DRAFT ENVIRONMENTAL ASSESSMENT

HILO FOREST RESERVE REFORESTATION PROJECT

North Hilo District
Island of Hawai'i

In accordance with
Chapter 343, Hawai'i Revised Statutes

Proposed by:

Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, Hawai'i 96813

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I. SUMMARY

Project Name	Hilo Forest Reserve Reforestation Project
Project Location	Hilo Forest Reserve: Laupāhoehoe and Humu'ula Sections North Hilo District Island of Hawai'i TMK 3-37-001-002 (Laupāhoehoe section) TMK 3-37-001-008 (Humu'ula section) TMK 3-37-001-009 (Humu'ula section)
Land Use	Conservation District, Resource Subzone
Applicant	Department of Land and Natural Resources, Division of Forestry and Wildlife
Landowner	State of Hawai'i Department of Land and Natural Resources
Approving Agency	State of Hawai'i Department of Land and Natural Resources
Anticipated Determination	Finding of No Significant Impact
Agencies & Organizations Consulted	Hakalau Forest National Wildlife Refuge Hawaii Volcanoes National Park U.S. Forest Service Department of Hawaiian Home Lands Office of Hawaiian Affairs Hamakua Hawaiian Civic Club Kahu Okahiko Inc. Kailua Civic Club Laupāhoehoe Hawaiian Civic Club The Nature Conservancy Sierra Club Janis Yang Clarence Ching

Summary of Action

The Department of Land and Natural Resources Division of Forestry and Wildlife proposes to stimulate the reforestation of native koa (*Acacia koa*)

in approximately 600 acres of heavily degraded forest areas in the Hilo Forest Reserve through a combination of methods.

The project area is located in the upper elevation area of the Laupāhoehoe and Humu'ula sections of the Hilo Forest Reserve, areas adjacent to State and private lands traditionally used for long-term cattle grazing operations. Though the forest reserve boundaries were fenced, these fences were not always well-maintained by the ranching lessees and range cattle commonly crossed into forested lands. As a result of the almost continuous presence of feral cattle populations, native flora has been heavily impacted. Most of the existing older koa in the project area is either dead or dying, and the groundcover layer of the proposed project area is dominated by kikuyu grass (*Pennisetum clandestinum*) and 'ākala berry (*Rubus hawaiiensis*) that greatly inhibits koa seed germination.

This project will employ surface soil scarification to reduce grass and weed competition in areas most heavily impacted by feral cattle and to stimulate the natural koa regeneration and native koa forest growth. Over the long-term, the project is anticipated to have positive benefits as degraded forest transitions to a healthier koa forest, improving the watershed capacity and habitat for native species.

The project area is located within the Conservation District on State land. As such, the project requires an Environmental Assessment prepared in accordance with Chapter 343 of the Hawai'i Revised Statutes.

II. PROJECT PURPOSE AND NEED

Forest ecosystems of the Hawaiian Islands provide among the world's most spectacular examples of the ecological and evolutionary processes of speciation and adaptation. Millions of years of isolation from continental land masses have resulted in outstanding adaptive radiations of native forest birds, plants, and insects from relatively few colonizing events. These biological resources are integral elements of the natural and cultural heritage of the Hawaiian Islands and their people.

Hawaii's forests also play a critical role as watersheds, providing recharge to critical underground aquifers and/or supplying surface water to agricultural, residential and commercial users each year. Unfortunately, many of the natural forest ecosystems of Hawai'i have been destroyed through clearing for pasture use or development or degraded by feral animal activity and the spread of invasive plant species.

The proposed action is to restore a portion of the Hilo Forest Reserve that was degraded and damaged by cattle. Koa is an early successional

species that requires and responds vigorously to site disturbance. The proposed actions of scarification and potentially, salvage of limited koa logs, will stimulate natural koa regeneration and koa forest growth. Over the long-term, restoration of native koa forest will partially remedy the decline and disappearance of native ecosystems, increase available habitat for native birds and invertebrates, and improve watershed capacity. If successful, the proposed actions can serve as a model for restoration of other areas of degraded koa forest.

III. PROJECT DESCRIPTION

The Division of Forestry and Wildlife proposes to restore degraded koa forest in approximately 600 acres of the *mauka* portion of the Humu'ula and Laupāhoehoe sections of the Hilo Forest Reserve (see Appendix A for maps of the project area).

Table 1. Management Units within the Hilo Forest Reserve Reforestation Project.

Unit	Acres	Land Cover Description
Humu'ula Unit: Forest	205	Degraded forest
Humu'ula Unit: Pasture	4	Degraded pasture
Laupāhoehoe Unit: Forest	355	Degraded forest
Laupāhoehoe Unit: Pasture	35	Degraded pasture
Total	**599**	

The objective of forest restoration will be pursued in the designated project area through a combination of methods, including feral cattle control, scarification by bulldozer, salvage operations, koa outplantings, and related activities. Additional activities include fence repair, fence maintenance, and control of invasive weeds. Over the long-term, the koa restoration is planned to enhance native forest and watershed values.

The project area consists primarily of dead or dying koa trees surrounded by a thick mat of kikuyu grass and 'ākala berry. Because koa seeds have great longevity and typically build up in surface soils under and adjacent to existing trees, the project area is believed to contain a substantial seed bank, making it a good candidate for forest restoration. However, the existing kikuyu grass prevents the natural sprouting of new seedlings and feral cattle browse on seedlings that do sprout. The proposed action will employ surface soil scarification to reduce grass and weed competition in areas most heavily impacted by feral cattle and to stimulate natural koa regeneration and will employ methods to remove feral cattle from the project area to prevent damage to the seedlings to encourage native

forest growth. These actions will be supplemented as necessary with replanting of koa.

Feral cattle control is already underway, having begun in July of 2003. Special hunts were conducted from November 2003 to April 2004 where the public was allowed to harvest animals shot by DOFAW staff. These public salvage hunts were discontinued due to lack of public interest. The lack of interest is attributed to the long travel time required to reach the forest reserve, the low quantity of animals being removed, and the possibility of committing time and effort with no guarantee of salvageable meat. DOFAW also opened a special hunt season from November, 2005, through November 2006 in the Hilo Watershed north of Saddle Road to allow the public to hunt cattle themselves. Again, these special hunts have been characterized by low public participation due to the long travel time and the difficulty of removing cattle from the forest reserve. In addition to public hunts, DOFAW continues to monitor and control residual feral cattle and potential cattle reentries.

