” major stream crossings via concrete and blacktop approaches since 1990.

Springs

Historic records indicate that springs are located on the property in the vicinity of the Pu`u `Ō`ō Ranch section of the site. Follow-up work needs to be done to verify the condition of the springs and reported condition noted below are based on a review conducted 10-years ago.

The first spring is located near the ranch camp. This spring, can supply water to the camp, the coral, and surrounding paddocks. The spring is in need of repair and no longer is able to provide water; the spring tunnel has caved in and will need to be cleaned up and dirt material removed. The holding tanks are leaking badly; they will need to be repaired or replaced to provide water to the camp for use. The waterline, a 1" black rubber-hose-like pipe called a driscoll, transfers water and is disconnected in a few places. The piping is repairable.

The second spring is located midway through the ranch, next to the Waiama Gulch. This spring used to be the main water source for the ranch. The water was piped to different areas for cattle to drink. Record show that even in times of drought, this water source was still providing water. The waterbox area is filled with dirt and rocks; it will take some bulldozer work to fill in the deep ruts and erosion caused by cattle trying to get into the water box area. The large water pond that this spring used to service has dried up and the bottom has grass and cracks in it; this pond needs to be restored to enable use of this paddock. (Assessment of Pi`ihonua – Brief Assessment for Beneficiary Ranching Leases at Pu`u `Ō`ō Ranch, Page 3)

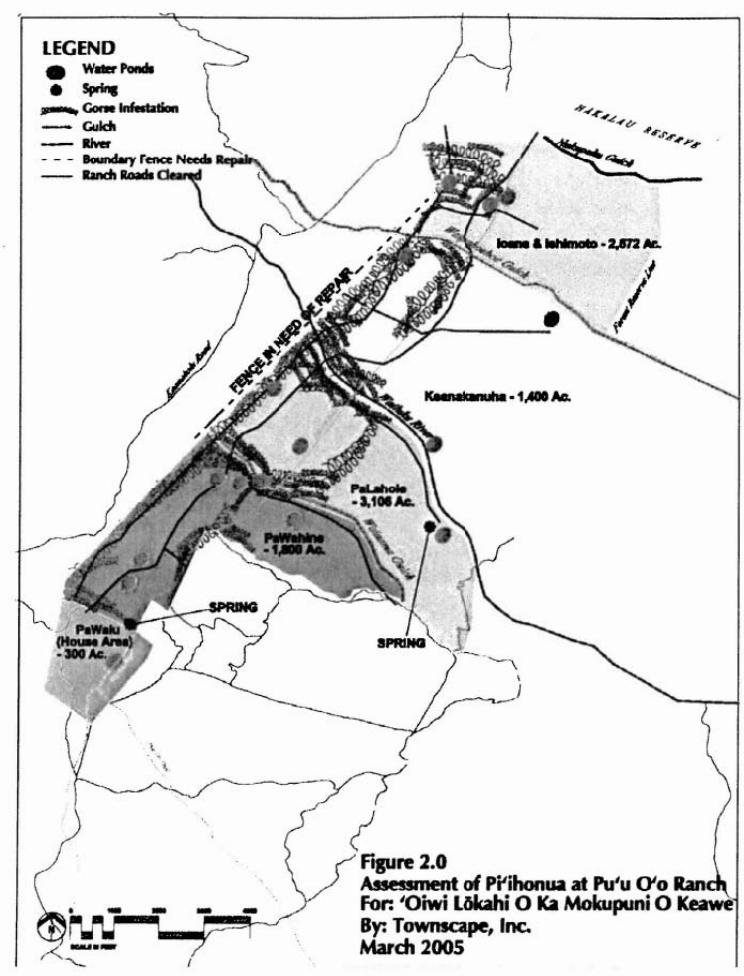
A third spring is reported to also be on the site.

Potable Water Supply

Catchment systems supply some water to the area and water is also hauled from outside supply sources. There are a few water tanks on the land parcel, two water reservoirs, and 12 to 16 dirt water ponds.

The two major water users in the area, Pōhakuloa Military Training Area and Mauna Kea Science Reserve, depend on County water hauled from Hilo in 5,000-gallon tankers. The Science Reserve has two 40,000-gallon storage tanks. 25,000 gallons of water per week are trucked to the Mid-Level Facility and an additional 15,000 gallons per week are trucked to the summit.

The Army's water contract is valued at $0.03/gallon. Water is stored in a 1.5 million gallon tank, re-chlorinated then delivered into the local area water system. (Rechlorination is needed due to higher water standards maintained by the Department of Defense. Under State health regulations, County water is usable "as delivered" if it contains "residual" chlorination.) (Humu`ula Sheep Station Adaptive Reuse Plan, Page 31)



Map Identifying Water Ponds, Springs, Gulches and Rivers

Water History in the Area

The Army attempted deep-well drilling, but halted after determining that drilling depths of 4,500 feet were required. Following this episode, the Army together with the State built a water pipeline that ran from a natural surface lake on the flanks of Mauna Kea down to the Pōhakuloa area. The pipeline served the training area and Pōhakuloa State Park until it failed to meet new health regulations for surface drinking water, leading to closure of the park. The Army then turned to a sand filtration system, but this also failed to meet State health regulations and the Army was forced to begin hauling water.

Water from the pipeline continues to be used for dip tanks in fire fighting. Meanwhile, the pipeline maintenance agreement between the State and Army has entered into hard times since the State stopped its pipeline use. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 31)

In the 1986 Water Resources Development Plan for DHHL lands, no plan for water development was established at Humu`ula because the area was considered too remote and water systems too costly to develop. Rainwater catchment systems were considered effective for residential use in the area.

A study conducted by the Army Corps of Engineers in 1996 for the Pōhakuloa Training Area analyzed various sources for domestic water, including drilling deep wells to intercept perched water source. Should army proceed with the well drilling at PTA (7,000 foot elevation,) the results of this project will provide valuable information as to the likelihood of encountering perched water at the DHHL lands and the costs involved for well development.

Wastewater

Any wastewater generated on the site would require composting toilets and/or septic tank/leaching fields for treatment. In view of the large area covered by the tract and the relative low density of the proposed development, wastewater treatment and disposal is not considered a major constraint on the land parcel.

Historical Overview of Settlement, Land Uses and Travel in the `Āina Mauna

The following historical overview is taken from "Mauna Kea – Ka Piko Kaulana O Ka `Āina" (Mauna Kea-The Famous Summit of the Lands), A Collection of Native Traditions, Historical Accounts, and Oral History Interviews for: Mauna Kea, the Lands of Ka`ohe, Humu`ula and the `Āina Mauna on the Island of Hawai`i" by Kumu Pono Associates LLC, March 30, 2005

Sequence of Hawaiian Settlement

Archaeologists and historians describe the inhabiting of these Islands in the context of settlement which resulted from voyages taken across the open ocean. For many years archaeologists have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawai`i were underway by AD 300, with long distance voyages occurring fairly regularly through at least the thirteenth century. It has been generally reported that the sources of the early Hawaiian population-the Hawaiian Kahiki-were the Marquesas and Society Islands (Emory in Tatar 1982:16-18).

For generations following initial settlement, communities were clustered along the watered, windward (ko`olau) shores of the Hawaiian Islands. Along the ko`olau shores, streams flowed, rainfall was abundant and agricultural production became established. The ko`olau region also offered sheltered bays from which deep sea fisheries could be easily accessed. Also, near-shore fisheries, enriched by nutrients carried in the fresh water running from the mountain streams, could be maintained in fishponds and coastal fisheries. It was around these bays such as at Hilo, that clusters of houses where families lived could be found (see McEldowney 1979). In these early times, the residents generally engaged in subsistence practices in the forms of agriculture and fishing (Handy, Handy and Pukui, 1972:287).

Over a period of several centuries, areas with the richest natural resources became populated and perhaps crowded, and by ca. 900 to 1100 AD, the population began expanding to the Kona (leeward side) and more remote regions of the island (Cordy 2000:130). Kirch (1979) reported that by ca. AD 1200, there were small coastal settlements at various areas along the western shore line of Hawai`i (Kirch 1979: 198). In this system of settlement and residency, the near-shore communities shared extended familial relations with those of the uplands.

By the 1400s, upland regions to around the 3,000 foot elevation were being developed into areas of residence and a system of agricultural fields. By the 1500s to 1600s, residency in the uplands was becoming permanent, and there was an increasing separation of royal class from commoners. During the latter part of this period, the population stabilized and a system of land management was established as a political and socio-economic factor (see Kamakau 1961; Ellis 1963: Handy. Handy & Pukui 1972: Tomonari-Tuggle 1985: and Cordy 2000).

The lowlands of Ka`ohe, Humu`ula and the other neighboring ahupua`a, extending from the shore to around the 3,000 foot elevation, supported residential, agricultural and subsistence activities, spanning the centuries of Hawaiian residency. The upper mountain lands of the Ka`ohe-Humu`ula region were frequented by travelers, collectors of natural resources, and for a wide range of cultural practices (see Kamakau, 1961; and Boundary Commission Testimonies, 1865 to 1891, in this study).

Traditions and historical records tell us that the deification and personification of the land and natural resources, and the practices of district subdividing and land use as described above, were integral to Hawaiian life, and were the product of strictly adhered to resource management planning. In this system, the people learned to live within the wealth and limitations of their natural environment, and were able to sustain themselves on the land and ocean. It is in this cultural system that we can understand the Significance of the lands of Ka`ohe, Humu`ula and the neighboring `āina mauna.

This traditional cultural knowledge will be an important part of the `Āina Mauna Legacy Program implementation process. In order to restore the `Āina Mauna to what ancient Native Hawaiians viewed the mountain lands as a heavily forested area, we recommend utilization of both traditional cultural knowledge and modern science in management efforts.

Land Use Practices

The land of Humu`ula -extending from sea level to the 9,000 foot elevation on Mauna Kea, and above the 13,000 foot elevation on Mauna Loa -is apparently named for a type of stone (Red jasper stone) that was used in making ko`i (adze). The place name of Ka`ohe -a land area extending from sea level to the summits of Mauna Kea and Mauna Loa -may be literally translated as "The-bamboo" or named for a type of kalo (taro) that may have been common In the region (ct. Pukui. et al. 1974).

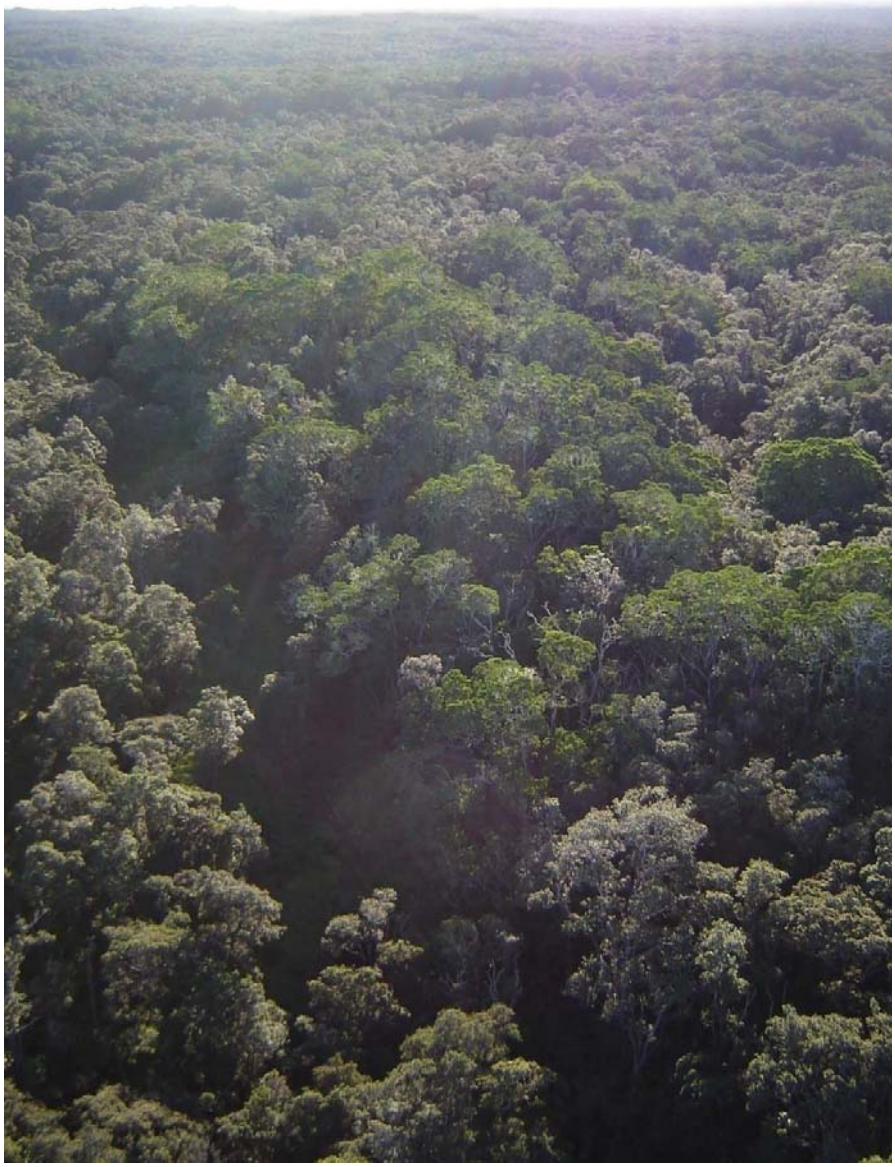
Native Hawaiian traditions and historical accounts describe the lands of Humu`ula and Ka`ohe -those areas extending from shore to around the 6,000 foot elevation -as having once been covered with dense forests, and frequented by native practitioners who gathered forest-plant resources, birds, and food. The larger `āina mauna were frequented by individuals who were traveling to the upper regions of Mauna Kea to worship, gather stone, bury family members, or deposit the piko (umbilical cords of newborn children) in sacred and safe areas; and by those who were crossing from one region of the island to another.

As early as the 1820s, introduced cattle, sheep, goats, and wild dogs had made their way up to the mountain lands and were bothersome to those who traveled the `āina mauna. In 1834, Scottish naturalist, David Douglas was gored and killed by a wild bullock near the boundary of Humu`ula and Laupāhoehoe. By 1850, the natural-cultural landscape of the `āina mauna was being significantly altered by the roving herds of wild bullocks, sheep and other ungulates, and ranching Interests were being formalized in the region. By 1857, the Crown and Government mountain lands -including Humu`ula and Ka`ohe -were leased to Francis Spencer and the Waimea Grazing and Agricultural Company, which established ranching stations and operations around the mountain lands. As a result, the `āina mauna have been intensively ranched for more than 150 years.

Humu`ula

Because hunting, and subsequently ranching of bullocks, cattle and sheep, was the primary activity on the mountain lands of Humu`ula, areas once forested, soon became open pasture land. While the first formal lease of Humu`ula was issued in 1857 (Keoni Ana to F. Spencer), it was Interests of the Parker Ranch that held the longest lease on the Humu`ula mountain lands. The lease, from 1900 to 2002, covered the area extending around Mauna Kea to the `Āina Hou-Pu`uhuluhulu vicinity. The Parker Ranch interests initially focused on sheep ranching in the Humu`ula-Kalai`eha section, but in 1964 the ranch terminated its sheep program. Cattle operations were maintained until the end of the Parker lease in August, 2002.

Today, limited ranching of cattle is continued on Humu`ula, under a permit by the Department of Hawaiian Home Lands, and leases from the State of Hawai`i. Also, some 10,000 to 13,000-acres have succumb to an infestation of the introduced gorse (first recorded on the land in 1892), which has had little maintenance since 1980.



Overlooking Koa and `Ōhi`a Forest at Humu`ula/Pi`ihonua Mauka

Na `Āina e pili `ana iā Mauna Kea

All other lands lying on the slopes of Mauna Kea -those belonging to the districts of Hilo, Hāmākua and Kohala -generally extended through the forests, where they are cut off by the traditional boundaries of Ka`ohe and Humu`ula. From the middle 1800s, those lands such as Waiākea, Pi`ihonua, Pāpa`ikou, Laupāhoehoe, `Ō`ōkala, Ka`ala, Kūka`iau, Pā`auhau, and Waikōloa, were either held in fee simple interest or leased out by the Crown and Government, for development of lumber collection, bullock hunting, cattle and sheep grazing, and in the elevations below approximately the 2,000 foot level, to development of sugar plantations.

In the early 1900s, forest lands below Humu`ula and Ka`ohe, and the Mauna Kea mountain lands from approximately the 9,000 foot elevation to the summit, were turned over to conservation in the form of forest reserves. The primary interest in the development of the reserves was the protection of water sheds to ensure that plantations would have access to water, necessary for the cultivation, harvesting, and processing of sugar. Interest in, and the value of Hawaiian forests and watersheds has since evolved as a greater awareness of the unique and fragile ecosystems of the Hawaiian mountain lands has been developed.

Travel - Na Ala Hele o ka `Āina Mauna

Travel across the `āina mauna is documented in native traditions, which describe ala hele (trails) passing from the coastal lowlands through the forest lands; along the edge of the forests; across the plateau lands of the Pōhakuloa-Ka`ohe region, and to the summit of Mauna Kea. These ala hele approached Mauna Kea from Hilo, Hāmākua, Kohala, Kona and Ka`ū, five of the major districts on the Island. Only Puna, which is cut off from direct access to the mountain lands, apparently did not have a direct trail to the `āina mauna. Thus, people traveling to Mauna Kea from Puna traveled through the lands of Waiākea, Hilo or Keauhou, Ka`ū to reach Humu`ula and the slopes of Mauna Kea.

By the early 1820s, foreign visitors, in the company of native guides, began making trips across the `āina mauna and to the summit of Mauna Kea. Based on their accounts, travel in the region through the middle 1800s basically followed the old trails, or cut across new areas-a result of dense forest growth, and new lava flows covering older routes. By the 1850s, the Kingdom of Hawai`i entered into a program of improving ancient trails and identifying new routes, by which to improve travel between various locations and facilitate commerce. The earliest recorded improvements (describing government activity on a trail around Mauna Kea) document work on the Waimea-Kula`imano trail (cutting across the lands of Ka`ohe, Hāmākua and Hilo), running above the forest line and to the coast of Hilo, date from 1854, when the Waimea-Kula`imano route was Improved to accommodate wagon travel.

In the later 1850s, as leases were given out for the lands of Humu`ula and Ka`ohe, and the sheep and bullock hunting interests grew, the 1854 route was maintained, and the upper trail between Kula`imano-Makahanaloa, was improved to the Kalai`eha vicinity. In 1862, the Kingdom again initiated a program to improve the government roads across the `āina mauna. Two routes were proposed, one between Hilo and Waimea via Kalai`eha, and the second to improve on the trail from Kalai`eha towards Kula`imano-Makahanaloa, and around through Hanaipoe-Mānā and Waimea. These trails, termed Alanui Aupuni, were appropriated and work completed by the late 1860s. The routes appear on island maps through 1901, with subsequent designations as trails on later maps.

Several ancient trails approached the summit of Mauna Kea, and were used by maka`āinana through the 1920s. Most of these trails were accessed via the improved government roads around the mountain. Primary approaches included, but were not limited to the Kalai`eha-Waiau Trail, the `Umikoa-Ka`ula Trail, and the Kemole-Pu`u Nanahu Trail. Historical accounts and oral history interviews record that these trails provided travelers with access to various sites, including areas where rituals and practices were observed, and that the trails converged at Waiau. At Waiau, travelers found a sheltered area and water for their use while on the mountain. Those who were traveling to the summit of Mauna Kea or to other locations in the summit region then followed smaller trails that provided them with the access necessary for their purposes.

By the early 1870s, the ancient trail between Kalai`eha and the summit of Mauna Kea was improved into a horse trail by the Spencers, lessees of the Mauna Kea mountain lands. Other routes, accessing outlying ranching stations, such as at Pu`u `Ō`ō and Puakala (Pua`ākala), Lahohinu, and Hānaipoe had also been improved by lessees, with routes running around the mountain, and down to Hilo or out to Waimea. In the leases of the Crown Lands and Government Lands, it was specified that improvements, including trails, reverted to the Crown or Government upon termination of the leases. Until the late 1940s, early 1950s, these trails and government roads were primarily used by lessees for transportation of goods-and cared for by the lessees. There are also numerous accounts by visitors to the `āina mauna document travel in the region. By the late 1890s, the Kohala road supervisor reported that while the mountain roads belonged to the government, they were all but private by the nature of their use.

Between the 1930s to 1940s, improvements were made to the Kalai`eha-Waipunalei section of the road to Waimea as a part of the Civilian Conservation Corps (CCC) and Territorial Forestry programs, with work also being done by the Parker Ranch. Likewise, the Kalai`eha-Waiki`i route was maintained by the ranch, and improved by the United States Army-U.S.ED., in 1942.

Apparently little work was done on the Kalai`eha-Hilo section of the road (trail), after the 1870s. The trail was accessed by ranchers, with routes diverging to Kalai`eha and Pu`u `Ō`ō, as described in survey records, journals and kama`āina testimonies. It was also periodically used by visitors to the mountain lands, usually those who were traveling to view Mauna Loa lava flows, or to make the ascent of Mauna Kea. It was not until 1942, that the route was modified as a vehicular road in what became the Saddle Road, following in areas, the native trail and historic route, while also cutting across new lands in other locations. The "Saddle Road" was formally turned over to the Territory in 1947, following which time the general public was then given an opportunity to travel to the mountain lands unhindered.

In 1963, interest in Mauna Kea as a site for a telescope, manifested itself. Hawai`i based scientists. Walter Steiger (with the University of Hawai`i) and Howard Ellis (with the National Weather Service's Mauna Loa Weather Station) facilitated trips by Dr. Gerard Kuiper and Alika Herring (both associated with the University of Arizona and NASA) to the summits of Mauna Loa and Mauna Kea. The Mauna Kea route basically followed the old foot trail from Kalai`eha, past Kalepeamoa, Keonehe`ehe`e and up to the summit. Over the years, the old trail was modified for horses and pack animals, and after World War II, for the occasional four-wheel drive vehicles that ascended the mountain. In 1964, Pu`u Poli`ahu on Mauna Kea had been chosen as the site for the first telescope, and state funds were released for grading a road to Pu`u Poli`ahu, to facilitate construction and access by the scientists. Since 1964, the primary route of access up the mountain slopes has remained generally the same, though as additional development in the summit region has occurred, new accesses and realignments of the earlier route have occurred.

Territorial Forestry and the Civilian Conservation Corps

The following history of Territorial Forestry and the Civilian Conservation Corps is taken from "Keanakolu: An Archaeological Perspective of Hawaiian Ranching and the Pacific Hide and Tallow Trade TMK 3-8-01:9" by Peter R. Mills.

In 1876, the legislature of Kamehameha III passed a law declaring all "forest lands" to be government property in an effort to conserve the forests from further encroachment on the seaward side by the plantations' need for fuel and on the mountain side from grazing animals. In 1901, approximately 30,000 acres of the upland forest were lost to a series of fires in Hāmākua. As a consequence, the Hilo Forest

Reserve was formerly established by the Territory of Hawai`i in 1905 (Tomonari-Tuggle 1996:19, 33-35). Johnny Ah San, who worked as a territorial forester, claims that in the years from 1924 to 1926 forest rangers expanded the log cabin at Keanakolu for use as a field station. Hundreds of thousands of pigs, sheep, cattle and goats were reportedly removed from Hawai`i's Territorial forests in those years (Tomich 1986:113). It was during this period that additional fruit trees were planted in an orchard below the log cabin, as well as hardwood and softwood trees in the surrounding vicinity. A group of six men periodically stayed in the cabin for maintenance purposes (e.g. orchards, trails). These men were responsible for the construction of many miles of fence to contain cattle that freely roamed the area during this time.

The Forest Reserves were established as a cooperative arrangement between the Hawai`i Sugar Planters Association and the territorial government. Plantations needed wood for fuel, but they also needed to keep the forests intact to draw mist precipitation from the trade winds, which in turn fed the irrigation systems in the cane fields below. Their own consumption of fuel had clearly been contributing to the decline of the forest at lower elevations, where flume systems transported large quantities of wood as well as cane. The first Territorial forester, Ralph S. Hosmer, suggested that the forest had been declining in the uplands as a result of fire, grazing and insects (Hosmer 1904:317, in Tomonari-Tuggle 1996:16). In order to preserve the forest, it was necessary to keep the cattle and sheep out, but the planters were also worried about hunters in the woods starting fires from their camps. The commercial ranchers were also wary of individual hunters who could also shoot cattle from the ranch, a problem that was apparently at its worst near the World War II era (Langlas et al. 1999:40). Consequently, the burden of maintaining fences and keeping cattle out of the upper forest were duties mainly shared by territorial foresters and the ranchers.

In 1934, the territorial foresters' camp at Keanakolu was expanded into a Civilian Conservation Corps (CCC) field camp. This was one of several such camps established throughout the mid-slopes of Mauna Kea in the early 1930s (Ah San 1992). The camp consisted of a bunkhouse that housed as many as 40 teenage boys, a mess hall, foreman's quarters, and other service buildings. Another foreman's quarters was added next to the *koa* cabin during this same year. All of these buildings are still standing today. In addition, the lower mess hall still contains the original kerosene stove and bunk beds. The corpsmen did not reside at Keanakolu Camp year-round due to water shortages. In an effort to conserve water, "the 'straw-boss' sat on the hill above the toilet and made sure the men were in and out of the showers quickly (Ah San 1992)." Major duties of the corpsmen included maintenance of trails that came up from the low lands, developing the Mana/Keanakolu wagon road into an auto road, construction of fences to keep cattle and sheep out of the forest, and the planting of a variety of forest and fruit trees. In all, over 20 varieties of pear, 25 varieties of plum, and 60 varieties of apple were planted. Ah San (1992) suggests that the orchard directly surrounding the log cabin complex was planted by the CCC, but a separate nearby orchard was planted earlier.

Also in 1934, the Hilo Burns Club erected a monument to David Douglas on a parcel of territorial forest land close to the location of Gurney's bullock pit. It appears that the actual pit was on ceded land, but because territorial forester L. W. Bryan was also a member of the club who sponsored the construction of the monument, its location is most likely due to it being on the parcel of territorial forest that is closest to the pit. The Club also planted about 200 Douglas fir seedlings around the monument, many of which have now grown to mature trees.

In 1935, the CCC began the monumental task of building a 60-mile long fence around the 85,000 acre Mauna Kea Forest Reserve to help keep an estimated herd of 40,000 wild sheep out of the reserve.

Seven cabins were built around the forest reserve boundaries for shelter as the project proceeded (Langlas et al. 1999:55). The CCC camps were disbanded in the 1940s, after which Keanakolu was once again used as a field station for the forest rangers. Rangers stayed alone in the mountains for long periods and continued to maintain the local natural resources. Names of some of these rangers were Ignacio, Pimental, Kahele, and Ah San (Ah San 1992). Their duties included acting as hunting guides to ensure that hunters would abide hunting regulations on leased ranchlands. Rangers who patrolled the massive jurisdictional land area rode horses that were pastured at the ranger station. Many times a year, forestry crews from Hilo would come up to work with the rangers on large fencing, trail construction, and tree planting projects (Ah San 1992). From 1945-1953 a major movement took place to control the sheep population. According to Ah San (1992), "the pasture above the fence was so overgrazed that at one time the ground was bare of vegetation and only dirt and large trees were visible."

As part of their efforts, the CCC also improved the wagon road into an auto route using rock-laid masonry:

> The cobble roadbed built by the CCC in 1935 is exposed in many places along Keanakolu Road. The cobble bed is made of basalt cobbles and small boulders set to form a relatively level surface, and it is evenly bordered with cobbles. Where both edges are preserved, the cobbled bed is 9 ft (2.8m) wide. The stones for the roadbed were quarried from various places along the road; drilled holes are visible in rock faces at several places along the road, indicating that blasting powder was used to quarry rock (Williams and O'Hare 2001:16).

By the 1940s, the CCC camp at Keanakolu was converted into a field station for territorial rangers. Johnny Ah San stated "these rugged men stayed in the mountains by themselves for long periods and continued to maintain the management of natural resources. Names of some of these hardy rangers were Ignacio, Pimental, Kahele and Ah San" (Ah San 1992). Forestry crews from Hilo would work with the rangers on occasion to work in fences, trails, and reforestation.

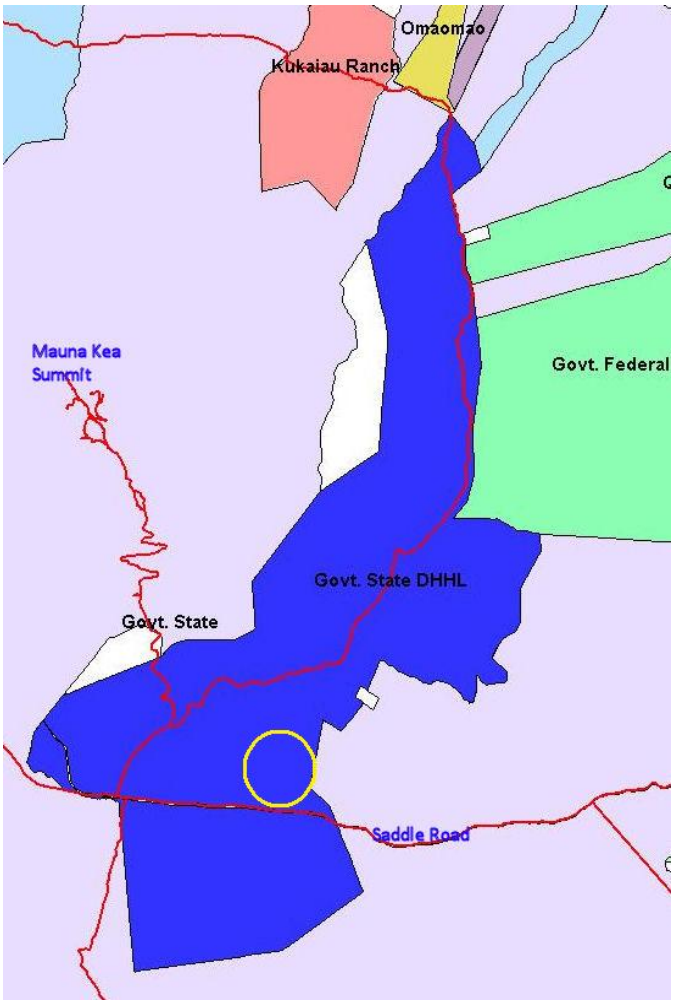
Parker Ranch lease-lands along Keanakolu Road were also used for some military training going as late at the 1980s and early 1990s (Williams and O`Hare 2001:12-14).

On October 15, 2001, an article appearing in the *Hawai`i Tribune Herald* discussed a lawsuit filed on behalf of Alfred J. "Freddy" Nobriga, a Big Island rancher who alleges that Mayor Harry Kim refused to maintain the Keanakolu/Mana Road that leads to the cattle ranch leased by Nobriga. Nobriga alleges that for the past two decades the County of Hawai`i has maintained the road, which he contends is "heavily used" by the public. Nobriga wants the county to grade the road so he can transport water to his ranch during the on-going drought. The county responded that it is the responsibility of the lessees of the Department of Hawaiian Home Lands to maintain the road (Loos 2001:1).

Homesteading

The Department of Hawaiian Home Lands' initial enabling legislation declares the objective of Congress and the State of Hawai`i, to be, to enable native Hawaiians to return to their lands. Therefore the role of the Department of Hawaiian Home Lands has been seen as providing land for native Hawaiians. It is therefore appropriate to have homesteading as one component of this `Āina Mauna Legacy Program.

The concept is to develop the first rural-development homestead area for DHHL beneficiaries in the south-eastern portion of the property. Preliminary design concepts call for a subdivision layout encompassing approximately 1,000-acres with a total of approximately 100 to 200-homesteads sites and other community uses.



General Location of Rural-Development Homestead Area Proposed in the `Āina Mauna Legacy Program

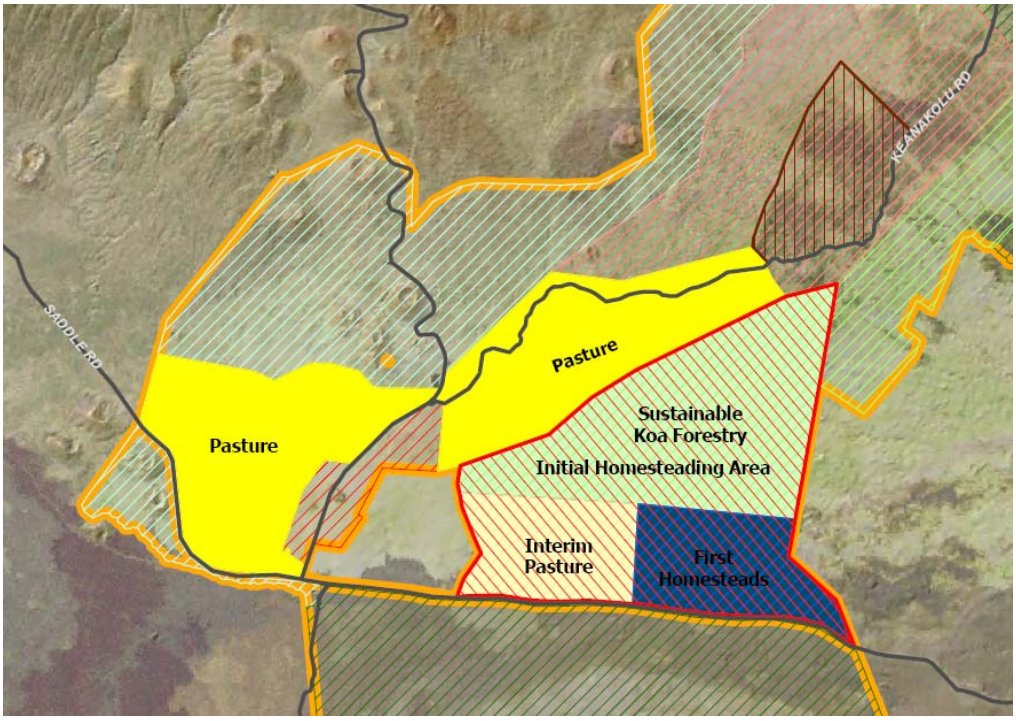
Layout

To take advantage of opportunities to further demonstrate the focus on efficient, self-sustainable communities, as well as provide for cost-effective development, the Legacy Program considers a variety of homestead development layouts to address various beneficiary needs.

Layout options include:

- Cluster homestead sites with separate agricultural/pasture lot
- Cluster homestead sites with community agricultural/pasture
- Homestead lot subdivision
- Combination of alternatives

It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming.



General Location of the First Rural-Development Homestead Area (Blue)

In order to make the development economically feasible, it is envisioned to be a rurally-developed homestead area in which roads would remain unpaved (cinder), and water would be catchment only (DHHL has installed two catchments at Humu`ula and successfully tested this concept.) Composting toilets/Septic systems and leach fields would be used for waste disposal.

The Homestead developments will also incorporate a variety of alternative/renewable energy opportunities including:

- Solar/Photovoltaic
- Catchment (With Fog drip Catchment Augmentation)
- Gray Water Reuse
- Composting Toilets
- Consideration for Low Wind Speed Generators

The `Āina Mauna Legacy Program incorporates several opportunities for homesteading across the entire landscape of the Humu`ula/Pi`ihonua lands. Much of Humu`ula, however, is not ready to support a "self-sufficient and healthy community" of homesteaders, as the land's productivity has significantly

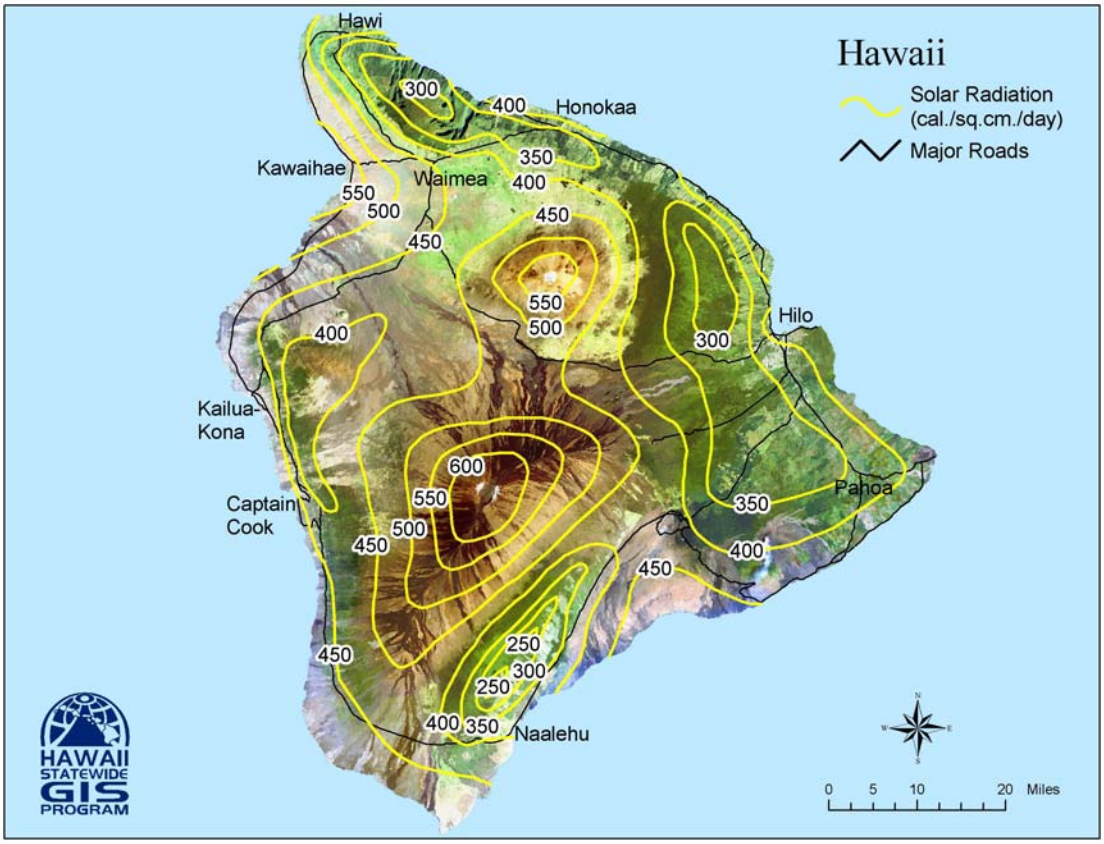
declined over the past 150 years. The bulk of the homestead opportunities are anticipated to be phased in once the land has been restored to productive use. This area includes the significant portions of the site that are proposed for sustainable koa restoration.

These forested areas also provide DHHL with an option for future homesteading. Once the koa restoration is accomplished, DHHL will have the opportunity to consider creation of forested homesteads for beneficiaries. The commercial koa forest management operations can continue, with the DHHL and beneficiaries benefitting directly from the commercial sale of koa.

Similar to many present-day homesteaders having ranches associated with their homesteads or area for agricultural use associated with homesteads, with the restoration and management of the forest here, future homesteaders may incorporate the management of koa forest into their homesteads. Ultimately, decision-makers decades from now may decide whether this is appropriate or not – once the forest is restored. The suggestion is that the Legacy Program expands future options, opportunities and choices for homesteading.

Characteristics of the First Rural-Development Homestead Area:

- Limited overall slope – relatively-level compared to balance of property
- Frontage/Accessibility to Saddle Road
- Accessibility from existing ranch roads
- Situated at the 80-inch mean annual rainfall contour
- Situated within 400 – 450 Cal/cm2 solar radiation contour (4.6 – 5.2 peak sun hours)



Hawai`i Island Solar Radiation Map

Since the property was not typically used for long term habitation, there are questions as to the demand for homesteads in this area. Humu`ula is a unique environment that historically has been minimally settled. It is important that beneficiaries are made aware and understand the advantages and disadvantages of living in this area. Given that the immediate homesteading area will be a rurally-developed (cinder roads, catchment water, photovoltaic, septic/composting toilets, etc) and the area is relatively isolated from employment, schools, shopping centers and other DHHL communities, it is not clear what the demand will be for these types of homesteads.

Although planning would begin immediately, full build out may not occur for several years. Additionally demand and interest for the homestead lots and the availability of funds for needed Infrastructure would also need to be taken into consideration. Subsequent homestead development may occur depending on demand, costs and policy relative to the overall use of the site. An in-depth look at the consistency of the recommendation with prior planning and background information related to this recommendation is below.

Background/Enabling Legislation/DHHL Primary Purpose – Homesteading

The "Humu`ula/Pi`ihonua Master Plan", developed by PBR Hawai`i in 1997 sites the Department's ability to implement a range of management programs and the flexibility to implement a broad range of policies and programs. These management programs include homesteading options (conventional and kuleana), cooperative management agreements, homestead general leases, and economic enterprise partnerships.

As noted in the initial enabling legislation, §101. Purpose of the Act, [L 1990, c 349, § 1], declares the objective of Congress and the State of Hawai`i, to be:

> "(a) ... to enable native Hawaiians to return to their lands in order to fully support self-sufficiency for native Hawaiians and the self-determination of native Hawaiians in the administration of this Act, and the preservation of the values, traditions, and culture of native Hawaiians."

The objectives of this policy on native Hawaiians is further defined under §101 (b) of the Act. They are designed to provide the essential guidelines to direct the Hawaiian Homes Commission and the Department in:

(1) Establishing a permanent land base for the benefit and use of native Hawaiians, upon which they may live, farm, ranch, and otherwise engage in commercial or industrial or any other activities as authorized in this Act;
(2) Placing native Hawaiians on the lands set aside under this Act in a prompt and efficient manner and assuring long-term tenancy to beneficiaries of this Act and their successors;
(3) Preventing alienation of the fee title to the lands set aside under this Act so that these lands will always be held in trust for continued use by native Hawaiians in perpetuity;
(4) Providing adequate amounts of water and supporting infrastructure, so that homestead lands will always be usable and accessible; and
(5) Providing financial support and technical assistance to native Hawaiian beneficiaries of this Act so that by pursuing strategies to enhance economic self-sufficiency and promote community-based development, the traditions, culture and quality of life of native Hawaiians shall be forever self-sustaining.

The objective of the Act is to provide native Hawaiians with a land base of 203,500-acres, more or less, administered through the Department of Hawaiian Home Lands. These trust lands thus, set aside serves two (2) purposes.

The primary purpose is of course the homesteading program for native Hawaiians. Homestead leases are currently awarded for residential, agricultural or pastoral purposes.

Secondarily, lands not currently awarded under homestead leases are generally available for income-producing uses by the public within certain parameters set by state law.

Prior Planning Efforts Discussing Homesteading

Humu`ula Rural Villages and Landscape Restoration Plan

`Ōiwi, with the technical assistance of Townscape, Inc., over the course of a two-year period, developed the “Land Use Concepts for Humu`ula/Pi`ihonua” (2002). This plan was presented to the Hawaiian Homes Commission as an alternative to the "Humu`ula/Pi`ihonua Master Plan," (1997) that was prepared by PBR Hawai`i on behalf of the Department of Hawaiian Home Lands (DHHL). (Humu`ula Rural Villages and Landscape Restoration Plan, Page 1)

The "Humu`ula Rural Villages and Landscape Restoration Plan" was prepared for `Ōiwi by Townscape, Inc. and proposes the development of homesteads through rural villages and community pastoral lands to be available to beneficiaries of the DHHL trust. Components of the plan are detailed below.

The “Humu`ula Rural Villages and Landscape Restoration Plan” proposes a near-and long-term development concept for 13,850-acres of Hawaiian Home Lands located in the Humu`ula ahupua`a in the North Hilo district on Hawai`i Island.

The Humu`ula Rural Villages are primarily for agricultural homesteading with common lands available for homesteaders that require additional land for raising animals, farming, or agro-forestry. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 1)

The Landscape Restoration Plan and Wahi Pana Management Plan recommend a process to focus on environmental restoration and cultural properties conservation.

This approach was discussed during the land use concept development stage of the Humu`ula/Pi`ihonua lands, in which it was recognized that 1) more favorable ranching lands were located at Pi`ihonua, and 2) the development of large pastoral awards would result in only a limited number of homesteaders settling on the land making the development less feasible. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 1)

The Humu`ula Rural Village and Landscape Restoration Plan Report was produced to continue and develop more detailed planning studies for the Humu`ula/Pi`ihonua area. The Plan proposes near and long-term development concepts for 13,850-acres of Hawaiian Home Lands located in the Humu`ula ahupua`a.

The plan outlines a development concept which includes four elements:

- Rural Village Areas - The Humu`ula "Rural Villages" would be primarily for agricultural homesteading with common lands available for homesteaders that require additional land for raising animals, farming, or agro-forestry
- Service Center (Neighborhood Store and Fire Station) - Community services would be developed within a Service Center area which would consist of a neighborhood store, park, community facilities and a fire station.
- Landscape Restoration Plan - The Landscape Restoration Plan process proposes three elements: gorse control, Māmane Reforestation, and "Kīpuka" Management.
- Wahi Pana Management Plan - The Wahi Pana Management Plan process suggests a series of steps for the development of a Cultural Properties Management Plan for the cultural resources located at Humu`ula.

Initial Concept of Rural Villages

A total of four Rural Village Areas of approximately 1,000 acres each were envisioned for 4,000 acres of the project site. Each rural village would contain a cluster of 100 homesteads on approximately 200 acres and associated common pastoral/agricultural lands of approximately 800 acres. Homesteaders within each village would organize a Village Association that would manage the common lands through a permit or other lease agreement with DHHL. Each Association would develop its own plan for use of the common pastoral lands. It is recommended that DHHL develop benchmarks to measure the Village Associations' capacities to manage common lands over time. (Humu`ula Rural Villages and Landscape Restoration Plan, Pages 1 & 2)

At full build-out, the four Village Areas would provide homesteads for a total of 400 families. The Village Areas would be developed incrementally, contingent upon applicant demand and active interest for this type of homestead development. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 2)

"Village Area A" may take ±10 years to develop and populate. Village Areas B, C, and D, the Humu`ula Park, the Neighborhood Store, the Fire Station, Potable Water Planning and Development and other infrastructure up-grades assume a long-term, 30-year or greater build-out timeframe. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 2)

The Humu`ula Rural Villages and Landscape Restoration Plan illustrates the long-term development concept for four Rural Village Areas, associated roads, a multipurpose community facility, service center, community park, and common pastoral/agricultural lands. Each Village Area is approximately 1,000-acres in size and is comprised of the following:

- An "Agricultural Homesteads Settlement" of approximately 200-acres, consisting of 100, 1-and 2-acre Agricultural Homestead Lots, associated roads, and a 15-acre community park with a multipurpose facility.
- Surrounding common pastoral/agricultural lands of approximately 800-acres for use by interested and active beneficiaries that are awarded Homestead Lots within a particular village. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 25)

Each Village will provide agricultural homesteads for approximately 100-families on 1-and 2-acre lots. At full build-out, the 4-Villages combined will thus; provide homesteads for a total of 400-families.