Scarification will be conducted by DOFAW staff using a D-8N bulldozer, clearing weeds (primarily kikuyu grass) and disturbing the soil to stimulate germination of the koa seed bank. Bulldozer scarification will occur only in areas open enough to allow passage by the bulldozer to avoid damage to existing healthy native trees.

Salvage of merchantable down, dead, or dying koa timber is proposed for the Humu'ula Forest unit of the project area (approximately 205 acres). Salvage activities are not recommended for the Humu'ula Pasture unit, the Laupāhoehoe Pasture unit, or for the Laupāhoehoe Forest unit. It is anticipated that the activity involved in removing the salvageable koa will scarify the ground sufficiently to encourage koa re-growth, supplementing planned bulldozer work by DOFAW staff. This would enhance overall koa forest restoration efforts while providing a legitimate source for koa to the market. Potential benefits of this action will include salvaging a valuable resource that would otherwise be lost through decomposition, partially satisfying demand for this resource and potentially deterring the future theft of healthy live trees on other lands.

From February 28 through March 4, 2005, DOFAW foresters conducted an inventory of potential koa timber resources for salvage in the Humu'ula Forest unit. The inventory work focused primarily on dead koa representing both standing trunks and those on the ground. Live koa trees were tallied for a small number of trees that had less than 10 percent live crown remaining and appeared to be in the final stages of decline. Staff foresters do not believe that any of the tallied live trees will live five years beyond the survey date.

Every living koa tree with a diameter of 10 inches or larger and every standing dead koa tree in the unit were counted. All standing trees that were tallied for proposed salvage were measured to provide timber volume estimates. A subsample of koa trees that were both dead and down on the ground was taken, with tree count and timber volume results for the sample area extrapolated to the full unit acreage. The following data in Table 2 summarize the results of the timber salvage survey:

Table 2. Timber Salvage Survey Results.

	Harvest trees	Leave trees	Total trees	Percent harvest	Harvest density (trees/acre)	Volume estimate (net ft^3)
Standing live	23	2,029	2,052	1	0.1	1,835
Standing dead	157	245	402	39	0.8	7,790
Dead and down	598	1,200	1,798	33	2.9	25,292
Total	778	3,474	4,252	18	3.8	34,918

No young, healthy koa in the project area is eligible for salvage (see photo 1). The proposed harvest of 23 dying koa trees is limited to one percent of the live trees within the reforestation unit, or only one tree per 10 acres. These trees are all in very poor health (see photo 2). It is notable that during a November 2005 site visit, staff returned to a small portion of the unit and observed that limbs of one of these "standing live" trees had broken off and the portion standing was dead (see photo 3).

The remaining eligible trees are either standing dead trees or downed dead trees (see photo 4). Thirty-nine percent of the standing dead koa trees were marked for salvage harvest. An estimated 33 percent of the dead and down trees in the unit are proposed for salvage. While it was difficult to count and grade all dead and down koa logs due to dense grass cover, DOFAW intends that all dead and down logs containing merchantable volume be made available for salvage harvest. Approximately 65 percent of the standing dead and dead and down koa trees will remain on-site to provide ecosystem and habitat benefits. In viewing the unit totals, 82 percent of all koa in the unit will remain after salvage operations are completed. Only an average of 3.8 trees per acre (a vast majority of which are dead) are proposed for salvage. These harvest levels and criteria are considered very conservation in the forestry profession. Based on the number of trees in the area, it is believed that there is a sufficient number of trees in the Humu'ula Forest unit to support salvage while leaving the majority of trees in place as habitat.

Photo 1. Young koa tree not eligible for salvage.

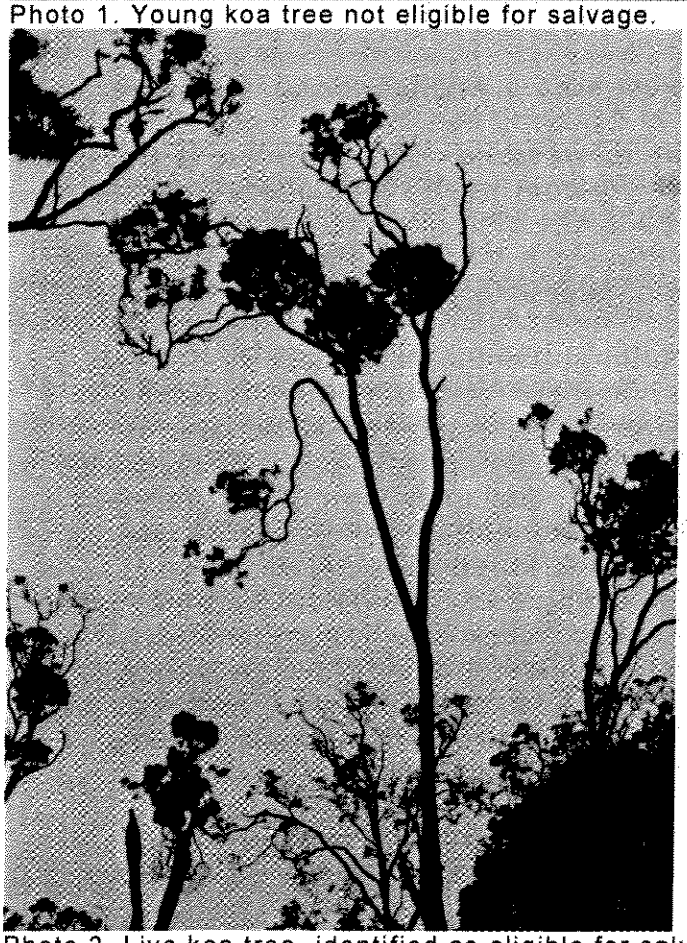

Photo 2. Live koa tree, identified as eligible for salvage.

Photo 3. Tree on left center of the photo was classified as a harvestable "standing live" tree during the survey; has died in the past eight months.