For each Village, a 15-acre park is located at a newly proposed access road that will connect to an interior village road. A 24-foot-wide unpaved roadway is proposed. A Multipurpose Building, estimated at 5,000 sq. ft., would provide space for community events, occasional medical clinic services, volunteer fire services, classrooms, cafetorium, and kitchen area. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 25)

The long-term development concept (30 years and beyond) also includes: 10 acres each for a neighborhood store and a fire station (located at the junction of Saddle Road and the proposed Main Access Road), electrical and telecommunications upgrades, and potable water supply development. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 25)

The `Ōiwi plan outlined guiding principles which were established by `Ōiwi in 2002 and served as a guide for the Humu`ula Rural Villages and Landscape Restoration Plan. These principals included:

- The character of homestead communities shall be rural. Homestead uses for these lands shall be agricultural and pastoral uses with their appurtenant uses.
- The first phases of homestead development shall focus on areas of Humu`ula that are closest to existing Saddle Road. Where necessary, interim uses will be allowed until final homestead plans are completed, funded and implemented. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 11)

Additionally, the Humu`ula Rural Villages and Landscape Restoration Plan, noted: The original concept of multiple rural villages may be too ambitious and large. Consider starting with one village plus a system of landscape restoration and management of adjacent lands. Additional villages could be planned and established according to need/demand.

Rural Villages Infrastructure Needs and Costs

This section reviews the infrastructure elements needed for the Rural Villages development and provides an order of magnitude cost estimate for infrastructure for Village Area A.

The overall theme of infrastructure for Village Area A should be “basic,” in order to avoid expensive road, water, electrical, and other costs. Thus, our recommendations for infrastructure include unpaved roads, water catchment systems, and the use of solar energy technology. (Humu`ula Rural Villages and Landscape Restoration Plan, Page 33)

Costs to develop infrastructure for "Village Area A" are estimated at $11,000,000. The long-term development will require additional electric and telecommunication upgrades, and water resource development, should a significant number of homesteaders settle the area. Infrastructure for the development of "Village Area A" includes the following: (Humu`ula Rural Villages and Landscape Restoration Plan, Page 3)

INFRASTRUCTURE COST SUMMARY FOR "VILLAGE A"

INFRASTRUCTURE ELEMENT	COST	
COMMUNITY INFRASTRUCTURE		
Access Road	$ 1,000,000	
Internal Roads to Lots	$ 1,000,000	
Ranch and Farm Roads	$ 500,000	
Reservoir(s)	$ 2,000,000	
Fencing	$ 500,000	
Community Park -Grading & First-Phase Facilities	$ 200,000	
Multipurpose Building	$ 300,000	
Community Infrastructure Cost:	$ 5,500,000	
(Add +/-20% for Project Management, Design, and Contingencies):	$ 6,600,000	
Cost per unit for 100 homesteads:	$ 66,000	
INFRASTRUCTURE FOR HOMES		
Water Catchment Systems	$ 15,000	per unit
Solar Electric Systems	$ 15,000	per unit
Septic Tank & Leach Field	$ 7,000	per unit
Home Infrastructure Costs:	$ 37,000	per unit
(Add +/-20% for Project Management, Design, and Construction):	$ 44,000	per unit
Cost for 100 homes:	$ 4,400,000	
Total Infrastructure Costs:	$11,000,000	
Infrastructure Costs per Unit:	$ 110,000	

Humu`ula/Pi`ihonua Master Plan

In 1996, DHHL began a master plan process for the Humu`ula and Pi`ihonua lands. The planning process included site studies, research, mapping, DHHL staff working meetings, and community meetings.

The product of this process was the December 1997, Humu`ula/Pi`ihonua Master Plan. The Humu`ula/Pi`ihonua Master Plan has a homesteading component which has some similarities to the Humu`ula Rural Villages and Landscape Restoration Plan's homesteading component.

As part of the planning process three alternative concept plans were prepared, each reflecting a particular emphasis, including: homesteading, economic development, and independent/multiple use.

In the evaluation of alternatives, various land management alternatives are identified and evaluated. The land management alternatives include:

1) Conventional Homesteading, in accordance with conventional Department leasing procedures;
2) Kuleana Homesteading, permitting homesteading on unimproved lands under a newly adopted DHHL program;
3) Cooperative Management Agreement, under which a cooperative of interested beneficiaries would take control and manage the lands and related resources;

4) Homestead General Leases, which would make parcels of land available to beneficiaries though request for proposals specifying the land management responsibilities and performance standards;
5) Economic Enterprise Partnerships, which, similar to the model used by the Maori tribes of New Zealand, would involve DHHL entering into agreements with private enterprises that would provide their expertise and capital, and beneficiaries would participate as "stock holders" or employees; and
6) Other Management Options as identified by DHHL or as variations of the above options. (Humu`ula/Pi`ihonua Master Plan, Page vii)

The alternative plans were reviewed with Advisory Task Force Committee, DHHL, and interested beneficiaries, and were evaluated against the Master Plan goals with the positive elements of each integrated and refined as part of the Preferred Concept Plan.

Major elements of the Preferred Concept Plan in regards to homesteading include the following: To provide additional opportunities to the beneficiaries on the pastoral waiting list, the Plan provides for a range of 50 to 150-pastoral homesteads which could be phased in increments to meet the desires of the beneficiaries.

Approximately 3,000-acres near the Saddle Road/Mauna Kea Access Road junction would be reserved for future homesteading if the infrastructure, primary water, can be developed economically to support a more intensive homestead settlement of several hundred lots.

Depending on the beneficiaries expressed interest to homestead these lands without infrastructure improvements, kuleana homestead awards could be made within the context of the overall Master Plan. (Humu`ula/Pi`ihonua Master Plan, Page vii)

Infrastructure Requirements

Planning estimates of the cost to make the lands habitable and useable for prospective lessees include; roadway improvements, a new storm drainage system, a new water catchments treatment and distribution system, electrical power, and sewer systems. Four planning alternatives were prepared by R. M. Towill Engineers. (Humu`ula/Pi`ihonua Master Plan, Pages 36 & 37)

Development Cost Estimates

Roadway Improvements	$6,088,439
Storm Drainage System	$3,223,150
Water System	$2,000,000
Electrical System	$2,314,500
Plus Contingency @ 15%	$2,043,913
TOTAL	$15,670,002

Humu`ula Sheep Station - Adaptive Reuse

The Humu`ula sheep station is a visible landmark along the Saddle Road and Mauna Kea Access Road. Its location presents an ideal place for a "gateway" to Mauna Kea and the `Āina Mauna lands. With the only access to Mauna Kea, cutting through the `Āina Mauna lands, the sheep station provides an opportunity for education and cultural awareness for those proceeding up the mountain.

The `Āina Mauna Legacy Program takes into account its historical, architectural and cultural importance and proposes to initiate the adaptive reuse of the Humu`ula Sheep Station, in accordance with findings and recommendations in the Humu`ula Sheep Station Adaptive Reuse Plan. The facility could be considered for a variety of uses, including redevelopment of the property into a Lodge, and serve as a focal point for events, education, staging, retreats, gatherings, meetings, etc.

In March of 2004 Kimura International prepared and published the "Humu`ula Sheep Station Adaptive Reuse Plan" (Reuse Plan) for the Department of Hawaiian Home Lands. The report was a collaborative effort between the consultants and DHHL to guide future development of the Humu`ula Sheep Station. The plan addresses potential development activities at the sheep station to generate revenue and restore the area.

In 1997, a master plan was prepared for Humu`ula/Pi`ihonua by the Department and consultant PBR Hawai`i. A separate land use concept plan was prepared in 2003 by the beneficiary group `Ōiwi Lōkahi o ka Mokupuni o Keawe and Townscape, Inc. The two plans contain differences in proposed uses for the Humu`ula/Pi`ihonua lands; however, they are consistent in recommending commercial development for the sheep station itself and adjacent properties. Both plans, as well as the Department of Hawaiian Homeland's Hawai`i Island Plan (2002), provided background and contextual information in planning future uses for the sheep station. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 23)

Summary of Adaptive Reuse of the Humu`ula Sheep Station Component

The `Āina Mauna Legacy Program proposes to initiate a broad RFQ/RFP, for the adaptive reuse of the Humu`ula Sheep Station, in accordance with findings and recommendations in the Humu`ula Sheep Station Adaptive Reuse Plan. Benefits would include; that the action implements a pre-existing plan (Adaptive Reuse Plan); is consistent with other planning efforts and allows for short- (ecotourism) and long-term (commercial, camping, lodge, etc) opportunities for revenue generation.

The site contains a mix of structures and artifacts with varying degrees of historic, architectural, and aesthetic significance. The Reuse plan proposes to establish a historic zone consisting of three historic buildings (the office and dwelling building, barn and sheering shed). The restoration of these buildings will be a required component of the lease terms.

DHHL's development objectives for the Subject Property call for a development project that:

- Will be undertaken by a qualified private sector lessee who will bear all of the costs of the redevelopment and will not be subsidized by DHHL.
- Will be developed under a lease agreement between DHHL and the selected applicant.
- Will redevelop the Subject Property taking into consideration the Reuse Plan, applicable laws, and allows for all improvements and facilities to be open to the public.
- Includes the establishment of a "historic zone", including the renovation of core buildings within the "historic zone".

- Increases the financial returns to DHHL from the Subject Property in a timely manner.
- Complies with all laws, ordinances, rules, regulations and restrictions applicable to the Subject Property including Chapter 343 Hawai`i Revised Statute.
- Is economically feasible to the developer/lessee.
- Does not include incompatible uses including Warehousing; Baseyard for transportation or construction operations or for utility companies; Manufacturing or repair services; Residential, except in a lodge, bed-breakfast or caretaker type of situation; Commercial agriculture; and Large-scale institutional or eleemosynary use or campus, as outlined in the Reuse Plan.

Various land use and management plans have called for the reuse of the Humu`ula Sheep station, with an emphasis on commercial activity. The following is a summary of that background information.

Site Description

The site is located at an elevation of approximately 6,700 feet, resulting in a cool climate year-round with frequent fog covering in the afternoon. Average annual rainfall is a moderate 40 inches. The climate presents an opportunity with heating costs offset by the novelty of a cool climate, one of the site's major selling points and no need for air conditioning. (Humu`ula Sheep Station Adaptive Reuse Plan, Pages 24 & 28)

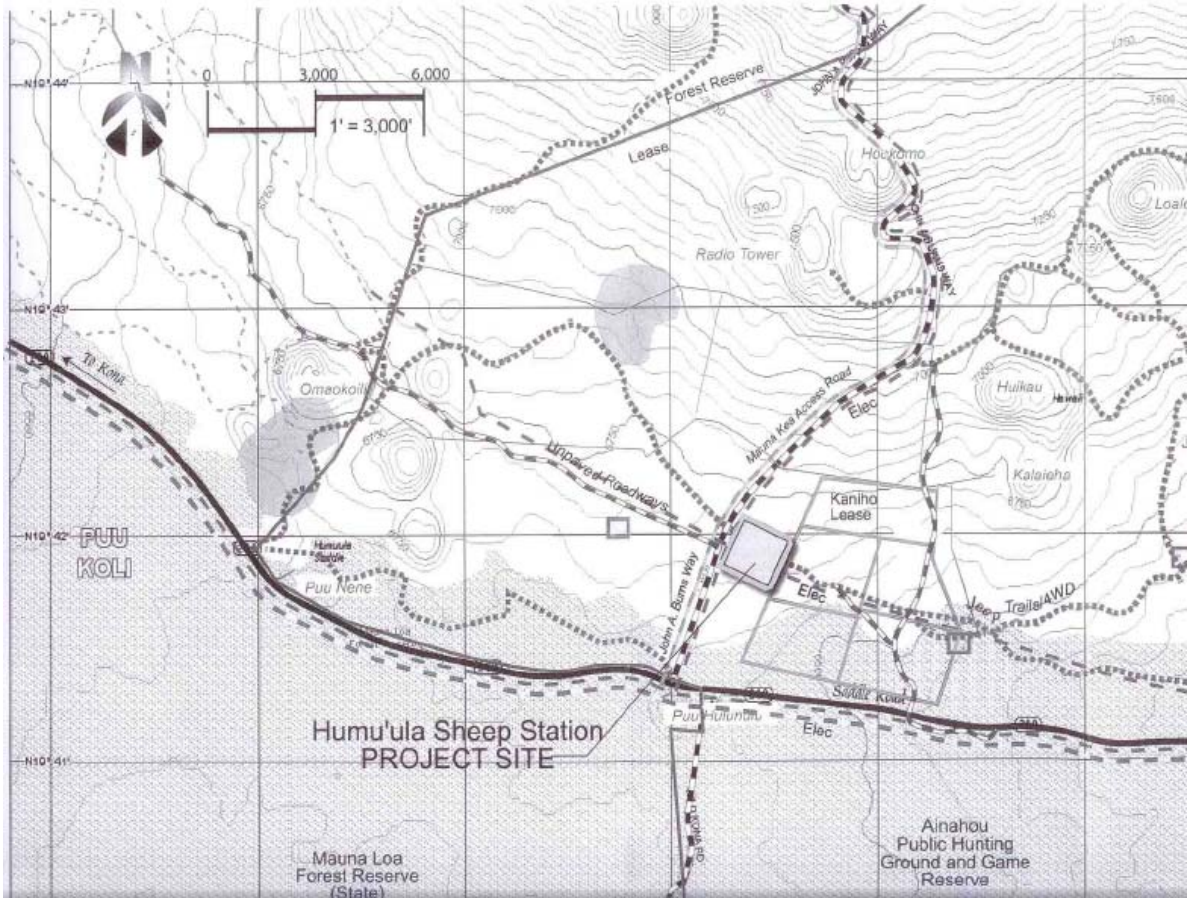
The remoteness of the area from population centers makes the Sheep station an attractive site for those seeking quiet and closeness to nature. The flora and fauna of the area present an interesting contrast between pastureland and old-growth kīpuka. There is good access to habitats supporting rare birds and native forests. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 29)

Site History

Historically, sheep raising was one of the oldest introduced agricultural pursuits in Hawai`i. Sheep were originally introduced to the Big Island by Capt. George Vancouver in 1793 when he left two ewes and a ram at Kealakekua. Sheep were being raised for export by 1809 and flourished through the early part of the 20th century. Most meat was consumed locally and wool was supplied to mainland United States buyers. Wool production reached its peak in 1875 when 565,000-pounds were sent overseas. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 24)

The Humu`ula Sheep Station has historical and architectural interest because sheep raising was one of the oldest introduced agricultural pursuits in Hawai`i and while never a major industry it was carried on until the last large flock in the Islands located at Humu`ula was phased out. Humu`ula's relationship to Parker Ranch and to the general agricultural history of Hawai`i is significant. The Humu`uIa Sheep Station Company chartered by the Hawaiian Government in 1883, was an operation of H. Hackfeld and Company. By 1894 the company had erected large and extensive paddocks at Kalaieha and also had a station at Keanakolu. Ownership of the station came under Parker Ranch and operations continued for years, often little known by Hawai`i residents due to its comparatively isolated location. (Humu`ula/Pi`ihonua Master Plan, Page 17)

Sheep raising at Humu`uIa was given-up in 1963 and although abandoned as a sheep station, ranch support activities have continued until recently. Therefore, the site contains a mix of structures and artifacts with varying degrees of historic, architectural, and aesthetic significance.



Humu`ula Sheep Station Project Site

Existing structures include offices, living facilities, outbuildings, work sheds, shearing sheds, holding pens, and catchment facilities. Buildings and artifacts tell an interesting architectural story and provide a historic backdrop for a contemporary rustic experience (Humu`ula Sheep Station Reuse Adaptive Plan, Pages 24 & 29)

The site was assessed by the State Historic Preservation Division for placement on the Hawai`i Register of Historic Places. The historian determined that the site's architectural interest and merit lie in "structures (c. 1900) [that] are typical ranch house style but are particularly interesting for their 'homemade' contrived plans and arrangements, both functional and picturesque."

The assessment concluded with a recommended "Valuable" status based primarily on its historical interest and secondarily on its architectural interest. "If possible, a restoration into an operating complex including visitor facilities would present an unusual 'outdoor museum' of great interest." (Humu`ula Sheep Station Adaptive Reuse Plan, Page 24)

The main historic building on site consists of an office and dwelling which was part of a cluster that represents the property's rustic character. It was originally built as a men's living cottage and, over time converted to office and residential use. The structure was built in stages and consists of two distinct wings, both with gable roofs. The 1973 SHPD assessment refers to the elaborate decoration of the living room with skylight, wainscoting and carved scrollwork. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 27)

Unfortunately, in the 36 years since the assessment, the building has deteriorated from neglect and lack of maintenance. A preliminary architectural inspection indicates that the building will require extensive structural rehabilitation to meet current health and safety standards for occupancy. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 27)

Humu`ula Sheep Station Reuse Plan

The Humu`ula Sheep Station reuse Plan documents the results of a collaborative effort between the consultants and DHHL to guide future development at Humu`ula. Because there is little commercial activity in the area to offer precedents of market potential, the plan's viability is based on a three-prong strategy consisting of:

- *Opportunism* - until Humu`ula becomes an established destination site, the proposed uses are intended to attract passing traffic and people participating in recreational activities in the saddle region;
- *Synergism* - assembling a compatible mix of uses that can "feed off each other"; and
- *Incrementalism* - the initial development could be modest or ambitious, but, in either case the plan provides space for expansion. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 1)

The plan embodies a course of development that is compatible with the special environmental, historic, and cultural resources that help to define the character of the site. It recognizes that raising the property's value will ultimately provide the means to underwrite long-term conservation efforts and generate further benefits for the community. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 1)

The adaptive reuse plan addresses the following objectives:

1. To establish the "character of use" – i.e., a limited range of potential uses. The character of use is sufficiently constrained so that it levels the field for bidders. On the other hand, the uses are not defined so narrowly that it hinders entrepreneurial creativity.
2. To describe a proposed action or a range of actions that can be used to prepare an environmental assessment. It is acknowledged that environmental impacts will be assessed before the property is leased.
3. To determine the size of the property to include in the initial lease.
4. To develop general design guidelines, including (but not limited to) controls on density, height limits, size of development footprints, construction materials, and architectural style. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 1)

The Reuse Plan proposes a mix of land uses, wherein the property is divided into three principal sub-areas: Historic/Community Center (5.5 to 6.0 acres); Open Campground (2.0 to 2.5 acres) and Commercial (7.0 to 8.0 acres), including retail, recreational, lodgings and restaurant activities appropriate to a transient or visitor market. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 3)

Alternative Land Use Plans

Three alternatives were developed for the Humu`ula site. The alternatives can be viewed in two ways: (1) a representation of different phases starting with a modest effort and expanding incrementally over time or (2) a representation of different outcomes. In the latter case, a developer may choose to start with a highly capitalized project, rather than taking a more gradual approach. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 3)

Humu`ula Sheep Station Site

Alternative 1: Low Intensity Development

The low-intensity alternative does not require a full-time presence on the site. The focal activity is a campground where users are largely self-sufficient. Capital investment is minimal since this development scheme does not require any permanent structures, with the possible exception of equipment storage sheds (which can be portable structures). Indeed, "improvements" consist primarily of demolishing unused structures, removing debris and clearing overgrown landscaping, and erecting fences around the remaining historic buildings (to keep people from going into hazardous structures). (Humu`ula Sheep Station Adaptive Reuse Plan, Page 3)

Development components:

- Campground. User provides tent and cooking equipment. Operator provides portable toilets and showers, fire pits, playfields, and possibly equipment (such as volleyball nets, softball gear, archery equipment, or a more elaborate ropes course)
- Continued use of picnic area by a private eco-tour operator
- Homesteaders association headquarters/community center (renovated Quonset hut)
- Infrastructure Costs $120,000
- Potential Annual Rent $53,400 (low) to $61,600 (high) (Humu`ula Sheep Station Adaptive Reuse Plan, Page 3)

Alternative 2: Medium Intensity Development

Alternative 2 involves one or more businesses that have regular hours of operation, thus, requiring permanent, probably full-time, employees. However, capital investment is still relatively limited and

development can occur incrementally, whether it is the number of cabins erected, types of eco-tourism activities staged on site, and/or the range of goods and services offered at the rest stop. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 3)

Development components:

- 10 Cabins (60 persons maximum)
- Eco-tourism/adventure tourism staging area (such as, hiking, bird watching, bicycling, horseback riding)
- Rest stop with food concession(s) and/or handicraft sales
- Campground
- Existing cottage converted into the beneficiaries' community center
- Interpretive signs and walkways in the historic zone
- Infrastructure Costs $355,000
- Potential Annual Rent $81,900 (low) to $100,100 (high) (Humu`ula Sheep Station Adaptive Reuse Plan, Page 4)

Alternative 3: High Intensity Development

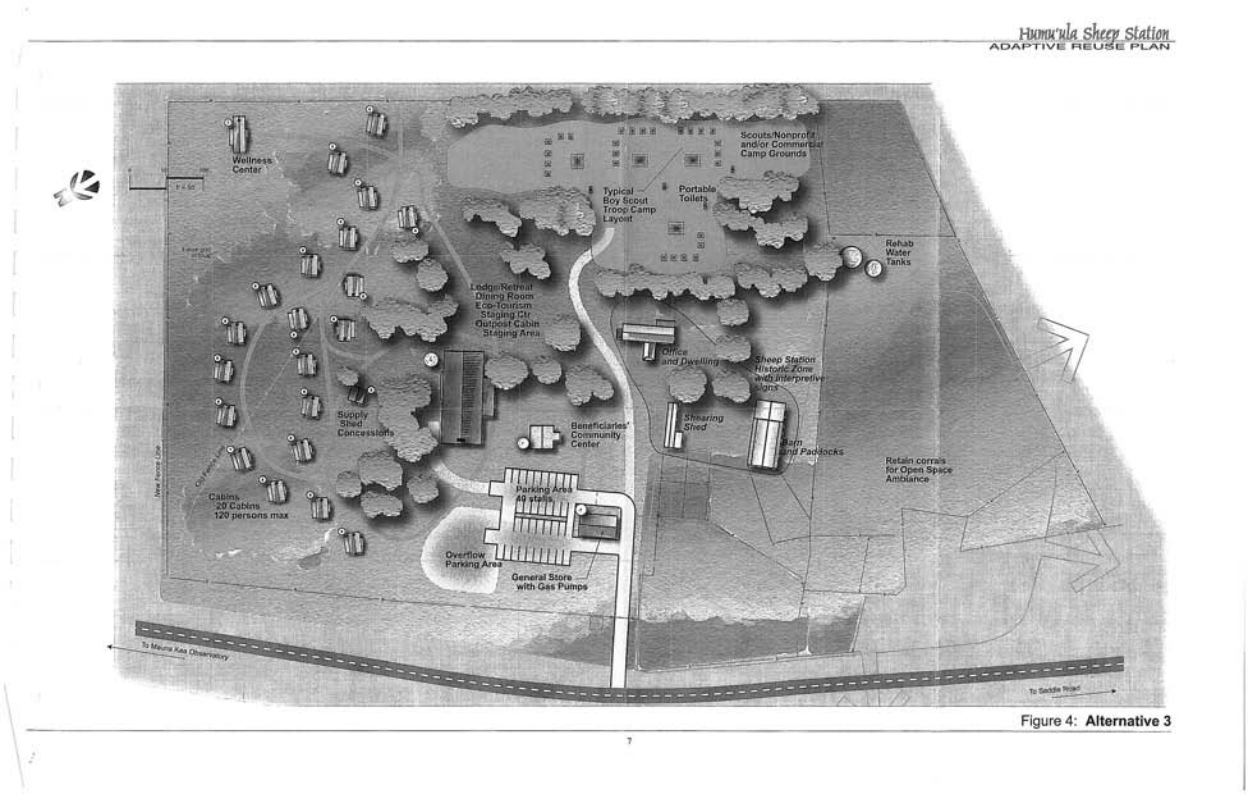
Alternative 3 represents a more sophisticated level of development. With a greater outlay of capital this alternative will need sustained market demand. On the other side of the coin, Alternative 3 offers the greatest variety of visitor amenities and could become a destination of potentially enormous appeal. The addition of a lodge could significantly alter the visitor experience by providing more congenial settings in which to socialize, for example, a dining room/restaurant, seminar rooms for meetings, spa/fitness facilities, and/or lounge with the iconic roaring fireplace. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 4)

Development components:

- 20 Cabins (120 persons maximum)
- Lodge with restaurant
- Eco-tourism staging center
- Wellness center, retreat, seminar rooms
- General store/Rest stop (with or without gas pumps)
- Campground
- Stabilize buildings in the historic zone for long-term restoration
- Infrastructure Costs $969,000
- Potential Annual Rent $241,400 (low) to $283,800 (high)
  (Humu`ula Sheep Station Adaptive Reuse Plan, Page 4)

*Note that estimated infrastructure costs are incurred during first three years and that annual rent is estimated in the tenth year of operation and assumes relatively mature, stable operations.

It will be up to the applicant to determine which of these or parts of these alternatives will be included in their development plan. The phasing of these alternatives does not have to be sequential (Alternative 1, 2, 3). The applicant may undertake any of the alternatives in any order.



Humu`ula Sheep Station Adaptive Reuse Plan – Alternative 3

Ecotourism and Recreation Use

The sheep station is located at a transportation crossroad, in a region that abounds with recreational, environmental, cultural and educational resources. There is tremendous potential to develop the Humu`ula sheep station in a way that complements and enhances the enjoyment of these resources. Examples of viable commercial and nonprofit activities are described below to provide an indication of the site's development potential. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 34)

- Biking Tours
- Bird Watching Tours
- Nature Tours
- Lodge/Camp
- Hiking Tours
- Horseback Tours
- Wilderness Resort/Guest Ranch

The Humu`ula Sheep Station provides the greatest opportunity to plan and manage multiple ecotourism and recreation activities that would capitalize on the unique resources of these lands including native flora and fauna, unique ecosystems, and observatory related activities. (Humu`ula/Pi`ihonua Master Plan, Page 57)

Commercial Activity

There are opportunities to provide service oriented businesses to serve the Saddle Road traffic. Recognizing the potentially significant increase in cross island traffic that will result from the ongoing improvements to the Saddle Road, the nearby Pōhakuloa Training Area and the growing interest in the astronomical activities on Mauna Kea, there is the opportunity and potential need for commercial service facilities to be located near the Saddle Road/Mauna Kea Access Road intersection. The Sheep Station provides an ideal location.

Commercial activity within the Sheep Station property would be best situated generally to the north of the proposed interior access road within the subject property. The Reuse Plan identifies an approximately 7.0 to 8.0 acre sub-area for commercial activity.

Commercial opportunities which could build upon the natural resources and locational advantages of these lands and/or possible activities considered appropriate for commercial activity in this subarea might include the following:

- General Store
- Convenience Store
- Gas Station
- Rest Stop
- Ecotourism Headquarters/Staging Area
- Restaurant
- Retail Activities
- Office space to support commercial activities (i.e. ecotourism)
- Other facilities that are appropriate to a transient or visitor market

Related to these activities, there would be opportunities to create commercial accommodations (i.e. Camping, Cabins and Eco-Lodge Facility) to take advantage of the surrounding environmental resources.

Additionally, an initial increment of specialty overnight accommodations in the form of a private lodge for eco-tourists is proposed as a natural component given the variety of eco-tour opportunities that the lands and Mauna Kea present. The master plan calls for 20 units. There is a provision in the Master Plan for an additional lodge at a separate site if and when the market warrants. (Humu`ula/Pi`ihonua Master Plan, Pages 36, 56 & 57)

The 1997 Humu`ula/Pi`ihonua Master Plan recognizes the Sheep Station's strategic location close to the intersection of the Saddle Road and the Mauna Kea Access Road that could contain a variety of commercial uses, as a mixed use facility.

In the plan, approximately 350-acres are reserved for these potential commercial and industrial uses near the crossroads of Saddle Road and Mauna Kea Access Road, where projected traffic increases resulting from the planned Saddle Road improvements and the on-going astronomical industry growth occurring at the Mauna Kea summit may support various business opportunities. This area would also be the logical hub for centralizing the headquarters for various ecotourism operations. The area of the Sheep Station could serve this purpose.

Incompatible Uses

The adaptive reuse plan is intended to allow for entrepreneurial flexibility; however, some uses are distinctly incompatible, including:

- Warehousing
- Baseyard for transportation or construction operations or for utility companies
- Manufacturing or repair services
- Residential, except in a bed-breakfast or caretaker type of situation
- Commercial agriculture
- Large-scale institutional or eleemosynary use or campus
  (Humu`ula Sheep Station Adaptive Reuse Plan, Page 4)

General Design Guidelines

The Reuse Plan also includes recommendations related to the general design guidelines of the sheep stations' reuse which are based on development outcomes envisioned in the adaptive reuse plan. Location Guidelines:

- Retain corrals and open fields on the south and west sides of the site so that the roadway approaches from Saddle Road and Mauna Kea Access Road convey an ambiance of wide open spaces and pastureland.
- Establish an historic zone consisting of three core buildings: the Office and Dwelling Building, Barn, and Shearing Shed. Paths linking these buildings should be constructed to define safe walking and observation areas for visitors. The area can be further improved with interpretive signs and displays of artifacts. Over the long term, the buildings will need to be stabilized against further deterioration and collapse.
- Limit long-term parking to lots near the entrance of the site. This will maintain a more natural look in the interior portions. Consider alternatives to black-top for the parking lots and obscuring expansive views of parked cars with berms and landscaping.
- Locate the rest stop or general store (with gas pumps) near the main entrance so that high volume, in-and-out traffic remains near the roadway. An alternative site for the rest stop/general store is closer to the intersection of Saddle Road and Mauna Kea Access Road. This location has the advantage of higher visibility and easier access from the highway; however, it would reduce opportunities to create market synergy with people staying at the cabins and campground.
- The northern, upslope areas are most appropriate for the cabins, offering views to adjacent open spaces.
- On-site infrastructure should incorporate sustainable technologies where possible, including rainwater catchment, solar power, and recycling. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 9)

Development Guidelines: Height, Bulk, and Density:

- Buildings should not exceed a maximum height of two stories, not including architectural or mechanical features, such as a chimneys and air shafts.
- The plan, as shown in Figures 2-4, has moved the existing fence line on the northern side and in the southeast comer, producing a developable area of about 15-acres.
- Cabin density should strike a balance between compactness (for walkability and ease of servicing) and privacy. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 9)

Design Guidelines: Architectural Styles and Materials:

- Roofing
  - Pre-finished or field painted corrugated metal: overhanging eaves; Roof angle similar to the existing office building
- Foundation
  - Post construction with an elevated ground floor
- Exterior siding
  - Wood cement board and composite battens; lava-like rock for chimneys, exterior posts, and accents
- Entrance doors
  - Wood stile Wood stile and rail, panel or true divided light (glass) doors
- Windows
  - Aluminum or vinyl clad wood, double hung or awning windows
- Coatings
  - Earth and vegetation tones and colors
- Other
  - Provide porches and verandas; incorporate lean-to type extensions (for example, to accommodate the lavatory). (Humu`ula Sheep Station Adaptive Reuse Plan, Page 10)

Criteria to Evaluate Land Use Alternatives

Land uses were evaluated on the basis of the following criteria:

1. Potential to maximize financial returns.
2. Feasibility of initiating development within five-years, with the possibility of reaching full implementation through an incremental process. (If more attractive uses are anticipated beyond a five-year period, the plan may advise DHHL to defer leasing.)
3. Compatibility with other uses, which allows risk sharing and the ability to establish synergistic markets.
4. Incorporates uses that are sympathetic to and will accentuate the site's history and culture.
5. Will serve as a possible springboard for homesteading in the surrounding area; in particular, will act as a magnet for infrastructure that could later be extended into nearby areas and/or provide community facilities for use by future homesteaders.
6. Provides opportunities for entrepreneurial development, employment, and education of native Hawaiian individuals and groups. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 23)

Infrastructure Needs for Sheep Station Reuse

Potable Water Supply - The two major water users in the area, Pōhakuloa Military Training Area and Mauna Kea Science Reserve, depend on County water hauled from Hilo in 5,000-gallon tankers. The Science Reserve has two 40,000-gallon storage tanks. 25,000-gallons of water per week are trucked to the Mid-Level Facility and an additional 15,000-gallons per week are trucked to the summit. Therefore trucking in water is the most viable solution at the present time. Because the sheep station is on the weather break, roof collection is another feasible option, depending on supply requirements. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 31)

Electricity - The existing single phase 7.2 kV line that serves the area would be adequate for smaller improvements, such as a convenience store. However, larger scale development, such as a lodge, may

require a three phase line, depending on the load. If this were the case, HELCO would design the line and back-charge a portion to the client. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 31)

Access - The most significant variable affecting market demand is the impending plan to upgrade the cross-island Saddle Road into a modem 48-mile highway connecting the tourism centers in West Hawai`i and the County seat in East Hawai`i. The expectation for economic development can be seen in the following projections:

- Increased usage associated with commuter traffic
- Residential development at both ends of the road
- Recreation and tourism
- Military operations
- Mauna Kea telescope complex
- Increasing congestion along alternative cross-island routes
  (Humu`ula Sheep Station Adaptive Reuse Plan, Page 33)

Gateway to the Mountain

The Humu`ula sheep station is a visible landmark along the Saddle Road and Mauna Kea Access Road. Its location presents an ideal place for a "gateway" to Mauna Kea and the `Āina Mauna lands. With the only access to Mauna Kea, winding through the `Āina Mauna lands, the sheep station provides an opportunity for education and cultural awareness for those proceeding up the mountain.

Ideas have circulated over the years regarding the Sheep Stations use as a staging area for educational opportunities. Its central location to the `Āina Mauna lands, make it an ideal are for groups to meet and learn about the area. Because the `Āina Mauna region is such a special and unique place, orienting and educating visitors to this is important. Much like the Sheep Station will be used as a staging area for ecotourism and other commercial endeavors, the Sheep Station could also serve as a staging area for educational opportunities.

As described in the education chapter, educational opportunities abound for this area whether they are geared toward school children, senior groups, scientists, cultural practitioners or visitors from a far.

Ecotourism

Ecotourism and recreation related activities, a growing sector of the state's visitor industry, have great potential within Humu`ula due to its unique natural and cultural resources. Ecotourism can provide a valuable economic use for an area such as Humu`ula, which, until now has not been utilized to its full potential and which can support only minimum permanent structures or impact.

Potential for Eco-Tourism

The natural resources of the project area provide an abundant attraction for eco-tourism and environmental education. Many geological and biological elements come together within Humu`ula and Pi`ihonua. Most striking may be the contrast between the stark lava lands of Mauna Loa on the south side of Saddle Road and the Pu`u-studded slope of Mauna Kea to the North. Similarly, the change in elevation and rainfall provide a range of biological communities, from tall rain forest in Pi`ihonua to pioneer shrub lands in `Āinahou. Unique or endangered birds, plants and biological communities can be viewed by visitors or students of Hawaiian natural history. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-17)

Although the grassy pastures and pu`u of Humu`ula provide a pleasing landscape, they are relatively uniform and common-place biologically. It appears that the widest range of natural attractions may be found near the saddle Road corridor itself. The remnant forests near Hakalau Forest National Wildlife Refuge, with endangered forest birds, may be the most significant exception to this generalization. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-18)

One of the key opportunity areas identified is ecotourism, a growing segment of the Hawai`i visitor industry. The unique natural resources of these and the surrounding lands provide an ideal setting for ecotourism related activities, such as biking, hiking, bird watching, camping, and horseback riding.

Related to these activities, there would be opportunities to create remote lodge facilities located in relation to the surrounding environmental resources. Also, recognizing the potentially significant increase in cross-island traffic that would result from the planned improvements to the Saddle Road, and the growing interest in the astronomical activities on Mauna Kea, the economic assessment points to the opportunity for a commercial service facility located near the Saddle Road/Mauna Kea Access Road intersection. The uses at this facility could include a gas station, rest stop, convenience store, outfitters for eco-tourists, and office space to support a variety of eco-tourism businesses. (Humu`ula/Pi`ihonua Master Plan, Page vi)

The areas remote location is appealing to growing eco-tourism market where visitors seek "off the beaten track" locations and "back to nature" experiences. The Humu`ula Sheep Station also offers a distinctive architectural and cultural history and can provide a staging area for eco-tour activities. The Economic Analysis of Proposed Alternative Development Plans for the Humu`ula Sheep Station property includes a list of possible activities considered appropriate for location in the Humu`ula area including ecotourism headquarters/staging area for tours involving site-seeing, bird watching, or horseback riding; staging area for hiking or mountain biking. (Humu`ula Sheep Station Adaptive Reuse Plan, Page iii & Appendix A, Page 2)

In the Humu`ula Sheep Station Reuse Plan all three stated alternatives call for eco-tourism related activities occurring on site:

- Alternative one: The low intensity development calls for the continuation of the existing Eco-Tourism operation at the subject property.
- Alternative two: The medium intensity development, suggests the sheep station be used as an eco-tourism/adventure tourism staging area (such as, hiking, bird watching, bicycling, horseback riding).
- Alternative three: The high intensity development calls for an eco-tourism staging center. (Humu`ula Sheep Station Adaptive Reuse Plan, Pages 3 & 4)

Diverse Array of Regional Assets and Activities

The sheep station is located at a transportation crossroad, in a region that abounds with recreational, environmental, cultural and educational resources. There is tremendous potential to develop the Humu`ula sheep station in a way that complements and enhances the enjoyment of these resources. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 34)

The location of Humu`ula can be taken advantage of by potential ecotourism operators. Its proximity to a variety of unique places can be added to its appeal. Nearby activities include:

Mauna Kea Science Reserve - With ideal natural conditions and a critical mass of world class telescope facilities, Mauna Kea has become a premier site for astronomical research. Along with the scientists have come steady streams of visitors taking part in summit tours and stargazing programs at the Visitor Information Station (VIS). Additionally, during snowfalls, the summit area can attract 200 vehicles on busy days. Vehicles park alongside roadways and visitors play (ski, snowboard, sled etc.) nearby. The Humu`ula Sheep Station Economic Analysis states that potential eco-tourism activity in the vicinity of the Mauna Kea Summit could be as substantial as, perhaps, 150 to 180 people per day. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 34 & Appendix A, Page 6)

Mauna Kea Ice Age Natural Area Reserve - The Mauna Kea Ice Age NAR is administered by the State's Division of Forestry and Wildlife. It is a rare alpine desert ecosystem with the state's only alpine lake. It also contains important cultural resources at an ancient Hawaiian adze quarry site. The area is first and foremost a refuge, but hiking and nature study are permitted. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 37)

Hakalau Forest National Wildlife Refuge - The 32,700-acre forest has some of the finest remaining stands of native rainforest, eight endangered bird species, endangered bat, and at least 6 endangered plant species. Select portions of the NWR are limitedly open to the public for hiking and photography. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 38)

Hiking, Horseback Riding, Biking - The Humu`ula-Mauna Kea Trail runs from the sheep station to Lake Waiau in the Mauna Kea Ice Age Natural Area Reserve. Horseback riding and bicycling are possible along existing jeep trails and could be further enhanced by defining and marking scenic routes with interpretive and destination signs. (Humu`ula Sheep Station Adaptive Reuse Plan, Page 41)

Ecotourism in Conjunction with Other Land Uses

Ecotourism and Service Facilities - Located near the Saddle Road/Mauna Kea Access Road junction, these facilities would support tour operations and remote lodge accommodations sited in relation to the environmental resources of these lands. For those lands with unique habitats (containing rare and endangered species), ecotourism could provide a viable economic use of these lands. The ecotourism uses could also be managed in conjunction with other land uses, such as forestry, on a seasonal or limited basis. (Humu`ula/Pi`ihonua Master Plan, Page viii)

The primary strategy is to return the land to native Koa forestry. Interim uses allow spot development of various kinds of pasture and crops to eradicate gorse in preparation to return the land to Koa Additionally, selected eco-tourism elements are proposed that will provide complementary uses to the land plan. (Humu`ula/Pi`ihonua Master Plan, Page 37)

Ecotourism and Recreation Based Enterprise and Service Facilities that would also be located in the commercial area near the Saddle Road/Mauna Kea Summit Road junction and may have some remote lodge accommodations related to the unique environmental resources of these lands.

Ecotoursim opportunity areas are shown at Pu`u `Ō`ō Ranch, where existing facilities provide an ideal setting for a lodge facility and for activities such as horseback riding, hiking, and eco-tours; and at the upper Humu`ula lands, where the diversity of resources and unique habitat provides further opportunities for a more remote camping facility as a base for hiking and other related activities. (Humu`ula/Pi`ihonua Master Plan, Page 55)

Ecotourism and recreation related activities, a growing sector of the island's visitor industry, have great potential here due to the natural resources of these lands. Other than providing an area, such as the Sheep Station area, to service and manage these activities, these uses and activities could be integrated and managed within other proposed economic uses. (Humu`ula/Pi`ihonua Master Plan, Appendix C-Alternative Concepts Considered/Evaluation of Alternatives, Page C-6)

Support facilities that may be needed would include a gas station, convenience store, outfitters facility, eco-business incubator space and various types of lodging facilities. (Humu`ula/Pi`ihonua Master Plan, Appendix C-Alternative Concepts Considered/Evaluation of Alternatives, Page C-7)

Each of the alternative plans provides the opportunity to integrate these uses into the overall utilization of these lands. As discussed further under Land Management Options, Alternative 2 provides the greatest opportunity to plan and manage multiple ecotourism and recreation activities that would capitalize on the unique resources of these lands including native flora and fauna, unique ecosystems, and observatory related activities. (Humu`ula/Pi`ihonua Master Plan, Appendix C-Alternative Concepts Considered/Evaluation of Alternatives, Page C-7)

Summary of Ecotourism Component Background

A way to solicit and select prospective operators is to issue a Request for Qualifications/Request for Proposals (“RFQ/RFP”) to solicit proposals from parties interested in providing ecotourism activities within Humu`ula. DHHL will evaluate the submitted proposals and may select multiple applicants whose proposals best satisfy DHHL`s RFQ/RFP objectives and selection criteria. The selected applicants may be granted a license from DHHL for their proposed activities.

Objectives for ecotourism activities through the issuance of licenses on the subject property call for proposals that:

- Will be undertaken by qualified applicants
    - DHHL is seeking applicants who have the experience, expertise and financial capacity to successfully undertake their proposed ecotourism activity.
- Generate income for DHHL
    - The income generated from ecotourism licenses will go towards the management of the entire Humu`ula property.
- Include a volunteering component
    - At Humu`ula, DHHL is in a program to restore the native ecosystem to the region, through activities such as native tree/plant replanting and invasive species removal. Thus, DHHL seeks ecotourism activities that incorporate regular voluntary assistance by the licensee and its customers and others as part of its ecotourism program, on site at Humu`ula.
    - Volunteer activities could be considered as “matching” in-kind and other requirements when seeking grants and other funding support for the restoration efforts.

A number of the enterprises could potentially be headquartered/staged at Humu`ula, most easily at the Humu`ula Sheep Station provided that appropriate office space and related needs are satisfied. The following background information is taken from various planning documents related to the Humu`ula/Pi`ihonua area and provides background information on ecotourism’s potential in the region.

<u>What is Ecotourism? Is It Related to Commercial Recreation?</u>

The Preliminary Market Assessment, which is included in the Humu`ula/Pi`ihonua Master Plan gives a good introduction to what Eco-tourism is and what role it can play in the economic development of Humu`ula.

Ecotourism is a very attractive and compelling concept. It reflects a growing global concern for the environment and the quality of life of communities. At the same time, however, it is very difficult to define. Definitions of ecotourism have largely reflected the many different values of specialty travel and niche market tourism. The most common of these definitions have developed out of the more traditional notions of "nature tourism," "culture tourism," and "adventure travel". Other definitions also include related sports activities such as big game fishing, parasailing, skiing, kayaking, surfing, snorkeling, scuba, and many others. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-3)

What ecotourism has added to these is a concern by tour operators for the wellbeing of the environment and local cultures where their tours take place. How this is done varies considerably, with some tour operators taking more activist roles in promoting these values, while others are more restrained in their approach. The more activist Eco-tour companies exhibit strong support for environmental and social causes. Companies employing the restrained approach may appear to differ little from traditional forms of specialty travel and are sometimes accused of expropriating the term "ecotourism" for purely financial gain. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-3)

Agreeing upon a precise definition of ecotourism has, therefore, been difficult and sometimes even been contentious. For our purposes, ecotourism is defined as:

> "Adventure Travel, Nature Travel, Cultural Tourism, Alternative Tourism, and Sustainable Tourism Development that is characterized by one or more of the following:
> (1) a strong concern by the tour operator for the environment and local cultures where the tours are operated;
> (2) a company policy of contributing to local environmental and social causes where the tours are operated; and
> (3) the education of both guides and tourists/clients to be more sensitive in the destination environment." (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-3)

Ecotourism represents a smaller and more profitable market segment than is currently attracted to Hawai`i for its natural beauty. Recognizing that ecotourism cannot replace mass tourism to Hawai`i, its potential might be viewed as one of market diversification and a possible source of market stability. Since "ecotourism is about packaging a different product, to a different audience, with vastly different results," achieving the “fit” between Hawai`i's products and this market segment depends on the range and quality of ecotourism products which can be offered and developed for the enjoyment of the visitors. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-10)

The environment is sound for the development of eco-tour, recreation/sport, and "observatory related" activities and businesses. They are well situated within the scope of the tourism industry and seem to be a product that is in demand by a growing number of visitors. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-17)

The natural resources of the Humu`ula/Pi`ihonua lands lend themselves to selected kinds of eco-tour related businesses. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-19)

Ecotourism activities can create additional revenue sources for the Department, provide a valuable economic use for an area, which cannot support permanent structures or impact, as well as, provide an opportunity for “volunteer service” oriented activities. The revenues generated from ecotourism related licenses’ will be used to support DHHL’s operations and habitat restoration of the `Āina Mauna region.