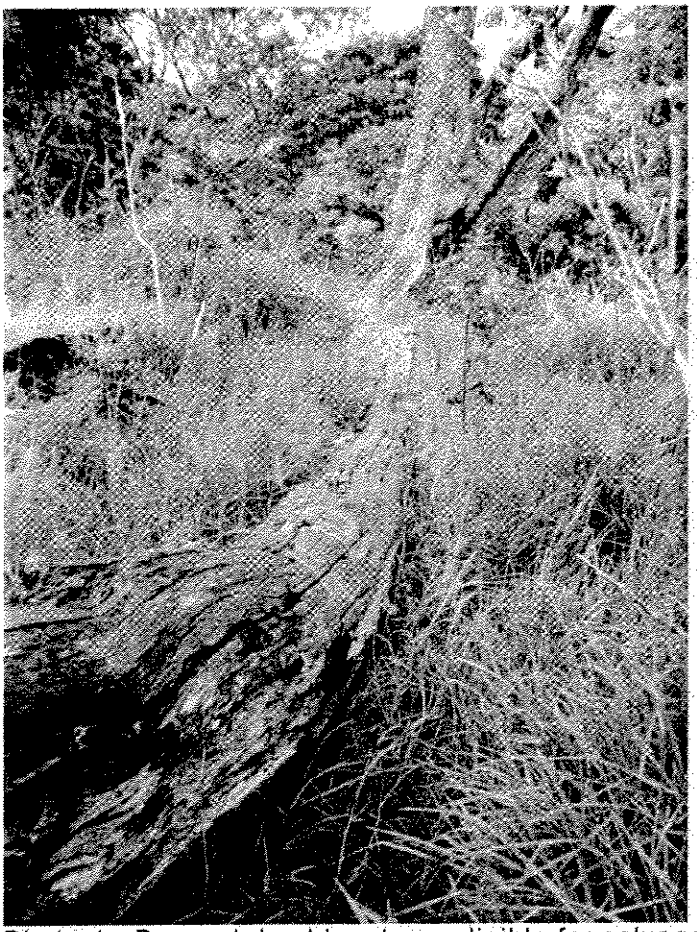

Photo 4. Downed dead koa tree, eligible for salvage.

The koa salvage bid process would clearly identify trees eligible for koa salvage and allow salvage operators to submit bids for the right to salvage part or all of the eligible trees. Eligible trees would be identified in advance through GPS coordinates as well as markings on eligible standing trees, and DOFAW staff will monitor the salvage operations to ensure the salvage operator does not remove any ineligible trees. To further encourage compliance, the contract for koa salvage will outline penalties for salvage of ineligible trees.

Koa salvage activities will be focused in openings and canopy corridors in the Humu'ula unit where healthy trees or forest canopy are absent. These canopy openings and corridors are dominated by kikuyu grass and 'ākala berry (see photo 5, 6, and 7), contain considerable dead, down, or dying koa, and contain only scattered healthy live native trees.

Photo 5. Photo of the Humu'ula unit: forest. An open area where kikuyu grass is inhibiting native forest regeneration.

Photo 6. Photo of the Humu'ula unit: pasture. An open area where kikuyu grass is inhibiting native forest regeneration.

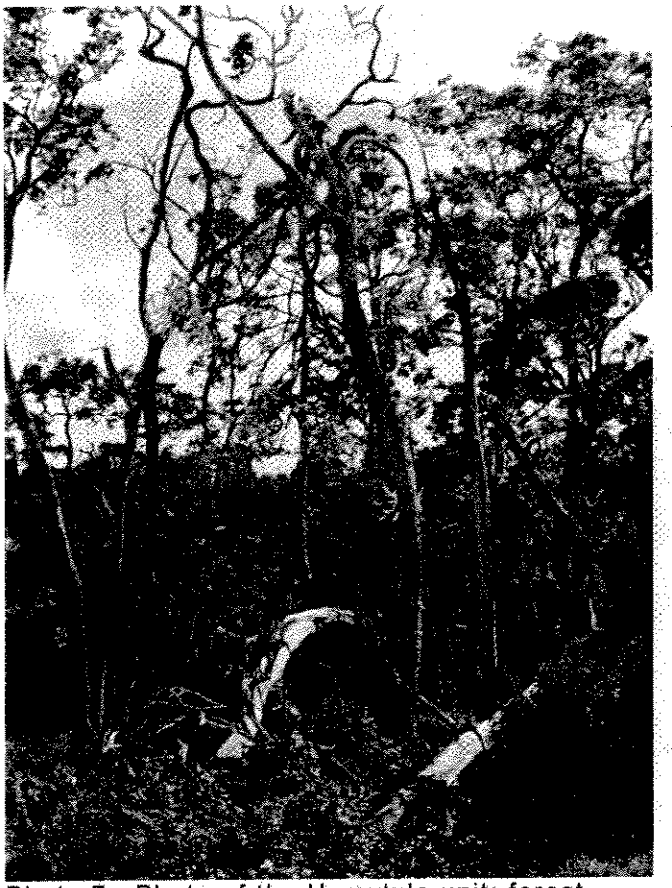

Photo 7. Photo of the Humu'ula unit: forest.

DOFAW will conduct supplemental planting of koa in portions of the project area where the bulldozer cannot go due to thick understory, proximity to healthy trees, or dangerous terrain. DOFAW will also plant koa and other native tree seedlings in selected areas where scarification or salvage efforts resulted in limited forest regeneration.

After the initial phase of scarification and koa outplanting, DOFAW will continue to monitor the site and conduct related management activities, such as fence repairs, kikuyu grass control, feral cattle control, and long-term monitoring and maintenance of koa regeneration.

The restrictions planned on bulldozer operation and on koa salvage are expected to minimize the impact on the surrounding environment, as most of the existing trees would remain in place. This would retain most of what overstory exists, maintain wildlife habitat, and promote a more complex forest structure as the new koa grows and matures. If there is no interest in the salvage of the eligible trees in the project area, then DOFAW will scarify the area without salvage.

The project will commence once all necessary approvals have been secured. The bid process for the salvage operations is anticipated to take three to twelve months. Meanwhile, DOFAW will begin scarification by bulldozer in areas of the project area not proposed for koa salvage.

The cost estimates for the project are as follows:

Item	**Estimated Cost**
Planning (includes surveys and preparation of EA)	$20,000
Scarification and koa outplanting by DOFAW staff	$35,700
Total	**$55,700**

Funding for this project includes $27,850 from the U.S.D.A. Forest Service and $27,850 State match (composed of in-kind contributions (use of equipment) and salaries). Additional funding may be accumulated from the salvage of koa as described earlier.