Applicants entering into a license agreement with DHHL will be required to adhere to numerous equipment and procedural requirements for the health and safety of visitors as well as protection of the area’s natural and cultural resources. A final list of required procedures and equipment will be included in the final license agreement, dependent upon the licensed activity. DHHL is seeking an applicant who addresses these requirements in detail and demonstrates an understanding of the health and safety of visitors as well as protection of the area’s natural and cultural resources. Such requirements may include:

- Minimal amount of water available per guest
- Proof of CPR and First Aid training for all employees working within the subject property
- Ability to communicate (via radio/satellite phone) with emergency services while conducting activities within the subject property

- Conducting a cultural and natural resources orientation to all guests before beginning ecotourism activities
- Provide portable toilet facilities and proper disposal of all waste
- Provide liability insurance
- Provide proof of vehicle insurance for all vehicles accessing the subject property
- Mandatory helmet use for all guests engaging in bicycle/ATV/horseback riding activities
- Provide safety briefing and demonstrations on use of all equipment used by guests before commencing an activity
- Maintain activities within approved designated areas

DHHL's objectives for ecotourism activities through the issuance of licenses on the subject property call for proposals that:

- Will be undertaken by qualified applicants: DHHL is seeking applicants who have the experience, expertise and financial capacity to successfully undertake their proposed ecotourism activity on the subject parcel.
- Generate income for DHHL: DHHL is seeking income return on its lands in Humu`ula. Currently the property produces little income and the income the property does produce is far less than the cost of maintaining the property. DHHL seeks to increase its income return on the property while also ensuring the protection of the area's natural and cultural resources. The income generated from ecotourism licenses will go towards the management of the entire Humu`ula property.
- Include a volunteering component: A relatively new segment of ecotourism, integrates volunteering activities into tourism activities. These volunteer "service" trips, allow participants the opportunity to volunteer at the site they are visiting and thus, give back to the community. At Humu`ula, DHHL is in a program to restore the native ecosystem to the region, through activities such as native tree/plant replanting and invasive species removal. Thus, DHHL encourages respondents to the RFP to consider ecotourism activities that incorporate regular voluntary assistance by the licensee and its customers and others as part of its ecotourism program, on site at Humu`ula.

DHHL will evaluate the submitted proposals and may select multiple applicants whose proposals best satisfy DHHL's RFP objectives and selection criteria. The selected applicants may be granted a license from DHHL for their proposed activities. Terms of the license are further discussed in the RFP. Applicants will be responsible for obtaining all required land use entitlements and government approvals/permits for their licensed activity.

Types of Activities

Ecotourism and recreation related activities, a growing sector of the island's visitor industry, have great potential within Humu`ula due to its unique natural and cultural resources. Ecotourism can provide a valuable economic use for an area, which, until now has not been utilized to its full potential and which cannot support permanent structures or impact. The potential uses and activities include:

- Biking Tours
- Bird Watching Tours
- Nature Tours
- Camping

- Lodge
- Hiking Tours
- Horseback Tours
- Wilderness Resort/Guest Ranch
- Historical Tours
- Nature Tours
- Volunteer “Service” Trips
- Outfitters Retail Store
- Remote Lodging at Huts, Ranches and Cabins

This is not a substantive list but rather an offering of some of the opportunities, which may be available on site.

The concept of critical mass and scale is important to discuss at this point. A number of the enterprises could potentially be headquartered at Humu`ula and possibly at the Sheep Station provided that appropriate office space and related needs are satisfied. Other businesses will use various areas of the property. If the right combination of elements could be assembled, a powerful synergy would result which could stimulate related businesses, and reinforce the strengths of all. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-19)

The lands of Humu`ula and Pi`ihonua are an important asset that can support a variety of businesses that range from eco-tourism to recreation/activities. While some of the proposed enterprises can be wholly sustained on the property themselves, others will utilize the land asset on a regular weekly basis and others on a seasonal basis. The general growth of tourism to the Big Island of Hawai`i will also sustain more eco-businesses where lease recipients may live on the land but either work at or operate businesses elsewhere. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-24)

Gorse Eradication

Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. Gorse has become established in extensive stands on agriculture and conservation lands on the eastern slope of Mauna Kea. The Humu`ula area suffers from heavy infestations of gorse.

The importance of eliminating this plant cannot be overstated.

Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands. Gorse has a life span of 30-40 years while the seed can remain viable in the soil for up to 70-years after that.

DHHL field trials and research projects have shown that shade from trees inhibit the ability for gorse to grown and spread. DHHL has planted portions of the perimeter of the Humu`ula/Pi`ihonua lands with trees to establish a boundary to limit the spread of the weed and has entered into various agreements for gorse eradication and management (chemical, mechanical and biological.)

It is anticipated that commercial-scale timber planting will shade the gorse sufficiently to keep it from producing seeds and perhaps kill it, depending on the tree species planted. With normal forestry operations, each year some portion of the seed bank will be removed. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator.

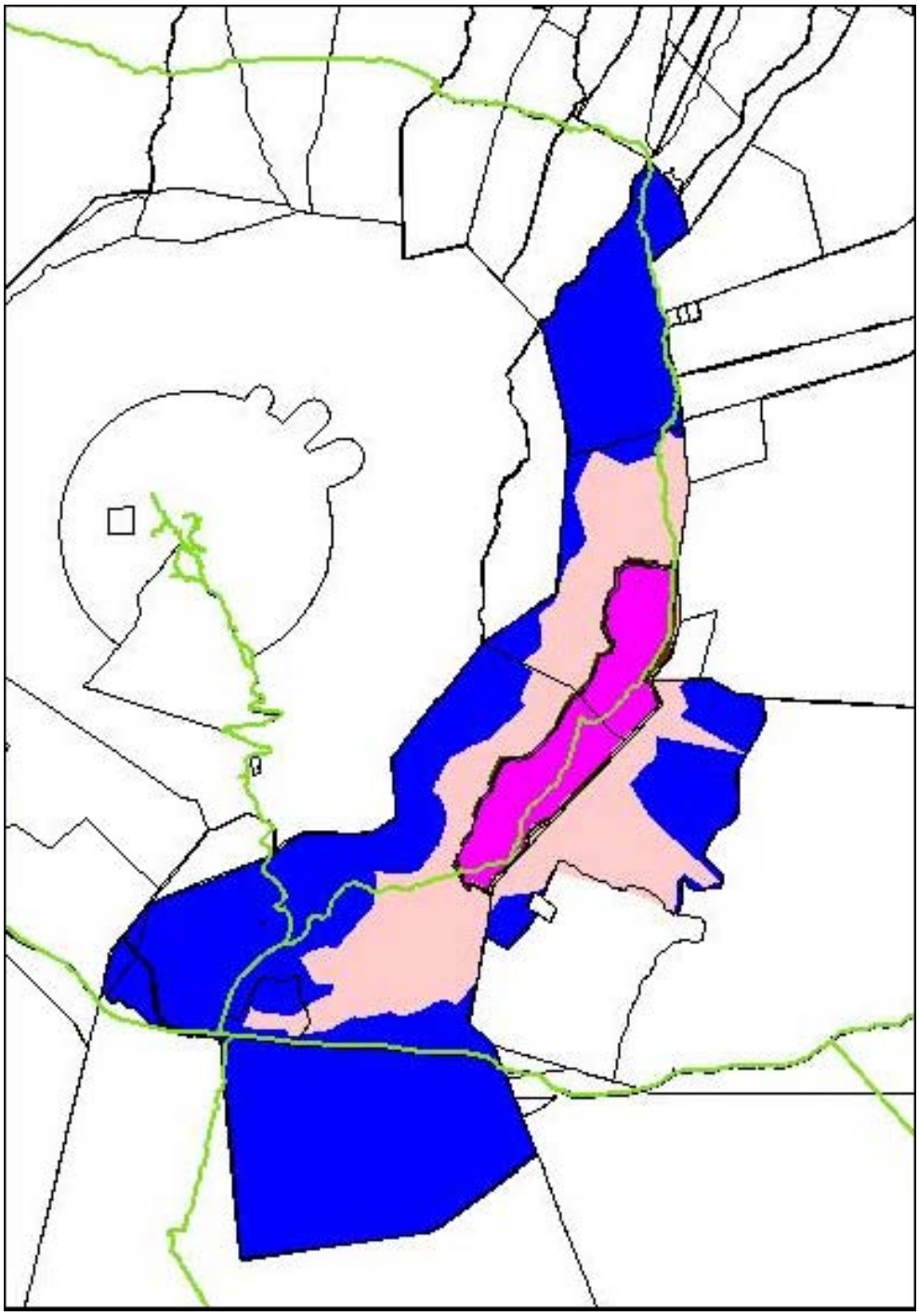
Eucalyptus and Sugi have been proposed because the initial development of these crops in the general area have given rise to increased investment in required infrastructure including marketing analysis and market development efforts by a number of private companies and government agencies. These market development efforts are currently on-going as is the basic supply/demand relationship for these forest crops. Planting trees to eradicate the gorse is a value-added land use – it eradicates the gorse and provides license/lease revenue in the process.

In addition to shading and eventual killing off the gorse, timber harvests can generate cash flow and open the ground for another round of gorse seed germination. Immediately after a timber harvest, gorse seedlings can be controlled with low volume herbicides, followed by another planting of timber. This cycle must be repeated until the majority of dormant gorse seed has germinated. The time estimated for gorse eradication is approximately 100 years due to the estimated 70-years gorse seed remains viable and the growth/harvest cycle of the eucalyptus and/or sugi.

Incorporating a commercial scale timber operation in and around the gorse infested areas provides four significant benefits:

(1) Gorse, classified as a noxious weed under Hawai`i Administrative Rules chapter 68, is shade intolerant and reforestation can limit seed production and gorse regeneration.
(2) As the commercial-scale timber operation serves to control and works to eliminate the gorse, it also provides revenue to DHHL that can be used for other management needs at the site.
(3) Implements the Governor's Clean Energy Initiative.
(4) Allows for native forest restoration.

Other viable gorse eradication opportunities can also be considered.



Map Noting Extent of Gorse Infestation on the Site

Color coding
Salmon: Overall extent of Gorse infestation (varying degrees of infestation over the coverage area)
Pink (with Brown border): Gorse Containment Area (significant infestation in this area)

A tree planting on Maui has shown promising results in its ability to limit gorse growth and expansion. Existing fences will minimize the transportation of seeds by animals. Sugi, a non-invasive and frost tolerant tree species, is suitable for this high elevation site. Studies on eucalyptus have also shown its effectiveness in controlling gorse.

The objective for this part of the implementation program is to initiate a broad RFQ/RFP for gorse eradication, native forest restoration and commercial timber (to include biomass for alternative energy) lease on approximately 10,000-acres. The activities are combined to highlight the actual benefit of forestry to eradicate gorse and restore the native forest:

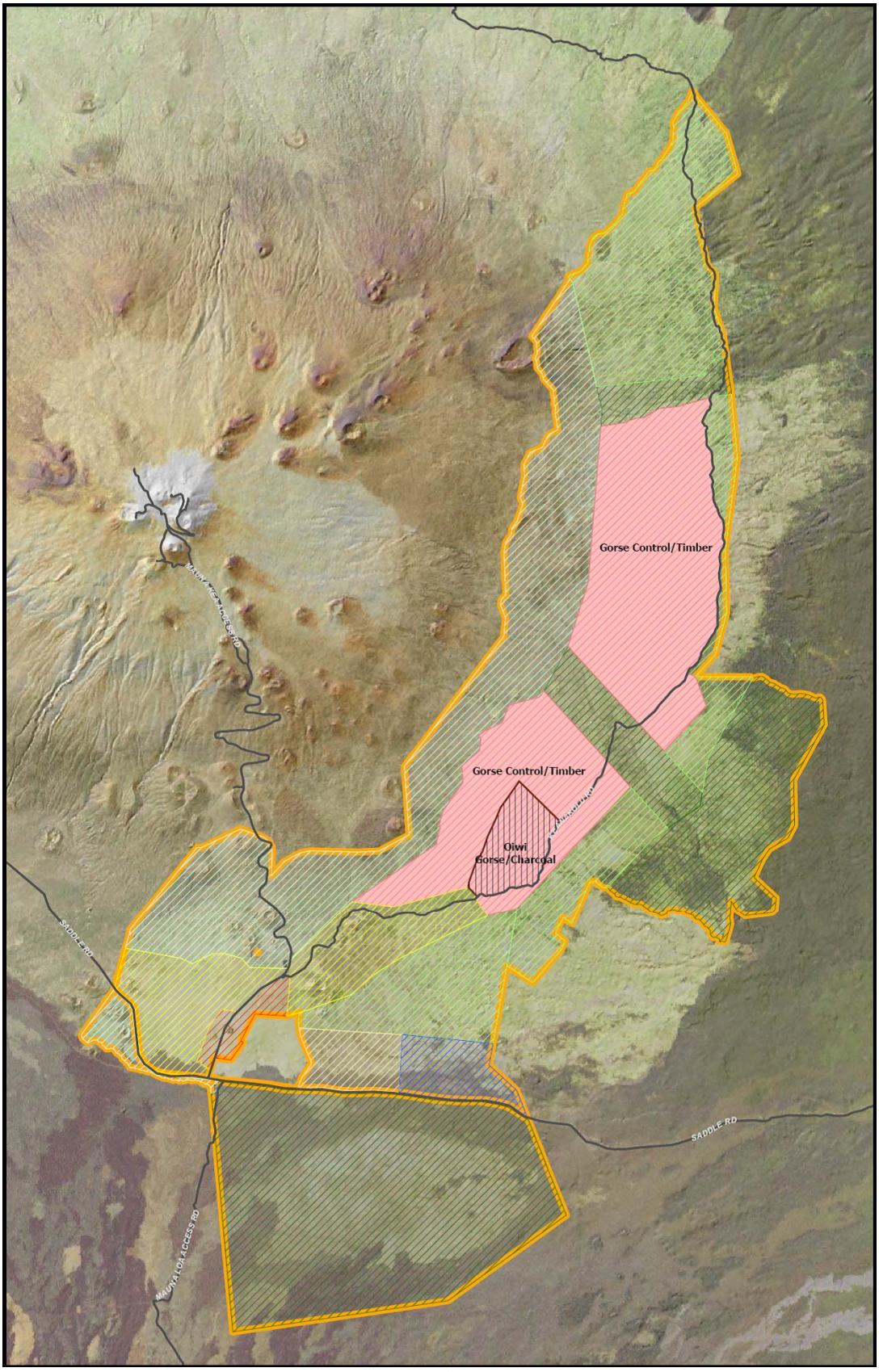
- Incorporate Carbon Credit opportunities to DHHL
- Use timber lease as DHHL implementation of Hawai`i Clean Energy Initiative
- Consider a long term agreement to accommodate multiple planting/harvesting rotations
- Require periodic native forest restoration (i.e. at 5-year intervals) on or outside of leased area

Benefits: Implements pre-existing plans (Master Plan, Agricultural Plan; referenced in various `Ōiwi Plans and Koa Salvage/Gorse Control Environmental Assessment); allows for opportunities for revenue generation; implements Governor's Clean Energy Initiative.

The economic opportunity for the land area not designated for homestead, commercial or ecotourism use is in the long term development of high quality koa. Other proposed agricultural uses are designed as either a temporary use prior to planting koa or as a solution to controlling and managing the gorse problem. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document B-Agricultural Assessment, Page B-1)

The forest restoration and enhancement can take on a variety of complementary focuses, including:

- Commercial non-native tree species (i.e. eucalyptus, sugi, etc.)
    - As noted previously, DHHL field trials have shown that shade from trees inhibit the ability for gorse to grown and spread and DHHL has planted portions of the perimeter of the Humu`ula/Pi`ihonua lands with trees to establish a boundary to limit the spread of gorse.
    - It is anticipated that commercial scale timber planting will shade the gorse sufficiently to keep it from producing seeds and that each year some portion of the seed bank will be removed. Thus, timber planting can serve both as a gorse eradication mechanism, as well as an income generator.
    - The harvest of the timber in approximately 25-years would generate cash flow and open the ground for another round of gorse seed germination. The planting of eucalyptus/sugi seedlings immediately after harvest is recommended to reduce the possibility of a re-infestation of gorse. This cycle must be repeated four to five times until the majority of dormant gorse seed has germinated. The time estimated for gorse control is approximately 100-years due to the estimated 70-years gorse seed remains viable.
    - Ultimately, after decades of commercial forestry have effectively cleaned out the gorse and its seed bank, the property can be considered for restoration to a native forest.
    - It is important to understand that all suggested crops other than koa are designed to initially address and control the gorse then support the eventual reforestation of the land back to native koa. Eucalyptus and sugi should be replaced with koa once it has been determined that gorse seed germination is no longer a threat.
    - Other viable gorse eradication opportunities can also be considered.



Gorse Control/Timber Area

60 +/-year-old Sugi planted on adjoining State Forest Reserve

Most have noted that the fledgling commercial forestry industry on the Big Island needs the critical mass of forest production and processing, as well as the appropriate investment for forestry management.

`Ōiwi Lōkahi o ka Mokupuni o Keawe – Gorse to Charcoal Demonstration Project

In addition to the proposed Gorse Eradication Utilizing Commercial Timber called for in this `Āina Mauna Legacy Program, there is another gorse eradication effort that has been initiated by `Ōiwi Lōkahi o ka Mokupuni o Keawe. It is expected that both activities will operate on the property and each is distinct from the other and thus, there is no apparent conflict in both continuing.

`Ōiwi Lōkahi o ka Mokupuni o Keawe submitted a proposal and request to DHHL that proposed a research and development project by containing, and maybe, eliminating the invasive gorse plant. The intent is to eradicate the invasive gorse shrub in hopes to restore the landscape for use by future beneficiaries.

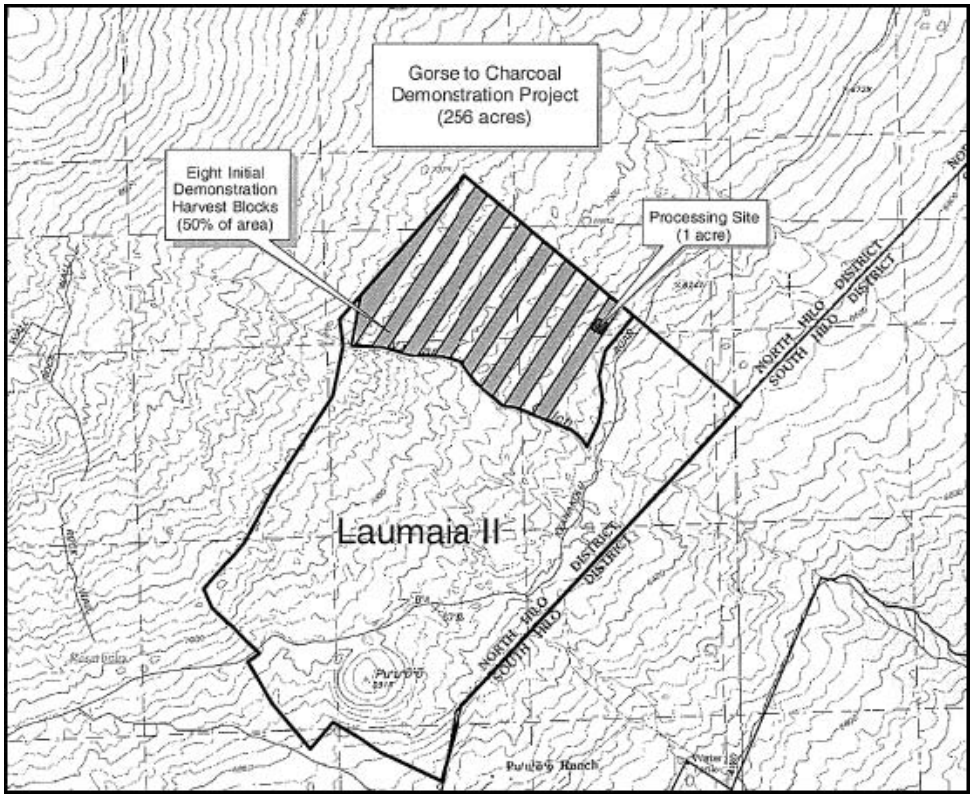
On November 28, 2006, the Department of Hawaiian Home Lands issued a license to `Ōiwi for the gorse infested lands. `Ōiwi is partnering with Carbon Diversion, Inc., a firm that owns a technology, researched and started at the University of Hawai`i, to convert green waste, even rubber tires, into an energy product and a usable bi-product.

DHHL License Agreement No. 673 is for a term of 5-years (which can be extended by mutual agreement for a total term not to exceed 25-years,) or until such time as Licensee ceases to operate the research and development project to eradicate gorse or other permitted use whichever occurs sooner, unless this License is sooner terminated.

The site involves a portion of Laumai`a II, a portion of Tax Map Key (3) 3-8-001-007 and contains an overall land area of one thousand (1,000) acres. According to the License Agreement, the Licensee may not use the premises for any purpose other than strictly to conduct a research and development project using the invasive gorse shrub. No other uses shall be permitted, including grazing rights to demonstrate gorse controlled by livestock. However, the uses may be modified from time to time with the approval of the Chairman of the Hawaiian Homes Commission.

As envisioned, a processing facility will be installed within the 256-acre demonstration area, which is part of the 1,082-acre Laumai`a II pasture paddock. Alternate strips of gorse, on contour and approximately 15 acres each in size, will be harvested to minimize erosion while providing enough gorse to demonstrate the feasibility of the project. If successful, the remaining strips will then be harvested when the grass has grown back. It is expected that up to 3 acres per day will be harvested, requiring about 49 working days, or 2 months to complete all initial harvest blocks.

According to `Ōiwi's initial request, there is no anticipated conflict between their proposed activity and DHHL's gorse control and reforestation projects. Likewise, it is not anticipated that `Ōiwi's activities will negatively conflict with the proposed Gorse Eradication Utilizing Commercial Timber proposed in this `Āina Mauna Legacy Program.



Map Noting Location of `Ōiwi Lōkahi o ka Mokupuni o Keawe Gorse to Charcoal Demonstration Project

Commercial Timber

Commercial forestry in Hawai`i had its beginning over one hundred years ago, with the sale of sandalwood by the Hawaiian ali`i. Since that time Hawai`i's trees have been harvested from the land and the land then used for other crops, such as cattle. There has not been a sustainable commercial forestry industry in Hawai`i until the present.

The demise of both the sugar and pineapple industries along with the vision of forestry minded individuals created the opportunity for a sustainable commercial forestry industry to emerge in Hawai`i. The forestry industry in Hawai`i today is viewed by both private business and government as a very viable economic crop for the state. The Hawai`i Forest Industry Association (HFIA) is the organization that represents private enterprise and is leading forestry research and market development efforts. The State of Hawai`i Department of Land and Natural Resources, Division of Forestry and Wildlife, along with the U.S. Forest Service are examples of government participation.

Because commercial forestry is a new industry for Hawai`i there are many unknowns and risks that face the entrepreneur. However, the huge scope of the international forestry business and the strong world demand for quality forestry products have convinced Hawai`i's industry leaders that forestry is our most promising crop for large acreage in Hawai`i.

History of Commercial Forestry

Commercial forestry has a long and storied history in Hawai`i. If there are any underlying positive themes of this industry since its inglorious debut in the early 1800s as Hawai`i's sandalwood trade, it must be persistence, diversity, and improvement.

For hundreds of years, native Hawaiians lived in harmony with the land. Elaborate systems of maintaining balance between the people and the land existed, and forests were recognized as a critical component of perpetuity. Forests provided both direct and indirect benefits -from canoe logs to clean water for lo`i. As western ways were introduced, however, that balance shifted. For almost 80 years, Hawai`i's forest resources were exploited to provide for changing social values.

In the late 1870s, island residents began to realize that a diminished forest cover was adversely impacting their lives. Over the next century attempts were made to "right the wrong" by setting aside tens of thousands of acres for watershed protection and by managing feral ungulate populations. On many private lands, however, forest conversion to agricultural uses continued. Hawai`i's two primary tree species, koa and `ōhi`a, were used for a variety of wood products, but management of the forest – as a forest and for a forest, seldom occurred. Wood was often a byproduct of other land uses and conversion to non-forest cover was common. Hawai`i's forest industry remained small in comparison to agriculture and pasture.

Fifty years ago, the economic sustainability of even a small wood industry in Hawai`i was questionable. In spite of Hawai`i's world class environment for growing trees, the available wood resource continued to diminish and startup businesses continued to fail. Attempts were made by the State and others to establish a commercial forest industry in Hawai`i that would create jobs, replace imports of wood products to Hawai`i, and generate income from State lands in perpetuity. Over 15,000 acres of DLNR land was cleared and planted to a variety of commercial tree species, thereby enhancing existing public land tree plantings dating back to the 1880s.

The environmental movement that began a decade later in the 1960s, however, stymied this commercial growth. New fields of science were rediscovering what native Hawaiians had learned over a millennium of experience. True sustainability is about taking care of the land in ways that can provide a living for both current and future generations.

The global forest industry of today has spent the last 35 years learning how to be profitable without destroying the land base upon which it is dependent. Technology is decreasing impacts on the land and increasing utilization of finite resources. Science is providing land managers with tools that maintain forest cover for many values. Economically, the value of forest products has risen to where many land protection practices are now affordable. Social values are changing as consumers appreciate forests in many ways, and they are willing to pay for their convictions. In combination, these developments are leading to a sustainability not seen for over 200 years in Hawai`i. (Commercial Forestry Areas for the Department of Hawaiian Home Lands, Pages 1 & 2)

Current Status of Hawai`i's Commercial forests

Today only about half of the State's tree plantations remain available and accessible to Hawai`i's commercial forest industry. In total, these state lands are not capable of supporting wood processing facilities in Hawai`i that must compete in today's global industry.

In 1995, following the significant downsizing of Hawai`i's sugar industry, thousands of acres became available for alternative uses. After careful due diligence, two large landowners on the Big Island dedicated land to growing Hawai`i's commercial forest industry. By 2005, Kamehameha Schools and Parker Ranch had combined efforts to create 32,000 acres of new plantations, resulting in an estimated 42,000 acres of accessible, available, and commercially acceptable trees.

The wood from these private and public forest lands is attracting a variety of new processing facilities to Hawai`i, including biofuels, wood chips, veneer, and lumber. An integrated industry representing all of the above processing options is essential for attracting forest industry investors to Hawai`i. The global wood products industry demands that no commercial part of a tree go to waste, since every tree contains wood with a range of values. Much like a cow produces both stew meat and steak, each tree must be processed to its full potential so that waste is minimal and investor rewards are greatest.

Although Hawai`i's current 42,000 acres of commercial forests can perpetually support a chipping or biofuels industry, much of the significant value adding of veneer and lumber would be lost at this level of production. It would be wasteful to process the entire cow into stew meat.

About 62,000 acres is needed to sustainably support each of the four types of processing now being proposed for Hawai`i. This can be accomplished if more land is dedicated to commercial forestry. An additional 20,000 acres is needed to provide enough wood for all processors to be competitive with their international peers.

A fully integrated industry at peak production on 62,000 acres could generate tens, if not hundreds, of millions of dollars in revenue and create hundreds of new jobs. As a fully renewable industry, replicable over generations, it would help Hawai`i reduce its current dependence on wood product and energy imports, create an export industry, maintain large open spaces, and enhance our environment in ways that only forests can.

As the fourth largest landowner in Hawai`i, the Department of Hawaiian Home Lands has several immediate opportunities to participate in this expanding industry, thereby generating income for the trust and providing alternative land uses for homesteaders. Growing trees for commercial purposes is the most immediate forest based opportunity.

All forestry efforts require a minimum of natural land characteristics to succeed. These include adequate rainfall (>40" per year) and good soils (>25" deep) with adequate soil nutrition. DHHL lands included in this report meet or exceed these criteria. (Commercial Forestry Areas for the Department of Hawaiian Home Lands, Pages 2 & 3)

Forest Products and Biomass for Alternative Energy Opportunities (liquid fuel and electricity)

Several forestry products and alternative energy producers have been identified as possible users of large scale areas for forestry development. Some of these have recently requested use and leasing of nearby State lands for these purposes. These, and others, may be considered as possible users of land within Humu`ula/Pi`ihonua:

SunFuels Hawai`i (Michael Saalfeld & John Ray)

SunFuels Hawai`i LLC proposes to establish a biomass-to-liquid (BtL) plant for the production of SunDiesel™ fuel on the Island of Hawai`i. Biomass for feedstock would be provided by tree and other non-food crops through long-term supply contracts.

The BtL facility would employ gasification technology licensed by CHOREN Industries and Shell Middle Distillate Synthesis (Fischer-Tropsch) technology to produce clean, renewable diesel fuel (SunDiesel™) for distribution and sale on the Big Island and other markets.

SunFuels Hawai`i has been working with Forest Solutions and others in identifying appropriate sites for forest production for the biomass-to-liquid-fuel operation. In November 2008, the BLNR approved in principle the direct leasing of up to 10,000-acres of state land in the Hāmākua area. The intent is for SunFuels Hawai`i to work with existing lessees on a compatible multi-use of the properties.

Hamakua Biomass Energy (Guy Gilliland, Allan King, Hilton Unemori & Kent Smith)

Hamakua Biomass Energy, a Maui-based bioenergy company, is planning to build a 30-megawatt biomass energy facility, which would burn eucalyptus trees for energy and supply 15 percent to 18 percent of the island's power, on a 60-plus acre tract between `Ō`ōkala and Pa`auilo.

In addition, in November 2008, Hamakua Biomass received BLNR approval in principle to lease 10,500-acres of vacant and unencumbered state land for tree cultivation. Hamakua Biomass is seeking a 50-plus year lease on the state property.

Hu Honua Bioenergy (Dan KenKnight & Guy Simmons)

Just north of Hilo, Hu Honua Bioenergy LLC, a $30-million project, is restoring the old Hilo Coast Processing Co. sugar mill at Pepe`ekeo. The company has been at work retrofitting the facility to burn biofuel, clearing the 26-acre property of old coal and preparing the land to plant leucaena, a fast-growing tree used for fuel wood and cattle feed.

The Hu Honua bioenergy facility is a 24-megawatt (MW) power station (providing 7 percent to 10 percent of the island's energy demand) consisting of a readapted existing facility that is being retrofitted with modern “green” technology to convert locally grown sustainable biomass into electricity. The goal of the clean energy project is to utilize 100 percent renewable feedstock (eucalyptus, leucaena, green waste from the county, leftover material from land clearing and other wood residue,) to generate electricity at the plant.

Eucalyptus Planted on the Hāmākua Coast

Haina Hawaiian Hardwood Mills (Bob Marr & Chuck Barker)

Haina Hawaiian Hardwood Mills proposed a timber operation on the Hāmākua coast. Recent media suggests that there may be serious financial concerns with the company however; they are included in this summary as they may ultimately move forward with their plans.

In December 2008, Haina Hawaiian Hardwood Mills requested to lease at least 10,000-acres of state forest land. The company asked that the Board of Land and Natural Resources lease "all available state agricultural forestry land on the Big Island of Hawai`i, for the present time geographically confined to the Hāmākua coast between Hilo and Waipi`o Valley."

The company would harvest lumber for wood veneer, furniture and other uses, and plant trees for carbon sequestration. A power co-generation plant would burn biomass to run the mill. Operations are scheduled to begin in early February 2009 with woods harvested from private land. The company will not only use the facility for milling woods like koa, `ōhi`a, eucalyptus, robusta, mango, mahogany and albizia, it will also use it for coffee roasting, canoe building, arts and craft, an education center, furniture building by local craftsman, picture frames and they may even have a macadamia nut dryer.

Plans are to ultimately integrate the operation to include a bio refinery which will produce power and can then be used in the existing power plant. At full production, in the plant and in field operations, the company hopes to hire up to 260 people, which will essentially be included entirely of local residents.

Tradewinds Forest Products (Don Bryan & Gary Edwards)

Tradewinds Forest Products has a license to harvest 8,000-acres of eucalyptus and maple in the state's Waiākea Timber Management Area, which is comprised of three Big Island forest reserves. Tradewinds will manufacture and market veneer made from eucalyptus logs. The company is located in the town of `Ō`ōkala on the Big Island's Hāmākua Coast.

Tradewinds Forest Products will produce veneer for use in plywood and laminated veneer lumber manufacturing. As the company matures, it may add a plywood manufacturing component, which would create plywood to sell locally. Tradewinds' facility will include a wood-fired co-generation plant which will provide power and steam for the manufacturing process and sell surplus power to HELCO.

Hawai`i Electric Light Co. has signed an agreement to buy renewable energy produced by a biomass-powered generation facility on the Big Island. The facility is a project of Tradewinds Forest Products LLC and Rockland Capital Energy Investments. Tradewinds is building a veneer mill on the Hāmākua Coast at the site of the old `Ō`ōkala Sugar Mill, which will use scrap wood as fuel to power the mill and provide excess power to the utility. Under the agreement, the utility will buy between 2 megawatts and 3.6 megawatts of electricity from Tradewinds on a scheduled basis. The mill site in `Ō`ōkala has been purchased. The air permit from the Department of Health's Clean Air Branch was obtained on October 3, 2008, and the stormwater permit is in hand.

Hawai`i Island Hardwoods (Jim Quinn & Kent Untermann)

The Board of Land and Natural Resources agreed to allow Hawai`i Island Hardwoods LLC, a startup sawmill operation, to harvest 1,100-acres of non-native timber on government land near Hilo. The five-year agreement is the second license allowing large scale harvests of state-owned timber (another company, Tradewinds Forest Products, already has a license to harvest in the Waiākea Forest Management Area.) In addition, Hawai`i Island Hardwoods has a timber supply agreement for certified species from an Hōnaunau, South Kona property, owned by Kamehameha Schools.

Hawai`i Island Hardwoods intends to be a consistent supplier of a variety of quality locally grown hardwoods, including: Acacia Koa, Lehua `Ōhi`a, Tropical Ash, Eucalyptus Saligna, Eucalyptus Robusta, Australian Red Cedar (Toona Ciliata) and Nepal Alder. Their first dry kiln began operation in June, 2008; it utilizes solar energy to heat water which is then circulated through heat exchangers to raise the air temperature in and through the drying chamber (a back up propane burner can be used, if necessary.)

In addition to the above operators, the region has also attracted international timber investment. The following illustrates the scope and scale of the forest industry on the island.

March 1996 - Prudential Timber leases 24,000-acres on the island of Hawai`i

Prudential Timber Investments Inc. (PruTimber) leased approximately 24,000-acres of land on the North Hilo-Hāmākua Coast from Kamehameha Schools Bishop Estate.

The land was planted with eucalyptus trees with the intent of export or to supply local processing facilities. Eucalyptus trees will grow very rapidly in Hāmākua's climate. Expected harvest cycle is seven to eight years. Eucalyptus is a versatile hardwood which can be manufactured into several products, including pulp, boards, veneer and panels.

Boston-based Prudential Timber Investments Inc., founded in 1990 as a subsidiary of The Prudential Insurance Co. of America, acquires and manages timber properties on behalf of pension funds and other institutional clients. PruTimber's investments aim to earn a competitive rate of return by growing and selling timber to manufacturers of pulp, paper and solid wood products. PruTimber manages nearly 150,000-acres of commercial timberland in six states.

March 2000 - Parker Ranch leases land to eucalyptus grower PruTimber

Parker Ranch has entered the forestry business, leasing 10,000-acres above the Big Island's Hāmākua Coast to Prudential Timber Investments. PruTimber already grows 15,000-acres of eucalyptus in Hāmākua and 5,000-acres in Ka`ū, and eucalyptus is the likely tree for the Parker Ranch land. The land is in Pā`auhau, at an elevation of 1,500 to 5,000 feet; the 15-year lease may be extended to 25 years. All the Parker Ranch land is above former sugar lands.

July 2005 - The Hancock Timber Resource Group (HTRG) acquires PruTimber

The Hancock Timber Resource Group (HTRG) announced that it has signed an agreement to acquire Prudential Timber Investments, Inc. (PruTimber), the timberland investment management unit of Prudential Financial, Inc.

With the acquisition, HTRG will assume management responsibility for PruTimber's approximately 450,000-acres of timberland worth approximately $660-million. The transaction will bring HTRG's total acreage and assets under management to approximately 2.5 million-acres and $3.1-billion. The assets currently managed by PruTimber include more than 20,000-acres in Hawai`i.

HTRG, a division of the Hancock Natural Resource Group, Inc., an operating company of MFC Global Investment Management, manages timberland in the Pacific Northwest and the Southeast United States as well as Canada, New Zealand and Australia. MFC Global Investment Management is the institutional asset management arm of Manulife Financial Corporation. HTRG is based in North America with investment offices in Toronto, Boston, London, Tokyo, and Hong Kong.

August 2007 - Cambium Global Timberland Ltd acquired the leasehold interest of the 6,100 leasehold acres of Big Island timber in Pāhala for $6.1 million

Cambium, which invests in forestry assets that are managed on an environmentally and socially sustainable basis, said it expects to produce timber and replant eucalypt species - a broader group of trees that includes eucalyptus - on the Big Island. Australia-based New Forests Asset Management will manage Cambium's Big Island timber land.

Cambium is an investment fund established in 2007 and is traded on the London Stock Exchange. The fund is managed by CP Cogent Asset Management LP, an affiliate of Dallas-based private equity investment bank Cogent Partners LP.

New Forests is a forestry investment management and advisory firm currently managing $200 million in assets throughout Australia, New Zealand, the U.S. and the Asia Pacific region. The company's investment philosophy is unique in seeking assets that deliver traditional timber returns as well as returns from emerging environmental markets, such as carbon, biodiversity and water quality.

New Forests endeavors to optimize timberland returns through the inherent benefits provided by forests' "ecosystem services". These ecosystem services have traditionally been externalized in market terms but are beginning to generate commercial value as environmental markets emerge.

2008 - Granthan, Mayo and Otto (GMO) Renewable Resources, a Boston based investment firm acquired the lease on approximately 13,000 eucalyptus–laden acres in Hāmākua

Kamehameha Schools has fee simple ownership of the land; while GMO owns a ground lease on the property (GMO's lease on the Kamehameha Schools' land is set to expire in 2021).

Other Complementary Forest Plantings on the Big Island:

Several large acreage commercial eucalyptus tracts have been planted in recent years. These complement the State (DLNR) tracts.

- Pāhala - Kamehameha Schools - 6,100-acres

August 2007: Cambium Global Timberland Ltd acquired the leasehold interest of the 6,100 leasehold acres of Big Island timber in Pāhala for $6.1 million. The property includes a 3,700-acre plantation to be managed for timber productions (the trees are expected to mature in 2012) and 2,400-acres of native Hawaiian forest.

- Pā`auhau - Parker Ranch - 10,000-acres

May 2008: Cambium Global Timberland Ltd acquired the leasehold interest in the land for about $7.9 million. The land is owned in fee by Parker Ranch and is in Pā`auhau. Cambium bought the leasehold interest and rights for the timber from another investor, and said it may extend its lease with Parker Ranch until 2025.

- Hāmākua-N/S Hilo - Kamehameha Schools - 24,000-acres (leased area); 15,000-acres (growing area)

Granthan, Mayo and Otto (GMO) Renewable Resources, a Boston investment firm acquired the lease on approximately 13,000 eucalyptus-laden acres in Hāmākua. Kamehameha Schools has fee simple ownership of the land; while GMO owns a ground lease on the property (GMO's lease on the Kamehameha School's land is set to expire in 2021.)

- Hōnaunau - Kamehameha Schools - 34,600-acres

In 2008, KSBE finalized an agreement with Untermann and Quinn for the Hōnaunau Management Area which is a 34,600-acre forest located on the slopes of Mauna Loa. Kamehameha Schools intends selective harvest and restoration of the native forest.

- Waiākea Timber Management Area (WTMA) - State-DLNR - 8,000-acres

Timber inventory data from 1997 indicate that the WTMA contains over 17,000,000-ft3 of timber on a gross merchantable basis on approximately 11,700-acres. Tradewinds Forest Products has the license to harvest 8,000-acres of eucalyptus and maple in the state's Waiākea Timber Management Area.

- Pepe`ekeo - State-DLNR - 1,100-acres

Hawai`i Island Hardwoods' sawmill in Pepe`ekeo will harvest 1,100-acres of non-native timber on government land near Hilo. The five-year agreement with Hawai`i Island Hardwoods LLC is just the second license allowing large scale harvests of state-owned timber (Tradewinds at Waiākea Timber Management Area being the other.)

- Hāmākua Timber Management Area (HTMA) - State-DLNR - 3,000-to 4,000-acres

The HTMA is located on the north and northeast slopes of Mauna Kea volcano along the Hāmākua coast between the 1,500-and 6,000-foot elevation within the North Hilo and Hāmākua Districts. The tree stands vary in size and are dispersed throughout the area.

The majority of trees in the planted stands are eucalyptus varieties with Eucalyptus robusta being the dominant species. Other species include Australian red cedar, tropical ash, sugi, and other minor tree species. The trees are ready for commercial harvesting.

Sometime in the future, DLNR-DOFAW intends to issue a Request for Proposals for a timber harvest license.

- Nienie Timber Management Area (NTMA) - State-DHHL - 500-acres

The NTMA is located on the northeast slope of Mauna Kea along the Hāmākua coast at approximately the 3,500 foot elevation within the Hāmākua District. The majority of trees in the planted stands are eucalyptus varieties with Eucalyptus robusta being the dominate species. Other species include Australian red cedar (Toona ciliata) and E. saligna. The trees are ready for commercial harvesting.

Sometime in the near future, DHHL intends to issue a Request for Proposals for a timber harvest license for this area.

<u>Eucalyptus</u>

Eucalyptus as a short term tree crop is recommended because it will provide a faster return on investment than koa or sugi and may provide an infusion of cash as the Humu`ula/Pi`ihonua area use is in transition. Eucalyptus has been planted in adjacent areas and is growing very well. Several species of eucalyptus have been recently tested at Humu`ula for their growth and form. These should be evaluated to ensure that they are non-invasive, economically viable, and capable of shading gorse properly.

Because thousands of acres of eucalyptus are planted in the region, the basic infrastructure and market development for this industry will be in place and can be used advantageously by the Department of Hawaiian Homes Lands.

There is flexibility in this crop as the eucalyptus can also be harvested as saw timber, veneer, and for ply board manufacturing by extending the harvest to 15 to 20 years if future conditions made it more favorable to delay the cash flow. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document B-Agricultural Assessment, Page B-9)

Sugi

Sugi, often called sugi pine (Cryptomeria japonica), is an aromatic softwood native to Japan. Cryptomeria is a genus of the conifer in the cypress family Cupressaceae; it includes only one species, Cryptomeria japonica. It is endemic to Japan, where it is known as sugi. The tree is also often called Japanese Cedar, though the tree is not related to the cedar.

Sugi is a market preferred choice. Although sugi is planned as a long range gorse control tool, it also has market potential. Harvesting of sugi occurs approximately at 25-to 35-years post plant and several rotations are needed to eradicate gorse as the gorse seed remains viable for up to 70 years.

Sugi is a higher quality wood which local sawmills and woodworkers will pay a premium. Also, there is a very limited quantity of sugi available with no plans of future plantings at this time.

The State Tree Nursery would be a resource for assistance in securing sufficient seed for planting. Seed planting and seedling care would follow commercial tree plantation guidelines.

Planting the seedling trees into the gorse area will need to be accomplished immediately following chemical/mechanical or other means for gorse elimination. If burning is utilized as a mechanical means to remove the gorse, herbiciding must follow in a timely manner to insure gorse seedling growth is controlled (burning promotes gorse seed germination). Some gorse control around the seedling trees may be necessary for the first two years or until the sugi trees are well established.

Sugi as a tree species are very hardy and have the ability to slow their metabolism down during climate stress such as prolonged droughts. This ability is very important to the success of the gorse control as these trees will be able to stand the stress of a drought, enhancing the likelihood of success.

The harvest of the sugi in approximately 25 to 35 years would generate cash flow and open the ground for another round of gorse seed germination. The planting of sugi seedlings immediately after harvest is recommended to reduce the possibility of a re-infestation of gorse. This cycle must be repeated until the majority of dormant gorse seed has germinated. The time estimated for complete gorse eradication is approximately 100 years due to the estimated 70 years gorse seed remains viable. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document B-Agricultural Assessment, Pages B-8 & 9)

Prior forestry trials throughout Hawai`i suggest that sugi is non-invasive. A small grove of sugi was planted near the Hakalau Forest National Wildlife Refuge in the 1930s as part of the Civilian Conservation Corp. In seventy years, only a few sugi trees have taken root away from the original planting site. In another nearby sugi planting of similar age however, several trees were observed a few hundred feet away. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 12)

Sugi can naturalize, however, and must be periodically monitored to ensure that it does not establish itself in native forests located downstream of the gorse control areas.

The 6,000 -7,000 foot elevation is in the upper range for koa. At this elevation, koa seedlings can suffer from frost mortality until they become established. Sugi is frost tolerant and a stand of sugi may serve as a shelter belt for future koa plantings. Sugi nearby could enable koa a better chance of surviving until the koa seedlings become established. A koa perimeter will be planted along the lower elevation border with the Hakalau Forest National Wildlife Refuge. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 12)

DHHL's Existing Gorse Containment Project

In 2001, DHHL finalized an Environmental Assessment for a Koa Salvage-Reforestation and Gorse Containment project at Humu`ula. The proposed project consisted of two parts, koa salvage-reforestation and gorse control. The introduction describes how the reforestation of the gorse infested area would in turn lead to the eradication of gorse in a symbiotic relationship.

Under the gorse project a 250 foot wide perimeter (buffer) of sugi trees would be planted to contain the leading edge of the gorse infestation. It is anticipated that sugi will shade the gorse sufficiently to keep it from producing seeds. Gorse control currently consists of aerial spraying, ground spraying, and mulching.

Sugi was trial planted on about 68 acres of the south and east boundaries of the gorse buffer. A 167 acres koa buffer was planted along the western border with the Hakalau Forest National Wildlife Refuge. Trial tree plantings within several ten acre fenced exclosures were also established. Koa, māmane, sugi, and douglas fir were among the species planted to test their capability of growing at the 6,000 to 7,000 foot project elevation to further abate gorse growth.

Revenues derived from timber salvaging will be used to finance site maintenance for the koa and gorse projects, promote forest-based economic opportunities, investigate sustainable forestry, and contain and abate gorse growth.

Gorse, classified as a noxious weed under Hawai`i Administrative Rules chapter 68, is shade intolerant and reforestation can limit seed production and gorse regeneration. A tree planting on Maui has shown promising results in its ability to limit gorse growth and expansion.

Multiple Benefits of Commercial Timber to Control Gorse

It is anticipated that commercial-scale timber planting (i.e. sugi and/or eucalyptus) will shade the gorse sufficiently to kill it and keep it from producing seeds and that each year some portion of the seed bank will be removed. Thus, interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator.

Sugi and Eucalyptus have been proposed because the initial development of these crops in the general area have given rise to increased investment in required infrastructure including marketing analysis and market development efforts by a number of private companies and government agencies.

Aerial Image of Planting of Gorse Containment Area

These market development efforts and the basic supply/demand relationship for these forest crops are currently on-going. Planting trees to eradicate the gorse is a value-added land use - it eradicates the gorse and provides license/lease revenue in the process.

Planting trees to eradicate the gorse is a value-added land use. Gorse has a life span of 30 to 40 years while the seed can remain viable in the soil for many years after that. It is expected that sugi will shade the gorse sufficient to keep it from producing seeds and that each year of subsequent management some portion of the seed bank will be removed. Each year that sugi impedes gorse growth and seed production results in decreased herbicide use. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 13)

It is important to understand that all suggested crops other than koa are designed to initially address and eradicate the gorse then support the eventual reforestation of the land back to native koa. Eucalyptus/Sugi should be replaced with koa once it has been determined that gorse seed germination is no longer a threat. Both eucalyptus sugi and are of lower economic value than koa.

In addition, DHHL has the opportunity to participate and benefit from other offsite programs through this commercial timber project. These include opportunities from carbon sequestration and participation in Hawai`i's Clean Energy Initiative (both programs are summarized below).

Carbon Offsets - Global Warming and Climate Change

In the early 1980s, scientists were beginning to raise concerns about global warming and climate change. The Earth is heating up because gases produced from vehicles, power plants, deforestation and other sources are building up in the atmosphere, acting like a thick blanket over our planet.

The terms global warming and climate change are often used interchangeably, but the two phenomena are different. Global warming is the rise in global temperatures due to an increase of heat-trapping carbon emissions in the atmosphere. Climate change, on the other hand, is a more general term that refers to changes in many climatic factors (such as temperature and precipitation) around the world.

The world mostly agrees that something needs to be done about global warming and climate change. With global warming on the increase and species and their habitats on the decrease, chances for ecosystems to adapt naturally are diminishing. Many are agreed that climate change may be one of the greatest threats facing the planet.

Tropical reforestation can mitigate global warming because trees sequester carbon through photosynthesis, converting carbon dioxide and water into oxygen and plant matter. Hence, forests that grow in area or density will reduce atmospheric CO2 levels. (Carbon is released if a tree or its lumber burns, but as long as the forest is able to grow back the net result is carbon neutral.)

Carbon offset can best be described as an act of paying a third party for reducing ("offsetting") greenhouse gas emissions when one is unable or unwilling to reduce one's own emissions. Some countries (or companies) seek to trade emission rights in carbon emission markets, purchasing the unused carbon emission allowances of others.

The idea of paying for emissions elsewhere instead of directly reducing your own emissions is closely related to the concept of emissions trading. However, while emissions trading is mostly in a strict formal and legal framework, carbon offsets generally refer to voluntary acts, often arranged by a commercial carbon offset provider.

Carbon credits are a key component of national and international emissions trading schemes that have been implemented to mitigate global warming. Credits can be exchanged between businesses or bought and sold in international markets at the prevailing market price. Credits can be used to finance carbon reduction schemes between trading partners and around the world.

There are also many companies that sell carbon credits to commercial and individual customers who are interested in lowering their carbon footprint on a voluntary basis. These carbon off setters purchase the credits from an investment fund or a carbon development company that has aggregated the credits from individual projects. The quality of the credits is based in part on the validation process and sophistication of the fund or development company that acted as the sponsor to the carbon project.

Hawai`i Clean Energy Initiative

On behalf of the State of Hawai`i, Governor Lingle and the U.S. Department of Energy (DOE) entered into a Memorandum of Understanding (MOU) to establish the Hawai`i Clean Energy Initiative, a long-term partnership designed to accelerate the transformation of Hawai`i into one of the world’s first economies

based primarily on clean energy resources. Opportunities may exist to include activities related to the Clean Energy Initiative with the property at Humu`ula/Pi`ihonua.

By government estimates, Hawai`i relies on imported fossil fuels, such as crude oil and coal, for more than 90 percent of its energy needs. The goal of the Hawai`i Clean Energy Initiative is to use renewable resources - such as wind, sun, ocean, geothermal, and bio-energy - to supply 70 percent or more of Hawai`i's energy needs by 2030. This will reduce the state's dependence on imported oil and help bring energy price stability to Hawai`i consumers.

The partnership will provide technical assistance and technology program support for a variety of innovative projects that draw on technologies developed through a range of DOE research and development programs. The Legacy Program may benefit from this initiative. The Hawai`i Clean Energy Initiative will also tap the expertise of other federal agencies, including the U.S. Departments of Agriculture and Defense, national research laboratories, and research and development entities, as well as the private sector. The Hawai`i Clean Energy Initiative recognizes that, while DOE and the State are providing the leadership, ultimately all of Hawai`i's citizens will need to be involved to create real and lasting change.

Sustainable Koa Forestry

Sustainable koa forestry includes koa salvage and restoration/reforestation of remnant koa forests.

The environmental and cultural benefits of forestry, e.g. clean water and air, soil augmentation, wildlife habitat, and traditional forest uses are well known if not well quantified. Economic returns from commercial forestry in Hawai`i are not well quantified either, as a fully modernized industry is still developing. In combination, however, these multiple values from forest lands will represent significant value to DHHL trust lands.

There are two types of commercial forestry that can generate revenue for DHHL. Koa forest restoration is currently the most lucrative. Management of DHHL lands as koa forests combines high quality hardwood returns from the sale of koa wood, eco-tourist opportunities as the forest is restored, and cultural uses such as gathering, and canoe logs.

Fortunately, DHHL can now adequately predict returns from koa forestry as a result of three years of koa salvaging on DHHL lands at Humu`ula. Potential tourist and cultural uses and revenues are not discussed in this review.

Koa Salvage Site

Koa Salvage

Koa Salvage creates a way to achieve both forest restoration and income generation for DHHL. DHHL has already implemented a koa salvage and reforestation program at Humu`ula. Likewise, DLNR has conducted a study on its neighboring land and is implementing a like program. Each target dead and/or dying koa and allow contractors to enter the property and harvest the koa. The koa salvage and reforestation program seeks to:

- Salvage koa trees before they are further reduced in value by weather, rot, and age, leaving certain trees for wildlife habitat and on-site seed production;
- Promote forest-based economic opportunities in the community;
- Generate income for DHHL;
- Promote koa regeneration from existing seed present in the soil;
- Provide a source of koa wood for Hawai`i's forest industry

The current koa project area is unhealthy and dying, and the ground is littered with wind thrown koa trees and broken branches. Many understory trees are dying as well, as evidenced by sparse crowns, cracked or peeling bark, or damaged tops from falling koa.

Koa Salvage Operation

Extensive research at Keauhou Ranch by Mueller-Dombois, et., al., provides insight as to how reforestation might occur. Mueller-Dombois describes two emergent species, koa and `ōhi`a, as "species ready to take advantages of local disturbances in the forest." Koa, in particular, "seems to be dependent on disturbances of the canopy."

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 and restore a diverse native forest. Some over-story component would be left behind to provide forest bird habitat and insect foraging opportunities for native species and to continue the process of koa seed production on site. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 10)

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 its 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. (Final Environmental Assessment, Koa Salvage-Reforestation and Gorse Containment, Page 12)

Harvested Koa

At Humu`ula, from 2003 to 2005, approximately 100 acres of koa harvest created five full time jobs, supplied enough koa wood to meet the annual needs of at least 60 woodworkers, and generated an average of $3,500 per acre per year in trust revenues.

If some of DHHL's lands that can support koa forests were managed on a reasonable 50 year rotation between harvests, 5,000 acres would sustain this level of output indefinitely (50 years times 100 acres = 5,000 acres). These returns are from an unmanaged, dying koa forest whose primary land use was pasture, however. Improved management practices and dedicating the land as koa forest should result in at least a 30% increase in wood output.

Restoration/Reforestation of Remnant Koa Forest

In April 2006 the Land Management Division Income Property Branch of DHHL produced the document, "Commercial Forestry Areas for the Department of Hawaiian Home Lands". The document gives a good background on the history of commercial forestry in Hawai`i as well as a summary of current industry practices. The document also provides valuable information regarding what commercial timber opportunities in Humu`ula are available and insight into Koa reforestation efforts and practice.

Based on soil, elevation, and rainfall characteristics, there are an estimated 15,500-20,000 acres in Humu`ula and adjacent Pi`ihonua mauka that could be restored and managed as koa forest. Almost half of these lands are currently covered in gorse and would require a long term commitment to restoration and conversion of at least two full rotations (100 years).

Managing all potential koa lands at Humu`ula/Pi`ihonua mauka would create a harvest potential of 310 acres per year and income of $4,450 per harvested acre. Total benefits to the trust from Humu`ula koa could be $1,379,500 in annual revenues, 15 to 20 on site jobs from logging and tree maintenance, and enough wood for at least 150 woodworkers. It should be noted that Hawai`i's woodworking industry has been estimated at about 1,000 woodworkers generating approximately $30,000,000 per year in revenues.

For comparison, a 1997 appraisal of the Humu`ula parcels revealed that cattle ranching in that area would command Annual Fair Market rents that are far below the potential income from koa. Table 1 compares these results. Dedicating only 50% of the lands at Humu`ula for koa management would generate 20 times the annual income historically realized from ranching at Humu`ula and Pi`ihonua. Whether managed as unencumbered trust lands, or as homesteads, koa forested lands offer greater economic opportunity for those relying on them for income. (Commercial Forestry Areas for the Department of Hawaiian Home Lands, Pages 4 & 5)

Table 1 – Comparison of Land Uses at Humu`ula; Cattle and Koa

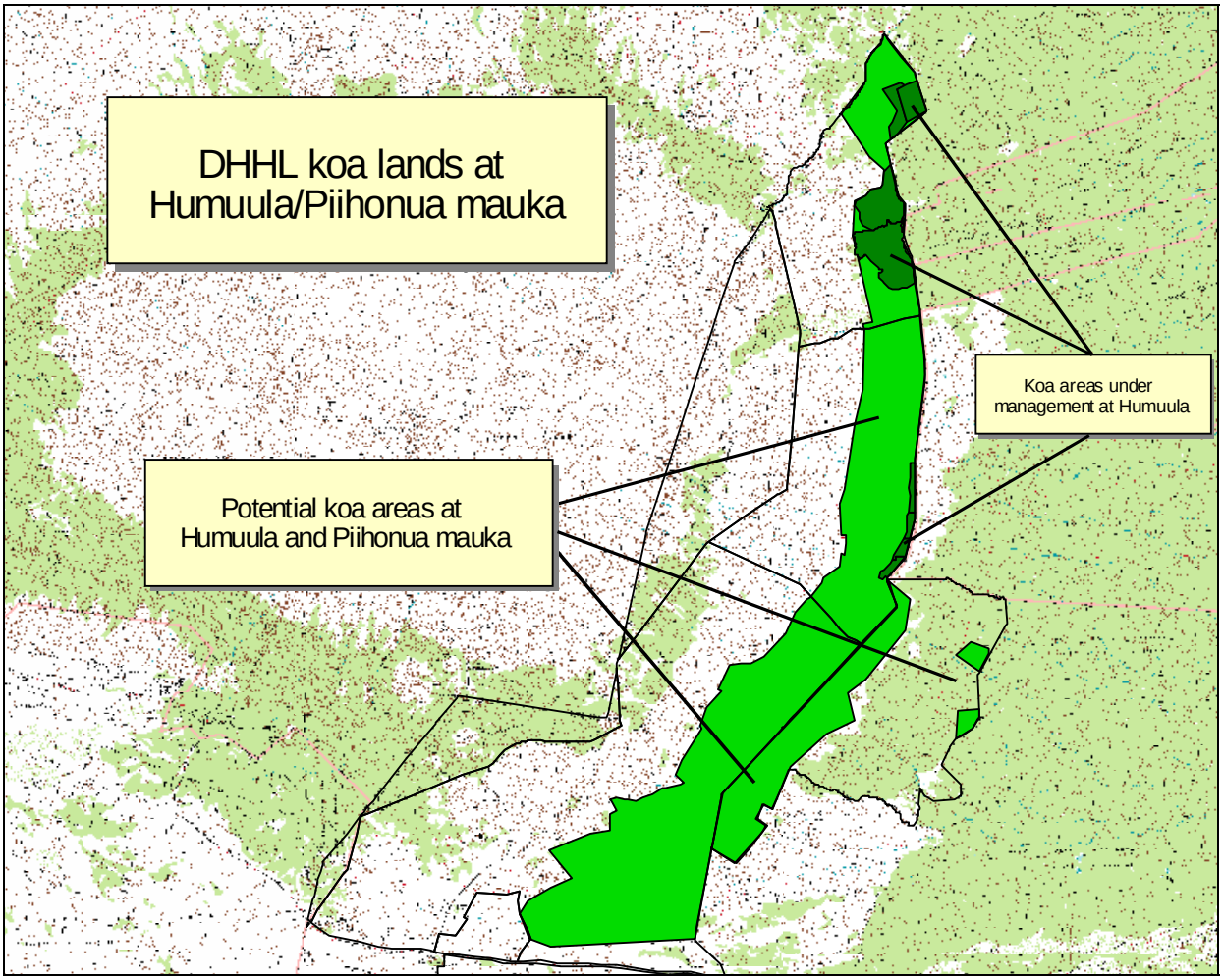
Area	Acres Dedicated	Land Use	Annual Valuation	Per Acre Annual Return, Entire Area
Humu`ula #1 (former GL 199)	5,290	ranching	$40,000	$7.56
Humu`ula #2 (former GL 200)	7,513	ranching	$40,500	$5.39
Humu`ula #3 (former GL 201)	19,828	ranching	$64,725	$3.26
Total Humu`ula Leases	32,631	ranching	$145,225	$4.45
Humu`ula/ Pi`ihonua	15,500* (13,350/2,150)	koa forest management	$1,379,500*	$89.00*

Large acreages dedicated to commercial forestry offers many logistical advantages for land managers compared to smaller, more scattered parcels. Planting, maintaining, and harvesting contiguous tracts of trees usually results in reduced costs and increased profits.

There are at least five large tracts of DHHL unencumbered lands that could be used for commercial forestry to augment the trust's long term income goals. Table 2 shows those tracts, their potential acreage, the annual harvest acreage, and the annual values that could be realized. (Commercial Forestry Areas for the Department of Hawaiian Home Lands, Pages 8 & 9)

Table 2. Potential large commercial forestry areas on DHHL lands

Island	Area	Estimated Total Acreage	Area Harvested Annually	Annual Value per Harvested Acre	Potential Annual Value
Hawai`i	Humu`ula and Pi`ihonua mauka	15,500	310	$4,450	$1,379,500



DHHL Koa Lands at Humu`ula/Pi`ihonua

Restoration of the `Āina Mauna Native Forest

DHHL is looking at its responsibility as a land manager not just to provide homes to its beneficiaries, but also to provide for the management and protection of native lands to support both cultural and resource management activities.

The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. These lands provide a glimpse into the natural environment and native forests which are disappearing throughout the state.

The area serves as valuable habitat to many native and endemic species. The area's proximity to Mauna Kea also makes it a valuable cultural resource. These lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries in perpetuity.

DHHL seeks to restore portions of the Humu`ula/Pi`ihonua lands in perpetuity to conserve these native forests and natural habitats for future generations. In doing so the Department is looking beyond housing and into a more holistic approach for communities and land management. By placing these lands in non-housing or ranching, the area can be used as a model and has the potential of serving as a sustainable land unit.

As noted in the following analysis, there are strong recommendations to enhance and restore various areas in the overall property because of their importance as habitat, biodiversity and condition (and ability to restore) as native forest. The setting aside of these areas is critical for the protection, restoration and enhancement of the `Āina Mauna.

As a means to assist in the funding of the restoration and enhancement of these areas, the department may negotiate long term and/or permanent conservation easements and/or leases with various entities.

Need for Consistency with Mission, Goals and Priority Issues

The foundation of the `Āina Mauna Legacy Program is the protection and restoration of the DHHL lands at Humu`ula/Pi`ihonua for future generations. After 150-years of sheep and cattle ranching, the formerly dense forest became significantly altered by these activities and the forest landscape was converted primarily to open pasture land.

In order to be consistent with the `Āina Mauna Legacy Program's Mission, Goals and Priority Issues (listed in the Introduction), certain areas of the site need to be converted out of pasture use and returned and restored to native forest. Previously prepared Biological and Vegetation Sensitivity Analysis reports were used to identify priority portions of Humu`ula and Pi`ihonua for restoration.

The Biological and Vegetation Sensitivity Analysis Reports (included in the 1997 Humu`ula/Pi`ihonua Master Plan Appendices) delineate areas containing endemic faunal and botanical sensitivity within the Humu`ula/Pi`ihonua area. The assessments give brief descriptions of each area and outline the endemic resources that should be factored into any programming of the area. The following summarizes areas for restoration and enhancement.

(A) `Āinahou Young Lava Flows - Nēnē Habitat

The `Āinahou Young Lava Flows are considered a high sensitivity zone both botanically and biologically. In most of `Āinahou plant growth is strongly controlled by the very poorly developed soils on the young Mauna Loa lava flows.

The vegetation is mostly native shrub land, in places with scattered native trees. With the exception of a small area in the northeast corner, these are raw lava lands that do not support pasture grasses. Young lava flows in the Saddle Road area have been found to be resistant to invasion by alien plants, the noxious fountain grass being a possible exception.

`Āinahou is designated as a high sensitivity area because the understory is not dominated by alien grasses and the shrub land communities are strongly native in character. Many species of endangered plants grow in similar communities nearby in the Pōhakuloa Training Area. A few small kīpuka in the east support a diverse closed `ōhi`a forest and warrant strong protection from disturbance. Although the early succession communities of `Āinahou often contain considerable areas of bare lava, this is their natural state, and they are an important part of the Humu`ula ecosystem.

(B) West of Mauna Kea Access Road - Māmane-Naio Forest - Palila Habitat

The Humu`ula Māmane-Naio forest is designated as a high sensitivity zone both botanically and biologically. The Māmane-Naio dry forest occurs only at high elevations on Hawai`i at Haleakalā, Maui, and is among the most endangered ecosystems in Hawai`i.

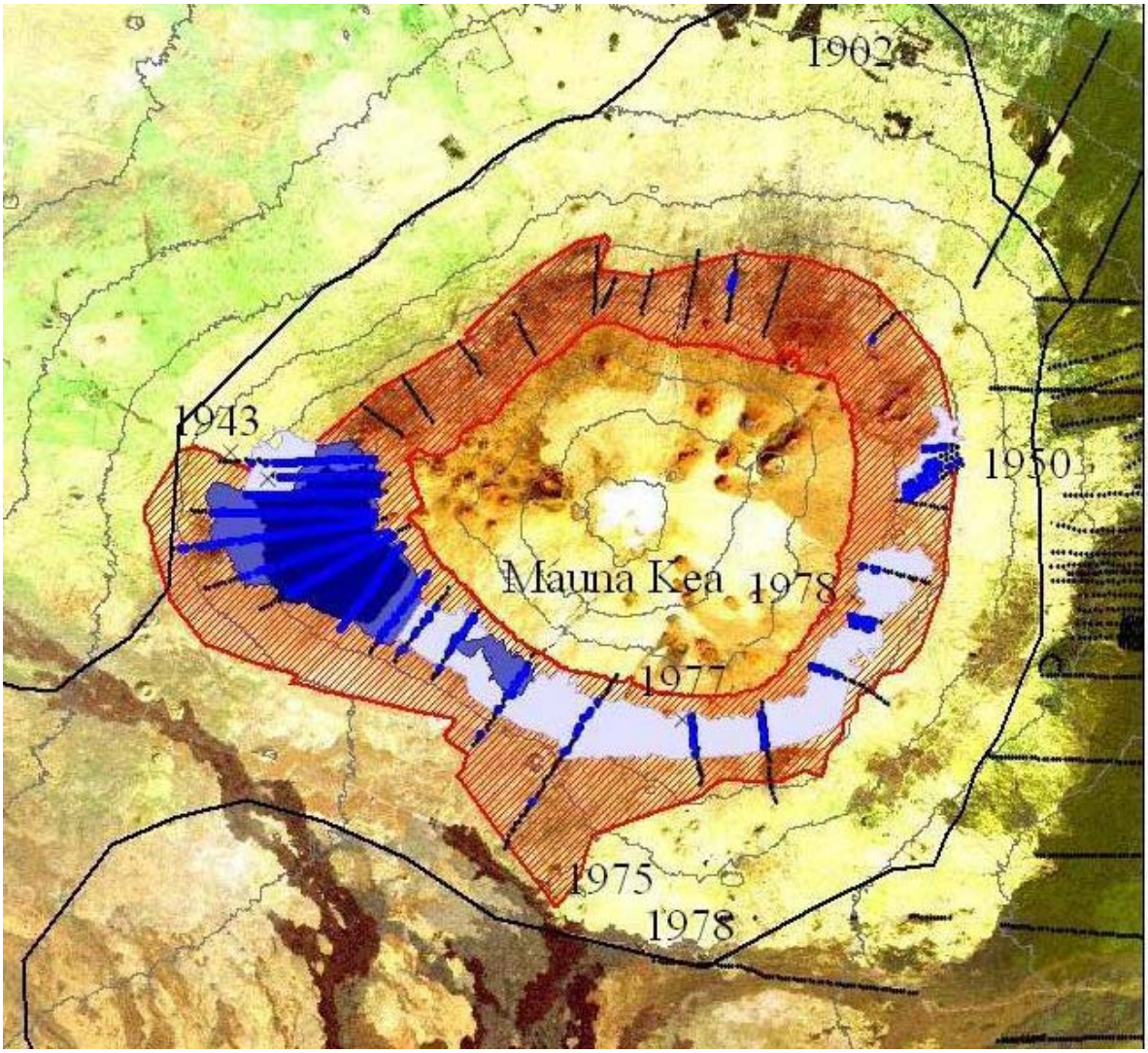
In Humu`ula, it has been subjected to some grazing and alien grasses grow here, but they do not dominate the understory. The low rainfall and sandy soil combine to keep plant productivity low. This zone contains both open and closed forests of māmane and naio. Like `Āinahou, this area is similar to neighboring areas where endangered plants are found. This zone is contiguous with part of the Mauna Kea Forest Reserve (state) that is designated critical habitat for Palila.

The upper portion of this area should not be further grazed as the Māmane forest represents a significant resource for the endangered Palila. If this area was further restored it would greatly enhance the habitat available for further restoration of this species. From recent research it appears that one of the most important resources for supporting Palila is a māmane forest with a large altitudinal range, similar to that found in the Pu`u La`au area. This allows the birds to move up and down slope following the bloom and pod set of the forest which occurs over an altitudinal cline.

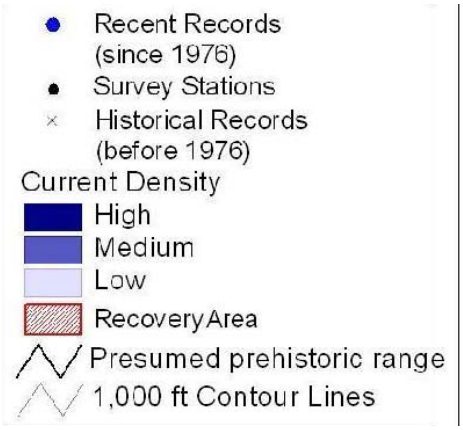
Much of the māmane forest within PTA on the other side of the HHL fence in this area has been severely impacted by the incursion of naio which has out-competed māmane due in part to the pressure from feral sheep and mouflon, which prefer māmane to naio as a foraging resource - thus, giving the naio an unfair advantage. Naio cannot support Palila; it also is extremely attractive to rats and creates a significant fuel load within the ecosystem.

(C) Pi`ihonua Mauka - `Ōhi`a-Koa Forest - Biodiverse Endangered Endemic Forest Bird Habitat

The Pi`ihonua `ōhi`a-koa forest is a high sensitivity zone both botanically and biologically. Pi`ihonua is the wettest part of the project area and can support diverse native rain forest. This vegetation, heavily impacted by grazing, is the interface between the Humu`ula pastures upslope and the forests of the neighboring Hilo Forest Reserve and Hakalau Forest National Wildlife Refuge.



Palila Habitat Map



The forest below the 6,000 foot level is significant from both an avian and botanical perspective. It is extremely good habitat for at least four endangered endemic avian species: Hawai`i `Ākepa, Hawai`i Creeper, `Akiapōlā`au, and `Io, as well as breeding habitat for at least five other endemic species.

(D) Upper Pi`ihonua Mauka - `Ōhi`a-Koa Forest - Biodiverse Native Forest

Upper Pi`ihonua `ōhi`a-koa forest are high sensitivity zones both botanically and biologically. This area contains the highest remaining rain forest on this side of the island, if not the whole windward side of the island.

There are also numerous endangered and rare plants found throughout this portion. It would be unfortunate if this area was further disturbed. It is used as both a foraging and breeding area by many of the endangered and other endemic avian species found in the Hakalau Forest National Wildlife Refuge located immediately to the north of this area.

(E) Kahinahina - Māmane Forest - Palila Habitat

Kahinahina is a high sensitivity zone biologically and a medium sensitivity zone botanically. This area can support populations of `Akiapōlā`au and Palila. The Māmane remaining in this area is significant for both species. Encouraging māmane regeneration should be one of the management objectives for this area.

(F) Kanakaleonui Bird Corridor - Koa-Māmane Forest - Native Bird Link to Forest Areas

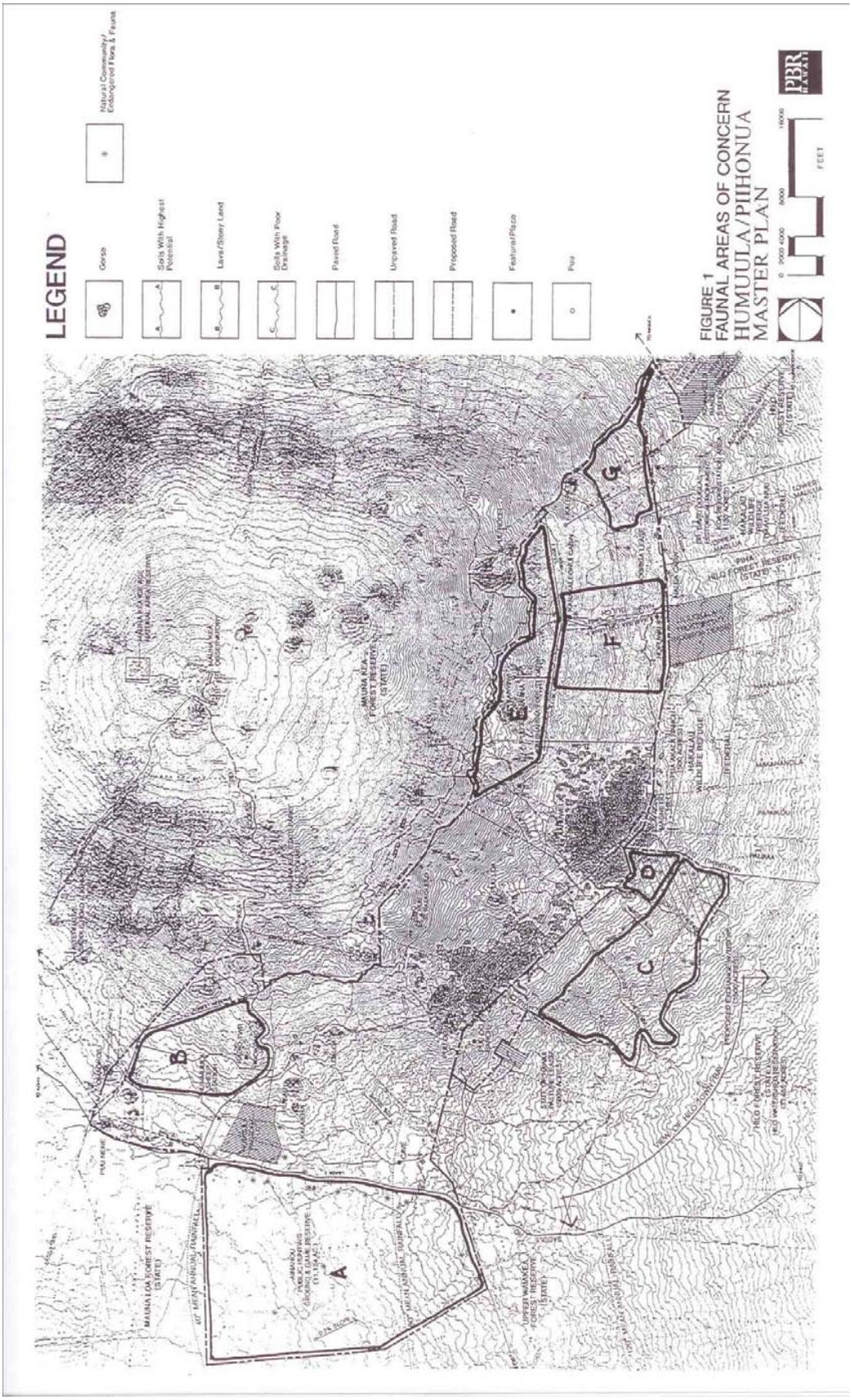
The 514-acre Kanakaleonui Bird Corridor (KBC) restoration project represents a collaborative multi-organizational effort to reestablish and maintain wildlife habitat for native bird populations. The Department of Hawaiian Home Lands is working with the U.S. Forest Service, the U.S. Fish & Wildlife Service (USFWS), the University of Hawai`i campuses at Hilo and Manoa, and other organizations in an effort to create wildlife habitat connecting the down slope Piha Forest Reserve and Hakalau Forest National Wildlife Refuge with the upslope Mauna Kea Forest Reserve.

The primary goal of this project, as expressed in the February, 2004 Piha Mauka Forest Management Plan and Environmental Assessment, is to “help create a more viable wildlife corridor for native birds dependent on seasonal mauka to makai migration patterns on Mauna Kea.” This goal would be achieved by restoring the KBC’s native forest habitat to that which existed before European contact with Hawai`i.

The KBC includes 514-acres of montane native Hawaiian forests that range in elevation from approximately 6,500-feet to 8,000-feet. Grass and scrubland vegetation dominate most of the area within the KBC. A small area is covered by koa and an even smaller area by māmane. Koa covers 55-acres and is prevalent in the lower portions of the KBC.

Koa stands are lush, with many large trees. Seedlings sprout up in groups just under the edge of the shade of larger trees. Koa stands are, as a whole, healthy, but there are large gaps between stands that are often filled with kikuyu grass.

In 2007, the USFWS provided funding to fence the 514-acre KBC in an effort to keep feral ungulates; cattle, and pigs from causing further damage. In 2008, the first research and permanent monitoring plots were established throughout the KBC with assistance from the U.S. Forest Service, the USFWS, University of Hawai`i Manoa and Hilo campuses, and the Hawai`i Community College.


LEGEND
Corps
Natural Community/ Endangered Flora & Fauna
Soils With Highest Potential
Lava/Stony Land
Soils With Poor Drainage
Paved Road
Unpaved Road
Proposed Road
Feature/Place
Puu
FIGURE 1
FAUNAL AREAS OF CONCERN
HUMUULA/PIIHONUA
MASTER PLAN
FEET
PBR HAWAII
A
B
C
D
E
F
G

(G) Keanakolu Māmane Forest

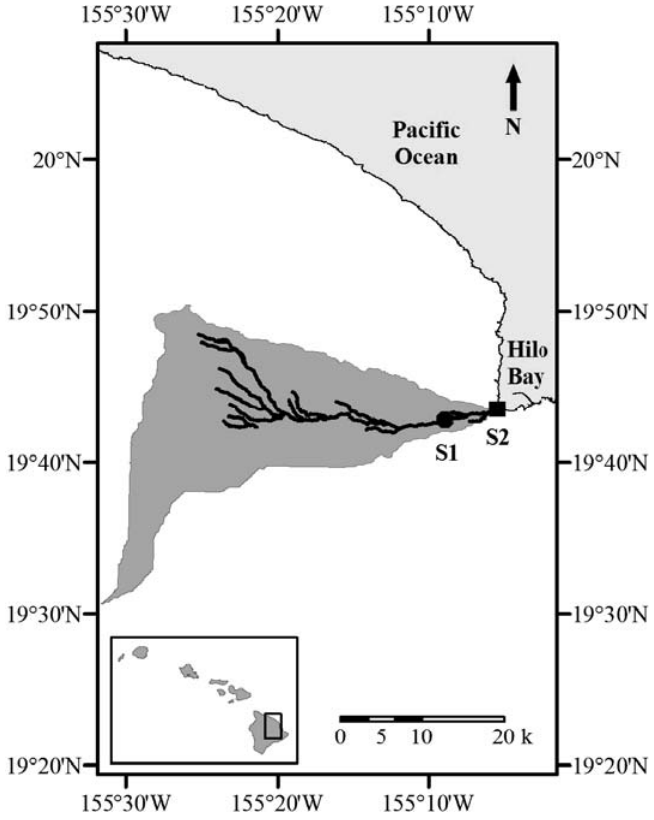
The Keanakolu Māmane Forest is considered an important sensitivity zone both botanically and biologically. Near Keanakolu, there is some cover of native trees and shrubs. Being somewhat drier than Pi`ihonua, the dominant tree species are koa and māmane, rather than `ōhi`a. `Ōhi`a does occur as a co-dominant species below 5,600 feet in parts of this area.

The native forest cover in this area may be indicative of bullock hunting pressure in the mid-1800s, followed by less formal grazing due to poor soils. The ground cover is alien pasture grasses, sometimes co-dominant with the occasional native shrubs. This area borders the Hilo Forest Reserve.

Wailuku River Watershed

The Wailuku River watershed is located on Hawai`i Island and drains both the tallest and the most massive mountains in the world, Mauna Kea and Mauna Loa, respectively. The Hawaiian meaning of the name is “water [of] destruction”. The area of the watershed is 252.2 square miles, with maximum elevation of 13,779 ft (4,200 m). The percent of the watershed in the different land use districts is as follows: 22.4% agricultural, 76.9% conservation, 0.7% urban and 0% rural.

The Wailuku River is an important landmark to geologists, because it marks the approximate boundary between the lava flows of Mauna Kea and Mauna Loa. The Wailuku River is the second longest perennial river in the state of Hawai`i (total stream length is 196.1 miles) and the largest source of surface water to Hilo Bay.



Map Illustrating Wailuku River Watershed

An average of 1-million cubic meters (275-million gallons) of water flows through the Wailuku River Watershed to Hilo daily, generating some of the electrical power used on the Big Island. During intense storms, the discharge can be more than 20-times greater. On average, the Wailuku River Watershed transports approximately 10-tons of suspended sediment into Hilo Bay each day.

Overlooking Portion of Keanakolu/Mana Road – Dip in Road, with concrete crossing, is Wailuku River

Conservation Corridors/Easements

Wildlife corridors can help provide continuous habitat for birds and may be managed in conjunction with other uses in an area. All neighboring landowners could be partners in the development of such corridors, particularly the USFWS and their Hakalau Forest National Wildlife Refuge.

There are many portions of the `Āina Mauna planning area that include unique natural resources that include native flora and fauna, some of which are listed by the State and Federal agencies as endangered. Careful land use planning and management will be necessary to conserve these resources. One area that has a high concentration of native flora and fauna is the koa forest adjacent to the Hakalau Forest National Wildlife Refuge. The USFWS has expressed an interest in acquiring or managing approximately 1,500 acres of these Pi`ihonua lands. (Humu`ula/Pi`ihonua Master Plan, Page 59)

The purpose of these corridors is to re-establish a native forest that will provide a contiguous habitat from the lower koa forest to the higher elevation māmane forest to facilitate the migration of native forest birds between these habitats. Once established, other uses, such as koa forestry could be accomplished within this are while still maintaining the habitat connections. (Humu`ula/Pi`ihonua Master Plan, Page 59)

This sub area is adjacent to the Hakalau Forest National Wildlife Refuge, which is managed by the U.S. Fish and Wildlife Service (USFWS). USFWS plans to implement some improvements to Keanakolu Road in the near future, to include some re-grading of washed out areas. USFWS has also expressed interest in entering into some form of easement agreement with DHHL to create a "conservation corridor" that would run mauka-makai through about the middle of Kanakaleonui (Kanakaleonui Bird Corridor). The objective of this conservation corridor is to provide a habitat link between the Hakalau Forest National Wildlife Refuge to the east and the upper slopes of Mauna Kea to the west. (Piha Mauka Forest Management Plan and Environmental Assessment, Pages 11-13)

A conservation easement is a legal agreement voluntarily entered into by a property owner and a qualified conservation organization such as a land trust or government agency. The easement contains permanent restrictions on the use or development of land in order to protect its conservation values. These easement restrictions vary greatly for each agency or organization. (Conservation Easements, Private Rights and Public Benefits)

Landowner motivations to acquire conservation easements are diverse. Most landowners hold a deep appreciation for wildlife, and an easement protecting habitat displays heartfelt concern for wildlife's future. There may be interests to retain limited development rights and conservation easements can be structured to address these interests. (Conservation Easements, Private Rights and Public Benefits)

Easements are flexible and can be written to meet a particular landowner's needs while protecting the property's wildlife resources. Most easements are permanent, remaining in force when the land changes hands. The easement holder ensures that the restrictions are followed. Easements are cost effective conservation. The cost of purchasing and managing a conservation easement on private land for government agencies is much less than purchasing the land. (Conservation Easements, Private Rights and Public Benefits)

Pi`ihonua Mauka Conservation Plan

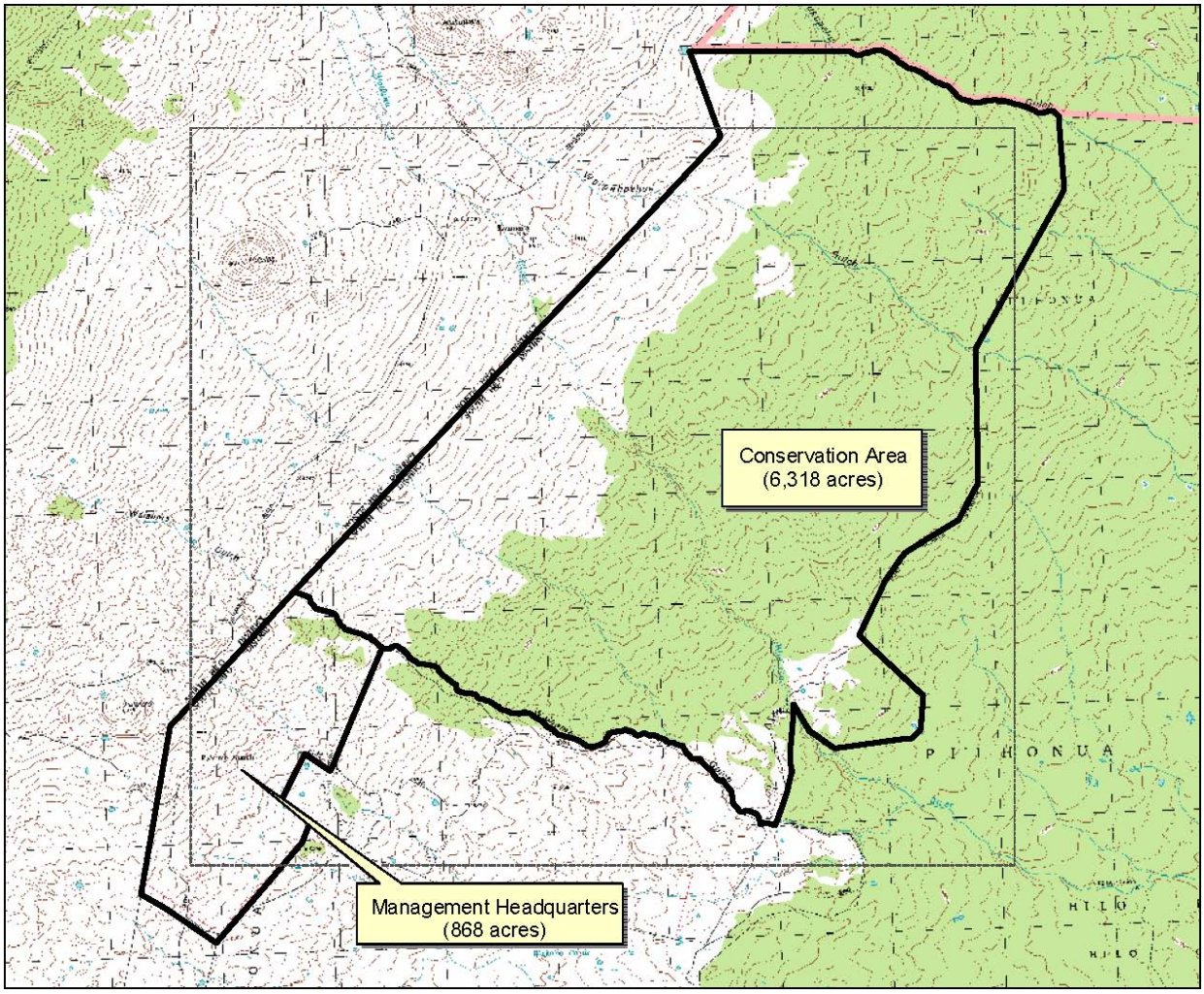
In November 2007, DHHL staff developed the "Pi`ihonua Mauka Conservation Plan" which delineates a potential solution to restoring the lands of Pi`ihonua Mauka to its full productivity over a period of at least fifty (50) years. The following references from this plan express a desired future condition that unfortunately does not currently exist at Pi`ihonua Mauka.

Pi`ihonua Mauka has been managed for natural resource production for over fifty years. Existing lower elevation `ōhi`a forests are healthy, diverse, and weed free. Native species, especially forest birds, thrive in this extensive habitat. Upper elevation former pasture land has been converted to a maturing, healthy koa forest in which commercial thinning and harvests are beginning to occur. These koa forests are also becoming more diverse as all cattle have been removed from Pi`ihonua Mauka for decades. (Pi`ihonua Mauka Conservation Management Proposal, Page 1)

The native Hawaiian community benefits economically from this managed area via conservation jobs which maintain the `ōhi`a forest, commercial jobs which reforest and harvest the koa forest, and by new visitor enterprises such as hiking, horseback riding, and bird watching. (Pi`ihonua Mauka Conservation Management Proposal, Page 1)

Cultural use of the forest is extensive as native Hawaiians use the forest in traditional ways. Scientific research focuses on solutions to perpetuate the forest and its benefits. The greater public good of East Hawai`i is equally served as erosion emanating from these headwater areas is minimized and weedy species no longer spread downstream. (Pi`ihonua Mauka Conservation Management Proposal, Page 1)

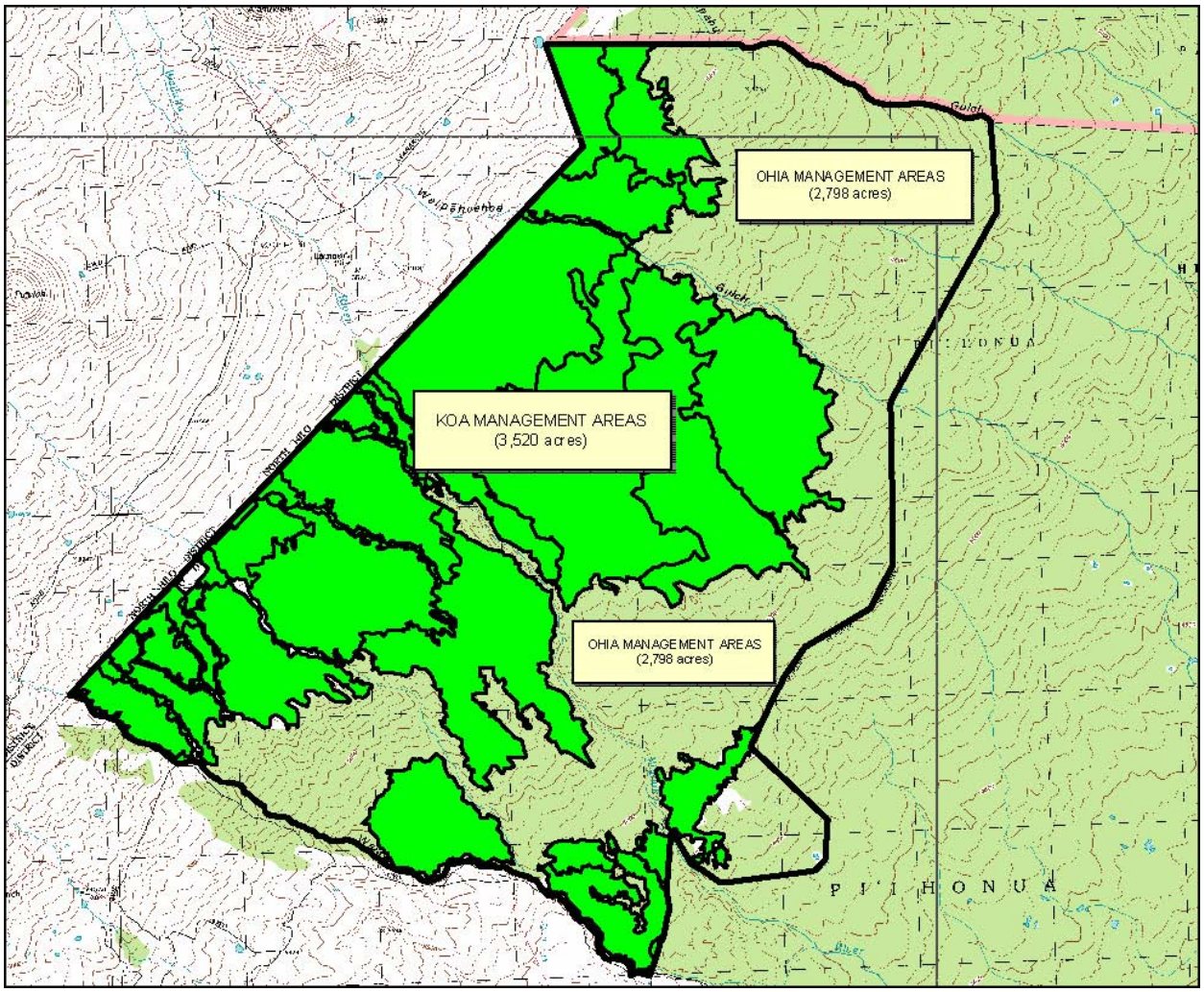
Most accurately, Pi`ihonua Mauka was most recently leased as Pu`u `Ō`ō Ranch until the early 1990s and there are still quite a few feral cattle in this area. This unit is made up mostly of introduced grasses with a significant `ōhi`a over-story. Access, especially during wet periods, is very difficult. There are sporadic patches of gorse in the mauka grasslands and gorse populations established along stream courses and gullies. The makai portion of the unit is mostly `ōhi`a forests with occasional large koa trees and stumps indicating past logging. (Wildland Fire Management Plan Humu`ula/Pi`ihonua Mauka, Page 10)



Pi`ihonua Mauka Conservation Management Area

The majority of Pi`ihonua Mauka (6,318-acres) would be withdrawn from homesteading considerations for a period of at least 50 years. The map above shows the area to be withdrawn and intensively managed for resource restoration, including weed control, cattle removal, and koa regeneration. It also shows a smaller area (868-acres) that would be developed as both a management headquarters and an area for generating additional income and use via licensing agreements for activities such as hiking, horseback riding, bird watching, cultural retreats, and camping. (Pi`ihonua Mauka Conservation Management Proposal, Page 2)

After the initial fifty year period, Pi`ihonua Mauka would be re-evaluated for its ability to contribute to the DHHL mission. The land would be managed in partnership with others to provide adequate funding and expertise to accomplish the above objectives. (Pi`ihonua Mauka Conservation Management Proposal, Page 2)



Areas Proposed for Management as `ōhi`a forest or koa forest

Pi`ihonua Mauka Conservation Budget

A fifty year conservation easement would be used as income to accomplish the goals listed above. Table 1 shows the potential sources of income and the projects that could be funded with such income. It is proposed that this income could also be used on DHHL lands adjacent to Pi`ihonua Mauka, i.e. Humu`ula, if such expenditures would benefit the management of Pi`ihonua Mauka. Examples could include weed control, koa seed collection, and administration costs for the Humu`ula/Pi`ihonua Mauka areas. (Pi`ihonua Mauka Conservation Management Proposal, Page 3)

Table 1. Potential income sources and project expenditures for managing forestry areas on DHHL lands at Humu`ula and Pi`ihonua Mauka. (Pi`ihonua Mauka Conservation Management Proposal, Page 3)

Income	Area	Annual Acreage	Revenue/ Cost/acre/yr	Total Annual Revenue/Costs	Total 50 Yr. Revenue/Costs
Easement Payments	Conservation Area	6,318	$45.00	$284,310	$14,215,500
Expenses					
Weed control	All	900	$90.00	$81,000	$4,050,000
Reforestation	All	140	$750.00	$105,000	$5,250,000
Administration	All	7,186	$14.00	$98,310	$4,915,500
		Total Costs		$284,310	$14,215,500

Expanded Opportunities for Gathering and Cultural Practices

The restored, healthy native forest provides a variety of benefits and opportunities to beneficiaries through gathering, cultural practices and opportunities to see and understand native forest ecosystems. The site (with restoration to healthy native forest) provides beneficiaries cultural practices access as the only site of this type in the Hawaiian Home Lands Trust inventory.