IV. SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT

Location and Physical Characteristics of the General Area

The proposed koa reforestation project area, consisting of approximately 600 acres, is located on State-owned land in the Hilo Forest Reserve. The Hilo Forest Reserve protects forested watershed on the northeastern middle slopes of Mauna Kea, from the 1881 lava flow at Pi'ihonua to Humu'ula. Koa reforestation is planned for two non-contiguous areas in the *mauka* (mountain-side) portion of the Humu'ula and Laupāhoehoe sections of the Hilo Forest Reserve, in the northern end of the Humu'ula and Laupāhoehoe ahupua'a. The ahupua'a of Waipunalei is located between the two project area units.

Mauka of the project area are lands owned by the Department of Hawaiian Home Lands, historically used for grazing and more recently subject to koa logging. Further *mauka* is the Mauna Kea Forest Reserve. *Makai* (ocean-side) of the project area is the Hilo Forest Reserve and the Laupāhoehoe Natural Area Reserve. Hakalau National Wildlife Refuge is located to the south of the project area.

The project area can be accessed by four-wheel drive vehicle in two ways: either from the eastern coast at Laupāhoehoe through a homestead road to a four-wheel drive road running between Hilo Forest Reserve and Laupāhoehoe Natural Area Reserve or from Saddle Road to Mana-Keanakolu Road (four-wheel drive).

The project area is situated between approximately 4,900 and 5,900 feet in elevation. Rainfall in the project area is approximately 60 to 100 inches per year, as a result of trade winds bringing moisture laden clouds which pile up against the slope of Mauna Kea in a belt extending from approximately 2,000 feet to 6,000 feet.

Soils in the project area are from the Hanipoe-Maile-Puu Oo association. These are deep, gently sloping to steep, well-drained soils found on uplands that have a medium-textured to moderately fine textured subsoil. The soils in the project area are well-drained silt-loams that formed in volcanic ash and consist of Hanipoe very stony loam, 12 to 20 percent slopes (HCD), Hanipoe silt loam, 12 to 20 percent slopes (HDD), and Puu silt loam, 6 to 12 percent slopes (PUC). In general, these soils have a dark surface layer that is high in content of organic matter. The total area of this association is about 6 percent of the island, and these soil types are used for pasture and woodland. The NRCS Soil Survey notes that this soil association produces some of the finest pasture on the island of Hawaii, has some excellent stands of tree plantings, and is favorable for many kinds of kinds of vegetables, though most areas are too steep for intensive cultivation and erosion control. Runoff is slow and the erosion hazard is slight.

The project area is located in Volcanic Hazard Zone 8, reflecting the limited probability of future coverage by lava flows. Most of Hazard Zone 8 has not been affected by lava flows within the past 10,000 years. Mauna Kea last erupted about 4,500 years ago, and is considered dormant.

There are no streams in the project area; however, the sources of Kaawalii Stream and of Ha'akoa Stream are located approximately one-half to one mile *makai* of the project area boundary.

Current Land Use and Zoning

The Humu'ula and Laupāhoehoe sections of the Hilo Forest Reserve are located within the Resource Subzone of the Conservation District. Both section are zoned Forest Reserve by the County, and the County General Plan (2005) designation for the area is Conservation. The project area is not located in the County of Hawaii's Special Management Area.

The primary use of the project area is as Forest Reserve. Hunting is allowed pursuant to the hunting rules of the Department. The Humu'ula unit is within State Hunting Unit B, which allows the hunting of wild pigs, sheep, and goats by rifle, muzzleloader, shotgun, handgun, bow and arrow, spear, and knife, with dogs, daily, year-round, with a bag limit of

two pigs, one goat, and one sheep per day. Special conditions prohibit access to Humu'ula from Keanakolu Road. The Laupāhoehoe project area is within State Hunting Unit C, which allows the hunting of wild pigs, and wild sheep by rifle, muzzleloader, handgun, shotgun, and bow and arrow, dogs not permitted, Saturday, Sunday and holidays year-round, with a bag limit of two pigs and one sheep per day. Special conditions require a phone-in reservation from the DOFAW Hilo office. Game bird hunting is allowed in both sections Saturdays, Sundays, and holidays from the first Saturday of November through the third Sunday in January.

The DOFAW Draft Management Guidelines classify the Humu'ula project area as A2 (mixed game use) and A4 (staff control of game) for game control management. The Laupāhoehoe project area is A2 (mixed game control) for game control management. An A2 ranking reflects that game management is an objective integrated with other uses, that habitat may be manipulated for game enhancement, and that game populations are managed to acceptable levels using public hunting, while an A4 ranking reflects that it is an area designated for animal removal by staff or agency designees because of environmental sensitivity, remoteness, or public safety. Both sections are classified as R2 (medium use) for recreational activities, reflecting that these are areas where outdoor recreation is limited or controlled, or where it may be integrated with other uses.

Flora

The project area is predominantly characterized as degraded koa/'ōhi'a (*Metrosideros polymorpha*) montane mesic forest with patches of forest interrupted by larger openings dominated by introduced grasses mixed with endemic species of young koa and 'ākala. Above 5,800 feet in both the Humu'ula and Laupāhoehoe units are open areas dominated by 'ākala berry and kikuyu grass with some young koa present. Banana poka (*Passiflora tarminiana*) remains present, but in greatly reduced numbers since the introduction of the Septoria fungus. Also present are pasture-type openings dominated by sweet vernal grass (*Anthoxanthum odoratum*), velvet grass (*Holcus lanatus*), and kikuyu grass.

Near the *mauka* boundary of the forest reserve, outside the immediate project area, are planted stands of sugi (*Cryptomeria japonica*), redwood (*Macrocarpa cupressus*), *Eucalyptus* spp., ironwood (*Casuarina equisetifolia*) and other introduced conifers. On the steeper slopes where cattle were less likely to graze, the native forest has a closed to open canopy up to 35 meters in height, consisting of emergent koa over 'ōhi'a, kōlea (*Myrsine lessertiana*), and pilo (*Coprosma rhynchoocarpa*), with a subcanopy of 'āweoweo (*Chenopodium oahuense*). Scattered in the subcanopy are 'ōlapa (*Cheirodendron trigynum*) and manono (*Hedyotis terminalis*) and in the understory are occasional ferns such as hō'i'o (*Diplazium sandwichianum*) and laukahi (*Dryopteris wallichiana*). Other

native constituents found in this forest type are the vines *Sicyos macrophyllus* and maile (*Alyxia oliviformis*), and the sedge *Carex alligata*. This forest type is present in a mosaic with more open areas down to about 4,900 feet elevation in both the Laupāhoehoe and Humu'ula sections of the forest reserve.