Pasture Use to Assist Wildland Fire Management

Cattle and sheep have been used effectively to reduce wildfire grass fuels in pastures and other grasslands on the island of Hawai`i. Use of grazing animals may also be an effective method of managing growth of invasive woody plants now or in the future. Grazing animals would be used only on pastures and other grasslands, not in the forest.

In 2007, the DHHL Land Management Division developed a Wildland Fire Management Plan for Humu`ula/Pi`ihonua Mauka. This fire plan represents the current fire management policy and strategy for the Humu`ula and Pi`ihonua Mauka lands of the Department of Hawaiian Home Lands, Hawai`i Island.

Humu`ula has many resource values to be protected, all of which are beneficial to future homestead communities. Primary concerns include the protection and augmentation of native koa (Acacia koa) forests that provide habitat for native fauna and may be utilized in sustainable forestry production. Introduced grass ecotypes provide ranching opportunities that supply food for livestock and a culturally rich paniolo (cowboy) lifestyle.

Historically, DHHL has relied on lessees or neighboring landowners for fire planning and mitigation. Due to recent lease terminations and potential uses of these Hawaiian Home Lands for homesteading, DHHL has assumed these fire planning and mitigation responsibilities.

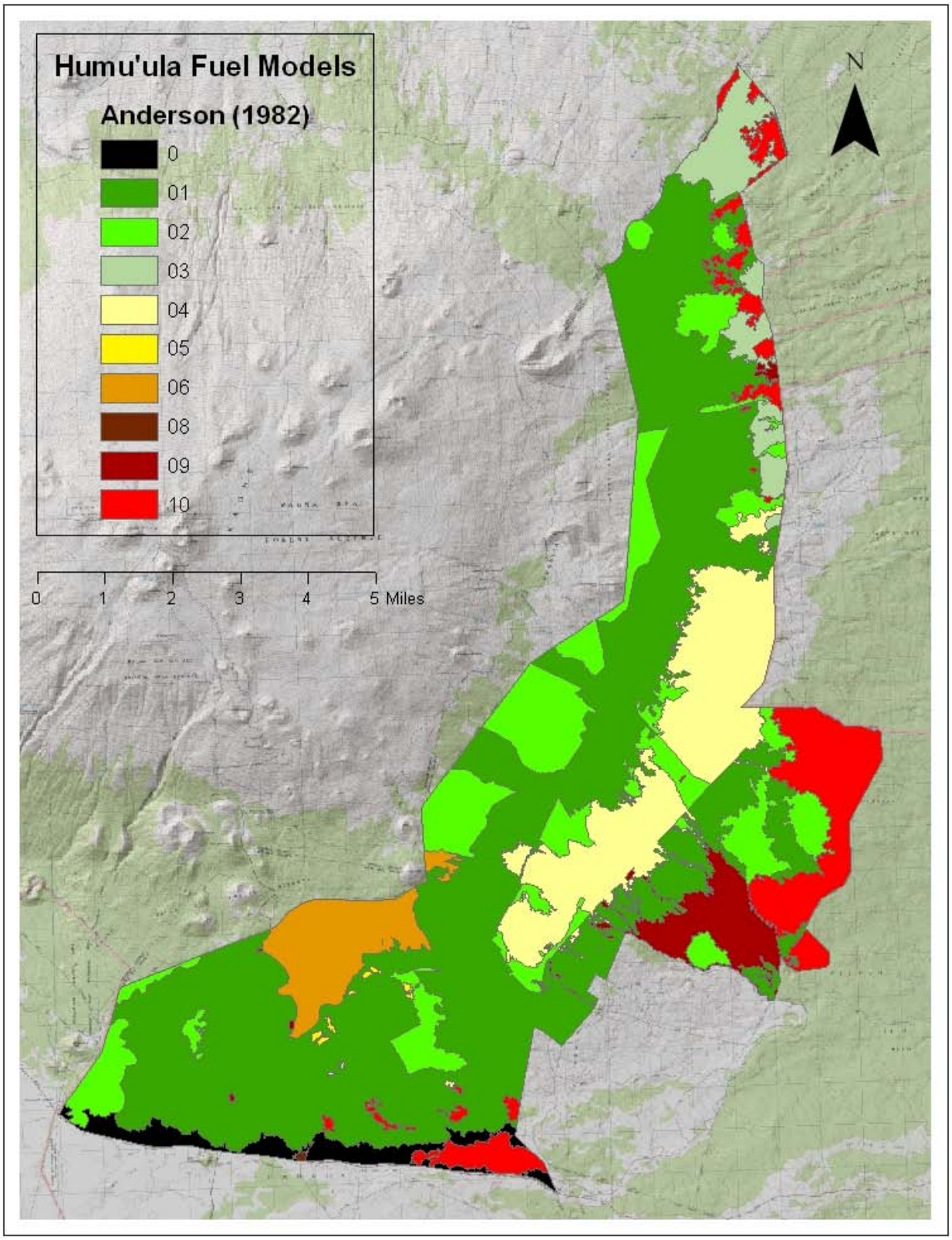
Fire appears to be a relatively infrequent, low intensity disturbance in native Hawaiian ecosystems, occasionally ignited by lava flows or lightning strikes. It is generally agreed that fire was not an important aspect of the evolution of native ecosystems. However, there are some native species that have been shown to be fire tolerant including māmane, naio, ohelo and native bunchgrass. However, none of these species require fire to regenerate and all can be killed by intense fire.

Protection of basic resources, such as soil and water, will sustain eco-processes and make available more productive and verdant lands. Proactive approaches and fire mitigation will aid in suppressing unwanted wildland fires on Hawaiian Home Lands while ensuring adjacent lands, primarily state and federal, are not adversely affected. Prevention and suppression of fires will protect existing ecosystems that are fire intolerant while managing fire fuels like gorse and most grasses at Humu`ula.

Vegetation variations are patterned by elevation, temperature, and rainfall, with some exceptions due to general topography, soils and underlying geologic substrate, and microclimate. There are several remnant patches of high elevation native forests scattered amongst primarily introduced grasses and shrubs at Humu`ula.

The introduced species in the area are the product of a long history of grazing and subsequent land conversion from high elevation native forest ecosystems to pasture lands. Remnant native forests that can still be found in the project area are koa/`ōhi`a, pūkiawe shrub complex, and high elevation māmane/naio.

The dominant introduced species are non-native grasses, primarily composed of kikuyu grass, sweet vernal grass and narrow-leaved carpet grass, the invasive shrub gorse and timber trees that have been planted for research and as windbreaks near areas of former habitation. (Wildland Fire Management Plan for Humu`ula/Pi`ihonua Mauka, Pages 2-7)



Humu`ula Fire Models

The most notable fuel type is the noxious weed gorse. In combination with grasses, gorse constitutes the greatest fire risk. (Wildland Fire Management Plan for Humu`ula/Pi`ihonua Mauka, Pages 9 & 28)

Hazard fuel reeducation strategies include treatment of hazard fuels and debris disposal including:

- Mechanical treatment can be accomplished by hand cutting or by utilizing specialized heavy equipment.
- Prescribed burning of gorse, in combination with timely herbicide applications, reduces biomass, stimulates gorse seed germination to deplete the gorse seed bank, and is very cost effective for large, inaccessible areas. Additional care must be taken during prescribed burn applications as dead biomass is more flammable.
- If bio-control release is necessary than strict guidelines and a continued monitoring program is suggested. Bio-control agents that have been released require sufficient habitat to be effective. Spraying and burning significant portions of these areas should be avoided until the bio-control's effectiveness is accurately determined.
- Cattle or other grazers may be utilized as a cost effective way to reduce fuel load in approved areas and under strict management guidelines to avoid conversion from one undesirable fuel to another, e.g. tall grass to gorse.
- Reducing forest fuel loads in strategically located areas can occur through selective manual thinning and treatment of logging slash. This reduces ladder fuels and overly dense tree canopies.
- Apply low intensity management-ignited prescribed fire to reduce surface fuels and simulate the effects of natural low intensity fire.
- Reduce hazard fuels and remove hazard trees around DHHL structures. (Wildland Fire Management Plan for Humu`ula/Pi`ihonua Mauka, Page 34)

Although koa is often killed by intense fires, seeds in the soil survive and are stimulated to germinate after fire. Healthy forest cover at Humu`ula reduces the risk of wildfire by reducing surface temperature fluctuations, increasing relative humidity, and reducing wind speeds.

In most cases, introduced species such as gorse and introduced grasses, are better adapted to fire than native plants. As a potential fuel, these introduced species represent a significant increase in fire risk at Humu`ula, especially the highly flammable shrub gorse.

The greatest wildfire threat to human life and property in Humu`ula is within the wildland-urban interface where astronomy facilities on Mauna Kea, ranch homes, state lodging facilities, and U.S. Fish & Wildlife Service lodging and structures intermingle with pasture and forested lands.

There is only one reliable access route to and from the Mauna Kea summit and it passes through Humu`ula lands.

There are two reliable exits from Humu`ula itself in the event of wildland fire but that access is limited to 4 x 4 vehicles. Terrain there is hilly with frequent ravines. The few jeep trails that are accessible by the Keanakolu/Mana road can be hazardous and are relatively impassable during the rainy season.

There are several important issues that define Humu`ula's wildland fire predicament:

- Threat of wildfire spread to or from adjacent properties/sensitive resources;
- Fire-prone shrubland and grasses;
- Limited access in the form of ingress/egress routes in the event of wildfire;
- Lack of reliable water sources for firefighting;
- Public unawareness of the threat of wildfire at Humu`ula.

Humu`ula land managers have identified several hazards and are taking steps to reduce and mitigate them to protect public health, on and off site structures, and sensitive resources using an integrated and proactive management approach that includes the following elements:

- Map Fire Management Resources (completed)
- Determine Fuel Models for Estimating Fire Behavior (completed)
- Improve and/or augment the existing Fuelbreak Network (in progress)
- Reduce fire-prone shrubs and other hazardous fuels (in progress)
- Improve and maintain access/egress throughout Humu`ula (in progress)
- Improve access to fire management resources such as water (in progress)
- Design and implement a Wildfire Awareness program for Humu`ula

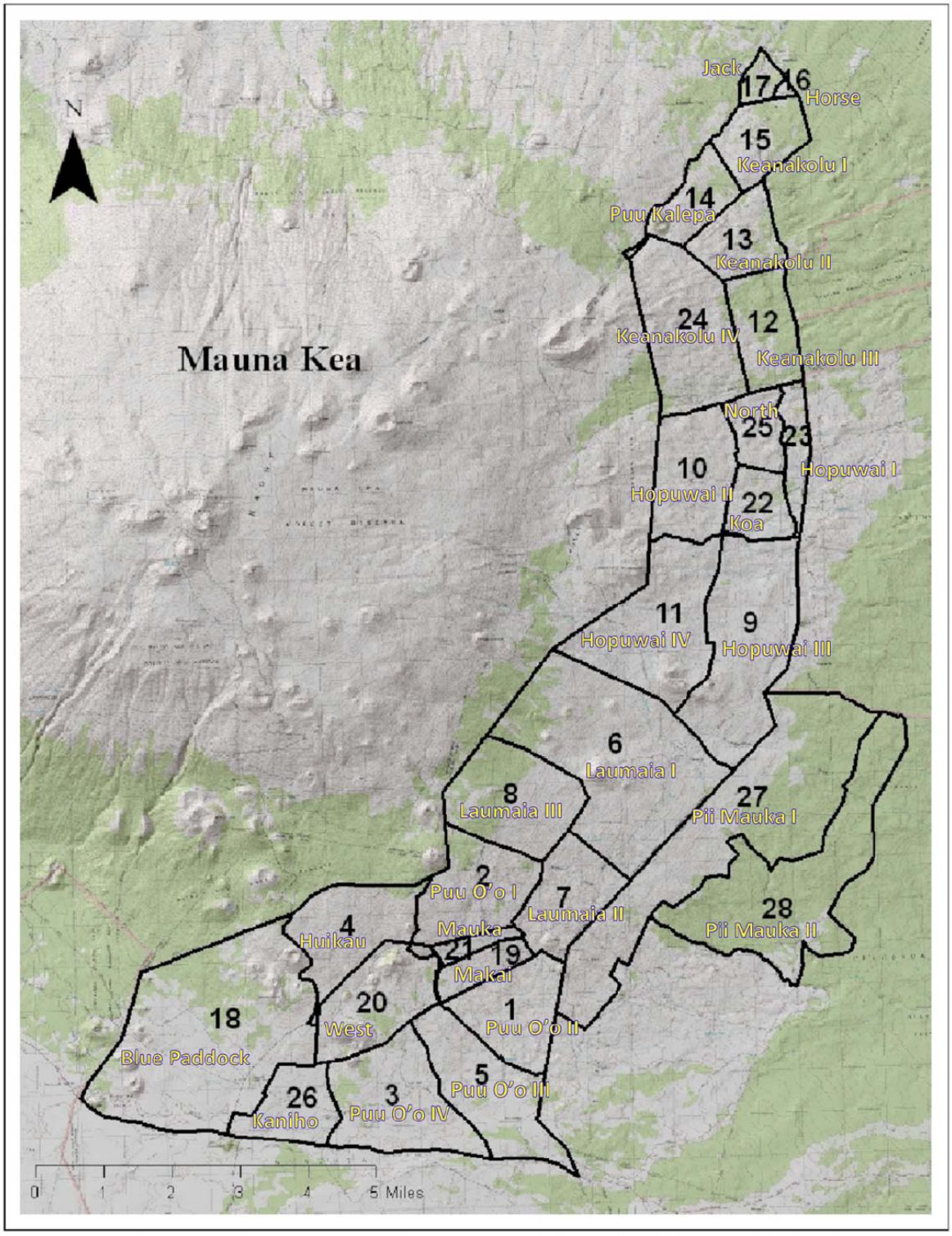
An aggressive program of reducing the presence of gorse outside of the containment area will continue to reduce the area of land at risk from intensive gorse fires. Strategies for reducing introduced pasture grasses, which are the second most dangerous fuel type at Humu`ula, may also be employed. Grazing can play a key role in managing these grass fuel types and may assist in the control of undesirable shrubs. However, it is important that close coordination is used with ongoing gorse eradication efforts because cattle and other ungulates are primary vectors of gorse. Reducing the gorse infestation while managing fire hazards from grass via grazing is a challenging yet possible solution to reducing hazardous fuels at Humu`ula. (Humu`ula/Pi`ihonua Mauka Community Wildfire Protection Plan, Pages 20 & 21)

Fire Management Units

Twenty-eight Fire Management Units (FMU's) have been created in ArcGIS using traditional and proposed ranching paddocks. These FMU's in combination with the Humu`ula Fuel models may be utilized to make informed fire management decisions. These FMU's will benefit managers and homesteaders by providing essential fire behavior information for examination to be used for a prioritized focus on specific fuel types at Humu`ula. (Wildland Fire Management Plan Humu`ula/Pi`ihonua Mauka, Page 27)

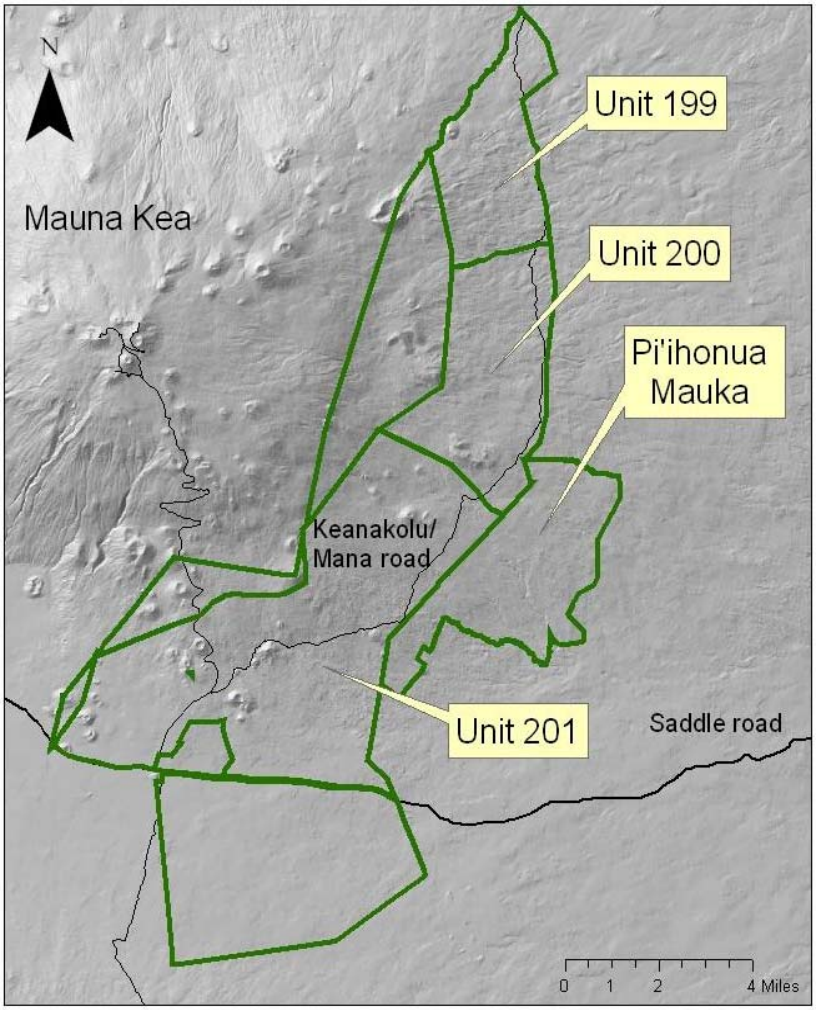
Fire Management Units

1	Pu`u `Ō`ō II	8	Laumai`a III	15	Keanakolu I	22	Koa
2	Pu`u `Ō`ō I	9	Hopuwai III	16	Horse	23	Hopuwai I
3	Pu`u `Ō`ō IV	10	Hopuwai II	17	Jack	24	Keanakolu IV
4	Huikau	11	Hopuwai IV	18	Blue Paddock	25	North
5	Pu`u `Ō`ō III	12	Keanakolu III	19	Makai	26	Kaniho
6	Laumai`a I	13	Keanakolu II	20	West	27	Pi`i Mauka I
7	Laumai`a II	14	Pu`u Kālepa	21	Mauka	28	Pi`i Mauka II



Fire Management Units Map

The Project Area was further analyzed using four data collection units: 199, 200, 201, and Pi`ihonua Mauka, that correspond to former pasture leases. Each data collection unit is slightly different and defined by its physical and biological characteristics. (Wildland Fire Management Plan Humu`ula/Pi`ihonua Mauka, Page 27)



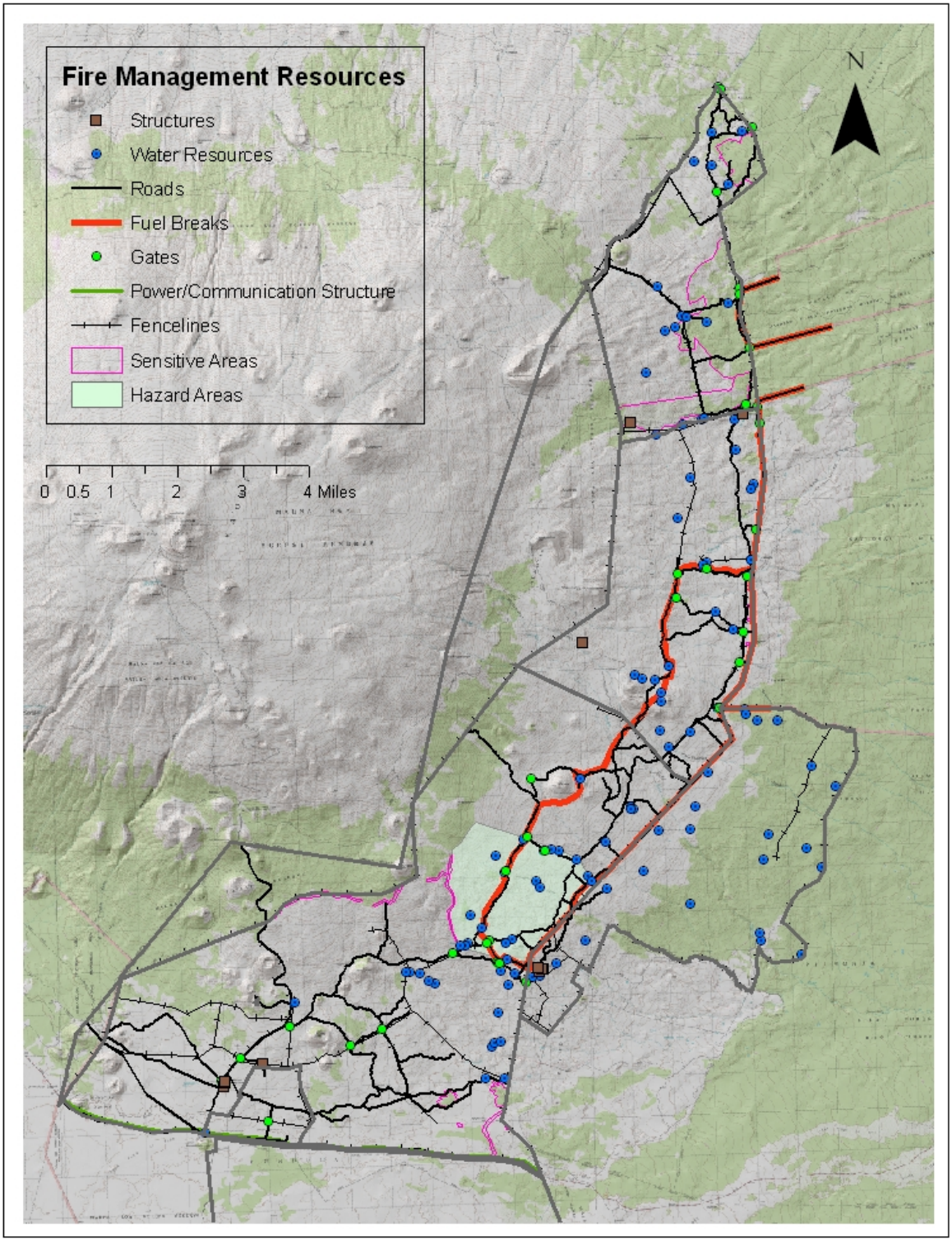
Fire Data Collection Units

Data collection unit 199 is most representative of native forests prior to the introduction of cattle with native koa/`ōhi`a forests at lower elevations and māmane/ naio at higher elevations. This unit has a heavy kikuyu grass component at lower elevations eventually thinning out to less dense open pasture grasses with increase in elevation. There are few introduced plants in this area besides pasture grasses. Introduced trees and saplings can be found along state boundaries and banana poka has been found within DHHL boundaries. Only a few individual gorse plants have been found in this area.

Data collection unit 200 is dominated by the main gorse infestation which is located along Keanakolu/Mana Road. The main gorse infestation begins near Pu`u `Ō`ō in Unit 201 and ends just north of the gated entrance to Hakalau Forest National Wildlife Refuge in unit 200.

Lands mauka (towards the mountains) of the gorse infestation are dominated by introduced grasses with pockets of small māmane/naio forests. North of the Hakalau Forest National Wildlife Refuge entrance there are small groups of remnant old growth koa forest and introduced grasses. There are pockets of native species communities that thrive in the ravines here and consist of koa, `ōhi`a, and diverse native shrub and tree understory. Remnant koa can be found interspersed within the gorse infestation.

Data collection unit 201 is composed of scattered māmane and introduced pasture grasses west of Mauna Kea access road. There are pūkiawe native mix shrub complexes south of Keanakolu/Mana road with occasional remnant koa/`ōhi`a forests interspersed throughout the area. These remnant koa/`ōhi`a forests are very diverse with many native understory species. The dominant vegetation is introduced grasses and large incipient populations of gorse. The main gorse infestation begins along the northeastern boundary of this unit near Pu`u `Ō`ō. There is a large band of high elevation native māmane/naio forests mauka of Keanakolu/Mana road upon entry from the Mauna Kea access road. These native populations are relatively intact and should be considered a valuable natural and cultural resource in the event of wildland fire.



Fire Management Resources Map

Pi`ihonua Mauka was most recently leased as Pu`u `Ō`ō Ranch until the early 1990s and there are still quite a few feral cattle in this area. This unit is made up mostly of introduced grasses with a significant `ōhi`a over-story. Access, especially during wet periods, is very difficult. There are sporadic patches of gorse in the mauka grasslands and gorse populations established along stream courses and gullies. The makai portion of the unit is mostly `ōhi`a forests with occasional large koa trees and stumps indicating past logging. (Wildland Fire Management Plan Humu`ula/Pi`ihonua Mauka, Pages 8-10)

Reduce Fire-Prone Shrubs and Other Hazardous Fuels

Areas comprised of fire-prone trees or shrubs are especially hazardous as these fires are more intense and cause more extensive damage to resources when wildfire occurs. In Humu`ula the most hazardous fuel type has been identified as gorse.

During the period between 2000 and 2002, Humu`ula was exposed to drought conditions and seven fires occurred (Table 1). The primary fuel was gorse and all seven fires were human caused. In 2006-2007, there was one fire at Humu`ula and one fire to the north of the Humu`ula boundary. Both of these fires occurred in grass fuel types. The fire at Humu`ula was human caused and lightning caused the other fire just north of the Humu`ula boundary.

Table 1. Wildland Fire History at the Hakalau Unit (2000-2002)

Name of Fire	Inclusive Dates	Approximate Acreage
`A`ahuwela	2/24/00 - 2/26/00	1400
`A`ahuwela II	3/16/00	3
Maulua	7/28/00 - 8/1/00	5
Pi`ihonua	8/16/00 - 8/18/00	200
`A`ahuwela	1/04/01 - 1/06/01	3
Gorse Fire	6/23/01	0.5
Pua Akala Gorse Fire	11/7/02 - 11/13/02	250

Pasture Uses to Address Wildfire Mitigation

Wildfire can quickly destroy important yet fragile assets of DHHL's lands. The Humu`ula and Pi`ihonua Mauka areas are especially vulnerable because of their remoteness, and the flammable fuel types found there. The closest public fire station is located in Hilo 25 miles away. Thus, the prevention of wildfires is of the upmost importance if homesteading is to take place in this area. One way to help control wildfire fuels is through pasturing in selected areas.

In 2007 DHHL produced the report "Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels". This report discuses the both harm that cattle have had on the Humu`ula landscape over the years as well as how pasturing can help reduce fire risks in the future.

Since cattle leases expired in 2002, many areas have little or no cattle present and important natural resources at Humu`ula have begun to show significant recovery. This recovery is most evident in the mauka and certain makai areas of Humu`ula where water and/or feed is limited and feral cattle have not yet congregated.

Giving this land "a rest" after more than 150 years of grazing is beneficial to the landscape by minimizing soil loss and allowing natural processes to recover the area's productivity. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Mauka areas (7,600 – 8,000 ft. elevation) are exhibiting a re-growth of the historic native Hawaiian ecosystem, including māmane, pūkiawe, and other species. Makai and gulch areas up to about 7,000 foot elevation are seeing a resurgence of koa natural regeneration. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Reintroducing cattle to these recovering areas would be a setback for the natural resources while contributing minimally to the priority reduction of fire fuels. The "Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels" report suggests areas for cattle licensing which would:

- Reduce wildfire fuels most at risk from ignition
- Avoid the spread of gorse by ungulates
- Generate income from cattle ranching
- Ranch the most suitable areas based on soils and estimated animal units per year (AUY's)
- Continue the natural recovery of most lands at Humu`ula
  (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

Wildfire fuel types were mapped throughout Humu`ula and Pi`ihonua Mauka in 2007 as part of a DHHL Fire Management Plan. Using GIS technology, these fuel types were analyzed to determine where pasturing might be most beneficial to accomplish the five objectives listed above. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

The Keanakolu Road is a county road open to public access. Along this road corridor, therefore, is an area at greatest risk from heavy fuels being ignited by a careless visitor. The rest of Humu`ula/Pi`ihonua Mauka is much less at risk because of its limited access and DHHL's no hunting policy. In short, most fires are started by humans and the limited human presence at Humu`ula greatly reduces the risk. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 1)

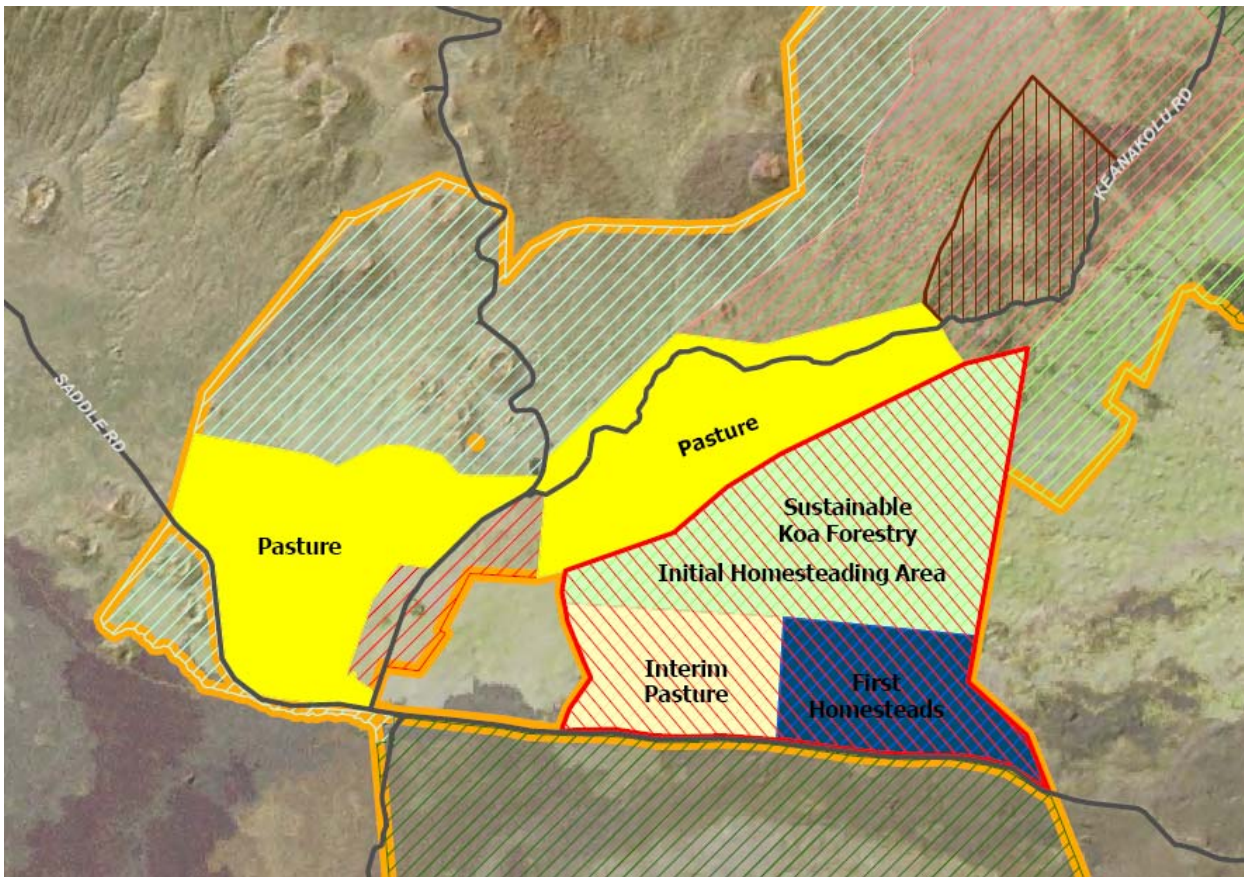
Control of fuels along the Keanakolu Road corridor is further complicated, however, by the presence of heavy gorse infestations in certain areas along the corridor. The presence of cattle in areas of medium to heavy gorse should be avoided as cattle easily spread gorse. Alternatively, in areas of light gorse infestations cattle can act as a tool for revealing isolated, young gorse plants so eradication strategies can be fully employed.

Careful coordination of ranching and gorse eradication efforts is needed. For example, cattle should not be grazed in light gorse infestation areas while gorse plants are actively seeding. Cattle can pick up gorse seed pods in their hair and tails and move it far distances in a short period of time. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 2)

The designated gorse containment area has an established grass fuel break surrounding it and is further segmented and surrounded by access roads. Eventually this entire buffer will be planted with trees, resulting in a shaded, cooler, and a wetter understory that is less susceptible to wildfire and the spread of gorse.

In the interim, wildfires originating inside the gorse containment area could be controlled by quickly "blacklining" the grassed fuel break and using backfires to determine the acceptable size of the gorse fire. If the spread of gorse is to be minimized, cattle should not be grazed in the gorse containment area or its grassed buffer as the risk of moving gorse seed outside through the sale or escape of cattle is high. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 2)

For Humu`ula South the Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels report indicates ideal grazing areas south of the gorse infestation and along Keanakolu Road where fuels would be reduced, gorse movement would be minimized, best AUY's exist, and natural recovery of adjacent lands could continue.



Humu`ula/Pi`ihonua Potential Pasture Areas for Fire Mitigation

Additional acreage pasture use is proposed for approximately 4,000-acres (these land areas are approximate references) - with about 2,000-acres designated for pasture along the Keanakolu-Mana Road and another 2,000-acres on the west side of the Mauna Kea Access Road (below the Radio Tower site and fronting Saddle Road and Mauna Kea Access Road.)

These areas proposed for additional acreage for pasture use are consistent with the Fire Plan and are proposed to be immediately available for beneficiary use. Additional acreage pasture use could also be in the form of Community Pasture.

Land reserved for future homesteads, beyond the initial area noted on the map above, is available for interim pasture use (in the south-eastern portion of the property - approximately 1,000-acres). This land is ultimately proposed for homesteading in the Initial Homesteading Area, however, while the homesteads are planned and awaiting development, in the interim, this land can be used as pasture. So, whether beneficiaries obtain a homestead or not, there is the opportunity for direct beneficiary benefit and use through additional acreage for pasture use.

Paddock Complex

Table 1 below reflects the current characteristics of this recommended South Paddock Complex, which consists of three new paddocks. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 2)

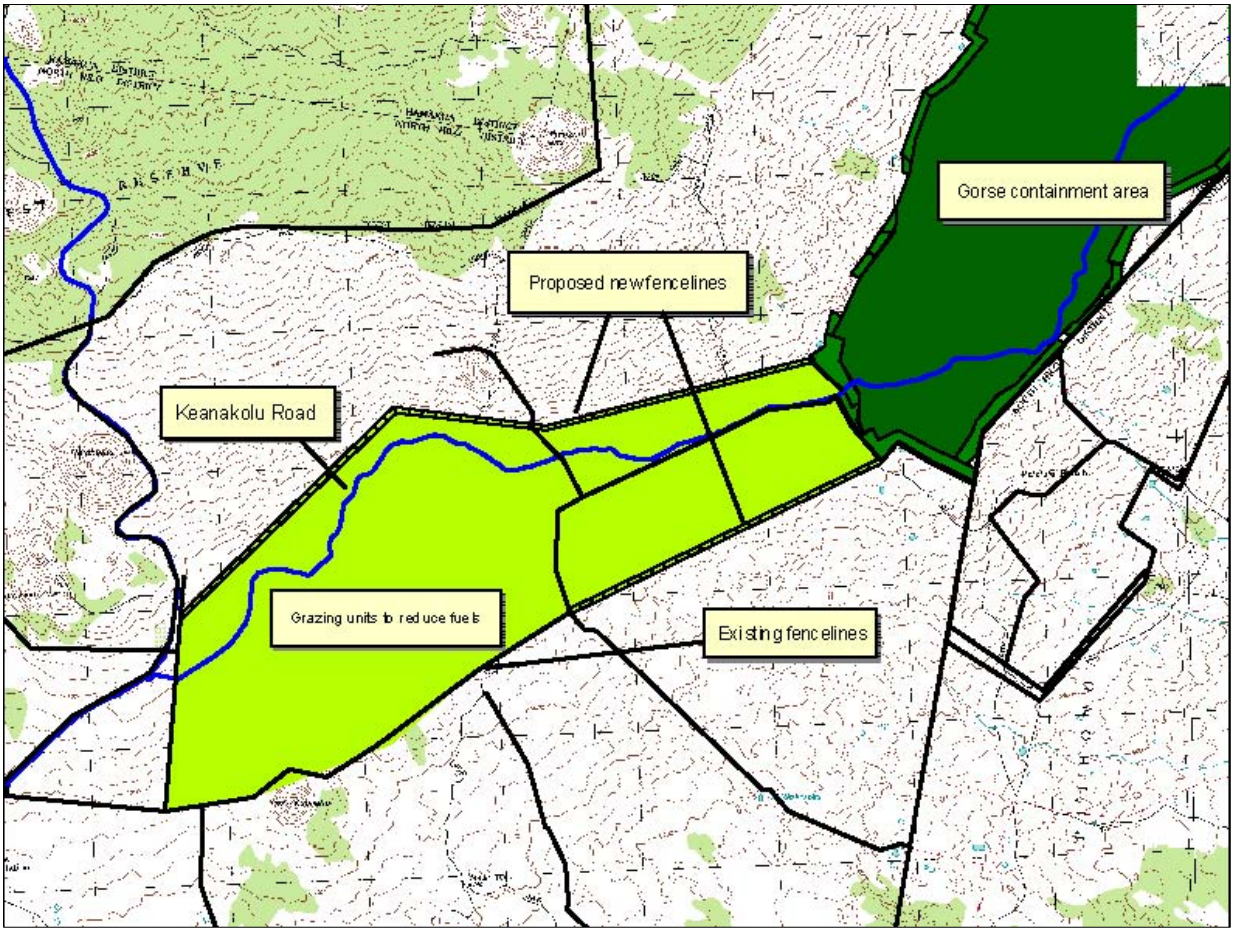
Table 1 – Characteristics of Humu`ula South Paddock Complex

Table 1 – Characteristics of Humu`ula South Paddock Complex	South Paddock Complex	West Paddock	Mauka Paddock	Makai Paddock
Total Acres	1,918	1,323	194	401
Acres in Pu`u `Ō`ō I paddock	198	37	161	0
Acres in Pu`u `Ō`ō II paddock	433	0	33	400
Acres in Huikau paddock	1,287	1,286	0	1
Fuel model 01 (light grass, scattered gorse)	1,568	1,061	185	322
Fuel model 02 (moderate grass, scattered gorse)	129	41	9	79
Fuel models 04/05 (minor grass, medium to heavy native species)	221	221	0	0
1997 appraisal AUY (based on rating of 7 AUY for area soils)	274	189	28	57
New fence lines required to manage complex (feet/cost @$5.00 per foot)	25,687/ $128,434	10,452/ $52,261	6,948/ $34,742	8,286/ $41,432
Annual Rent ($37.50 per AUY, 1997)	$10,275	$7,088	$1,039	$2,148
Estimated payback for fences (years)	12	7	33	19

Three paddocks (as described above) are suggested - West, Mauka, and Makai - using Keanakolu Road as a reference point. These paddocks use existing fence lines as much as possible, include the best grazing lands available, and have some water sources already in place. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 2)

A review of those paddocks indicates that AUY's vary greatly in these traditional paddocks, from 6 to 50 acres required per animal. This lowers the per acre value of the best areas for ranching and it is recommended that these paddocks be divided into more productive areas.

Two new fence lines would be required to create all of the new paddocks. Using a conservative AUY of 8 and a per AUY value of $37.50, the payback of fencing costs from rental fees range from a low of 7 years by developing the West Paddock to a high of 12 years for fencing all three. (Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels, Page 2)



Recommended Grazing Areas – Humu`ula South Side Complex

Educational Opportunities and Employment

The implementation of the `Āina Mauna Legacy Program offers the opportunity for others to visit and experience the natural and cultural resources of the Humu`ula/Pi`ihonua region and provide formal and informal educational opportunities for children and adults to:

- Connect with the world around them
- Have hand's on experiences in a healthy Hawai`i native forest
- Foster awareness, appreciation and understanding of Hawai`i and its natural and cultural environment
- Encourage wise stewardship of precious island ecosystems
- Participate in an unique and educational experience

The educational programs should consider involvement and participation with native Hawaiian immersion charter schools, other organized public and private educational entities, as well as partnership with existing private non-profit entities (such as Tropical Reforestation and Ecosystems Education (TREE), The Nature Center, etc.)

There is a need to manage and restore the forest resources on these lands, not only for their economic value, but also as a cultural and educational resource for future generations.

The Master Plan's "Vegetation Sensitivity Analysis" notes the educational potential of the area's natural resources. The natural resources of the project area provide abundant attraction for eco-tourism and environmental education. Many geological and biological elements come together within Humu`ula and Pi`ihonua. Most striking may be the contrast between the stark lava lands of Mauna Loa on the south side of Saddle Road and the Pu`u-studded slope of Mauna Kea to the North. Similarly, the change in elevation and rainfall provide a range of biological communities, from tall rain forest in Pi`ihonua to pioneer shrub lands in `Āinahou. Unique or endangered birds, plants and biological communities can be viewed by visitors or students of Hawaiian natural history. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document G-Vegetation Sensitivity Analysis, Page G-17)

School Education

One avenue for education is through charter Sschools. Many of the charter schools on the Island of Hawai`i have curriculum which deals with Hawaiian culture, agriculture and natural history. Humu`ula presents an excellent place for these students to learn and take part in "hands on" educational experiences.

There is also the opportunity for public school and private school students to also benefit from the educational opportunities in this region.

Mandatory `Āina Mauna Cultural, Natural Resources and Safety Briefing

One method to ensure that all visitors receive the information they need in order to better protect the `Āina Mauna's cultural and natural resources is to require everyone who visits/enters the area to participate in a mandatory `Āina Mauna cultural, natural resources and safety briefing.

The `Āina Mauna cultural, natural resources and safety briefing should include three important components.

- Cultural Briefing
- Natural Resources Briefing
- Safety Briefing

Specific contents of the `Āina Mauna cultural, natural resources and safety briefing will need to be determined. At a minimum, the briefing should include the following components:

Cultural Briefing

- History of the area
- Concerns regarding sensitivity of cultural resources
- Specific guidelines for culturally appropriate behavior
- Provide guidance and information as to what constitutes respectful and sensitive behavior

Natural Resources Briefing

- Concerns regarding sensitivity of natural resources
- Describe the status, condition and diversity of natural resources present, including biotic and physical elements
- Outline the potential and existing threats to the natural resources
- Litter and debris control
- Requirements of the Invasive Species Prevention, Control and Eradication Program
- Summarize the protection afforded the natural resources via various rules and regulations
- Provide expectations and requirements to avoid habitat damage

Safety Briefing

- Health and safety issues
- Rules and regulations
- Prohibitions
- Emergency procedures
- Restrictions on smoking and other potential fire sources
- Steps to take and consider regarding personal safety and potential hazards

There are many forms that the `Āina Mauna cultural, natural resources and safety briefing could take and DHHL staff would need to decide which will be the most appropriate for the `Āina Mauna area.

- Video
- Program (live in person)
- Brochure

There are several additional details that must be worked out before implementing a mandatory `Āina Mauna cultural, natural resources and safety briefing, including how often individuals would be required to attend the briefing (e.g., for each visit, annually, etc); location of briefing (at Sheep Station, elsewhere, commercial operator's vans, on the internet); and whether there will be any exceptions to requirements for attending a briefing.

Other details include working out how proof of attendance will be provided. Options include maintenance of a database of registered users, a colored armband or bracelet, a pin or button, etc.

The `Āina Mauna cultural, natural resources and safety briefing should be required for all who enter the property including visitors, tour operators and staff, DHHL staff, contractors, researchers and volunteers. It is recommended that, at minimum, commercial tour operators and existing and potential future staff and contractors are required to incorporate the `Āina Mauna cultural, natural resources and safety briefing into their programs. This requirement can be included in the various permit conditions and in all other contracts.

Employee/Volunteer Training Program

A separate training program for employees and volunteers should also be developed and approved by DHHL, in addition to the `Āina Mauna cultural, natural resources and safety briefing. The training will address field-personnel training, volunteer training and general staff training. General training requirements include review of applicable laws and regulations, and basic cultural and natural resources information.

Training requirements for all personnel involved in field-based management activities include general safety training, 4-wheel drive vehicle operation, briefing on working at high elevations, emergency response, CPR and first aid, and recognition of culturally significant areas and items and protected flora and fauna. All staff who access the area should receive safety briefings and basic cultural and natural resources training including basic emergency response training (including CPR and first aid).

Invasive Species Control Program

An Invasive Species Control Program would educate employees regarding the status, condition, diversity and protection afforded the natural resources present on the mountain.

Management tools to deal with invasive species include preventing new species from becoming established and controlling established species. Monitoring is a necessary component of both these tools.

Prevention and control measures for invasive species to consider include:

- Report any observation of intentional and/or accidental introductions of invasive species
- Request that everyone brush down their clothes and shoes to remove invasive plant seeds and invertebrates
- Require wash-down of all vehicles and equipment before they enter the area

Educational Materials

Educational materials in a variety of formats can be used on and off site to explain important aspects of `Āina Mauna. While printed brochures are useful for visitors on site and can be distributed from various outlets (Sheep Station, commercial tour operators etc), web-based products are more interactive and can reach a broader audience.

Types of brochures that could be developed, and distributed include educational materials, including newsletters, videos, and brochures on topics such as safety, cultural resources, natural resources, and recreational activities. Educational materials provided by commercial tour operators, should be reviewed and approved by DHHL to ensure the quality and accuracy of the information they provide to visitors.

Website Development

Web sites are an effective means of broadly distributing information. There should be consideration of developing an `Āina Mauna website. The website should be updated regularly to include information on the natural and cultural resources found in the area and on visiting the area safely and responsibly.

The website and an email list-serve can be used to distribute information pertinent to the community, to keep the public informed. Such information shall take the form of newsletters, announcing volunteer and educational opportunities.

Research

The uniqueness of the `Āina Mauna region presents an unparalleled opportunity for scientists and researchers to learn about the area. Historians as well as cultural practitioners can also benefit from the area. The `Āina Mauna region should be viewed as a place where people can come to learn about Hawai`i.

Employment Opportunities

Employment opportunities are an important component of the `Āina Mauna Legacy Program. While developing the `Āina Mauna Legacy Program the importance of job opportunities and training were emphasized by many. The `Āina Mauna Legacy Program will require a wide range of jobs and provide a wide range of job and training opportunities.

The restoration of the `Āina Mauna native forest will require a multitude of conservation oriented jobs. As noted in the DHHL Pi`ihonua Mauka Conservation Management proposal, Pi`ihonua Mauka has been managed for natural resource production for fifty years. The native Hawaiian community benefits economically from this managed area via conservation jobs which maintain the `ōhi`a forest, commercial jobs which reforest and harvest the koa forest, and by new visitor enterprises such as hiking, horseback riding, and bird watching. (Pi`ihonua Mauka Conservation Management Proposal, Page 1)

At Humu`ula, from 2003 to 2005, approximately 100-acres of koa harvest created five full time jobs. These jobs have continued with the on-going koa salvage currently taking place at Humu`ula. Not only can jobs be created through koa salvage operations, if some of DHHL's lands that can support koa forests were managed on a reasonable 50-year rotation between harvests, 5,000-acres would sustain this level of output indefinitely (50-years times 100-acres = 5,000-acres), thus, creating a permanent industry and job opportunities.

Commercial forestry can support possibly hundreds of new jobs. As a fully renewable industry, replicable over generations, it would help Hawai`i reduce its current dependence on wood product and energy imports, create an export industry, and create job opportunities for generations to come.

The adaptive reuse of the Humu`ula Sheep Station, eco-tourism opportunities, and homestead development, will also offer a variety of job and career opportunities.

Employment and economic development are key factors in considering ecotourism's business potential. One of the strongest arguments favoring ecotourism is the creation of employment opportunities for residents in rural areas. Although employment data on ecotourism is lacking in current literature, there

is evidence, particularly from nature-based tourism that ecotourism jobs are more desirable than other forms of employment in rural areas.

It has been reported that an excellent tour guide may collect an average of $100 to $300 per group and a guide working year-round can make up to $30,000 annually. There are also suggestions that nature-based tourism jobs have better advancement opportunities and a longer duration of employment. The degree of job safety is also high as compared to jobs in agriculture. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-10)

A recent DBEDT-TIM ecotourism survey indicates that for-profit nature-based operators in Hawai`i employ an estimated 5,195 full-time employees and an additional 2,000 part-time employees. As a benchmark for comparison, the hotel sector employed 38,000 workers in 1993. There are also a large number of volunteers reported on a seasonal basis. (Humu`ula/Pi`ihonua Master Plan, Technical Reference Document C-Preliminary Market Assessment, Page C-10)

Partnerships

Partnerships are an important component to any successful plan. The planning of Humu`ula is no exception. There are many partnerships available for DHHL to take advantage of especially in the areas of invasive species eradication, natural resources restoration, education, and funding.

During the creation of the Humu`ula/Pi`ihonua Master Plan, an Advisory Task Force Committee was formed to provide a broad range of expertise in planning of the Humu`ula/Pi`ihonua area. Some of the issues discussed by the Committee were in relation to partnerships and collaboration. These included partnering with Hakalau Forest National Wildlife Refuge to create wildlife corridors and buffers as well as working with the military at Pōhakuloa Training area on gorse eradication and control.

Invasive Species Control – Big Island Invasive Species Committee

The control of alien species (such as gorse and banana poka) within these lands is also critical to maintaining the value of forest resources and needs to be included as part of an overall management plan. (Humu`ula/Pi`ihonua Master Plan, Page 59)

Cooperative efforts with the State Department of Agriculture, DHHL, and individual ranches are underway to implement a program to control and eliminate the gorse problem. In February 1997, a new Gorse Steering Committee was formed that included interested Federal, State, County and private businesses to integrate all related efforts to gorse control and eradication. The military has also suggested the potential of utilizing the gorse area in training activities that would include burning and clearing of the gorse. (Humu`ula/Pi`ihonua Master Plan, Page 60)

Watershed Partnership – Mauna Kea Watershed Alliance

Watershed Partnerships are voluntary alliances of both public and private landowners committed to the common value of protecting forested watersheds for water recharge, conservation, and other ecosystem services through collaborative management. The first Watershed Partnership began in East Maui in 1991. Today, there are nine statewide on six major islands - Kaua`i (1), O`ahu (1), Lāna`i (1), Moloka`i (1), Maui (3), and Hawai`i (2).

Together, these partnerships involve over 45 private landowners and 24 public agencies that cover over 1.6 million acres of land in the state. The Hawai`i Association of Watershed Partnerships (HAWP) is comprised of nine Watershed Partnerships on six islands. HAWP seeks to increase the management and protection of such areas by raising the capacity of Watershed Partnerships, facilitating the sharing of watershed management knowledge, building public support and awareness of watershed values, and developing sustainable funding sources.

University of Hawai`i, Hilo – College of Agriculture, Forestry and Natural Resource Management

The College of Agriculture, Forestry, and Natural Resource Management (CAFNRM) provides quality education to assist individuals in acquiring the scientific knowledge, attitudes, and practical skills needed to practice environmentally sound, sustainable agriculture, forestry and natural resource management and to be productive and responsible global citizens.

The program blends comprehensive classroom instruction with practical, technology-based, hand-on education through the use of the University of Hawai`i at Hilo Agricultural Farm Laboratory and on-campus laboratory facilities.

The College is especially interested in moving agriculture and natural resources in the tropical and semitropical areas of the Pacific Basin toward more economical and self-sustaining methods. CAFNRM provides student interns through the Hawaiian Intern Program (HIPP) and the Pacific Internship Program for Exploring Science (PIPES) program to serve on natural resource projects.

Timber Management

The Humu`ula/Pi`ihonua Agricultural Master Plan notes that because new information about koa and other timber product cultivation is becoming rapidly available, management needs to utilize all resources available. Resources listed include:

- Hawai`i Agricultural Research Center (formerly HSPA)
- State of Hawai`i, Department of Land and Natural Resources, Division of Forestry and Wildlife
- University of Hawai`i, Manoa - College of Tropical Agriculture and Human Resources (CTAHR)
- University of Hawai`i, Hilo - College of Agriculture, Forestry and Natural Resource Management (CAFNRM)
- U.S. Fish & Wildlife Service (Hakalau Forest National Wildlife Refuge)
- USDA Forestry Service (Honolulu)
- USDA Natural Resources Conservation Service (Hilo)

Funds should be budgeted to provide for ongoing research in support of the proposed forestry program. Hawai`i Agricultural Research Center (formerly HSPA), the University of Hawai`i, Hilo, College of Agriculture, Forestry and Natural Resource Management and the University of Hawai`i, College of Tropical Agriculture and Human Resources have researchers with the expertise necessary to conduct the requited research. Because both the state and federal government are promoting forestry as well as many private groups and foundations, matching grants are available.

Mauna Kea Neighbors

The Mauna Kea Neighbors partnership was initiated in 2003 by the Department of Land and Natural Resources. The partnership is made up of representatives from a variety of area landowners and was formed in recognition that different landowners along the slopes of Mauna Kea share a responsibility to work together to help protect and manage the area.

A series of periodic meetings began in early 2004 with landowners taking turns hosting each meeting with the agenda focused on the activities and accomplishments of the host. Group members were able to learn more about their neighbors and have a chance to see firsthand what challenges and opportunities each face on their property.

The meetings were additionally a way for landowners to consider opportunities for partnerships. Ultimately the meetings moved all participants toward a better understanding of who their neighbors in the area are and what they are doing.

The meetings offer a chance for landowners to look toward the future of the Mauna Kea area and work together to help guide the future plans for the area in a cooperative stewardship of Mauna Kea:

- State of Hawai`i, Department of Hawaiian Home Lands
- State of Hawai`i, Department of Land & Natural Resources
- Office of Hawaiian Affairs
- U.S. Army - PTA
- Waiki`i Ranch
- Parker Ranch
- University of Hawai`i Institute for Astronomy
- U.S. Fish & Wildlife Service - Hakalau Forest National Wildlife Refuge
- Hawai`i Island Economic Development Board
- Office of Mauna Kea Management
- University of Hawai`i, Hilo - College of Agriculture, Forestry and Natural Resource Management

In addition, other entities to consider are:

- Sierra Club - Moku Loa Group
- The Nature Conservancy
- Hawaiian Heritage Program
- Hawai`i Forest Industry Association
- Alternative Energy Producers
- Eco-Tourism Industry
- Hawai`i Island Chamber of Commerce

Alternative Funding Sources

The following describes alternative funding sources including grants, partnerships, and other sources of funds for among other things, invasive species control, forest product production, alternative energy projects, forest management, cultural programs, wildlife management and protection. Initial, preliminary listing of possible options for funding include:

Conservation Resource Enhancement Program (CREP) - An offspring of the Conservation Reserve Program (CRP), CREP is a voluntary program for agricultural landowners. Unique state and federal partnerships allow you to receive incentive payments for installing specific conservation practices. Through the CREP, farmers can receive annual rental payments and cost-share assistance to establish long-term, resource-conserving covers on eligible land. CREP is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water. This program is in the process of being activated in Hawai`i, but at the present time is not available.

Western Wildland Urban Interface Grant Program - The Western Wildland Urban Interface Grant Program awards funding through a competitive process with emphasis on hazard fuel reduction, information and education, and community and homeowner action. This portion of the National Fire Plan was developed to assist interface communities manage the unique hazards they find around them. Long-term solutions to interface challenges require informing and educating people who live in these areas about what they and their local organizations can do to mitigate these hazards. There is a 50/50 match requirement and each grant request is limited to a maximum of $300,000.

Clean Water Act Section 319 - The Nonpoint Source Management Program Section 319 is an amendment to the Clean Water Act to establish a Nonpoint Source Management Program to help focus State and local nonpoint source efforts. State, Territories, and Indian Tribes receive grant money to

support a variety of activities such as technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring. The State, Territory, or Indian Tribe may take the provided funding and contract out to local organizations to help meet the objectives of the Act.

Private Lands Initiative - The Private Lands Initiative involves a cooperative agreement between an armed service and a non-governmental organization (NGO) or a state/local agency to cost-share the purchase of land titles or conservation easements from willing land owners (at market value) to minimize incompatible use. The NGO or state/local agency purchases and manages the land titles or easements.

Army Compatible Use Buffers Program - A program of the US Army the Army Compatible Use Buffers Program is available to NGOs or state/local agencies to purchase a portion of land (titles or conservation easements). The program helps the Army meet Endangered Species Recovery Act and prevention of future threatened and endangered species listings. The program offers a possible reduction in land taxes, is permanent and the Army may use the land for low-impact training.

Partners for Fish and Wildlife - The Partners for Fish and Wildlife program is administered by the US Fish and Wildlife Service. Its purpose is to restore natural habitats and provide long-term benefits to threatened and endangered species and satisfy the needs of wildlife populations on National Wildlife Refuges. There is a 10-year minimum commitment, up to a 50% cost-share and technical assistance is also provided.

Environmental Quality Incentives Program (EQIP) - This program is a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. Cost-Share 75/25.

Wildlife Habitat Incentives Program (WHIP) - This program is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP, USDA's Natural Resources Conservation Service provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. Cost-Share 75/25.

State Forest Stewardship Program (FSP) - The purpose of this program is to assist non-industrial private forest landowners whom manage their forests and related resources to increase the economic and environmental benefits of their lands. Cost-share funding opportunities for private landowners range from $5,000 to $75,000 per year, for 10 yrs, with a following maintenance period. Cost-Share 50/50.

Urban & Community Forestry (Kaulunani) - This program promotes the creation of healthier, more livable urban environments. Kaulunani maintains, restores, and improves the health of urban trees, forests, green spaces and sustainable forest ecosystems. The Program provides educational, technical and cost-share funding to cities, counties, schools, and community groups in urban areas. Kaulunani funding is available ranging from $1000 to $10,000 for cost-share projects. Matching for this program comes primarily from public and private community, in-kind project contributions and/or labor. Cost-Share 50 Federal/50 Landowner.

Watershed Partnership Program - These programs are voluntary alliances of public and private landowners committed to the common value of protecting large watersheds for water recharge and other values. Presently eight (8) successful watershed partnerships have been established covering

thousands of acres. On the ground projects focus on alien species control, fencing, ecosystem restoration, and technical assistance.

Safe Harbor Agreements (SHA) - These agreements encourages proactive natural resource management to benefit endangered and threatened species. It provides regulatory assurances that future property-use restrictions will not be imposed if those efforts attract endangered or threatened species to their enrolled property or result in increased numbers or distributions of listed species already present.

**State of Hawai`i Legacy Land Conservation Fund** - This program provides a source for funding for the conservation of Hawai`i's unique and fragile places and resources. State, county agencies and non-profits who are seeking funding to acquire property from private entities may apply for this grant. Proposed projects may include acquisition of fee title or conservation easements. Cost-share funding is only required of nonprofit organizations. Cost-Share 75/25.

Cooperative Forest Health Protection - This program directs and implements measures to prevent, retard, or suppress unwanted, native and non-native invasive insects, pathogens, and plants affecting trees and forests. The primary goals are to minimize the spread of established invasive species and reduce damage caused by native insects and diseases. The program protects and improves America's forests using cutting-edge technology to rapidly respond to forest health threats. Funding and technical assistance is available for insect and pathogen management for private landowners through the State. This program is committed to finding innovative ways to rapidly respond to forest health threats to avoid unacceptable loss of forest resources. Cost-Share 50/50.

Watershed Forestry Assistance Program (WFAP) - The Healthy Forest Restoration Act (HFRA), contains two watershed forestry assistance programs (WFAP), State Watershed Forestry Assistance and the Tribal Watershed Forestry Assistance Programs that are to be administered by the Secretary of Agriculture through the Chief of the Forest Service. The Forest Service is working with State Forestry Agency personnel and with Indian Tribes to develop separate guidelines for the State and the Tribal Watershed Forestry Assistance Programs.

Memorandums of Agreement (MOAs) - Example, Wao Kele o Puna provides habitat for a variety of native species and serves as an important seed bank for future restoration to nearby lava flows. After the acquisition of the property by OHA, OHA and DLNR signed a MOA for the management of the area. OHA provides funding and DLNR implements the management functions. This MOA can serve as a model for developing partnerships to help DHHL gain capacity and bring together contemporary management skills with traditional practices for the best overall management of the land and forest which could be applied to Humu`ula and Pi`ihonua as well.

The following are conservation related organizations which could be partnered with and may offer assistance in development of conservation plans.

**Hawai`i Island Land Trust (HILT)** - HILT is a community-based, non-profit organization whose mission is to provide an inclusive approach to land conservation on the Island of Hawai`i. HILT works with landowners who voluntarily choose to protect their land and collaborates with individuals, other non-profits, and governmental organizations to achieve conservation objectives. HILT uses a variety of tools to protect lands such as voluntary conservation easements, land donations, or fee-simple purchases.

The Nature Conservancy - The mission of the Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on earth by protecting the land and waters they need to survive. The Nature Conservancy has developed a strategic, science-based planning process, called Conservation by Design, which helps to identify the highest-priority places, landscapes and seascapes that, if conserved, promise to ensure biodiversity over the long term. In other words, Conservation by Design allows the achievement meaningful, lasting conservation results.

The Trust for Public Lands - The Trust for Public Land (TPL) is a national, non-profit land conservation organization. TPL works with private and corporate landowners, community groups, cities and towns, and public agencies at the State and Federal levels. TPL strives to find ways that lets everyone work together, achieve our conservation goals, and see that many of America's most special places are preserved. TPL's mission statement is simple: to conserve land for people. The work, however, is complex, challenging, and rewarding. In 25 years, more than 1 million acres of land, valued in excess of $1.2 billion dollars, have been protected by TPL.

**Hawai`i Invasive Species Council (HISC)** - HISC is a government body established by the Legislature of the State of Hawai`i with the authority to provide funding for the removal of and the establishment of State policy related to invasive species. The Hawai`i Invasive Species Council's special purpose is to foster coordinated approaches that support local initiatives for the prevention and control of invasive species, such as the coordinating group on alien pest species and the island invasive species committees.

Youth Conservation Corps (YCC) - The Youth Conservation Corps is a hands-on summer learning experience educating Hawai`i's youth. Members and team leaders receive a stipend and if eligible, will receive three (3) college credits upon successful completion of the program. YCC programs are held on the islands of O`ahu, Maui, Moloka`i, Kaua`i, and the Big Island.

Preliminary Operating Budget

`Āina Mauna Legacy Program - Operating Budget

Operating Statement
(Existing and Stabilized) - stabilized operating revenue expected in 2012 after procurement

Revenue:		**Subtotals**	**2010**	**Start-up 2011**	**Phase In 2012**	**Stabilized 2013 +**
Timber license/lease						
(10,000 x $15/ac)		$150,000				
(10,000 x $5/ac) (restoration activities)		$50,000		$200,000	$200,000	$200,000
Koa Salvage						
($3,500/ac)			$300,000	$300,000	$300,000	$150,000
Sheep Station lease						
(base rent)		$50,000				
(percentage)						
Alt 1	Campground	$5,000		$55,000		
Alt 2	Campground	$5,000				
	Cabins (10)	$10,000				
	Commercial	$20,000			$85,000	
Alt 3	Campground	$5,000				
	Cabins (20)	$20,000				
	Commercial	$150,000				$225,000
Remote Accommodations lease(s)				$25,000	$25,000	$25,000
Eco-tourism licenses						
(percentage-variable)		$50,000	$40,000			
(restoration activities or match)		$5,000		$55,000	$65,000	$75,000
Conservation support (Grants/match)				$500,000	$500,000	$500,000
Total Operating Revenue			$340,000	$1,135,000	$1,175,000	$1,175,000

Expenses:		2010	Start-up 2011	Phase In 2012	Stabilized 2013 +
Start-up Costs					
Vehicle (1)	$30,000			$30,000	
Quads (2)	$20,000		$10,000	$10,000	
Office/Accommodations at Sheep Station			$250,000	$30,000	
Kanakaleonui Propagation Facility			$70,000		
Pu`u `Ō`ō Propagation Facility				$54,000	
Operating Expenses					
Personnel (salary and employment costs)					
Manager	$100,000	$100,000			
Compliance/Grants/Field Work	$75,000		$175,000		
Field Work	$50,000			$225,000	$225,000
Vehicles and equipment usage	$10,000	$4,000	$10,000	$10,000	$10,000
Office operations		$4,000	$4,000	$5,000	$5,000
Invasive Species Management		$50,000	$75,000	$100,000	$100,000
Reforestation		$150,000	$500,000	$600,000	$700,000
Road Maintenance				$30,000	$30,000
Fence Maintenance				$40,000	$45,000
Total Operating Expenses		$308,000	$1,094,000	$1,134,000	$1,115,000
Excess Revenue after Expenses		$32,000	$41,000	$41,000	$60,000

Summary Budget Information

The following are some order-of-magnitude estimated revenues and costs associated with some of the facilities and programs to be implemented in the `Āina Mauna Legacy Program. Ultimately, refinement of many of these estimates will be more defined, as details of each facility are better known.

As noted in the `Āina Mauna Legacy Program mission, a fundamental principal is that the program is economically self-sustaining. That means costs are covered by revenue generated from the property. Given the scope and scale of the needs, it may mean that certain capital and operating expense items may have to be deferred and delayed until sufficient funds are available.

These revenue and cost estimates address preferred/needed expenditures; they may need to be deferred due to availability of funds. It is the intention that during the implementation phase revenue generating items be initiated first, in order to raise funds for management and implementation.

In addition to the magnitude of the expense for construction, since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management.

While the Homestead lots will be rurally-developed because of the area's remote location and lack of traditional infrastructure, the cost of development is significant and beyond the scope and capacity for the remaining revenue-generating opportunities proposed on the property. These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses.

Administration-Base Facility

Cost

Establish Base Facility in vicinity of Sheep Station (1st phase) $400,000
(Office, accommodations for staff, lab, restrooms, catchment, storage, etc)

Expansion of Base Facility (2nd phase) $1-million
(Dormitory, storage, restroom/shower, support facilities)

Photovoltaic system /low wind speed generators $1-million
(Base facility, water system, propagation centers/field worker facilities and Humu`ula Sheep Station - power, battery storage, generator backup)

Native Forest Reforestation

Revenue

Easement Payments (estimate) $45-per acre

Conservation Support (estimate) $500,000-per year
(Grants/match)

Cost

Kanakaleonui Propagation Center (1st phase) (Greenhouse, composting toilet, storage, catchment, etc)	$70,000
Kanakaleonui Field Worker Facility (2nd phase) (Bunkhouse 15-20 people, restroom/shower, kitchen, dining, lab, storage, catchment, etc)	$400,000
Kanakaleonui Field Worker Facilities (3rd phase) (Bunkhouse 15-20 people, restroom/shower, storage, office, catchment, etc)	$300,000
Pu`u `Ō`ō Propagation Center (1st phase) (Greenhouse, composting toilet, storage, catchment, etc)	$54,000
Pu`u `Ō`ō Field Worker Facility (2nd phase) (Bunkhouse 15-20 people, restroom/shower, kitchen, dining, lab, storage, catchment, etc)	$400,000
Pu`u `O`o Field Worker Facilities (3rd phase) (Bunkhouse 15-20 people, restroom/shower, storage, office, catchment, etc)	$300,000
Native Forest Restoration	$2,000-per acre
Some breakdown of component costs:	
Site preparation	$150-$180-per acre
Herbicide	$70-per acre
Fertilizer	$250-per acre
Ungulate Control	
New Fencing	$7 - $10-per lineal foot
Fence Replacement	$5-per lineal foot
Fence Maintenance	$5-per lineal foot

<u>Sustainable Koa Reforestation</u>

Revenue

Koa Salvage (dead and dying koa harvesting)	$3,500-per acre

Cost

Sustainable Koa Forest Reforestation	$2,000-per acre
Some breakdown of component costs:	
Site preparation	$150-$180-per acre
Herbicide	$70-per acre
Fertilizer	$250-per acre

Unmanaged-Ungulate Control

Cost

New fencing	$7 - $10-per lineal foot
Fence Replacement	$5-per lineal foot
Fence Maintenance	$5-per lineal foot

Site Development and Homestead Development

Based on actual costs and estimates in the Honokaia Homestead and Pastoral Infrastructure, Humu`ula Rural Villages Plan and the Humu`ula/Pi`ihonua Master Plan the overall site infrastructure cost and cost per home are listed below. (Infrastructure includes roadway improvements, storm drainage system, fencing, septic/leach fields, community Park, water system, electrical/solar system, plus contingency.)

Cost

Infrastructure Construction Estimate - `Ōiwi Plan (100 homesteads)		$11,000,000
Community Infrastructure	$66,000-per home (based on 100-homes)	
Individual Home Infrastructure	$44,000-per home (based on 100-homes)	
Total Infrastructure (community and home)	$110,000-per home (based on 100-homes)	
Total Infrastructure – Humu`ula Master Plan		$15,670,000
(Proposed 50 to 150 pastoral homesteads)	$105,000 - $313,400 per lot	
Infrastructure Construction Cost – Honokaia		$7,820,000
(No water, 27-pastoral lots in two phases)		
Dividing evenly regardless of lot size	$289,600-per lot	
Individual homestead power/water cost estimates		
3KW PV system and battery backup	$34,000-per home	
Rain Catchment System	$8,000-per home	

Water System

Cost

Water System (for base facility/Sheep Station area - single well)		$8-million
Drilling and finishing well development - $1,000 per foot of depth	$5-million	
Potable water storage and distribution to Base Facility/Sheep Station area	$3-million	
Stock water construction and distribution		$2-million
(Intent is to incorporate PTA military training into reservoir construction effort)		
Humu`ula Master Plan estimate for deep well water system		$11.5 to $13.3-million
50-homesteads - $11,500,000		
500-homesteads - $13,300,000		

Humu`ula Master Plan estimate for catchment water system $2.2 to $8.1-million
50-homesteads - $2,000,000
500-homesteads - $8,100,000

Timber License Lease

Revenue

License/Lease ($20 per acre) $200,000-per year
(Actual revenue will be determined by a broad-based RFQ/RFP process. Hamakua lease rents for large-scale timber operations are approximately $40-$50 per acre - the estimated lease rent from the `Āina Mauna is discounted due to the anticipated added costs for tree cultivation, differences in the areas and prior uses, and need to address the gorse during the planting stage)

Remote Accommodations

Revenue

Lease $25,000-per year
(Actual revenue will be determined by a broad-based RFQ/RFP process. Estimates noted here relate to figures presented in the Humu`ula Sheep Station Adaptive Reuse Plan.)

Eco-Tourism

Revenue

License $50,000 - $75,000-per year
(Actual revenue will be determined by a broad-based RFQ/RFP process. Estimates noted here relate to figures presented in the Humu`ula Sheep Station Adaptive Reuse Plan.)

Humu`ula Sheep Station

Revenue

Lease $55,000 - $225,000 per year
(Actual revenue will be determined by a broad-based RFQ/RFP process. Estimates noted here relate to figures presented in the Humu`ula Sheep Station Adaptive Reuse Plan.)

Cost

Humu`ula Sheep Station restoration/development $1-million
(Historic property restoration and other site development)

Gorse Eradication and Control

Revenue

Timber License ($20 per acre) $200,000-per year
From trees to shade gorse (eucalyptus, sugi etc)
(Actual revenue will be determined by a broad-based RFQ/RFP process. Hamakua lease rents for large-scale timber operations are approximately $40-$50 per acre - the estimated lease rent from the `Āina Mauna is discounted due to the anticipated added costs for tree cultivation, differences in the areas and prior uses, and need to address the gorse during the planting stage)

Cost

Aerial spraying $70+ per acre
Helicopter boom spray $30 per acre
Herbicide $41 per acre

Mulching $650-per acre
(This also equates to approximately $240-per hour)

Example of Unmanaged-Ungulate Control

Revenue

Assuming 1,100 head of marketable cattle are captured $330,000

Cost

Unmanaged Ungulate control overall cost $291,000
Fence Replacement of 38,000 lineal feet @ $5.00 per lineal foot $190,000
Fence Maintenance of 19,000 lineal feet @ $5.00 per lineal foot $95,000
Lottery Administration of 60 months @ $100 per month $6,000

Example of Cost and Timing for Sustainable Koa/Native Forest Reforestation of 500 acres

Cost

Total initial cost $1,180,000
Site prep, herbicide, planting, fertilizer, etc
500 acres @ $2,000-per acre $1,000,000
Fencing of 500 acres (18,800 lineal feet) @ $8 per lineal foot $180,000
Initial plantation-style (Sustainable Koa) or "Islands" (Native Forest) planting is proposed
Sustainable Koa - (7 x 7-foot spacing; approximately 800 – 1,000 seedlings per acre)
Native Forest – (30 x 30 spacing of islands with diversity of native plants in each "Island")
Experienced planters can plant approximately 1,000-1,500 seedlings per day
Volunteer planters can plant approximately 50-150 seedlings per day
Assume 200 seedlings planted per day x 20 planters = 4,000 seedlings planted per day
Assume team of twenty volunteer planters, 500-acres can be planted in ~6 months
Ongoing management includes weed control, fertilizer and thinning.

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Assessment of Pi`ihonua: A Brief Assessment for Beneficiary Ranching Leases at Pu`u `Ō`ō Ranch - N. Duke Kapuniai and `Ōiwi Lōkahi o ka Mokupuni o Keawe - March 2005

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Appendix A - Revised Substitute Motion -Hawaiian Homes Commission
Appendix B - Archaeological Filed Inspection Report - Todd Tulchin & Hallett H. Hammatt Ph. D, Cultural Surveys Hawai`i, Inc.
Appendix C - Humu`ula and Pi`ihonua Native Traditions, Historical Accounts and Oral Interviews Report - Kepā Maly & Onaona Maly, Kumu Pono Associates, LLC
Appendix D - Personal Interview Final Report

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- Appendix - A - Planning Team members and Special Study Consultants
- Appendix - B - Planning Process/Work Plan
- Appendix - C - Alternative Concepts Considered/Evaluation of Alternatives
- Technical Reference Document - A - Community Input and Meeting Notes - PBR, Hawai`i
- Technical Reference Document - B - Agricultural Assessment - Agricon Hawai`i
- Technical Reference Document - C - Preliminary Market Assessment - RE2
- Technical Reference Document - D - Economic Assessment - RE2
- Technical Reference Document - E - Legal and Institutional Area: Overview of the Legal Context for Homestead Awards - Allen Hoe, Esq.
- Technical Reference Document - F - Gorse Assessment Report - Ron Terry, Ph. D
- Technical Reference Document - G - Vegetation Sensitivity Analysis - PBR Hawai`i & Grant Gerrish, Ph. D, Natural Sciences Division, University of Hawai`i at Hilo

Technical Reference Document - H - Biological Sensitivity Analysis - Reginald E. David, Pacific Biological Survey

Technical Reference Document - I - Archaeological Review and Predictive Model - D. Kyle Latinis, M.A., Scientific Consultant Services Inc.

Technical Reference Document - J - Infrastructure Feasibility Study - R. M. Towill Corporation

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Hawai`i Register of Historic Places, Historic Sites Information and Review Form, Humu`ula Sheep Station - Department of Land and Natural Resources, Division of State Parks - June, 1973

Feedback - Waimea Consultation Meeting - 09/23/09 - Response to Questions/Comments

Approximately 30 people attended the September 23, 2009 Waimea Beneficiary Consultation meeting at Kuhio Hale. The following are questions and comments raised at the meeting. Each was responded to and, for the most part, the information was noted to already be contained in the report. The responses on the right column reflect the response at the meeting, as well as generally stated in the report.

Homesteading	
Is the lower area, near the road, for homesteading covered in lava?	A small portion of that property has lava, near the road. Homesteads would be built away from the road, so this area would serve as a buffer to the road.

Program Process	
Who were the different parties involved in the process? Who drew up the plan? Who was involved?	The Program is based on several past studies. Ho`okuleana LLC was hired to write the Program and is the consultant for this project.  During the development of the `Āina Mauna Legacy Program, the `Āina Mauna Legacy Program Advisory Group was formed to provide advice and recommendations in identifying the optimum land use, infrastructure patterns, best management practices and estimated financial requirements to achieve the goals of the `Āina Mauna Legacy Program. Group members served as liaisons between their constituents and communities, as well as helped with outreach to their respective communities on behalf of the `Āina Mauna Legacy Program. Additionally, the draft Executive Summary is posted on the DHHL website and the draft Program has been circulated to many different entities including native Hawaiian, environmental, and community groups.
What is the timetable for the Program? When will beneficiaries get on to the land?	We would like to bring the Program before the HHC in November. Once it has been approved we would like to begin implementation immediately. The Program identifies 12 Initial Immediate Actions which would begin immediately: • Form the `Āina Mauna Legacy Program Implementation Advisory Council • Initiate the first rural-development Homestead Area (on south-eastern portion of the property) • Initiate the Humu`ula Sheep Station Adaptive Reuse Plan • Initiate expanded Ecotourism opportunities • Initiate use of Remote Accommodations • Initiate gorse eradication (consider all viable gorse eradication opportunities, with commercial timber appearing to be the most viable and beneficial to the Department) on approximately 10,000-acres or other viable gorse eradication opportunities • Investigate and implement additional areas for sustainable koa forestry opportunities

	• Initiate a set-aside of portions of the property for restoration and enhancement purposes • Pasture uses (focused on fire fuel mitigation – additional acreage) around Keanakolu-Mana, Saddle and Mauna Kea Access Roads • Initiate unmanaged-ungulate eradication over entire property • Initiate state, federal and private grant applications to support resource restoration • Initiate Safe Harbor Agreement to address endangered species over the entire property
What funding is available? Who will get the money?	One of the central focuses of the `Āina Mauna Legacy Program is that the activities and programs implemented need to be economically self-sustaining, with the goal to reinvest the revenue into the management of the property and implementation of the Program. In considering revenue generation, several opportunities exist including expansion of the existing commercial koa sales, adaptive reuse the Humu`ula Sheep Station, Ecotourism and others. The Program will also initiate State, Federal and Private Grant Applications to Support Resource Restoration including: • Conservation Resource Enhancement Program (CREP) • Partners for Fish and Wildlife • Wildlife Habitat Incentives Program (WHIP) • State Forest Stewardship Program (FSP) • Watershed Partnership Program (Mauna Kea Watershed Alliance) • Army Compatible Use Buffers Program The Program will seek separate earmarked funds through State and Federal funding sources. Due to limitations in Federal regulations, Na Kupa`a O Kuhio should be considered to take advantage of Federal funding opportunities

Commercial Forestry to Eradicate Gorse	
Gorse should be eradicated first! How do you know Sugi and Eucalyptus will work? Why not plant native trees like naio? Won't native trees work better with the ecosystem?	The Program looks to begin gorse eradication as soon as possible. It will be one of the first actions taken, once the Program is approved. The Program suggests timber to fight gorse but also allows for other viable gorse eradication opportunities. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. Eucalyptus and Sugi have been proposed because they have proven successful in fighting gorse and others are willing to pay

	rent in order to plant and manage the trees. The existing development of these crops in the general area have given rise to increased investment in required infrastructure including marketing and market development efforts by a number of public and private entities. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands. Gorse has a life span of 30 to 40-years while the seed can remain viable in the soil for up to 70-years after that. DHHL field trials and research projects have shown that shade from trees inhibit the ability for gorse to grown and spread. It is anticipated that commercial-scale timber planting (the initiation of Gorse Eradication Utilizing Commercial Timber - to include biomass for alternative energy on approximately 10,000-acres) will shade the gorse sufficiently to keep it from producing seeds and perhaps kill it. With normal forestry operations, each year some portion of the seed bank will be removed. Shading has proven to be a method for killing gorse, and also generates revenue for the department however, if other viable gorse eradication processes are developed, they will be considered as well. DHHL field trials and research projects have shown that shade from native trees species such as koa are not effective on gorse because they do not produce enough shade. Eucalyptus, sugi or others trees are selected to eradicate and control the gorse; once the gorse eradication process is well underway, the area is to be reforested back to a native koa.

Feral Ungulates	
Wild pigs are part of the ecosystem; won't eradicating them hurt the environment?	• Unmanaged-ungulates (hoofed mammals such as cattle, sheep, pigs, goats, etc) introduced to Hawai`i can be detrimental to Hawai`i's native ecosystems via the damage they can inflict on both vegetation structure and composition. • Ungulates impact native plants and ground cover, facilitating sediment run-off • Soil disturbance caused by rooting ungulates also facilitates the introduction and expansion of invasive plants and creates breeding grounds for mosquitoes that transmit avian disease to native forest birds. • Feral Ungulates can have high population growth rates

	• Feral Ungulates are elusive and can jump or circumvent most existing fences.
	• Four main components in successful Feral Unmanaged-Ungulate population control (primarily sheep, cattle and goats)
	  o Establishment of Barriers to Isolate Populations
	  o Remove sufficient numbers of animals to prevent unacceptable damage to the land and its resources
	  o Barrier Installation, Inspection and Maintenance
	  o Vigilance in Monitoring of Animal Population Increase and Ingress
	• Methods for Removal of Feral Unmanaged-Ungulate Populations
	  o Beneficiaries Capture
	  o Professional Capture
	  o Professional Eradication
	• Ultimately, additional Fencing is required to exclude ungulates from sensitive areas
	• Additional Roadways will need to be added for access (also serving as beneficial fire breaks)
	• Implementing unmanaged-ungulate eradication (primarily sheep, cattle and goats) and allowing management of pigs (so long as the resources are protected) will provide food for beneficiaries, reduce the impacts to the forest resources and generate revenue for the Trust.

Water	

Where is the water going to come from? Will the current reservoir be used? Can homesteads survive on catchment?	Initial water will come from catchment. The area for homesteading fits within the County's required rain amount for a catchment system. A well will also be explored, although its cost (it could be in excess of $5 million) makes it not an immediate choice or option.
	
	Water Resource Management and Planning will include the following Water Source Opportunities:
	• Investigate reported springs and restoration to supplement water needs
	• Rainwater Capture/Collection
	  o Catchment (water tanks) for small scale-residential, pasture
	  o Reservoirs for larger scale collection
	• Fog drip to supplement rainwater catchment
	• Investigate groundwater wells (deep well)
	  o Initial exploratory well above the Sheep Station

With more forests won't there be more water?	We believe that increased forest cover will result in water resources benefits. The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL

	trust. Based on soil, elevation, and rainfall characteristics, there are an estimated 17,800-acres in Humu`ula and adjacent Pi`ihonua mauka that could be restored back to a healthy, diverse native koa and `ōhi`a forest ecosystem. Likewise, there are approximately 10,000-acres across the mauka portions of the property that can be restored to māmane forest, a critical Palila bird habitat. There are strong recommendations to enhance and restore various areas in the overall property because of their importance as habitat, biodiversity and condition (and ability to restore) as native forest. The setting aside, protection and restoration of these areas is critical for the protection, restoration and enhancement of `Āina Mauna.

Pasture	
What will the process be for pasture areas?	Dispositions of Homestead and Pasture Leases, Licenses and/or RPs: • Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management. • These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses • While the Homestead lots will be rurally-developed, due to the areas remote location and lack of traditional infrastructure, the cost of development is likely to be significant and beyond the scope and capacity for the remaining revenue-generating opportunities proposed on the property.

Other	
Is Parker Ranch liable for gorse since they had the last lease?	The Program is moving forward with gorse eradication as described above. The department is free to pursue remedies outside of the Legacy Program.
Is this Program consistent with the Hawai`i Island Plan?	The `Āina Mauna Legacy Program is consistent with the Hawai`i Island Plan.

Feedback - Hilo Consultation Meeting - 09/25/09 - Response to Questions/Comments

Approximately 30 people attended the September 25, 2009 Hilo Beneficiary consultation meeting at the Hilo High School Cafeteria. The following are questions and comments raised at the meeting. Each was responded to and, for the most part, the information was noted to already be contained in the report. The responses on the right column reflect the response at the meeting, as well as generally stated in the report.

Pasture	
What DHHL programs are in place now for agriculture/ community pasture?	According to DHHL, Moloka`i uses a community pasture program and it has been successful. Previous tries at community pasture on Hawai`i Island have apparently not been as successful. However, the Program is open to a variety of scenarios, with community pasture being only one of the options or combinations of options for management.
Has the long term pasture area noted on the map been studied? Is it sustainable for cattle?	The pasture area west of Humu`ula Sheep Station was previously used by Parker Ranch and identified as good for pasture. According to the Ranch, this area was an ideal place for birthing cattle and it was used accordingly.

Commercial Forestry to Fight Gorse	
Are there other ways to eradicate gorse besides commercial timber? The emphasis on commercial timber seems to give a precedent for commercial timber, not other options. Why not use native trees to control gorse?	The Program suggests timber to fight gorse but also allows for other viable gorse eradication opportunities. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. Eucalyptus and Sugi have been proposed because they have proven successful in fighting gorse and others are willing to pay rent in order to plant and manage the trees. The existing development of these crops in the general area have given rise to increased investment in required infrastructure including marketing and market development efforts by a number of public and private entities. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands. Gorse has a life span of 30 to 40-years while the seed can remain viable in the soil for up to 70-years after that. DHHL field trials and research projects have shown that shade from trees inhibit the ability for gorse to grown and spread. It is anticipated that commercial-scale timber planting (the initiation of Gorse Eradication Utilizing Commercial Timber - to

	include biomass for alternative energy on approximately 10,000-acres) will shade the gorse sufficiently to keep it from producing seeds and perhaps kill it. With normal forestry operations, each year some portion of the seed bank will be removed. Shading has proven to be a method for killing gorse, and also generates revenue for the department however, if other viable gorse eradication processes are developed, they will be considered as well. DHHL field trials and research projects have shown that shade from native trees species such as koa are not effective on gorse because they do not produce enough shade. Eucalyptus, sugi or others trees are selected to eradicate and control the gorse; once the gorse eradication process is well underway, the area is to be reforested back to a native koa.
What would "Commercial forestry" look like? Will trucks be hauling lumber off the mountain or will there be a processing plant? How much revenue can DHHL make thru commercial timber?	The RFQ/RFP process will be designed to provide for the best overall benefit to the department. The recommendation is to solicit proposals for a timber license for the planting and harvesting of commercial non-native tree species (i.e. eucalyptus, sugi or other) that will first serve to fight the gorse, but will also provide valuable wood products for a variety of uses which can include: • Lumber • Wood chips • Veneer • Forest products • Biomass for alternative energy opportunities (liquid fuel and electricity) Additionally, DHHL would retain rights to any Carbon Credit opportunities. The RFQ/RFP process would be initiated to find interested parties in commercial forestry. The Program does not anticipate allowing a processing plant. Additionally, Best Management Practices and other precaution will be made if hauling lumber off the mountain is anticipated.

Native Forest Restoration	
What is the plan to restore the māmane forest?	The lands of Humu`ula and Pi`ihonua represent the most important native forest areas remaining in the DHHL trust. Based on soil, elevation, and rainfall characteristics, there are an estimated 10,000-acres across the mauka portions of the property that can be restored to māmane forest, a critical Palila bird habitat. There are strong recommendations to enhance and restore various areas in the overall property because of their importance as habitat, biodiversity and condition (and ability to restore) as native forest.

	The setting aside, protection and restoration of these areas is critical for the protection, restoration and enhancement of `Āina Mauna. Wildlife corridors help provide a contiguous habitat from the lower koa forest to the higher elevation māmane forest to facilitate the migration of native forest birds between these habitats. Additional Fencing, excluding and removing ungulates, would allow existing trees to produce and maintain root shoots and basal sprouts, thereby increasing foliage and subsequent tree processes. Centralized plant propagation, staging and storage facilities will be located at Kanakaleonui Bird Corridor and north of Pu`u `Ō`ō. These propagation centers will be used for both the native forest restoration and sustainable koa forests.  Replanting efforts would focus on a mosaic of 'islands' using combinations of native plants grouped together (for example, pūkiawe, pilo, `a`ali`i and `ohelo may be planted together) that will grow outward until they all connect into one diverse native forest. Māmane (mauka areas) trees would then be planted around the existing shrubs so that they can utilize the beneficial traits of the 'islands.' Continued research is necessary to effectively evaluate the various experimental methods of out planting. Experimental plots should be established to be used for this research.

Homesteading	
What is meant by "new model" for future homesteading"?	The Program has been revised to further explain this concept. Instead of "a new model", the language has been revised to "an option". Once the gorse eradication process is well underway, the homesteading area will be planted with koa for reforestation. This area includes the significant portions of the site that are proposed for sustainable koa restoration. The forested areas also provide DHHL with an option for future agricultural homesteading. Once the koa restoration is accomplished, DHHL will have the opportunity to consider creation of agricultural homesteads using forestry for beneficiaries. Homesteaders would be responsible to control ungulates, gorse and other invasive species in the homestead area. The commercial koa forest management operations can continue, with the DHHL and beneficiaries benefitting directly from the commercial sale of koa.

Who will be able to sign up for homesteads?	Dispositions of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions: • Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management. • These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses • While the Homestead lots will be rurally-developed, due to the areas remote location and lack of traditional infrastructure, the cost of development is likely to be significant and beyond the scope and capacity for the remaining revenue generating opportunities proposed on the property.

Koa Forestry	
Will the initial homesteading area need to be planted with koa? Is there koa there now?	There are scattered koa trees in the area now. Koa planting would begin immediately in the form of koa forest restoration. Koa is one of the predominant tree species found naturally in the Humu`ula/Pi`ihonua lands. It is presently the highest value timber crop in Hawai`i. It grows easily and well in this area if introduced ungulates are removed. Restoring the Humu`ula/Pi`ihonua lands to koa through carefully planned and managed reforestation is its highest and most compatible economic use.  Based on soil, elevation, and rainfall characteristics, there are an estimated 10,000 acres in Humu`ula and adjacent Pi`ihonua mauka that could be restored and managed under a sustainable koa forest harvesting regime. A restored sustainable koa forest provides several opportunities and options for future decision-making by DHHL. • A sustainable koa forest would provide jobs and generate income to the DHHL trust. • Once a sustainable koa forestry operation is in place, portions of the property could be considered for future agricultural (sustainable koa forested) homestead opportunities, affording homesteaders a sustainable koa forest as a part of their homestead.

Other	
What is the elevation?	Elevations range from approximately 4,500 to 9,000 feet mean sea level.
There are three springs on the property? Where are they?	The three springs are reported to be near Pu`u `Ō`ō Ranch.

Feedback - Hilo (Keaukaha) Consultation Meeting - 10/14/09 - Response to Questions/Comments

Approximately 35 people attended the October 14, 2009 Hilo Beneficiary consultation meeting at the Keaukaha Elementary School Cafeteria. The following are questions and comments raised at the meeting. Each was responded to and, for the most part, the information was noted to already be contained in the report. The responses on the right column reflect the response at the meeting, as well as generally stated in the report.

Homesteading	
How big are the homesteads lots going to be?	A significant portion of the property (4,500-acres) is proposed for immediate homesteading. The concept is to develop the first rural-development Homestead Area for DHHL beneficiaries in the south-eastern portion of the property. The Legacy Program describes general ideas about subsequent development with specific design, sizes and layout to be determined during the implementation process. Preliminary design concepts call for a subdivision layout encompassing approximately 1,000-acres with a total of approximately 100 to 200-homesteads sites and other community uses. To take advantage of opportunities to further demonstrate the focus on efficient, self-sustainable communities, as well as provide for cost-effective development, the Legacy Program considers a variety of homestead development layouts to address various beneficiary needs: cluster homestead sites with separate agricultural/pasture lots, cluster homestead sites with community agricultural/pasture, homestead lot subdivision or a combination of alternatives. It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming. The Legacy Program also calls for an additional 10,000-acres that may be considered for future homesteading opportunities after the gorse in the area has been eradicated.
Who is going to finance the homesteaders for the homestead lots? What about families who have residential homesteads now but have always wanted this type of opportunity for a homestead?	Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions: • Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management.