Below the 4,900 feet elevation, the forest becomes more dominated by 'ōhi'a and as it is wetter, slightly different understory species are present, including kanawao (*Brousaissia arguta*) and hāpu'u (*Cibotium* spp.). In this region, the forest becomes more densely vegetated and is wetter than above – because of this, this lower forest reserve area is not proposed for larger-scale scarification or koa planting.

No endangered plant species were observed within the project area during a botanical survey conducted by DOFAW staff in 2004 (see Appendix B for the botanical survey conducted by DOFAW staff).

The DOFAW Draft Management Guidelines classify the Humu'ula project area as primarily V4 (badly degraded areas), with the *makai* edge of the project area classified as V2 (predominantly native areas). The Laupāhoehoe project area section is classified as V3 (considerably disturbed areas).

Fauna

Several native birds endemic to the Hawaiian Islands have been observed in the project area including the 'apapane (*Himatione sanguinea*), 'amakihi (*Hemignathus virens*), 'i'iwi (*Vestiaria coccinea*), 'ōma'o (*Myadestes obscurus*), and the endangered 'io (*Buteo solitarius* [Hawaiian hawk]). (see Appendix C for the faunal survey conducted by DOFAW staff).

'Ōpe'ape'a, or the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*), are found in the project area. Surveys for the bat were conducted by the Hawaiian Bat Research Cooperative team on two nights in the fall of 2005 and one night in the spring of 2006 in the area of the proposed koa salvage. On each of the three nights, the survey team detected bats in the area of the orchard, old cabin, or roads in the vicinity. The detections consisted of single passes, which could indicate that bats were commuting or passing through the area. Activity was associated with edge or open habitat, and the survey team detected no signs of feeding (feeding buzzes or consistent activity), though it is suspected that bats forage in the general area.

No specific studies of the invertebrate community are known to have been done in the project area. Given the degraded condition of the area

intended for scarification, the project area may not currently support many native invertebrates. However, observations on Kaho'olawe and other managed areas demonstrate that native invertebrates respond quickly to restoration of habitat and will recolonize areas on their own after native plantings. In addition, as koa is of particular importance as habitat for a wide range of native invertebrates, including the koa bug (*Coleotichus blackburni*) and koa butterfly (*Udara blackburni*), the restoration of a koa forest would provide additional habitat for diverse invertebrate species.

Non-native birds observed in the project area include the Japanese white-eye (*Zosterops japonica*), the house finch (*Carpodacus mexicanus*), the Northern cardinal (*Cardinalis cardinalis*), and common myna (*Acidotheris tristis*). The hunting of game birds is permitted in the Hilo Forest Reserve, implying the presence of game birds such as francolin and quail in the project area.

Non-native mammals observed or thought to occur in the project area include feral pigs (*Sus scrofa*), mongoose (*Herpestes auropunctatus*), cattle (*Bos taurus*), feral dogs (*Canus familiaris*), rats (*Rattus spp.*), and cats (*Felis catus*).

Significant and Sensitive Habitats

The *mauka* portion of the Laupāhoehoe project area is within the federally designated critical habitat for the endangered plant *Clermontia pyrularia*. There is no designated critical habitat for any endangered or threatened species within the Humu'ula project area.

Other sensitive areas include flood plains, tsunami zones, beaches, streams, rivers, oceans, estuaries, achialine ponds, fresh or coastal waters, erosion prone areas, and geologically hazardous land. The project area is not located in or nearby any of these types of sensitive areas.

Archaeological Sites and Cultural Practices

The following steps were taken to determine the cultural and historical significance of the project area: (1) general literature review to determine if there were any reports or studies with relevant information regarding North Hilo and Keanakolu; (2) the sending of pre-consultation letters to a variety of agencies and organizations that might be interested in the project or have relevant information, including the State Department of Hawaiian Home Lands, the Office of Hawaiian Affairs, and three local chapters of Hawaiian Civic Clubs; (3) survey of the project area by a State Parks archaeologist and DOFAW staff to determine if there were any visible archaeological features, such as rock walls, or any features

potentially used for cultural reasons, such as lava tubes or caves; (4) consultation with Dr. Peter Mills, Associate Professor with the University of Hawai'i at Hilo, who has been conducting archaeological research in the Keanakolu area since 2001; and (5) research into State archives and agency files regarding the history of the general area surrounding the project area.

History

During pre-contact, it is likely that the project area, located in the upper Hilo Forest Reserve, provided important forest resources. While the lower elevation koa forests above Hilo and Kona were the primary traditional sources for canoes, being closer to the ocean, the upper forests of Laupāhoehoe and Humu'ula may have provided a number of edible and medicinal plants and been a location for the collection of bird feathers.

Mauna Kea may be literally interpreted as "white mountain" because during the winters, the summit is covered in snow. Mauna Kea may also be translated as "Wakea's Mountain." Wakea, also written and pronounced as Akea and Kea, was the god-father of the island of Hawai'i. The island child was born by Papa or Haumea, the goddess who gave birth to the islands. Humu'ula is defined in the Hawaiian dictionary as red jasper stone, as used for adze. There is an adze quarry located near the summit of Mauna Kea and the project area may have been traversed as a route to the quarry.

Boundary Commission testimonies describe trails through the forest lands, rising from the lowlands of Waiākea, 'Ōla'a, Keauhou, and Humu'ula. A cross-island trail generally forms the boundaries between the Humu'ula ahupua'a and *makai*-side ahupua'a. In the 19th century, it was called the Laumai'a Road, but it likely originated in earlier times. The present Mana-Keanakolu Road roughly follows the Laumai'a alignment. Based on the native traditions and kama'āina testimonies given before the Boundary Commission, it is likely that additional "practitioner" trails existed throughout the forest region. Features such as "*kauhale manu*" (bird-catcher's shelters), "*kahua kālaiwa'a*" (canoe-makers clearings), "*o'io'ina*" (trailside resting places and shelters), the "*ala hele*" (trails), and other features associated with traditional and customary accesses, would leave little evidence in the present-day, as the traditional features and uses generally had minimal impact on the natural landscape. Those things left behind, not cared for or maintained, were simply reabsorbed into the landscape.

For much of the post-contact period to the mid-1800s, the land use of the general project area would not have changed significantly, but indirect impacts to the forest would have begun as cattle and goats introduced by George Vancouver in the late 1700s spread across the island of Hawai'i.

During the 1800s, wild cattle were in great numbers and fairly wide ranging across the slopes of Mauna Kea. The Keanakolu area served as a major focal point. In the early 1800s, base camps and huts were built in the area by foreigners and Native Hawaiians who were exploiting the wild cattle herds on these upland slopes. To deliver hides and barrels of salted beef to ports at Hilo and Kawaihae, bullock hunters focused their efforts along relatively easy transportation routes. One method of capturing cattle in the region was bullock pits. It is likely that bullock pits, as described below, were located along the Mana-Keanakolu Road.

Beginning in the 1820s and continuing into the 20th century, the mesic forested lands were logged and burned to clear the land for cattle ranching. When the extensive ahupua'a of Humu'ula was first leased by the government in 1862, the lessee established one of its two major sheep stations at Keanakolu. Subsequent lessees continued to use and expand the Keanakolu facilities as a base of operations for this side of the mountain.

By the end of the century, there were two major ranches in the area, Kukaiau Ranch and Puu Oo Ranch. Later, Parker Ranch occupied most of the Humu'ula ahupua'a. While the Humu'ula forest may have been too far to supply firewood for sugar plantations along the Hamakua coast, sheep and cattle ranching, and their wild counterparts probably accounted for most of the depletion of the timber resources. Trees were also used as fence posts for the ranching industry.

By the early 1900s, major portions of the Humu'ula and Laupāhoehoe ahupua'a were designed forest reserve lands as part of the Hilo Forest Reserve and Parker Ranch began to use its leased and private land holdings near Keanakolu solely for cattle ranching. Facilities on Forest Reserve lands became a headquarters for forestry fencing, survey, and nursery projects in the area, while those on Parker Ranch's leased land in Humu'ula were being developed to support its increasingly modernized cattle ranching operations.

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

Archaeological features

Between May 2 and 6, 2005, staff archaeologists with Division of State Parks staff conducted an archaeological survey of the proposed project

areas on behalf of DOFAW. Survey coverage was limited to a total of five transects because it was not feasible or warranted to survey either project area in its entirety due to thick vegetation, rough terrain, and generally low probability of historic properties being present in these areas. To gain a better understanding of what historic properties could be present in the general area, State Parks staff also spent a day with Dr. Peter Mills, an archaeologist at the University of Hawaii at Hilo, who has been conducting archaeological research in the Keanakolu area for several years. Dr. Mills and his students have identified and studied a number of historic-period stone features located inland of the current project areas. Most were ranching related features that appear to have been created and used primarily during the second half of the 1800s.

No historic properties were found on any of the five transects surveyed within the project areas to be directly impacted by the proposed scarification and salvage operations. This includes an absence of surface features or any evidence of subsurface deposits in areas where soil deposits were exposed by pig wallowing, by the uplifted root crowns of fallen trees, along access roads, or in animal tracks. This absence of sites is consistent with results of other archaeological surveys in comparable sections of the Hilo Forest Reserve and with the historic record of activities in Keanakolu, which suggest that the highest intensity of use between 1800 and the 1940s, particularly those activities that were most likely to leave durable remains, occurred outside the current project area.

Several historic-period structures were, however, identified within the larger "area of potential effect" of the Humu'ula section of the project area, which includes a buffer of 500 feet around the limits of the directly affected project area. State Park archaeologists believe that as a complex, these features are significant under multiple National Register criteria. The complex consists of a koa log cabin built sometime between 1876 and 1885 as part of the original sheep station at Keanakolu, auxiliary buildings constructed around the log cabin in 1927 to temporarily house forestry workers, experimental fruit orchards and arboretum that were fully established by 1921, and a series of fence lines that delineated the orchards, corrals, and experimental planting plots. The log cabin and layout of some of the fence lines reflect the period from 1876 and 1905 when Keanakolu was used primarily as a sheep station. The other structures and features are associated with the early establishment and management of the Hilo Forest Reserve from 1905 through the 1940s. Although all these structures and features have been modified or have changed over time, they all retain sufficient integrity to convey their original function, use of materials, design, and layout. The koa log cabin is, in particular, a unique and unusual example of 1800s log cabin construction in Hawaii using logs from a native tree.

Contemporary cultural practices

There were no cultural practices identified by consulted parties during pre-consultation that may be impacted by the elements of the proposed koa reforestation project. Gathering of plant material, for lei making, medicinal use, or other Native Hawaiian traditional use, may occur in the Hilo Forest Reserve. The contemporary practice of recreational public hunting also takes place within the Hilo Forest Reserve.

V. ALTERNATIVES CONSIDERED

Three project alternatives are described: the proposed action involving feral cattle control, bulldozer scarification, koa salvage, and koa planting (preferred alternative); an alternative involving only feral cattle control, bulldozer scarification and koa planting; and a no-action alternative.

Alternative #1: Encourage koa reforestation through feral cattle control, bulldozer scarification, koa salvage, and koa planting (preferred alternative)

The preferred alternative is to restore the koa forest as outlined above. The preferred alternative will restore native forest, increasing wildlife habitat, enhancing watershed capacity, and contributing to the recovery of several rare and endangered native species. Restoration contributes to regional conservation efforts, such as ongoing resource management in the adjacent Laupāhoehoe Natural Area Reserve and planned conservation in the Kohala Watershed Mountains Partnership area, by increasing the total acreage of native forest.

Alternative #2: Encourage koa reforestation through feral cattle control, bulldozer scarification, and koa planting

Alternative #2 is to restore the native forest without use of koa salvage. While this alternative provides the same ecological benefits as the preferred alternative, it does not provide the same social and economic benefits of making a legitimate source of koa available to artisans and potentially discouraging theft of healthy koa from other forests.

Alternative #3. No action.