	• These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses Due to the area's remote location and lack of traditional infrastructure, the cost of development is likely to be significant and beyond the scope and capacity for the revenue generating opportunities proposed from the property, so the implementation will be through the typical homestead development process of the Department.
Under which category will the homesteads fall (residential, agriculture, pastoral)?	The Program envisions all three types of homesteading being available for consideration.
How long before the homestead awards are given out?	We would like to bring the Legacy Program for approval by the HHC in November. Once it has been approved we would like to immediately begin implementation. The Legacy Program describes general ideas about subsequent development with specific design, sizes and layout to be determined during the implementation process. Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of developments and dispositions.

Pasture	
How big are the pasture lots going to be?	Additional acreage propose for pasture use covers approximately 4,000-acres (these land areas are approximate references) - with about 2,000-acres designated for pasture along the Keanakolu-Mana Road and another 2,000-acres on the west side of the Mauna Kea Access Road (below the Radio Tower site and fronting Saddle Road and Mauna Kea Access Road.) These areas proposed for additional acreage for pasture use are consistent with the Fire Plan and are proposed to be immediately available for beneficiary use. Additional acreage pasture use could also be in the form of Community Pasture. The Legacy Program describes general ideas about subsequent development with specific design, sizes and layout to be determined during the implementation process. Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions.
Beneficiaries are allowed 300 acres of quality pastoral and 1,000 acres of additional acreage, how does that fit with only 4,000 acres of pasture?	Since 2005 the Department has taken an active role at looking into the needs of Beneficiaries in regard to pasture use. The Honokaia model assesses how much land Beneficiaries need for pasture and distributes pasture land accordingly. Thus, it is incumbent upon the lessees to utilize their land accordingly.

	Dispositions of Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions.
The proposed pasture lands are marginal.	The Pasture Recommendations at Humu`ula for Controlling Wildfire Fuels report indicates ideal grazing areas south of the gorse infestation and along Keanakolu Road where fuels would be reduced, gorse movement would be minimized, best AUY's exist, and natural recovery of adjacent lands could continue. Best AUY analysis in this report was based upon the 1997 Summary Appraisal Report for former Parker Ranch lease GL 201 and conversations with Parker Ranch employees. Additionally, the pasture area west of Humu`ula Sheep Station was previously used by Parker Ranch and identified as good for pasture. According to the Ranch, this area was an ideal place for birthing cattle and it was used accordingly.
If the goal is to feed people, cattle are not the best thing. Maximize the use of the land by having food crops. Cattle do not mix well with native forests.	The Program envisions a variety of uses on site including agriculture, pasture and native forest restoration. Fencing and management will be an integral part of the program in order to prevent the various uses from impacting each other.

Commercial Timber	
How long before sugi/eucalyptus is planted will it be harvested? When will we see results? Will the land be "tied up" in commercial timber for 75-100 years?	The Program suggests timber to fight gorse but also allows for other viable gorse eradication opportunities. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. Eucalyptus and Sugi have been proposed because they have proven successful in fighting gorse and others are willing to pay rent in order to plant and manage the trees. The existing development of these crops in the general area have given rise to increased investment in required infrastructure including marketing and market development efforts by a number of public and private entities. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands. Gorse has a life span of 30 to 40-years while the seed can remain viable in the soil for up to 70-years after that. DHHL field trials and research projects have shown that shade from trees inhibit the ability for gorse to grown and spread. It is anticipated that commercial-scale timber planting (the initiation of Gorse Eradication Utilizing Commercial Timber - to

	include biomass for alternative energy on approximately 10,000-acres) will shade the gorse sufficiently to keep it from producing seeds and, depending on the species selected, perhaps kill it. With normal forestry operations, each year some portion of the seed bank will be removed. Shading has proven to be a method for killing gorse, and also generates revenue for the department. However, if other viable gorse eradication processes are developed, they will be considered as well. DHHL field trials and research projects have shown that shade from native trees species such as koa are not as effective on gorse because they often do not produce enough shade. Using native overstory species such as `ōhi`a and koa as an option to eradicate gorse is also limited by the high elevations of the gorse infestation areas. Frost in these areas frequently kill out-planted native species that are not frost tolerant, such as koa. Creating an overstory that is frost tolerant and creates heavy shade will both eradicate gorse and create a more favorable environment for future conversion to a native forest. Such an overstory will maximize frost-free days. Eucalyptus, sugi or others trees are selected to eradicate and control the gorse; once the gorse eradication process is well underway, the area can then be gradually reforested back to a native species.
Will native birds live in sugi or eucalyptus?	The commercial forestry to eradicate gorse and the sustainable koa forest areas will create an environment friendly to certain bird and bat species. Since the program's goal is to restore the area to native koa forest after the gorse has been eradicated, it is essential that the program be allowed to take proactive management steps which in some cases may cause a temporary loss of habitat for bird species. Because the activities proposed in the `Āina Mauna Legacy Program could affect habitat for threatened and/or endangered plants, birds and animals, it is recommended that a blanket Safe Harbor Agreement be developed and incorporated into the Legacy Program. Since one of the goals of the `Āina Mauna Legacy Program is the restoration of habitat, as well as planting of trees that could attract native birds and bats, the Safe Harbor Agreement can protect DHHL from future impacts to the habitat and the species.
What are carbon credits and how would they be used? The credits should be for the entity that plants the trees not the Department.	Carbon offsets can best be described as an act of paying a third party for reducing ("offsetting") greenhouse gas emissions when one is unable or unwilling to reduce one's own emissions. Some countries (or companies) seek to trade emission rights in carbon emission markets, purchasing the unused carbon emission allowances of others.

	Carbon Offsets/Credits are a key component of national and international emissions trading schemes that have been implemented to mitigate global warming. Credits can be exchanged between businesses or bought and sold in international markets at the prevailing prices. An added opportunity to enhance revenue opportunities is to consider carbon credits/offsets retained by DHHL in the event certain forestry programs are implemented.

Gorse	
How did the gorse get here? Did ranchers use it?	Early diary records note gorse on Mauna Kea is at Pi`ihonua Mauka (Pu`u `O`o ranch - from diary of ranch manager August Haneburg): Friday, February 20th, 1891: "… uprooted Australian weeds [gorse] in Sheep Padd II and Horse Padd II" and another reference from W.D. Alexander, 6/1892 quotes "The present manager has been at much labor and expense in extirpating two pests, which are said to have been accidently introduced from New Zealand, viz. the Scottish thistle and the gorse". Gorse is native to Northwest Europe but has become a major pest species in various parts of the world, including New Zealand. There is a long history of gorse in Hawai`i. It was apparently brought to Hawai`i in the 19th century as a hedge plant by a Scottish immigrant, and possibly utilized in the previous sheep operation at Humu`ula. It was first collected wild by J. R. Rock on Maui in 1910. On the island of Hawai`i it is found in pasture and scattered forest lands on Mauna Kea at elevations between 2,000 and 7,000 feet.
Are you working on gorse eradication right now?	Annual DHHL efforts to control gorse have been underway since 2003. A variety of contracts to control gorse include chemical, mechanical and biological efforts. Due to limited resources, focus has been on controlling outlying areas and containing the main infestation from spreading further. DHHL field trials and research projects have also shown that shade from trees inhibit the ability for gorse to grown and spread. DHHL has planted portions of the perimeter of the Humu`ula/Pi`ihonua lands with trees to begin establishing a boundary to limit the spread of the weed In addition, `Ōiwi Lōkahi o ka Mokupuni o Keawe has a license over 1,000-acres within the containment area to conduct a research project processing the heaviest infestations of gorse into charcoal and biofuel.
As the gorse is eradicated where will it go?	Gorse will not be allowed to be removed from the site to prevent its spread to other areas of the island. All gorse eradication techniques will require the gorse to be dealt with and disposed of onsite.

Money should not be the driver for getting rid of the gorse.	As required in the Mission and goals of the Legacy program to be ecologically, economically and culturally self-sustaining, commercial forestry is considered to assist in a variety of ways, including the opportunity to provide additional funding to help with the overall management of the property. The long-term eradication of gorse will require significant financial resources that may need to be subsidized by other economic uses. This makes timber planting as a gorse eradication mechanism so attractive. It can serve as both a gorse eliminator and income generator. The environmental and cultural benefits of forestry, e.g. clean water and air, soil augmentation, wildlife habitat, and traditional forest uses are well known if not well quantified. Economic returns from commercial forestry in Hawai`i are not well quantified either, as a fully modernized industry is still developing. In combination, however, these multiple values from forest lands will represent significant value to DHHL trust lands.
Can gorse be used as a revenue generator?	Commercial forestry is considered to assist in a variety of ways, including the opportunity to provide additional funding to help with the overall management of the property. The non-profit organization, `Ōiwi Lōkahi o ka Mokupuni o Keawe, currently has a license on 1,000-acres at Humu`ula from DHHL for gorse control work. They have been working on a process in which burning harvested gorse produces carbon. Their studies and research are ongoing. It is hoped that as their project becomes successful in using gorse as a product, subsequent conversion to trees will replace gorse as the raw material for their project, thereby perpetuating the gorse eradication component of the Legacy Program.
There is nothing in the Program regarding the `Ōiwi Lōkahi o ka Mokupuni o Keawe Gorse Project.	Ōiwi Lōkahi o ka Mokupuni o Keawe's gorse demonstration project is referenced several times in the `Āina Mauna Legacy Program and the 1,000-acres currently under license with the Department is noted on the Program map and incorporated into the Program. They have been working on a research process in which burning harvested gorse produces charcoal and other carbon products, as well as a biofuel. Their studies and research are ongoing.

Native Forest Restoration	
Are other trees besides koa being considered for forest restoration?	Besides Koa the program is proposing the planting of māmane and `ōhi`a trees as well as a variety of native understory plants. One method being used onsite currently is "island planting" which creates pockets of diverse native species which can spread across the site that eventually grow together into a diverse forest.

Why will Pi`ihonua be "tied up" in a Conservation Easement for 50 years?	As a means to assist in the funding of the restoration and enhancement of these areas, the department may negotiate encumbrances such as easements and/or leases with various entities. A conservation easement is a legal agreement voluntarily entered into by a property owner and a qualified conservation organization such as a land trust or government agency. The easement contains agreed upon conditions on the use or development of land in order to protect its conservation values. These easement restrictions vary greatly for each agency or organization.
Has there been a study on the area's micosystems?	A variety of extensive studies have been done on the property and surrounding areas. Of particular note, the Biological Sensitivity Analysis delineates areas containing endemic faunal sensitivity within the Humu`ula/Pi`ihonua area. The assessment gives a brief description of each area and outlines the endemic vertebrate resources that should be factored into any master planning of the areas delineated. Additionally, studies on geography, geology, soil, endangered/threatened species, vegetation, and cultural resources have all been done and are included by reference in the Program.

Roads	
Are the roads shown on the map really there? Are they all open (not locked)? Who owns the Mana/Keanakolu Road? Only Beneficiaries should be allowed to access the area.	The map shows Saddle Road, Mauna Kea Access Road and the Mana/Keanakolu Road all of which are used currently. All roads are open although is it advised to use a four-wheeled vehicle on the Mana/Keanakolu Road. A gate project by the Land Management Division is currently underway to install gates at strategic locations to limit unauthorized access to the Program area. The Mana/Keanakolu is considered a "road in limbo", that, while considered a public road, ownership has not been established between the State and the County. The legal ownership of the road is beyond the scope of the Program but as stated above the road is believed to be a "road in limbo", and as such it is a public road which cannot be automatically be gated off.

Other	
What happened to homesteading in the Pi`ihonua Makai Area? Is it residential or agriculture?	Residential lots have been awarded in the Pi`ihonua Makai Area. The Pi`ihonua Makai area is outside of the Program area.

The Department needs to change its policy regarding the selling of leases.	This is out of the realm of the `Āina Mauna Program, however the concern is noted and has been passed on to the Department.
Has the Department looked into having Beneficiaries take on a Konohiki role?	As an integral part of the implementation of the `Āina Mauna Legacy Program, the Legacy Program includes the formation of an implementation advisory council (`Āina Mauna Legacy Program Implementation Advisory Council) to provide advice and recommendations to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands regarding the implementation of the `Āina Mauna Legacy Program. Additionally, the implementation process will include the Council, Beneficiary and community involvement and participation in advising the Department and Commission. The Council may serve as a forum for consultation and deliberation among its members and as a source of consensus advice to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands. Such consensus advice shall fairly represent the collective and individual views of the Council members. The Council does not have the authority to perform operational or management functions, or to make decisions on behalf of the Hawaiian Homes Commission and/or the Department of Hawaiian Home Lands. The Council will be advisory only. The Department and Commission will have final decision-making authority. This rich cultural history of the area, presents a unique opportunity to link traditional cultural knowledge and modern science in restoring the area back to a healthy native forest, as well as other uses that benefit the Land, Beneficiaries and the Trust.
We need to understand the Hawaiian names of the area and what they mean. There is a reason why the ahupua`a look like they do. We need to understand why.	We concur. The cultural and historical research conducted by Kumu Pono Associates documents descriptions of Ka`ohe, Humu`ula, and Pi`ihonua. The study provides readers with documentation pertaining to the traditional, cultural and historical setting of the `āina mauna on the Island of Hawai`i.
This Program is something that the Department needs to do and has needed to do for a long time. While we may not agree with all of it, we need to do something and this is a first step.	We concur. The mission of the `Āina Mauna Legacy Program and its implementation is to protect approximately 56,000-acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community.  Initial goals for the `Āina Mauna Legacy Program include: Goal 1: Develop an economically self-sustaining improvement and preservation program for the natural and cultural resources (invasive species eradication and native ecosystem restoration) and implementation strategy. The focus of the `Āina Mauna Legacy

	Program shall be on: • Restoration and enhancement of DHHL trust resources; • Identify immediate and future opportunities for DHHL beneficiaries; • Removal of invasive species - gorse, etc.; • Conserve natural and cultural resources and endangered species; • Address reforestation and restoration of the ecosystem; • Develop revenue generation, reinvestment in land to sustain activities; • Provide educational and cultural opportunities; • Identify and secure partners to sustain activities; • Identify opportunities for alternative/ renewable energy projects; and • Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model Goal 2: Develop an outreach program to gain interest, participation, and support from the Hawaiian Homes Commission, DHHL Staff, beneficiaries groups, cultural practitioners, natural resource scientists, and the broader community for the Legacy Program and its implementation. The creation of this Program is the first step in achieving these goals.

Feedback - Beneficiary Email and Written Comments - Response to Questions/Comments

The following are questions and comments raised in emails and comment letters from beneficiaries. The responses on the right column reflect the responses which are also generally stated in the report.

Eradication of unmanaged ungulates	
So-called eradication of livestock (not ungulates) to be done by different strategies, all to be under management of Beneficiary committee. Unmanaged "ungulates" is the problem created by the now uninformed, inexperienced DHHL management team. This activity should not be conducted with a goal of collecting income for the trust.	The primary goal of the eradication of unmanaged ungulates (hoofed mammals such as cattle, sheep, pigs, goats, etc) is to protect the natural resources on the property. The invasion of non-native species poses one of the greatest threats to Hawai`i's native ecosystems and their inhabitants. Unmanaged-ungulates are detrimental to Hawai`i's native ecosystems via the damage they inflict on both vegetation structure and composition; impact native plants and ground cover, facilitating sediment run-off. The soil disturbance caused by rooting ungulates also facilitates the introduction and expansion of invasive plants, and creates breeding grounds for mosquitoes that transmit avian disease to native forest birds. A secondary benefit is that there may also be an opportunity for DHHL to raise funds from the process; however, revenue is a secondary benefit, the primary purpose is resource protection.
Any leases and plantings to be done with fencing. Hoping animals will be eradicated and therefore not around to eat the plantings has proven to be erroneous.	We note the need to fence sections of the property in several areas of the Legacy Program. We understand that each of the koa salvage permits have included perimeter fencing to exclude ungulates from the permit areas; these are included to help protect the regeneration of koa seed bank.

Koa Salvage/Sustainable Koa Forestry	
Koa Salvaging project should remain with the current contractor, at a price he feels is just; Beneficiary committee to monitor and make recommendations.	The program recommends that disposition of the respective commercial licenses, leases, etc. to implement these actions would be through a broad RFQ/RFP process to select the best qualified applicants (background, experience, financial capability, business plan, etc) to conduct the respective activities - to the extent permitted by law preference will be given to native Hawaiians. We understand the existing operator has been awarded two of the three harvesting permits granted for koa salvage.
The Sustainable Koa Forest (Initial Homesteading Area) is referred to as agriculture. To call a forest agriculture is ridiculous. Can you image agricultural homesteaders who don't do	There are scattered koa trees in the area now. Koa planting would begin immediately in the form of koa forest restoration. Koa is one of the predominant tree species found naturally in the Humu`ula/Pi`ihonua lands. It is presently the highest value timber crop in Hawai`i.

anything on it and leave it virgin justifying non-use because you folks call forest agriculture? If it is a Koa Forest, instead of cutting it up for individual homesteaders to use, keep it whole and assign it to the community to control harvest and replant. As a group, they would be better able to arrange for the cutting and selling of wood than on an individual basis. Proceeds would be split among the homesteaders.	Restoring the Humu`ula/Pi`ihonua lands to koa through carefully planned and managed reforestation is its highest and most compatible economic use. The forested areas also provide DHHL with an option for future homesteading, once the koa restoration is accomplished. Dispositions of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions.

Agriculture	
There is nothing offering agriculture opportunities in the present plan. Please allow for possible agriculture opportunities. At this elevation there is also high potential to grow unique crops of particular interest. Beneficiaries constantly express their wishes for more agricultural awards. This was not indicated or considered on the proposal or any designed "agricultural" lots.	The Legacy Program considers a variety of homestead development layouts to address various beneficiary needs: cluster homestead sites with separate agricultural/pasture lots, cluster homestead sites with community agricultural/pasture, homestead lot subdivision or a combination of alternatives. It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/ uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming.

Commercial Activity	
Initiate alternative living: development of cabin-like dwellings for eco-tourism to help restore some of the deforestation - supporting flexibility for the plan.	We agree that the use of remote accommodations cover a small footprint on the overall landscape and have limited impact on the resources, but provide opportunities for ecotourism uses, etc. In the Legacy Program, there are recommendations that require ecotourism operators to have their guests “volunteer” in the reforestation, invasive species control and other implementation activities. It is believed that this will not only assist with the implementation efforts, it will also provide for more meaningful experiences for the guests on the property.
Initiate a Mauna Kea-Loa Museum to educate the public of the fragile state of the area - income generating and self-sustaining.	The Legacy Program includes recommendations for the restoration of the Humu`ula Sheep Station and use of the site as an ecotourism staging area. Because the `Āina Mauna region is such a special and unique place, orienting and educating visitors to this is important. The facility could be considered for a variety of uses, including redevelopment of the property into a lodge, serving as a focal point for education, staging, gatherings, meetings, etc.

Ecotourism and recreation use (red) may be possible but on a limited basis. I do not think any particular group should control this area for their own use or with DHHL funds.	The Program recommends ecotourism uses on various portions of the property, with the suggestion that staging areas be included around the Humu`ula Sheep Station.

Native Forest Restoration	
Trying to justify forestry and the so-called need to increase the acreage in forestry, island wide, to support whom?	The foundation of the `Āina Mauna Legacy Program is the protection and restoration of the DHHL lands at Humu`ula/Pi`ihonua for future generations. These lands represent the most important native forest areas remaining in the DHHL trust. DHHL seeks to restore portions of the Humu`ula/Pi`ihonua lands in perpetuity for future generations.
I would like to commend all of you for taking this step to realizing the goal and intent of the DHHL mission statement. The incorporation of long term planning, acknowledgment of native Hawaiian Forests (māmane at high elevation, koa, and koa/`ōhi`a at montane/mesic elevations) as an important part of what makes Hawaii unique and special, and planning for sustainable healthy native Hawaiian communities is uplifting.	We concur.

Gorse Eradication	
We reside in an island "culture" in the middle of the Pacific Ocean. Each island should be self-sufficient, now. Will putting additional acres in commercial timber at the expense of decreasing lands for food production solve the self-sufficiency need for now and the future? True, we have to address the gorse problem, which, in Sonny Kaniho's words, was allowed by the HHC to get to such a state.	To take advantage of opportunities to further demonstrate the focus on efficient, self-sustainable communities, as well as provide for cost-effective development, the Legacy Program considers a variety of homestead development layouts to address various beneficiary needs: cluster homestead sites with separate agricultural/pasture lots, cluster homestead sites with community agricultural/pasture, homestead lot subdivision or a combination of alternatives. It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/ uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming.
`Ōiwi's request for license was intended to encumber the	The non-profit organization, `Ōiwi Lōkahi o ka Mokupuni o Keawe, currently has a license on 1,000-acres at Humu`ula from DHHL for

whole gorse infected area**.** `Ōiwi and its partners will sit with DHHL to develop the best plan. We expect to have a concrete plan for processing during this fourth year of the five-year license term.	a gorse research and demonstration project. According to the DHHL License Agreement, the Licensee may not use the premises for any purpose other than strictly a research and development project using the invasive gorse shrub. No other uses are permitted, including grazing rights to demonstrate gorse controlled by livestock. To date, the equipment to process the gorse to charcoal and biofuel has not been delivered and the process has not been demonstrated. It is hoped that as their project becomes successful in using gorse as a product; subsequent conversion to trees will replace gorse as the raw material for their project, thereby perpetuating the gorse control component of the Legacy Program.
Re-growth of gorse to be managed in a variety of ways, not only by chemicals or planting trees.	The goal is gorse eradication, not management. All viable gorse eradication opportunities will be considered. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. The importance of eliminating this plant cannot be overstated. Eradication of this noxious plant, that has already rendered thousands of acres useless, is an essential component in any land use and management plan for these lands.
The department plans to put (pink area) pasture lands into commercial operations. They plan to lease it out for commercial purposes with planting trees such as eucalyptus and shoji. This is not restoration of native forest. A better idea would be when the 13,000 acres of gorse are removing or managing, to divide the lands for pastoral pursuits for those lessees homesteading (living) at Humu`ula. Large parcels must be given to lessees due the less than productive pasture and the lack of water during certain times of the year. They will at least have good access to these parcels using the roads that the bio-fuel company is establishing. Why waste it and plant invasive forests for commercial	All viable gorse eradication opportunities will be considered. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. The Program looks to begin gorse eradication as soon as possible. It will be one of the first actions taken, once the Program is approved. The Program suggests timber to fight gorse but also allows for other viable gorse eradication opportunities. The goal is gorse eradication, not management. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. Eucalyptus, sugi or others trees are selected to address and control the gorse; once the gorse eradication process is well underway, the area is to be reforested back to a native koa. This area is considered for future homesteading, once the gorse is eradicated.

companies. Planting invasive species is not conserving natural habitats for future generations.	
I am not convinced or believe that the Gorse plant seed will be inactive for 70 years. If the Gorse plant is still a sustainable food for cattle and can live for up to four decades, then why not work with the "Ōiwi Pilot Project" in more depth while still controlling its boundaries from spreading. Wouldn't this be income-generating in and of itself for DHHL short and long term?	All viable gorse eradication opportunities will be considered. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. The Program looks to begin gorse eradication as soon as possible. It will be one of the first actions taken, once the Program is approved. The Program suggests timber to fight gorse but also allows for other viable gorse eradication opportunities. The goal is gorse eradication, not management. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. Eucalyptus, sugi or others trees are selected to address and control the gorse; once the gorse eradication process is well underway, the area is to be reforested back to a native koa.
We propose that the homestead community will help with the *kuleana* of managing the gorse problem (as a part of *kuleana* for all of Humu'ula) with the DHHL land manager and that we may use diverse native Hawaiian forests to shade out gorse. Sugi pine provides the most shade, around 95-98 percent, but diverse native Hawaiian forest with at least two canopies is a close second and provides approximately 90-95 percent. In addition to shading most forest restoration scientific journals cite the addition of litter fall. This technique has proven effective for controlling non-native grasses in several restoration studies including recent research from Hawaii Volcanoes National Park. Therefore effective control of introduced and invasive plant species is a function of both	The long history of pasture has transformed the property from dense native forest to non-native grasses with limited survival of native plants. In addition, gorse has rendered thousands of acres of the property unusable. All viable gorse eradication opportunities will be considered. Gorse is a noxious weed species that is threatening natural habitats and agro-ecosystems around the world, including Hawai`i. The Program looks to begin gorse eradication as soon as possible. It will be one of the first actions taken, once the Program is approved. The Program suggests timber to fight gorse but also allows for other viable gorse eradication opportunities. The goal is gorse eradication, not management. Interim commercial-scale timber planting can serve both as a gorse eradication mechanism, as well as an income generator. As required in the Mission and goals of the Legacy program to be ecologically, economically and culturally self-sustaining, commercial forestry is considered to assist in a variety of ways, including the opportunity to provide additional funding to help with the overall management of the property. The long-term control of gorse will require significant financial resources that may need to be subsidized by other economic uses.

shade and leaf litter fall. A diversity of trees is also essential in long term planning as leaf litter of this type is beneficial for soil production and healthy ecosystems. In Sugi or eucalyptus plantations there is little to nothing left of any native species in the under-story. Some eucalyptus species even poison the ground so that other species can't grow. It is possible that we may find that if eucalyptus is used at Humu'ula, Hawaiian plants may not be able to grow due to chemical and biological changes in the soil. We already know that gorse acidifies the soil beneath it thereby changing the composition and makeup of those soils. It is unknown if acidified soils might be beneficial or not to native species in the long run such as those within the gorse containment area.	This makes commercial timber planting as a gorse control and eradication mechanism so attractive. Once the gorse eradication process is well underway, the area is to be reforested back to native koa.

Carbon Credits	
Carbon Credits, at least 80%, shall go to the gorse harvesting and gorse processor which invests in the project.	The goal is gorse eradication, not harvesting/processing. We are proposing that 100% of any benefit from Carbon Offsets/Credits be retained by DHHL in the event certain forestry programs are implemented.
The concept of carbon credits is a question of morality, not one of economics or legality. *`Aina* is *`aina,* here or there, North America, Europe, Africa, Antarctica, etc., each unique and special. The idea of buying and selling carbon credits to offset atmospheric pollution is reprehensible and is not a righteous action. This is an immoral action that will have far	The focus of the Legacy Program is the restoration of the land. This includes a variety of forestry opportunities. An added opportunity to enhance revenue opportunities is to consider carbon credits/offsets retained by DHHL in the event certain forestry programs are implemented.

reaching consequences and is a human construct to justify the means to an end. This type of thinking is representative of western ideology and fails to incorporate the connectivity of humans and our environment, so thus fails to incorporate Hawaiian values.	

`Āina Mauna Legacy Program Implementation Advisory Council	
Convene a Beneficiary Committee, two members of which shall sit on the `Āina Mauna Legacy Program Implementation Advisory Council: 1) To review proposed beneficiary lease schemes 2) To revise plan for proposed Beneficiary Leases 3) To recommend the best solutions for Beneficiary Lease, Revocable Permit, or License 4) To consider lease/RP/License to others and recommend	As an integral part of the implementation of the `Āina Mauna Legacy Program, the Legacy Program includes the formation of an implementation advisory council (`Āina Mauna Legacy Program Implementation Advisory Council) to provide advice and recommendations to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands regarding the implementation of the `Āina Mauna Legacy Program. The Council may serve as a forum for consultation and deliberation among its members and as a source of consensus advice to the Hawaiian Homes Commission and the Department of Hawaiian Home Lands. Such consensus advice shall fairly represent the collective and individual views of the Council members. The Council does not have the authority to perform operational or management functions, or to make decisions on behalf of Hawaiian Homes Commission and/or the Department of Hawaiian Home Lands. The Council will be advisory only; the Department will have final decision making authority.
The `olelo noeau referred to serves the narrow purpose of the `Āina Mauna Legacy Program. The HHCA was created to take care of the people now, by providing a place, training, and opportunities for self-sufficiency. If this is the beneficiaries' land for self-sufficiency, the beneficiaries shall have direct participation in the decision-making for these trust lands and should carry the kuleana for stewarding thereof.	The opportunities for beneficiaries are extensive and diverse; and, there are opportunities for beneficiaries within each component of the recommendations, whether it is homesteading, pasture, unmanaged-ungulate eradication, native forest restoration, commercial timber, koa forestry, ecotourism or cultural practices. Some of the benefits are proposed to be relatively immediate, while others will necessarily take time for the real benefit to come to fruition. Additionally, the implementation process will include opportunities for Beneficiary and community involvement and participation at all stages of the process.

I agree and support the plan need for flexibility because of the diverse land and the amount of acreage to be allocated for specific purposes; however, under the condition that the beneficiaries are informed adequately before any change implementation to the program occurs. It is very obvious that flexibility with the plan is foremost importance as it moves forward. Because of its unique and majestic location against Mauna Kea, which significance is the connection or piko of the Big Island, it is my proposed preferences that this land mass development be considered to a group of beneficiaries as a hui that will have stewardship over the various phases of land management.	The `Āina Mauna Legacy Program is a "living document" that is intended to be flexible and is subject to change, as times and needs change. Therefore, the program should be re-examined on a periodic basis (possibly every 5-years) to ensure that it addresses DHHL's needs in the future. The Legacy Program includes the formation of the `Āina Mauna Legacy Program Implementation Advisory Council to provide advice and recommendations to the Commission and DHHL regarding the implementation of the `Āina Mauna Legacy Program. The implementation process will include the Council, Beneficiary and community involvement and participation in advising the Department and Commission. The Council serves as a forum for consultation and deliberation among its members and as a source of consensus advice to the Commission and DHHL. The Council does not have the authority to perform operational or management functions, or to make decisions on behalf of the Commission and/or the Department. The Council will be advisory only. The Department and Commission will have final decision-making authority.
I think the department should give more credence to these homesteaders/associations.	The Legacy Program includes the formation of the `Āina Mauna Legacy Program Implementation Advisory Council to provide advice and recommendations to the Commission and DHHL regarding the implementation of the `Āina Mauna Legacy Program. The implementation process will include the Council, Beneficiary and community involvement and participation in advising the Department and Commission. The Council serves as a forum for consultation and deliberation among its members and as a source of consensus advice to the Commission and DHHL. The Council does not have the authority to perform operational or management functions, or to make decisions on behalf of the Commission and/or the Department. The Council will be advisory only. The Department and Commission will have final decision-making authority.

Homesteading	
Prospective interested lessees for the Villages should determine land use within the area and around them.	A significant portion of the property (4,500-acres) is proposed for immediate homesteading. The Legacy Program describes general ideas about subsequent development with specific design, sizes and layout to be determined during the implementation process.

Village design shall be led by `Ōiwi planners, with funds from DHHL - DHHL consultants stand by and provide assistance when asked. The Village concept is a beneficiary idea and shall be implemented with beneficiary input.	Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions: • Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/ Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management. • These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses Since the property was not typically used for long term habitation, there are questions as to the demand for homesteads in this area. Humu`ula is a unique environment that historically has been minimally settled. It is important that beneficiaries are made aware and understand the advantages and disadvantages of living in this area.
It is not reasonable and somewhat offensive to expect beneficiaries to have to wait out their lifetime hoping that they may have an opportunity for homesteading as indicated on the map.	A significant portion of the property (4,500-acres) is proposed for immediate homesteading. The Legacy Program describes general ideas about subsequent development with specific design, sizes and layout to be determined during the implementation process. The opportunities for beneficiaries are extensive and diverse; and, there are opportunities for beneficiaries within each component of the recommendations, whether it is homesteading, pasture, unmanaged-ungulate eradication, native forest restoration, commercial timber, koa forestry, ecotourism or cultural practices. Some of the benefits are proposed to be relatively immediate, while others will necessarily take time for the real benefit to come to fruition. Additionally, the implementation process will include opportunities for Beneficiary and community involvement and participation at all stages of the process.
I am also concerned about how the applicant wait list will be reconfigured to accommodate the new rural homestead residential leases concept development? How would this impact the existing categories with DHHL? There are also deep concerns about the new category of "rural homesteading" and the impact it will have on the applicants wait-list status as to the	Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions. Since the property was not typically used for long term habitation, there are questions as to the demand for homesteads in this area. Humu`ula is a unique environment that historically has been minimally settled. It is important that beneficiaries are made aware and understand the advantages and disadvantages of living in this area. Given that the immediate homesteading area will be a rurally-developed (cinder roads, catchment water, photovoltaic, septic/composting toilets, etc) and the area is relatively isolated

awarding processes - fairness, etc.	from employment, schools, shopping centers and other DHHL communities, it is not clear what the demand will be for these types of homesteads.
The ideas incorporated in the ‘Aina Mauna Legacy report regarding rural homesteading is right on regarding green living. Included with the current ideas we suggest the incorporation of a glass greenhouse built into each home for growing *kalo*, sweet potato, etc., as well as to moderate temperature, provide healthy living environment, water collection, utilize natural lighting, etc. Growing native Hawaiian plants for cultural uses (clothing, shelter, mats, etc.), to make high quality native Hawaiian products and for restoration across Humu‘ula. In concept this allows every family to have their own food supply and work, thus minimizing their need to travel afar.	The Legacy Program considers a variety of homestead development layouts to address various beneficiary needs: cluster homestead sites with separate agricultural/pasture lots, cluster homestead sites with community agricultural/ pasture, homestead lot subdivision or a combination of alternatives. It is envisioned that these alternatives will enable DHHL beneficiaries to have sufficient land for self-sustaining homesteading: land for a home site and related improvements/ uses, including land for alternative energy for their use, pasture, agricultural uses, and land available for subsistence farming.
The sustainability of a Humu‘ula homestead community is dependent on meeting the community needs at a local level. The overall homestead (many homesteads) should be designed in a way that supports community and community interaction. This means that education, health care, cultural practices, recreation, carpentry skills, sustainable living (solar knowledge, catchment tanks) must all be available on site. We must also hunt and gather (sustainably of course) in the local area thus controlling to some extent cattle and other non-native fauna.	Since the property was not typically used for long term habitation, there are questions as to the demand for homesteads in this area. Humu`ula is a unique environment that historically has been minimally settled. It is important that beneficiaries are made aware and understand the advantages and disadvantages of living in this area. Given that the immediate homesteading area will be a rurally- developed (cinder roads, catchment water, photovoltaic, septic/composting toilets, etc) and the area is relatively isolated from employment, schools, shopping centers and other DHHL communities, it is not clear what the demand will be for these types of homesteads. Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions.

Pasture	
Additional parcels for farming, ranching, or forestry shall be awarded on separate lease, without any ties to the original lease. The current "Additional Acreage" strategy enforced by DHHL and the HHC is counter-productive, counter self-sustaining and counter self-determining.	Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions: • Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/ Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management. • These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses
I believe that community pastoral and/or community agriculture is a plantation-like concept that will help restore and unify differences while appreciating the need for the crisis in the issues of sustainability and self-sustenance for the State.	According to DHHL, Moloka`i uses a community pasture program and it has been successful. The Program is open to a variety of scenarios, with community pasture being only one of the options or combinations of options for management.
The long term pasture (yellow), interim pasture (striped yellow) should also be given to the homesteaders in smaller parcels, along with the existing pasture leases when they expire. Perhaps homesteaders can use this area to rotate their cattle in dry periods.	Additional acreage propose for pasture use covers approximately 4,000-acres (these land areas are approximate references) - with about 2,000-acres designated for pasture along the Keanakolu-Mana Road and another 2,000-acres on the west side of the Mauna Kea Access Road (below the Radio Tower site and fronting Saddle Road and Mauna Kea Access Road.) These areas proposed for additional acreage for pasture use are consistent with the Fire Plan and are proposed to be immediately available for beneficiary use. Additional acreage pasture use could also be in the form of Community Pasture.

Budget	
The annual budget for wages, equipment, and supplies identified for managing the whole project shall include: 1) Training and employing interested beneficiary(ies) whose education has been in related fields, for a long-term position 2) Training and employing a beneficiary to eventually manage the whole project	It is suggested that there be three initial full time employees dedicated to implementing and managing the program. These employees can be phased in over time, during the transition from contractor to fully staffed employees. The positions will include a Program Coordinator, Contract Management, Compliance and Grant Specialist and a Field Worker. The Program Coordinator will primarily be working in and on issues related to `Āina Mauna Legacy Program including: • Supervising • Administration • Outreach/Education • Field Work

3) Including one individual to develop educational curriculum and to manage educational retreats, extended excursions, etc. (1/2 FTE) and one to investigate and manage eco-activities (1/2 FTE). 4) Conducting Semi-annual status meetings to include all contractors, interested Humu`ula/Pi`ihonua Beneficiary Lessees, `Āina Mauna Legacy Program Implementation Advisory Council and the Beneficiary Committee to provide and discuss up-dates and review progress in the different project areas 5) Fees for the Beneficiary Committee	• Performs miscellaneous related duties, as required. The Contract Management, Compliance and Grant Specialist will manage procurement functions for `Āina Mauna Legacy Program staff including: • Contract Management • Contract Compliance • Grant Writing, Management and Compliance • Outreach/Education • Performs miscellaneous related duties, as required.  The Field Worker will assist in conducting operations to implement the `Āina Mauna Legacy Program, as part of a team, including: • Fieldwork • Coordinates Volunteer Activities • Outreach/Education • Performs miscellaneous related duties, as required.
The Annual budget does not include new fencing, although new fencing is mentioned.	Fencing is intended and included in many aspects of the implementation, from forest restoration, ungulate eradication and other aspects. The program, at this point, reflects many general uses. As more details of aspects of the Program are detailed, then the budget will further detail specific aspects. The final document includes further revenue and cost estimates, including allocations for fencing.

DHHL/HHC	
Revise Procurement Law or Rule for use by DHHL; First offer to Beneficiary or Beneficiary organizations. Then, public bid process to others.	Revising state law is beyond the scope of this planning process. The program recommends that disposition of the respective commercial licenses, leases, etc. to implement these actions would be through a broad RFQ/RFP process to select the best qualified applicants (background, experience, financial capability, business plan, etc.) to conduct the respective activities - to the extent permitted by law, preference will be given to native Hawaiians. Homestead and Pasture agreements would be under the typical DHHL disposition process for these types of uses.
DHHL and the HHC purpose should be to manage the lands or exchange lands (acre for acre to keep the trust whole, change the law which demands value for value) in order to provide homes and rehabilitative opportunities for the intended	The opportunities for beneficiaries are extensive and diverse; and, there are opportunities for beneficiaries within each component of the recommendations, whether it is homesteading, pasture, unmanaged-ungulate eradication, native forest restoration, commercial timber, koa forestry, ecotourism or cultural practices. Some of the benefits are proposed to be relatively immediate, while others will necessarily take time for the real benefit to come to fruition.

beneficiaries. That is the purpose for this HHCA rehabilitative program, nothing else. As long as DHHL, on behalf of the HHC stand in court trying to justify why DHHL does not request sufficient funds to implement the HHCA for the intended beneficiaries and make excuses for such, DHHL and the HHC is in violation of their fiduciary responsibilities. DHHL & HHC, as well as the Implementation Advisory Council and the Beneficiary Committee, should focus on sustainable human communities.	Additionally, the implementation process will include opportunities for Beneficiary and community involvement and participation at all stages of the process. Land exchanges are beyond the scope of the Legacy Program. Dispositions and financing of Homestead and Pasture Leases, Licenses and/or RPs will be through the standard DHHL processes for these types of dispositions: • Since homesteading and pasture use are the typical and conventional disposition activities of DHHL, it is recommended that the proposed uses at Humu`ula/ Pi`ihonua come under existing DHHL planning, design, development, funding, disposition and management. • These proposed uses can fit in the "queue" for development scheduling and disposition with other Homesteading and Pasture uses
DHHL and the HHC will continue to violate their fiduciary responsibilities to the rehabilitation of the intended beneficiaries, as long as they insist on providing for the management and protection of "native lands to support both the cultural and resource management activities". When the beneficiaries can finally control the lands and conduct a self-sustaining activity in the area, what income-producing cultural activity does DHHL, HHC and the `Āina Mauna Legacy Program Implementation Advisory Council foresee - bird catching for gathering feathers? Mr. Gumapac was correct when he asked about how these studies incorporated the traditional Ahupua'a concept.  The `Āina Mauna Legacy Program is just a discussion for	The opportunities for beneficiaries are extensive and diverse; and, there are opportunities for beneficiaries within each component of the recommendations, whether it is homesteading, pasture, unmanaged-ungulate eradication, native forest restoration, commercial timber, koa forestry, ecotourism or cultural practices. Some of the benefits are proposed to be relatively immediate, while others will necessarily take time for the real benefit to come to fruition. Additionally, the implementation process will include opportunities for Beneficiary and community involvement and participation at all stages of the process. The mission of the `Āina Mauna Legacy Program and its implementation is to protect approximately 56,000-acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community. It is recommended that traditional knowledge and modern science be used in making management decisions. DHHL believes that the Humu`ula/Pi`ihonua lands have the potential for serving as a sustainable native forest and land unit by simultaneously providing environmental, economic and social benefits to the trust and its beneficiaries, in perpetuity by linking traditional cultural knowledge and modern science. The goal of a restored forest is consistent with the DHHL Energy Policy. The restored, healthy native forest provides a variety of benefits and opportunities to beneficiaries through gathering, cultural

the specific area and although it touts cultural and resource management, the plan has no cultural significance or strong points for future beneficiary stewardship, accept references to noted cultural studies.	practices and opportunities to see and understand native forest ecosystems. The site (with restoration to healthy native forest) provides beneficiaries cultural practices access as the only site of this type in the Hawaiian Home Lands Trust inventory. In addition there are multiple economic opportunities for beneficiaries. The Legacy Program recommends a mandatory `Āina Mauna cultural, natural resources and safety briefing to ensure that all visitors receive appropriate information they need in order to better understand and protect `Āina Mauna's cultural and natural resources. Specific contents of the `Āina Mauna cultural, natural resources and safety briefing will need to be determined.
Why did DHHL allow Parker Ranch to return the trust lands without restoring the land or take some responsibility to make it right again the way they first received it? Isn't this irresponsible stewardship and mismanaging of the lands?	The Program is moving forward with gorse eradication as described above. The department is free to pursue remedies outside of the Legacy Program.
What is the overall stance that DHHL is taking with the incoming leadership and any projected information as to next steps with award prioritization? What discussions, if any, about lands that are more realistically available and accessible closer to the town vicinity of Hilo. Lower Pi'ihonua and Honumu areas should be the focus before further management plans are pursued by DHHL. What plans are in place for these attainable areas?	The Lower Pi`ihonua and Honumu areas are outside of the Program area.

Other	
We propose that a solution to current management and resource concerns be solved with the development of human infrastructure (training for the Hawaiian people), that the foundation of homesteads and economic activity be grounded in native Hawaiian culture, we base our decisions locally and thinking of sustainability	The `Āina Mauna Legacy Program will provide a wide range of jobs and provide a wide range of job and training opportunities.  The restoration of the `Āina Mauna native forest will require a multitude of conservation oriented jobs. The native Hawaiian community will benefit from the `Āina Mauna Legacy Program via conservation training and jobs which restore the native forest, commercial jobs which reforest and harvest the koa forest, and others, such as ecotourism activities.

keeping in mind that our decisions will have direct effects on our successors so should be made with the greatest of thought.	
We suggest that embracing Hawaiian culture as your guiding principle versus economic opportunity, believing in the Hawaiian people and providing for their success, and follow through on promises will go a long way in healing and bridging this divide.	We concur. The rich cultural history of the area, presents a unique opportunity to link traditional cultural knowledge and modern science in restoring the area back to a healthy native forest, as well as other uses that benefit the Land, Beneficiaries and the Trust.
The Aina Mauna Legacy Program map indicates two things: (a) ID Labels with area description and acreage, and (b) color schemes labels with area description and acreage. Neither of these descriptions and acreage coincides with the color scheme labels, so the viewer is unable to identify what the consultant is really talking about.	The mapping noted on the documents posted on the DHHL website-beneficiary consultation-executive summary and program document have correct color coded maps.
We received our notices after the meeting date.	Due to problems with the initial mailing, an additional beneficiary meeting was held in Keaukaha.
Will the Mauna Kea access road be relocated since it is cutting through some of the trust land property?	There are no plans to relocate any of the roads.
Would you kindly clarify why the numerous programs and their particular purposes, especially if they don't have an invested interest in the immediate communities of Island.	The Program is based on several past studies. Ho`okuleana LLC was hired to write the Program and is the consultant for this project.  During the development of the `Āina Mauna Legacy Program, the `Āina Mauna Legacy Program Advisory Group was formed to provide advice and recommendations in identifying the optimum land use, infrastructure patterns, best management practices and estimated financial requirements to achieve the goals of the `Āina Mauna Legacy Program. Group members served as liaisons between their constituents and communities, as well as helped with outreach to their respective communities on behalf of the `Āina Mauna Legacy Program.