The no-action alternative fails to take advantage of existing funding opportunities to restore degraded native koa forest. With no action, the current degraded state of the forest and pasture would remain, and the valuable benefits provided by a restored native koa forest as watershed and habitat would not realized. Finally, the no-action alternative reduces

the potential for success of affirmative conservation measures, such as outplanting, that are necessary for the long-term recovery of many species.

VI. GENERAL DESCRIPTION OF THE ACTION INCLUDING ENVIRONMENTAL AND SOCIOECONOMIC CHARACTERISTICS

Environmental Impacts

Native vegetation
Bulldozer scarification would result in the disturbance and destruction of non-native vegetation (kikuyu grass). Young, healthy koa trees in the project area would be avoided by the bulldozer. An overwhelming majority of the koa designated for salvage would be composed of dead material, as well as a handful of dying koa trees that are anticipated to be dead within the next five years. Due to the degraded nature of the area planned for bulldozer scarification and koa salvage, there are no significant negative impacts to native plants anticipated. After bulldozer scarification and koa salvage, the koa seed bank is expected to germinate, providing a positive benefit to native plants over the long term.

Native animals
The core project area is heavily degraded, making it poor habitat for native birds and the bat. There are no known bird nests in the project area, and bat roosting is not expected on potential standing salvage trees as bats are more likely to roost in forest area with denser and darker canopies rather than on individual trees in open areas that have little crown area. The limited nature of the proposed action is anticipated to have a negligible impact on native birds and the bat, and over the long-term, the impact on native animals is expected to be positive as native forest restoration would provide additional habitat for native species.

Water impacts
Based on the nature of the terrain and the lack of any streams within the project area, no adverse changes in the normal runoff or percolation patterns is anticipated as a result of this project. The project is anticipated to improve percolation and improve the watershed function of the project area.

Alien species
Bulldozer scarification and koa salvage operations could increase the risk of accidental introduction or spread of non-native plants and animals within the project site through the transport of equipment and crew to the project area.

Archaeological or culturally significant sites

Despite the presence of a significant historical complex, the State Parks archaeologist believes that no adverse effects would result from the proposed action because the complex is not within the area to be impacted directly by the proposed activities and no specific mitigation measures are needed to protect the complex during the project. The complex can be easily avoided and there is little risk of accidental disturbance, as the outer boundaries of the complex are clearly marked by maintained fence lines that would prevent inadvertent straying into the complex.

In addition, the State Parks archaeologist believes that the probability of any surface features or subsurface cultural deposits being present is too low to recommend any further work. No evidence of these features was observed during surveys, and these survey results are consistent with archaeological surveys in comparable sections of the Hilo Forest Reserve.

Cultural practices that occur within the Hilo Forest Reserve, including gathering of plant material for lei making, medicinal use, or other Native Hawaiian traditional use, are not expected to be adversely impacted by the proposed project beyond temporary disruptions while restoration activities are underway, and will likely benefit over the long-term with the restoration of the koa forest improving habitat for native plants. Public hunting is not anticipated to be impacted beyond temporary disruptions in the immediate project area while restoration activities are occurring.

Air pollution

Limited air pollution from use of bulldozing and salvage equipment and the use of small power tools will be unavoidable. Use of this equipment is temporary and is not anticipated to significantly contribute to the overall air quality in the region.

Environmental benefits

Environmental benefits associated with the project include the benefits associated with the restoration of native koa forest, which represents one of the most important native forest ecosystems in the islands. Restoring native ecosystems provides habitat for rare and endangered native plants and animals, while contributing to watershed function.

Social Impacts

Periodic noise from equipment use, power tools, and other activity associated with the project will be unavoidable during scarification and koa salvage operations. Because no residences are located near the project area, and because work associated with the project will occur only

during the week, noise impacts are anticipated to be negligible to the general public, including visitors to the forest reserve cabins on weekends. Overall, social impacts of this project are expected to be positive. The restoration of Hawaii's native forest will enhance opportunities for stewardship, education, cultural enrichment, and research.

Economic Impacts

The proposed action involves the expenditures of funds necessary to complete the project. The estimated total cost of the proposed action is approximately $55,700. Current funding for the project includes funds provided by the U.S.D.A. Forest Service and the State of Hawai'i.

The project is not expected to have any major negative economic impacts. Small positive economic impacts will result from the release of project funds into the State economy through the purchase of goods and services from local vendors. Other positive impacts associated with the preferred alternative include the availability of koa for local artisans provided by the koa salvage opportunity. The proposed action may attract additional funding for additional restoration activities in other degraded forest or pasture areas after this project is complete.

Cultural Impacts

The proposed action is not expected to significantly affect archaeological sites or historical features because there are no known sites within the area to be scarified by bulldozer or to be subject to koa salvage activities. Historical features associated with cattle ranching in the general project area, such as the Keanakolu Cabin, will be avoided. The proposed action is also not expected to significantly impact Native Hawaiian traditional and cultural practices, based on the remoteness of the project area, the difficult access, the restoration purpose of the proposed action, and the temporary nature of any limitation on access required for public safety during implementation of the project. Finally, the proposed action is not anticipated to significantly impact contemporary cultural practices, such as hunting. The restoration project is not designed to block access by people and no area will be removed from public hunting. As a result, this project is not anticipated to impact any contemporary cultural practices.

VII. MITIGATION MEASURES

While this project is not expected to have any significant negative impacts on the environment, the following items have been identified as possible areas of concern. Planned actions to mitigate possible negative effects are described below.

Native vegetation
In order to minimize overall damage to the remnant native vegetation in the project area, the following guidelines will be followed. Areas with sensitive biological resources or with standing healthy live trees will be avoided during bulldozer scarification and will not be subject to koa salvage operations. It is anticipated that the natural recovery of koa after scarification and/or koa salvage will compensate for any damage to native plant species incurred during restoration activities.

Native fauna
To avoid harming or harassing native birds, particularly the 'io, DOFAW staff will conduct additional surveys prior to salvage operations. No nests are anticipated to be found within the core project area, but if a nest is found in a salvageable tree, the nest tree would be left in place to allow the 'io to use the same nest in future years and would no longer be eligible for salvage. In addition, no activities will occur within 100 feet from the nest tree during breeding season to minimize disturbance to nesting 'io.