Letters of Support

Paula Helfrich, Teacher/Archaeologist	August 16, 2009
Queen Emma Land Company - Les Goya, Vice President	September 14, 2009
Hawai`i Forest Industry Association - Heather Gallo, Executive Director	September 15, 2009
UH Hilo, College of Ag, Forestry & Natural Resource Mgmt - Bill Steiner, Dean	September 24, 2009
Bishop Museum - Napua Harbottle, Botany Collections Manager	September 25, 2009
The Trust for Public Lands - Lea Hong, Hawai`i Islands Program Director	September 30, 2009
University of Hawai`i, CTAHR - J.B. Friday, PhD, Extension Forester	October 1, 2009
Bishop Museum - Tim Johns, President and Chief Executive Officer	October 5, 2009
Hawai`i Audubon Society - Wendy Johnson, First Vice President	October 7, 2009
Ross Wilson Jr. - Member of the Royal Order of Kamehameha	October 12, 2009
Josh Stanbro - Former Hawai`i Project Manager, The Trust for Public Lands	October 12, 2009
U.S. Fish and Wildlife Service - Jim Kraus, Refuge Manager, Hakalau Forest NWR	October 13, 2009
University of Hawai`i, NREM - James Leary, PhD, Invasive Weed Management	October 15, 2009
David B. Kaapu - native Hawaiian	October 21, 2009
Kamehameha Schools - Ulalia Woodside, Manager, Land Legacy Resources	October 22, 2009
Queen Lili`uokalani Trust - LeeAnn E. P. Crabbe, Vice President	October 23, 2009
The Nature Conservancy - Suzanne Case, Executive Director	October 30, 2009
Hawai`i Island Economic Development Board - Jacqui Hoover, Executive Director	October 30, 2009
Conservation Council for Hawai`i - Marjorie Ziegler, Executive Director	October 30, 2009
Big Island Invasive Species Committee - Zeada Pachecano, Manager	November 5, 2009
Office of Hawaii Affairs - Clyde Nāmu`o, Administrator	November 12, 2009
Hawai`i Island Chamber of Commerce - Jon Y. Miyata, Vice President	November 13, 2009
Hawaiian Civic Club of Kona-Kuakini - Gene “Bucky” Leslie, President	November 19, 2009
John De Fries - native Hawaiian	November 20, 2009
Army - Pōhakuloa Training Area - Stephen Troute, Community Relations	November 20, 2009
Royal Order of Kamehameha I, Ali`i Chapter - Alika Desha	November 25, 2009
Kahea Hawaiian-Environmental Alliance - Miwa Tamanaha & Marti Townsend	December 4, 2009

August 16, 2009

Kaulana H. Park
Chair
Department of Hawaiian Home Lands
91-5420 Kapolei Parkway
Kapolei, Hawaii 96707

Re: ‘AINA MAUNA LEGACY PROGRAM

Honorable Chair and Members of the Commission:

My name is Paula Helfrich and I am a 39-year resident of Hawaii, primarily in Waimanalo, Ewa, and Hawaii Island. I am currently doing research in Myanmar towards a doctoral degree in cultural resource management, although most of my work in recent years has centered around Aina Maunakea.

This summer, my colleagues and I were privileged to present a petition and testimony reinstating the ancient name of Kukahau’ula at the summit cone of Maunakea. For more than thirty years, I have ridden and walked the lands of Maunakea as part of many controversial projects from telescopes to Saddle Road, gorse infestation, ancient trails in Kaohe, paniolo cultural preservation, Umi a Liloa complex, Humu’ula, and Keanakolu among others. I have been privileged to learn from dozens of cultural practitioners, academics, historians and authorities from DLNR and DHHL, as well as private landowners and especially kumu paniolo.

I am so happy to see the good work that has been developed in the ‘Aina Mauna Legacy Program centering on Humu’ula and the lands of Keanakolu. This Program has always been an essential component for any kind of coherent cultural resource management of the region, and I am most pleased to offer my enthusiastic support.

I want to encourage continued dialogue by all stakeholders. This ‘Aina Mauna Legacy Program has the capacity to preserve, protect, cherish and enable the future for the wa’o kele lands, which must also influence the nest steps for the wa’o akua lands above. It is one mountain, ‘Aina Maunakea.

With humility and respect,

Paula Helfrich
Teacher/Archaeologist
c/o 117 Thumingalar Housing
Thingangyun, Yangon
Myanmar
Helfrich.paula@gmail.com

QUEEN EMMA LAND COMPANY

1099 Alakea St., Ste. 1100 • Honolulu, HI 96813 • (808) 532-6100 • FAX: (808) 535-5415 • www.queens.org

September 14, 2009

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Re: Support for the `Āina Mauna Legacy Program

Dear Chairperson Park:

We have reviewed the draft of the `Āina Mauna Legacy Program and take this opportunity to offer our support for this aggressive and ambitious project. We encourage the Hawaiian Homes Commission to approve and implement this program.

We understand the commitment it takes to restore land back into its former healthy native ecosystem. As an adjoining land owner at Kawaihae on the Island of Hawaii, we have embarked on a native forest restoration program of our own. We are restoring the native ecosystem through planting of native trees and ground cover vegetation which was once abundant in the area, installing fences and protecting stream corridors. Through this ongoing effort, we know that restoration efforts take considerable amounts of time and money. However, like you, we agree that the commitment to this long-term recovery is worthwhile, even though we may not see the true benefits well into the future. We encourage you to stay focused, so future generations will benefit from your efforts today.

Likewise, we believe you have incorporated an appropriate balance and variety of short and long-term uses on the site that will serve immediate and long-term needs. We are pleased to see that certain areas are dedicated for native forest restoration and protection and, at the same time, areas for homesteading and pasture use have been incorporated for the needs of your beneficiaries.

Queen Emma Land Company is part of The Queen's Health Systems which has as its stated mission ". . . to provide in perpetuity quality health care services to improve the well-being of Native Hawaiians and all of the people of Hawaii." With that mission, we share your commitment to restore your lands and agree with your program's use of the expression, "Ola ka `āina, ola ke kanaka"; Healthy land results in healthy people - care for the land, it cares for you.

We believe your program helps to further demonstrate the need for landscape-scale native ecosystem restoration and, in doing so, help to develop self-sufficient and healthy communities. Thank you for this opportunity to provide this letter of support for your `Āina Mauna Legacy Program.

Sincerely yours,

Leslie Y. Goya
Vice President

HAWAI'I FOREST INDUSTRY ASSOCIATION
P. O. Box 5594 ❖ Kailua-Kona, HI 96745-5594
Phone: 808-933-9411
Email: hfia@hawaiiforest.org
Website: www.hawaiiforest.org

September 15, 2009

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana'ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Support of `Āina Mauna Legacy Program

Dear Mr. Park,

On behalf on the Board of Directors of the Hawai'i Forest Industry Association (HFIA), I would like to express our support for your `Āina Mauna Legacy Program. HFIA recognizes the importance of efforts that will benefit the social, economic, and environmental resources in Humu'ula/Pi'ihonua. We are particularly concerned about the sustainable management of the native forest resources and support your plans to restore portions of this area to conserve the native forests and natural habitats for future generations.

HFIA supports DHHL's goals to restore and enhance the koa/'ōhi'a and māmane forest ecosystems at Humu`ula/Pi'ihonua. We approve of your plans to initially control gorse by implementing commercial timber practices using sugi and eucalyptus species, then eventually reforesting the land back to a native koa forest. We would also suggest appropriate native understory establishment. Timber planting can serve as an effective way of controlling gorse, as well as providing community economic benefits. This project also provides an opportunity for the use of koa wood products. With the restored forest, woodworkers will have cultural and economic opportunities for a variety of koa wood product production.

HFIA is especially interested in the Legacy Program's goals of providing restoration, educational, and cultural opportunities. We agree that restored, healthy native forests provide many opportunities for gathering, cultural practices, and ways to learn about native forest ecosystems. HFIA has successfully managed a 70-acre dryland forest at Ka'ūpūlehu in North Kona for the past 14 years. We provide youth education and forest stewardship opportunities through our award-winning Ka'ūpūlehu Dryland Forest Volunteer Outreach Program. Over the past five years, over 3,000 volunteers have contributed over 13,000 hours participating in forest stewardship activities. To date, over 5,000 native seedlings have been outplanted and 23 acres are being intensively managed. HFIA has leveraged over $950,000 through grants and volunteers to match $600,000 contributed to the project by landowner Kamehameha Schools. We are interested in working with you to bring our forest management and outreach services to benefit the lands and communities at Humu'ula/Pi'ihonua.

We appreciate you keeping us informed of this important community project and look forward to remaining involved in the process. Please feel free to contact me at 808-933-9411 or hfia@hawaiiforest.org.

Sincerely,

Heather Gallo

Heather Gallo, Executive Director
Hawai`i Forest Industry Association

Dean - College of Agriculture, Forestry and Natural Resource Management at the University of Hawaii in Hilo

September 24, 2009

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

To Whom It May Concern:

As a member of the Mauna Kea Partners coalition, I have been apprised by Peter Young of the work that DHHL is doing to plan on restoring and developing the Mauna Kea holdings you hold. The scope of the work is vast and the many facets are challenging but it is my opinion that the plan coming together to preserve and build mountainside communities important to Hawaiian small farmers is important and appears to be addressing many issues simultaneously there. As a developing watershed and supporting community, it will only add to the economic buildup of the entire Hilo region.

After addressing an earlier draft with my concerns, the latest draft appears as a strong and well developed project for DHHL to consider and undertake. As a native Hawaiian I find much promise for the building of strong roots for the culture on the Mauna Kea mountainside. As the Dean of the College of Agriculture, Forestry and Natural Resource Management at the University of Hawaii in Hilo, I stand ready to assist the work to be done by helping develop joint grants to bring about restoration, aid farm development and assist native Hawaiians to build strong economic ties to their own farm. My College has in the past contributed student interns to the developing project through the UH HIP program which we house. As our Natural Resource Program develops, it will be able to provide and help seek out advice, aid and joint development grants from Federal agencies in the areas of invasive species reduction, native plant restoration, saving of ESA species, building of forested slops, and building of farms and community. We look forward to working with you in the future.

Aloha

William Moekahi Steiner, Dean

BISHOP MUSEUM

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana'ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

September 25, 2009

Aloha Kaulana:

I am in full support of the Aina Mauna Legacy Program, for its all encompassing plan to improve, restore and revive the unprofitable lands of Humuula and Pi'ihonua.

I am mostly interested in that part of the DHHL Hawaiian Homes Commission Mission Statement:

"To manage the Hawaiian Home Lands trust effectively"; and your initiative to partner with others towards developing sufficient and healthy communities.

As the curator of the Bishop Museum's botanical collection and a strong advocate for improving the health of Hawaii's environment and natural resources, you can count on me for the following:

To be your advocate and consultant on insuring that The Department of Hawaiian Home Lands preserves the valuable natural resources and native eco-systems upon which the entire State and DHHL beneficiaries rely on.

Sincerely,

Napua Harbottle
Botany Collections Manager
1525 Bernice Street
Honolulu HI 96817-2704
Ph. (808) 848-4177
napuah@bishopmuseum.org

September 30, 2009

Kaulana Park, Chairman
Halea Kalaniana‘ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Re: ‘Āina Mauna Legacy Program

Aloha Chairman Park,

The Trust for Public Land (TPL) conserves land for people to enjoy as parks, gardens and other natural places, ensuring livable communities for generations to come. Nationwide, TPL has five program initiatives: (1) providing parks for people, (2) protecting working lands (farms, ranches, and forests), (3) conserving natural lands (wilderness, wildlife habitat), (4) safeguarding heritage lands (cultural and historical resources), and (5) preserving land to ensure clean drinking water and the natural beauty of our coasts and waterways. In Hawai‘i, TPL has worked with public and private partners to conserve over 36,000 acres of land in the State, with a focus on coastal lands and lands important to Hawaiian communities.

TPL’s Native Lands Program works at the request of native communities and organizations to protect land important to Hawaiians. TPL considers the Department of Hawaiian Homelands (DHHL) an important partner in conserving land for Hawaiians here in Hawai‘i. TPL looks forward to working with DHHL to acquire additional conservation lands, which will benefit Hawaiian homestead communities.

TPL supports DHHL’s efforts to plan for and manage its conservation and mauka lands. While TPL does not generally comment on specific land use projects, we support the general intent of the ‘Āina Mauna Legacy Program which seeks to restore native forest ecosystems and provide sustainable management of the land for the Hawaiian Home Land Trust and its Beneficiaries. DHHL should be commended for its efforts.

Mahalo,

Lea Hong

Lea Hong
Hawaiian Islands Program Director

UNIVERSITY OF HAWAI'I AT MĀNOA
College of Tropical Agriculture and Human Resources
The founding college of the University of Hawai'i, Established 1907

Cooperative Extension Service

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

October 1, 2009

Dear Mr. Park,

I am writing to support the proposal for the ʻĀina Mauna Legacy Program for the DHHL lands of Humuʻula and Piʻihonua prepared by Hoʻokuleana LLC. I am the extension forester with the University of Hawaiʻi Cooperative Extension Service and I am based in Hilo. For the past ten years, a major part of my program has been koa forest management and restoration. In my professional judgment, koa forest restoration on Mauna Kea can be a success both ecologically and economically. My colleagues and I have several projects near Humuʻula, including on Umikoa Ranch, the Laupāhoehoe section of the Hilo forest reserve, Kukaiau Ranch, and Hakalau Forest National Wildlife Refuge. We have shown that the prolific koa regeneration that occurs after logging can be managed by thinning and fertilization to improve potential timber yield. We have shown that grass control and early fertilization can double growth rates of planted koa. By comparing koa growth at Laupāhoehoe with koa growth at Honomalino in South Kona and Keauhou Ranch in Volcano, we have shown that koa growth on the windward side of Mauna Kea is some of the best in the state. We would be happy to work with DHHL both in developing management prescriptions and in designing trials to answer relevant management questions.

Our knowledge of koa forestry in Hawaiʻi has greatly increased in the past ten years, to the point where we feel confident that koa forest restoration can be economically profitable in the long run. In addition to work done by UH, the USDA Forest Service, the Nature Conservancy, Hawaiʻi Volcanoes National Park, Kamehameha Schools, Forest Solutions, and the Hawaii Agriculture Research Center have all contributed to our current knowledge of koa forestry. For the past several years DHHL has been managing one of the best-run koa harvest and restoration operations in the state and today we can see the beginnings of a young, healthy koa forest.

The ʻĀina Mauna Legacy Program addresses the major problems of land management on the mauka lands such as gorse and feral ungulates. It incorporates both economic and environmental aspects and would be a model for other land management agencies and large landowners. I urge DHHL's full support of the project.

Sincerely,

J. B. Friday, PhD
Extension Forester

875 Komohana Street, Hilo, Hawaii 96720-2757
Telephone: (808) 969-8254, Facsimile: (808) 981-5211, E-Mail: jbfriday@hawaii.edu, Web: www.ctahr.hawaii.edu/forestry

BISHOP MUSEUM

October 5, 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Dear Chairperson Park:

Please let me extend our support for your `Āina Mauna Legacy Program seeking to restore portions of your Humu`ula/Pi`ihonua lands in perpetuity to restore and enhance these native forests and natural habitats for future generations.

We applaud your ambitious efforts to protect approximately 56,000 acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community. We agree that restoration of the land upon which native Hawaiians have always depended is key to the success of the beneficiaries, the Trust and the community.

Bishop Museum has embarked upon our own ambitious restoration and renovation project. Just recently, we reopened the newly restored Hawaiian Hall after three years of its first renovation in over a century. Bishop Museum's mission since founding has been to study, preserve and tell the stories of the cultures and natural history of Hawai`i and the Pacific. We share the commitment to serving and representing the interests of native Hawaiians.

We appreciate the challenge you face in responding to and balancing the many and varied interests concerned with your lands. We see that you have incorporated a diversity of immediate actions that include opportunities for beneficiaries within each component of your recommendations, whether it is homesteading, pasture, unmanaged-ungulate eradication, native forest restoration, commercial timber, koa forestry, ecotourism or cultural practices.

We encourage you to adopt and implement this plan. While we recognize that it will take a considerable amount of time and money, we believe this is an effort that is worthwhile and necessary to make these lands available for native Hawaiian use.

Sincerely,

Timothy E. Johns
President & Chief Executive Officer

Cc: Allen Allison, Vice President of Science
Bishop Museum

1525 Bernice Street • Honolulu Hawai'i 96817-2704 • Ph. (808) 847-3511 • Fax: (808) 841-8968 • Email: museum@bishopmuseum.org

For the Protection of Hawaii's Native Wildlife

HAWAII AUDUBON SOCIETY

850 Richards Street, Suite 505, Honolulu, HI 96813-4709
Phone/Fax: (808) 528-1432; hiaudsoc@pixi.com
www.hawaiiaudubon.com

October 7, 2009

Kaulana Park
Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana'ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Dear Mr. Park:

The Hawai'i Audubon Society appreciates the opportunity to offer these comments in support of the Department of Hawaiian Home Lands' Aina Muana Legacy Program native forest restoration efforts at Humu'ula/Pi'ionua on the island of Hawai'i.

As you may know, the Hawai'i Audubon Society was founded in 1939 and is Hawai'i's oldest conservation organization. Our primary mission is the fostering of community values that result in the protection and restoration of endemic bird species, as well as, native ecosystems through education, science, and advocacy in Hawai'i and the Pacific.

Since the 1990's, Audubon has been supporting gorse eradication and koa forest restoration efforts of the U.S. Fish and Wildlife Service in the Hakalau Forest National Wildlife Refuge which lies adjacent to Humu'ula/Pi'ionua. We certainly appreciate the benefit that similar gorse eradication and koa forest restoration efforts at Humu'ula/Pi'ionua would have in restoring the forest bird habitat. These efforts will ensure the critical survival of the endangered Hawai'i creeper and the 'akiapola'au, which now can be seen regularly in the plated koa groves in Hakalua. The 'akiapola'au is one of seven species that forage in koa trees. In fact, 30 of Hawai'i's 35 remaining native forest bird species can be found in koa forests. In addition, 30% of the threatened endangered plant species in Hawai'i are also found in koa forests.

Audubon also supports the long term goal of creating an economically-sustainable, healthy native forest ecosystem at Humu'ula/Pi'ionua. We also believe that the re-examination of ongoing efforts every five years would ensure that required changes could be made to obtain the very best possible sustainable koa forest outcome.

In closing, we note that the Legacy's goals and priorities are consistent with those of the Audubon Society. It is hoped that we will be able to develop a collaborative partnership with DHHL to work together on projects that benefit both organizations and their constituencies.

On behalf of the Hawai'i Audubon Society's Directors.

Sincerely yours,
Wendy Johnson

Ross_Wilson-Support-e-mail-10-12-09

From: Ross Wilson [rossw@current-events.com]
Sent: Monday, October 12, 2009 2:17 PM
To: kaulana.h.park@hawaii.gov
Cc: bob.c.freitasjr@hawaii.gov; PeterYoung@Hookuleana.com
Subject: Kona Support For Aina Mauna Legacy Program

October 12, 2009

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Aloha!

As a native Hawaiian and a member of the Board of Directors of Ahuena Heiau Inc, and a member of the Royal Order of Kamehameha, I appreciate that the Department of Hawaiian Home Lands is working on the Aina Mauna Legacy Program that calls for the restoration of DHHL lands at Humuula on the slopes of Mauna Kae.

Although I can't speak for the groups that I'm a member of, I personally support your efforts with the Aina Mauna program and ask that once the plan is adopted that you immediately work toward its implementation. Your legacy with this program should begin today.

I was raised in Hilo and attended Hilo High School and the lands of Humuula are clearly visible to Hilo residents including my mom and sister and brother.

I have since moved to Kona and I know there are many like me who feel that it is important to restore the native forest on Mauna Kea. After decades of decline, we now have an opportunity to reverse the trend and bring back what was once there.

I am also happy to see the extensive areas for homesteads for native Hawaiians called for in the plan. I am especially happy that native Hawaiians can and should benefit from this program through needed jobs and economic development opportunities especially given today's economic outlook.

I know it will take a lot of time and effort to finally see the results of this plan but it is worth the effort for the generations following us and I ask that you adopt and implement the plan.

Mahalo for your kokua,

Ross Wilson Jr.
75-5751 Kuakini Highway, Suite 202
Kailua-Kona, HI 96740

808-937-3678

CREATIVE COMMONS
CONSULTING AND SUSTAINABLE MODELS

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalanianaole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Aloha Chairperson Park,

This letter is sent in support of the Aina Mauna Legacy program.

I have a background in land conservation and environmental consulting in Hawai'i. For five years, I worked as the Hawaii Project Manager with the Trust for Public Land's Hawaii office working on land conservation projects throughout the Islands. In that role, we worked to expand the Hawaiian Islands Program's relationships with local communities and provided technical assistance to local land trusts and conservation groups working on every major island. As a consultant to non-profit conservation organizations, I have helped organizations make long-term plans to build sustainable organizations and land stewardship conservation plans.

I know that it can be difficult to be a large landowner in Hawai'i and find the right balance doing right by the land, the local economy, and local communities. I support your proposal to restore balance and native forests to the land as part of this program. Likewise, I understand the commitment of time and money that it will take to do so. The Aina Mauna Legacy Program strikes me as a thoughtful approach and a beneficial tool to conserve this important legacy for future generations.

I am particularly impressed with the program's attempt to balance present needs of beneficiaries, through areas for initial homesteading, with long-term sustainability elements. This commitment to creating a sustainable plan for the restoration and conservation of the lands, while also providing economic opportunities and use for DHHL and its beneficiaries, seems to combine important, diverse goals in the management of these lands.

I know that implementation of this program will take a great deal of time and energy. It will not be easy, but it seems to me to be the pragmatic and right thing to do for the long haul.

Aloha,
Josh Stanbro
(808) 306-5518

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Big Island National Wildlife Refuge Complex
60 Nowelo Street, Suite 100
Hilo, Hawaii, 96720

October 13, 2009

In Reply Refer to:
2009-10-13-HFNWR

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Re: **The DHHL Aina Mauna Legacy Program**

Dear Mr. Park:

The purpose of this letter is to express support for the Aina Mauna Legacy Program prepared for the Department of Hawaiian Home Lands by Ho`okuleana LLC. The objective of the plan is to guide the management of DHHL's Humu`ula and Pi`ihonua lands which includes some of the most important native forest areas remaining in the DHHL trust today on Mauna Kea.

The U.S. Fish and Wildlife Service owns and manages the 32,733 acre Hakalau Forest National Wildlife Refuge which neighbors both the Humu`ula and Pi`ihonua parcels. The refuge was established in 1985 and is part of the The National Wildlife Refuge System which comprises the world's largest collection of lands set aside specifically for wildlife and provides habitat for native plants and animals. It is administered by the Department of Interior's Fish and Wildlife Service, the principle Federal agency responsible for conserving, protecting, and enhancing the nation's fish and wildlife populations and their habitats for the benefit of the American people. The refuge provides habitat for eight endangered bird species, the Hawaiian hoary bat, and at least six species of endangered plants.

Over the past 25 years Hakalau Forest NWR has been responsible for the restoration of over 400,000 native trees and plants at the refuge and has lead control efforts to remove non-native invasive species across over 14,000 acres of refuge lands. In addition, Hakalau Forest NWR is involved in several beneficial partnerships with DHHL including the construction and long-term maintenance of a shared fuel break, two koa restoration/gorse removal projects, and the protection and restoration of a bird corridor at Kanakaleonui. We believe this example of cooperative conservation represents an excellent model for addressing land management challenges on Mauna Kea and elsewhere.

The initial goals and immediate actions outlined in the Aina Mauna Legacy Program including

the eradication of invasive species and the restoration of native ecosystems are consistent with the goals of Hakalau Forest NWR. These shared goals may provide a framework for additional opportunities to collaborate through partnerships with the National Wildlife Refuge and the U.S. Fish and Wildlife Service's Conservation Partnerships Program in the future.

Hakalau Forest NWR supports DHHL's efforts to plan and manage it's mauka lands through the Aina Mauna Legacy Program. It addresses key problems faced today by managers of the Mauna Kea uplands including forest restoration, fire prevention, invasive weed and feral animal management. We look forward to continuing cooperation in sound stewardship of the land as neighbors of DHHL and offer our assistance on any matters of mutual interest or concern. If you have questions, please contact me at (808) 443-2300.

Sincerely,

Jim Kraus
Refuge Manager
Hakalau Forest NWR

UNIVERSITY OF HAWAI'I AT MĀNOA
College of Tropical Agriculture and Human Resources
Department of Natural Resources and Environmental Management

October 15, 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Subject: Support for the ʻĀina Mauna Legacy Program

Dear Mr. Park,
I have reviewed ʻĀina Mauna Legacy Program proposal prepared by Hoʻokuleana LLC and consider all of the items in this agenda to be highly appropriate for implementation within the Humuʻula and Piʻihonua areas that are maintained by DHHL. I have been conducting research in these areas over the last five years developing relevant approaches to gorse management and koa restoration. In my experiences, there are very few passive solutions and I strongly feel that our best opportunities for success will come through active land management in agriculture, forestry and conservation. Not only does this program neatly provide guidance to remediate the ecology of Humuʻula and Piʻihonua, but also more importantly realizes the potential to empower DHHL's constituents with the *kuleana* to become a part of the solution. I support DHHL championing this cause with further development and implementation of this program. As a public servant, please consider my services for contribution to future needs as we progress. Mahalo for your consideration and please do not hesitate to contact me at anytime.

Sincerely,

James Leary, PhD
Assistant Specialist, Invasive Weed Management
Department of Natural Resources and Environmental Management
University of Hawaii at Manoa
Email: leary@hawaii.edu
Phone: 808-352-8774

DAVID B. KA`APU
Attorney at Law
Territorial Centre, Suite 201
75-5751 Kuakini Highway
Kailua-Kona, Hawaii 96740
Telephone No.: (808) 329-1385 Facsimile No.: (808) 329-0512
E-mail: DBK2009@gmail.com

21 October 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Aloha Chairman Park:

I am writing in support of the Aina Mauna Legacy Program.

I believe the department has the responsibility to restore this area, while at the same time provide opportunities for native Hawaiians to use these lands. The plan shows a good balance of uses and benefits and has incorporated a variety of means to support the efforts, including ecotourism, commercial uses, timber, etc.

The focus to fight the gorse is also a good thing. Under existing conditions, the land is worthless. The suggestion that timber be used to fight the gorse looks like a good one. Doing so, it also provides rental income to offset other costs of management.

Hawaiian Homes has the opportunity to demonstrate appropriate restoration and management efforts to return health back to these lands. I know it will take a long time and considerable work and money to do so. However, I believe the effort is worth it.

Please approve the Aina Mauna Legal Program and work toward its implementation.

Sincerely,

David B. Kaapu

KAMEHAMEHA SCHOOLS

October 22, 2009

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana'ole

91-5420 Kapolei Parkway
Kapolei, HI 96707

Re: Department of Hawaiian Home Lands' 'Āina Mauna Legacy Program

Mr. Park,

Kamehameha Schools has reviewed the Department of Hawaiian Home Lands' 'Āina Mauna Legacy Program and is in support of its proposal to protect approximately 56,000 acres of native Hawaiian forest in Humu'ula and Pi'ihonua. We expect that the initiatives detailed in the Legacy Program's draft plan, shared with us by Peter Young of Ho'okuleana, LLC, will provide multiple values for Hawaiian beneficiaries and believe this plan to be in alignment with our own land management strategies and our shared visions of a thriving Hawaiian people.

We wish to particularly commend the proposal to contain and control gorse, a habitat-modifying invasive weed. This undertaking will be a critical step in protecting the health of upland natural and cultural landscapes on Hawai'i Island.

Of further importance are the encouraging plans for koa reforestation, a strategy that is known to provide multiple ecosystem service benefits—from habitat for forest birds,to source for cultural practices—while expanding mauka forest cover and attracting clouds and rain to the higher elevations of Mauna Kea.

This proposal represents a sound strategy to protect the suite of natural and cultural resources that are the cornerstones of Hawaiian identity and well-being. We agree wholeheartedly that Kalaniana'ole's vision of healthy, self-sufficient Hawaiian communities is one that will be sustained by healthy, thriving lands.

'O au iho nō me ka 'oia'i'o,

Ulalia Woodside
Manager, Land Legacy Resources
Kamehameha Schools Land Assets Division

QUEEN LILI`UOKALANI TRUST

Alakea Corporate Tower
1100 Alakea Street, Suite 1100
Honolulu, Hawai`i 96813
Telephone: (808) 203-6150 Facsimile: (808) 203-6151

October 23, 2009

VIA EMAIL

Mr. Kaulana Park, Chairperson
Department of Hawaiian Homelands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Subject: `Āina Mauna Legacy Program

Dear Mr. Park,

We have had the opportunity to review the `Āina Mauna Legacy Program proposed for the Department of Hawaiian Homelands (DHHL) lands at Humu`ula/Pi`ihonua.

We believe this is a fine plan that will benefit generations to come. We commend your efforts on this plan and look forward to seeing this vision realized.

Please contact me if you have questions on this matter at 808-203-6150. Mahalo.

Very truly yours,

LeeAnn E.P. Crabbe
Vice President

CC: Bob Freitas, Jr.
Peter Young

The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy
Hawai'i Program
923 Nu'uanu Avenue
Honolulu, HI 96817

tel (808) 537-0400
fax (808) 545-2019
www.nature.org hawaii

October 30, 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana'ole
91-5420 Kapolei Parkway
Kapolei, Hawai'i 96707

Dear Mr. Park:

The Nature Conservancy (TNC) has reviewed the draft of the 'Āina Mauna Legacy Program and supports the Program's efforts to restore native biodiversity to its Humu'ula / Pi'ihonua properties.

TNC owns or manages approximately 40,000 acres in Hawai'i. We understand that restoring the islands' natural communities is time consuming and expensive, but it is well worth the effort. Specifically, TNC is pleased to see the 'Āina Mauna Legacy Program's goal to conserve native forests and natural habitats on these lands in perpetuity. We are especially interested in the long-term protection of the Pi'ihonua parcel, as it contains some of the most biologically important and healthy forested areas in the region.

TNC is committed to working with conservation partners in Hawai'i to find the best solution for long-term conservation management. It is our hope that this living document is the first step toward enabling a reality that will ensure responsible management practices on the Department of Hawaiian Home Lands' 'Āina Mauna Legacy Lands to maintain the health of these areas for generations to come.

Please do not hesitate to call should you have any specific questions.

Sincerely,

Suzanne Case

Suzanne Case
Executive Director

Hawaii Island Economic Development Board
ISLAND OF OPPORTUNITY

30 October 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Transmit via e-mail to: kaulana.h.park@hawaii.gov

Aloha Mr. Park,

The Hawaii Island Economic Development Board (HIEDB) is a member-based organization incorporated in 1984. During our twenty-five year history, HIEDB has been committed to providing and promoting private sector support and expertise for balanced growth in Hawai`i County in partnership with both public and private resources.

The efforts to restore and conserve into perpetuity portions of the Humu`ula/Pi`ihonua lands, native forests, and habitats are a firm demonstration of the culturally sensitive and balanced growth sought by HIEDB and its members respectively and collectively.

HIEDB recognizes the multiple near and more importantly, long-term benefits including and not limited to economic, social, environmental and educational opportunities afforded through the `Āina Mauna Legacy Program. We also recognize the over-arching opportunities for long-term, self-sufficiency for beneficiaries of the Department of Hawaiian Home Lands and we strongly endorse and applaud these efforts.

Please do not hesitate to advise if we may be of any assistance in helping to achieve the worthy goals of the `Āina Mauna Legacy Program.

Mahalo and Best Regards,

Jacqui L. Hoover

Jacqui L. Hoover, Executive Director
Hawaii Island Economic Development Board, Inc.
E-mail: jhoover@hiedb.org

c: bob.c.freitasjr@hawaii.gov ;
PeterYoung@Hookuleana.com

Conservation Council for Hawai‘i

October 30, 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Dear Mr. Park,

Aloha. Conservation Council for Hawai‘i supports the intent of the Department of Hawaiian Home Land’s ‘Aina Mauna Legacy Program on the island of Hawai‘i. We appreciate the Department’s proposal to control introduced species, such as gorse, domestic and feral cattle, and feral sheep and goats on its Mauna Kea lands. Left unchecked, these alien species will eventually eliminate all of the natural and cultural values attached to this land.

Thank you.

Sincerely,

Marjorie Ziegler

Hawai‘i’s Voice for Wildlife – *Ko Leo Hawai‘i no na holoholona lohiu*

Telephone/Fax 808.593.0255 • email: info@conservehi.org • web: www@conservehi.org
P.O. Box 2923 • Honolulu, HI 96802 • Office: 250 Ward Ave., Suite 212 • Honolulu, HI 96814

Big Island Invasive Species Committee

November 5, 2009

Department of Hawaiian Homelands
c/o Ho'okuleana LLC
25 Kane'ohe Bay Drive Suite 212
Kane'ohe, HI 96734

RE: Support for the 'Aina Mauna Legacy Program

To whom it may concern:

The Big Island Invasive Species Committee (BIISC) is in full support of the 'Aina Mauna Legacy Program. The goals and intentions of this program are in-step with the goals and mission of BIISC to control invasive species within Hawaii County. In addition, BIISC agrees with the overall mission of the legacy program to enhance and restore native habitat in Humu'ula/Pi'ihonua in perpetuity for future generations. BIISC has worked very hard to keep Miconia, a highly invasive pest species, from spreading in the upper Pi'ihonua and N. Hilo districts for the past decade. BIISC sees this legacy program has an additional partnering of agencies to fulfill the overall goal of protecting Hawai'i's unique natural habitat and cultural resources. DHHL has been a strong supporter of BIISC for many years now, and we applaud your efforts to protect native ecosystems with the long term goal of preserving resources for beneficiaries and Hawai'i's people alike.

Sincerely,

Zeada Pachecano
Temporary Manager

Cc: BIISC Executive Committee Members (Roger Imoto, Ann Marie LaRosa, Laura Hillis, Dr. Pat Conant)

23 East Kawili Street Hilo, Hawaii 96720 Website: www.hear.org/biisc, www.bigislandisc.org
Phone: (808) 933-3326 Fax: (808) 933-3339 Hotline: (808) 961-3299

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD09/4642

November 12, 2009

Peter Young
Ho'okuleana LLC
25 Kāne'ohe Bay Drive, Suite 212
Kailua, Hi 96734

RE: 'Āina Mauna Legacy Program, Department of Hawaiian Home Lands.

Aloha e Peter Young,

The Office of Hawaiian Affairs (OHA) is in receipt of your email requesting comments on the above-mentioned project. The Department of Hawaiian Home Lands (DHHL) has developed the 'Āina Mauna Legacy Program to manage approximately 56,200 acres of its Humu'ula/Pi'ihonua lands located along the northeast slopes of Mauna Kea. The 'Āina Mauna Legacy Program includes plans for invasive gorse removal, koa/'ōhi'a/māmane reforestation and a variety of commercial initiatives to make the program economically self-sustainable. OHA has reviewed the project and offers the following comments.

OHA supports the concept of the 'Āina Mauna Legacy Program, and believes that it will serve as a model for other long-term land management plans. We commend DHHL for its commitment to restoring the native ecosystems on its properties and for involving its beneficiaries in the process. OHA especially appreciates that economic sustainability is a major component of the program. Long-term restoration and land management plans have a greater likelihood of succeeding if they can fund themselves and not drain the financial resources of the administrating agency.

It is our agency's understanding that the foundation of the `Āina Mauna Legacy Program is based on the program's mission, goals and priority issues. The mission of the `Āina Mauna Legacy Program and its implementation, as stated, is to protect approximately 56,000 acres of Native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community.

In accomplishing this mission, we are identifying the optimum land use, infrastructure needs, best management practices and estimated financial requirements to achieve the following Legacy Program goals and priority issues:

- Restoration and enhancement of DHHL trust resources
- Identify opportunities for DHHL Homesteading
- Preservation of Natural and Cultural Resources and Endangered Species
- Address reforestation and restoration of the ecosystem
- Removal of invasive species - gorse, etc.
- Develop revenue generation, reinvestment in land to sustain activities
- Provide educational and cultural opportunities
- Identify and secure partners to sustain activities
- Identify opportunities for alternative/renewable energy projects
- Be a lead and/or model for others to engage in ecosystem restoration in a culturally sensitive manner based on partnerships to develop a self-sustaining model

However, we ask that program officials be careful when selecting alien species to plant within the project site. We have specific concerns with the types of trees that may be used in the Commercial Timber to Fight Gorse initiative. We note that eucalyptus trees are one of the identified trees for the commercial timber project. Eucalyptus is a close relative of ʻōhiʻa trees, which are a major pillar of our native forests. Because of their close relation, diseases carried by eucalyptus trees may also affect ʻōhiʻa trees. (One example of a disease that affects both trees is the recently introduced ʻōhiʻa rust.) If a disease hits ʻōhiʻa trees particularly hard, our native forests could be wiped out.

Therefore, we recommend that program managers use eucalyptus seedlings grown in state to avoid bringing in plants that may be infested with new diseases. However, if importation is absolutely necessary, program managers should try to obtain clean planting material and then quarantine the shipment to evaluate whether the plants are harboring new diseases.

Program managers should use the Department of Land and Natural Resources' Weed Risk Assessment Program for all planned alien species introductions, and work closely with DLNR's Division of Forestry and Wildlife and the Hawaiʻi Invasive Species Council.

OHA also asks whether an environmental assessment will be developed for the ʻĀina Mauna Legacy Program in accordance with Hawaii Revised Statutes, Chapter 343 as well as an archaeological inventory survey in compliance with Chapter 6E, HRS. There are at least three important historical Hawaiian ranching stations in this area as well as many individual ahupua'a transecting through this rich area.

This project has the potential to establish good precedent for other large areas of our islands facing similar issues.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong by phone at (808) 594-0248 or e-mail him at sterlingw@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Hawai'i CRC Office

Hawaii Island Chamber of Commerce

106 Kamehameha Avenue
Hilo, Hawaii 96720
Phone: (808) 935-7178
Fax: (808) 961-4435
E-mail: admin@hicc.biz
www.hicc.biz

November 13, 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home lands
Hale Kalaniana'ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Re: Aina Mauna Legacy Program

Dear Mr. Park:

The Hawaii Island Chamber of Commerce which represents over 300 businesses and has close to 800 members supports the Department of Hawaiian Home Lands Aina Mauna Legacy Program. We feel that it is important for the Department to restore certain lands to conserve those native forests and natural habitats for future generations. What makes this Program attractive is its goals of creating a sustainable plan for the areas of Humu`ula and Pi`honua where the lands can be conserved while also providing an economic resource for the Department and its beneficiaries.

We envision the beneficiaries taking advantage of the opportunities afforded by this Program including homesteading, unmanaged-ungulate eradication, native forest restoration, ecotourism and cultural practices to name a few. This in turn has the potential to foster other opportunities not only for the beneficiaries, but for businesses, our members and the general public.

The success of this program will also help serve as an outstanding model for the successful managing of existing and future activities and to ensure the protection of the Department's trust property. Accordingly, the Hawaii Island Chamber fully endorses this Program.

Very truly yours,

Jon Y. Miyata
Vice President

HAWAIIAN CIVIC CLUB OF KONA ʻ KUAKINI

November 19, 2009

Mr. Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana‘ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

RE: Support for Department of Hawaiian Home Lands ‘Aina Mauna Legacy Program

Aloha!

The Association of Hawaiian Civic Clubs (AHCC) is the oldest Hawaiian community-based grass roots organization founded in 1918 by Prince Jonah Kuhio Kalaniana‘ole.

The Hawaiian Civic Club of Kona-Kuakini, organized in 2003, believes in being a strong voice at County, State and Federal levels, and supports the AHCC’s mission to serve with pono in advocacy of culture, health, economic development, education, social welfare and nationhood.

The Hawaiian Civic Club of Kona-Kuakini stands in support of the department’s ‘Aina Mauna Legacy Program and we applaud the long-term vision to conserve and restore these lands for future generations. DHHL’s commitment to reforest important native forest areas will assure the continued health of many native and endemic species.

As President, I am encouraged by the first rural homesteading opportunity for the Humu‘ula/Pi‘ihonua lands and the economic possibilities it will bring to Native Hawaiians. How wonderful it will be when the agricultural operations planned for ‘Aina Mauna, including commercial koa forest management operations, provide a means for Native Hawaiian beneficiaries.

‘Aina Mauna Legacy Program has the long-term vision to be the crown jewel for Native Hawaiian beneficiaries for generations to come.

The Hawaiian Civic Club of Kona-Kuakini enthusiastically supports the department’s plans for the Humu‘ula/Pi‘ihonua lands.

Mahalo,

Gene “Bucky” Leslie
President

75-5815 Mamalahoa Highway • Holulaloa, Hawaii 96725

HŌKŪLI'A

November 20, 2009

Mr. Kaulana Park, Chairman
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Subject: Letter of Support for Aina Mauna Legacy Program

Aloha Chairman Park:

Before addressing the merits of the Aina Mauna Legacy Program, let me emphasize how professional and transparent the process of public consultation has been, to date. Both supporters and detractors have been listened to very carefully and through this intense dialogue much has been learned. What unites all parties is our combined love of the land and respect for this special mountain.

In voicing my support for this program let me focus on three key elements:

1) **Functionality:** We have a societal responsibility to make these lands productive through reforestation. And, while it won't happen overnight, making the land productive is a core Hawaiian cultural value.

2) **Opportunity:** Native Hawaiians will benefit from the added opportunities in homesteading and new careers in forestry and environmental tourism. The restored forest will inspire a return to the appropriate Hawaiian cultural practices, as well.

3) **Flexibility:** While immediate approval of the proposed plan is prudent, the plan is framed in a way that preserves flexibility; so in the future as needs change the plan can adapt.

Cease the moment, DHHL and move to approve this plan immediately and effect its implementation. In doing so, you will again be fulfilling your mandate of reconnecting native peoples with their native places.

E Malama Moku o Keawe,

John De Fries
President and CEO

1250 Oceanside Partners • 78-6831 Ali'i Drive • Suite K15 • Kailua-Kona, Hawai'i 96740-2440
phone *808-324-1500* • fax *808-324-0171* • *www.hokulia.com*

November 20, 2009

Kaulana Park, Chairperson
Department of Hawaiian Home Lands
Hale Kalaniana`ole
91-5420 Kapolei Parkway
Kapolei, HI 96707

Re: Aina Mauna Legacy Program

Pōhakuloa Training Area (PTA) supports the Aina Mauna Legacy Program. As an adjoining neighbor to the project site, we appreciate the opportunity to review and comment on your proposal.

We concur with the concept "to protect approximately 56,000 acres of native Hawaiian forest that is ecologically, culturally and economically self-sustaining for the Hawaiian Home Lands Trust, its beneficiaries and the community." This is a great complement to our environmental efforts here at PTA.

The U.S Army Garrison – Pōhakuloa shares your commitment to protecting the region's natural and cultural resources. In addition to our mission and vision of being the best military training area in the Pacific, we endeavor to set the standard for environmental stewardship and energy efficiency. The natural and cultural resources personnel at PTA are working diligently to protect the environment in order to allow the Army and the other services to train here.

We note that you emphasize the need for partnerships to implement your proposal. As your neighbor, we see this as an important opportunity and look forward to working with you in this regard. We regularly collaborate with adjoining and neighboring properties and in 2006 The PTA environmental program was selected by the US Fish and Wildlife Service for the Military Installation Conservation Partner Award for natural resource conservation achievements through cooperative work with the Service and others. Our Federal Fire department routinely assists with prescribed burns of gorse infestation at Huum'ula.

We encourage you to continue this program and move forward with its implementation. The plan sets a good example for all of us to follow and we are standing by to assist you in the process of long-term improvements.

Respectfully Submitted,

Stephen W. Troute
Community Relations Specialist
Pōhakuloa Training Area

Ali'i Sir Herman K. K. Kana'e, K.G.C.K.
Ali'i Nui & GrandMaster

www.royalorderofkamehameha.org

Ali'i Sir Francis Ching, K.G.C.K.
Kākā'ōlelo Nui

Office of the Kākā'ōlelo Nui
Ali'i Chapter, Heiau O Nā Ali'i
P.O. Box 1924
Kailua Kona, Hawai'i 96745

November 25, 2009

Peter T. Young
President, Ho'okuleana LLC
25 Kāne'ohe Bay Drive, Suite 212
Kailua, Hawai'i 96734

SUBJECT: DHHL 'Āina Mauna Legacy Program

Greetings Mr. Peter Young,

We received the executive summary report for the above program. Please accept our letter of support for the 'Āina Mauna Legacy Program on Hawai'i Island.

The lands of Humu'ula and Pi'ihonua represent the most important native forest areas remaining in the DHHL trust. The Legacy Programs' mission to protect our native forest is an important step in preserving the lands that are ecologically, culturally and economically self-sustaining for its beneficiaries and our Hawaiian community.

The Order of Kamehameha I was established on April 11, 1865 by his Majesty King Kamehameha V (Lot Kapuaiwa) to honor the legacy of his grandfather, the unifier of these islands, Kamehameha the Great. The Order was re-organized by Prince Jonah Kūhiō Kalaniana'ole in 1902. One of the Orders major purpose is to preserve and perpetuate the ancient customs and traditions of Hawai'i.

The Royal Order lives in peaceful coexistence with the United States Government, but sees the restoration and preservation of our native lands as a priority, and the only viable option that ensures the life of the land, and its uniqueness of Hawai'i Nei. We will continue to assure that our Native Hawaiian traditional & customary gathering rights in areas such as this is protected. It is our duty.

The uplands of Humu'ula and Pi'ihonua was once rich in natural resources. It provided our ancestors with much fruit and wood materials such as koa, ʻōhiʻa and māmane for housing. The lower valleys were suited for cultivation of crops and fresh water fishing. Now this area has been taken over by the gorse weed and we have watched the dwindling of our native fauna through the years. We feel that with proper management, this area will be protected for future generations.

If you find the need for our assistance in the future, do not hesitate to contact us through our website, www.royalorderofkamehameha.org.

"In the light of our ancestors"

Me ka ʻoia ʻiʻo,

Alika K. Ikaka for

Aliʻi Sir Francis K.W. Ching, K.G.C.K.
Kākāʻōlelo Nui

cc: Aliʻi Nui, Pūkaua Nui, Mamo Aliʻi Nui, Kākāʻōlelo Nui

HOʻOKAHI NO KĀ ʻĀINA A ME NA KANAKA
KAHEA
THE HAWAIIAN-ENVIRONMENTAL ALLIANCE

Office
1149 Bethel St., Ste. 415
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kahea-alliance@hawaii.rr.com

December 4, 2009

Aloha Mr. Young,

Mahalo for this opportunity to comment on the proposed 'Āina Mauna Legacy Program. We commend DHHL for exploring new models for integrated management of Hawaiian lands--reaching for new, innovative strategies for holistic stewardship of Hawaiian lands. We are supportive and hopeful for programs from DHHL which recognize together the need to protect native ecologies and cultural practice--the well-being of Hawaiian people as inseparable from the well being of Hawaiian lands. We applaud what we hope represents a long-term (multi-generational) commitment to the health of the people and lands of 'Āina Mauna.

To date, our experience with the Paphānaumokuākea Monument in the Northwestern Hawaiian Islands tells us that it is not simply about promises made, but promises kept. We do believe full, committed and pono implementation of the project as envisioned in the pre-final report (dated 10/15/09) reviewed by KAHEA, can result in positive outcomes. We hope it may in the future serve as a model for integrated management of natural areas for which commercial extraction is deemed by local communities to be appropriate.

Past experience with integrated management schemes for natural resources affirms that a strong commitment to the public good must be made by the managing agency. We see many examples where revenue-generating activities override needs that do not "make money." We also know that policies supporting fair and transparent process, enforceable and public commitments, and citizen participation make all the difference--in taking a promising proposal to full and principled implementation.

This kind of implementation is well in reach. With it, this program represents a incredible opportunity to see a sizable area of moku o keawe (Hawai‘i Island) restored for the benefit of Native Hawaiians, and for all people of Hawai‘i.

Malama pono,

Miwa Tamanaha
Executive Director

Marti Townsend
Program Director