Alien species
The transport of equipment and disturbance to the ground surface and vegetation involved with scarification and/or koa salvage operations may create conditions suitable for the establishment of weedy plants. The following practices will be implemented to minimize the introduction of alien plants and insects and to reduce the possibility of establishment. First, boots, equipment, and materials will be inspected for seeds, eggs, larvae, etcetera, prior to delivery and/or entry into the project area and cleaned. Any bulldozer or large truck used during scarification or koa salvage operations will be inspected and cleaned, following appropriate alien species prevention protocol. All workers will be instructed on specific procedures to prevent the spread or introduction of noxious alien plants in the project area. In addition, precautions will be taken to prevent spreading alien plants already found in the project area, and all food, refuse, tools, and gear will be removed upon completion of work.

Archaeological or culturally significant sites
While there are no archaeological or cultural sites anticipated to be affected by the proposed action, should evidence of any archaeological or culturally significant sites be encountered during scarification and/or koa salvage operations, all activities would immediately cease and the appropriate agencies, including the State Division of Historic Preservation, would be consulted immediately.

VIII. ANTICIPATED DETERMINATION

It is not expected that this project will have a significant negative impact on the environment, and a Finding of No Significant Impact is anticipated.

IX. FINDINGS AND REASONS SUPPORTING EXPECTED DETERMINATION

The goal of the proposed action is to restore approximately 600 acres of degraded koa forest and pasture to native koa forest through a combination of methods including feral cattle control, bulldozer scarification, koa salvage, koa plantings, and other related management activities. Little germination is currently observed in the project area due to the existing weeds, and scarification and/or koa salvage operations are needed to clear the kikuyu grass and disturb the soil to promote koa germination from the existing seed bank.

The proposed activities are anticipated to facilitate native koa forest restoration, increasing available wildlife habitat and improving watershed capacity. Restoration contributes to the regional conservation efforts, such as resource management in Laupāhoehoe Natural Area Reserve, by increasing the total acreage of native habitat.

The anticipated Finding of No Significant Impact is based on the evaluation of the project in relation to the following criteria identified in the Hawai'i Administrative Rules § 11-200-12:

1) *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.*

The proposed action does not involve an irrevocable commitment to loss or destruction of any natural or cultural resource. Instead, the goal of the proposed action is to reverse the loss of native koa forest by restoring degraded koa forest and pasture.

2) *Curtails the range of beneficial uses of the environment.*

The proposed action will not curtail beneficial uses of the environment. Instead, the project will increase beneficial uses by restoring a native koa forest, an important ecosystem for many native plants and animals, especially native invertebrates. This project will increase wildlife habitat and improve watershed capacity.

3) *Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any*

revisions thereof and amendments thereto, court decisions, or executive orders.

The proposed action is consistent with the environmental policies established in Chapter 344, Hawai'i Revised Statutes (HRS) and contributes to the conservation of threatened and endangered species, as covered by Chapter 195D, HRS, by increasing the acreage of native forest available as habitat for rare species. It is also consistent with Section 4 of the County of Hawai'i General Plan (2005), which sets policies for maintaining environmental quality. Finally, reforestation in Humu'ula and Laupāhoehoe implements actions recommended in the Draft Revised Recovery Plan for Hawaiian Forest Birds (2003).

4) Substantially affects the economic or social welfare of the community or state.

The proposed action will not adversely affect the economic or social welfare of the community or state. The ecosystem-related goals of the project will directly benefit the economic, cultural, educational, and recreational interests of the community and the State.

5) Substantially affects public health.

The proposed action is not anticipated to substantially affect public health. The proposed action may have a positive impact on public health by restoring native forest.

6) Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed action is not anticipated to result in any substantial secondary impacts, such as population changes or effects on public facilities.

7) Involves a substantial degradation of environmental quality.

The proposed action does not involve a substantial degradation of environmental quality. Instead, environmental quality is anticipated to improve with the implementation of the proposed action. Restoration of native koa forest will enhance environmental quality by increasing available habitat for native plants and animals and improving watershed capacity.

8) Is individually limited but cumulatively has considerable effect upon environment or involves a commitment for larger actions.

The proposed action does not have a cumulative considerable effect on the environment nor does it involve a commitment for larger actions. Though it is anticipated that the results of this project will be positive, restoration of this area alone is not sufficient to provide for all habitat and watershed needs. While success in this project could lead to future restoration efforts, the proposed restoration activities, including bulldozer scarification and/or koa salvage and koa planting in the project area alone has value in restoring native forest and promoting forest recovery.

9) Substantially affects a rare, threatened or endangered species, or its habitat.

There are no known rare, threatened or endangered plants within the planned project area; however, rare native plants and animals are anticipated to benefit from native forest restoration and the additional habitat provided by restored forest. Reforestation in Humu'ula and Laupāhoehoe would improve critical habitat for the endangered plant *Clermontia pyrularia* and implements actions recommended in the Draft Revised Recovery Plan for Hawaiian Forest Birds (2003).

10) Detrimentally affects air or water quality or ambient noise levels.

The proposed action will have no detrimental effects on air quality, water quality, or noise levels. The area is remote, and construction noise will be localized and temporary.

11) Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The planned action is not located in the flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, coastal water, or other environmentally sensitive area and so will not affect environmentally sensitive areas and is not likely to suffer damage from these events.

12) Substantially affects scenic vistas and view planes identified in county or state plans or studies.

The proposed action is not anticipated to affect any vistas or view planes identified in county or State plans or studies. Given the surrounding terrain and proximity to existing forest, restoration of the native forest in the project area is unlikely to substantially affect any scenic vistas or view planes.

13) Requires substantial energy consumption.

The proposed action does not require substantial energy consumption, but instead will consume small amounts of energy during bulldozer scarification and/or koa salvage operations.

X. LIST OF PERMITS REQUIRED FOR PROJECT

Construction of the project is anticipated to require the following permits:

Permit	Issuing Agency	Comment
Board approval	State Board of Land and Natural Resources	The project involves reforestation of an existing forest reserve located in the Conservation District using scarification and salvage.
National Pollution Discharge Elimination System (NPDES) General Permit	State Department of Health Clean Water Branch	NPDES general permit coverage required if construction activities involve clearing, grading and excavation that result in the disturbance of one or more acres.

XI. ENVIRONMENTAL ASSESSMENT PREPARATION INFORMATION

This Environmental Assessment was prepared by staff of the Department of Land and Natural Resources, Division of Forestry & Wildlife.

XII. REFERENCES

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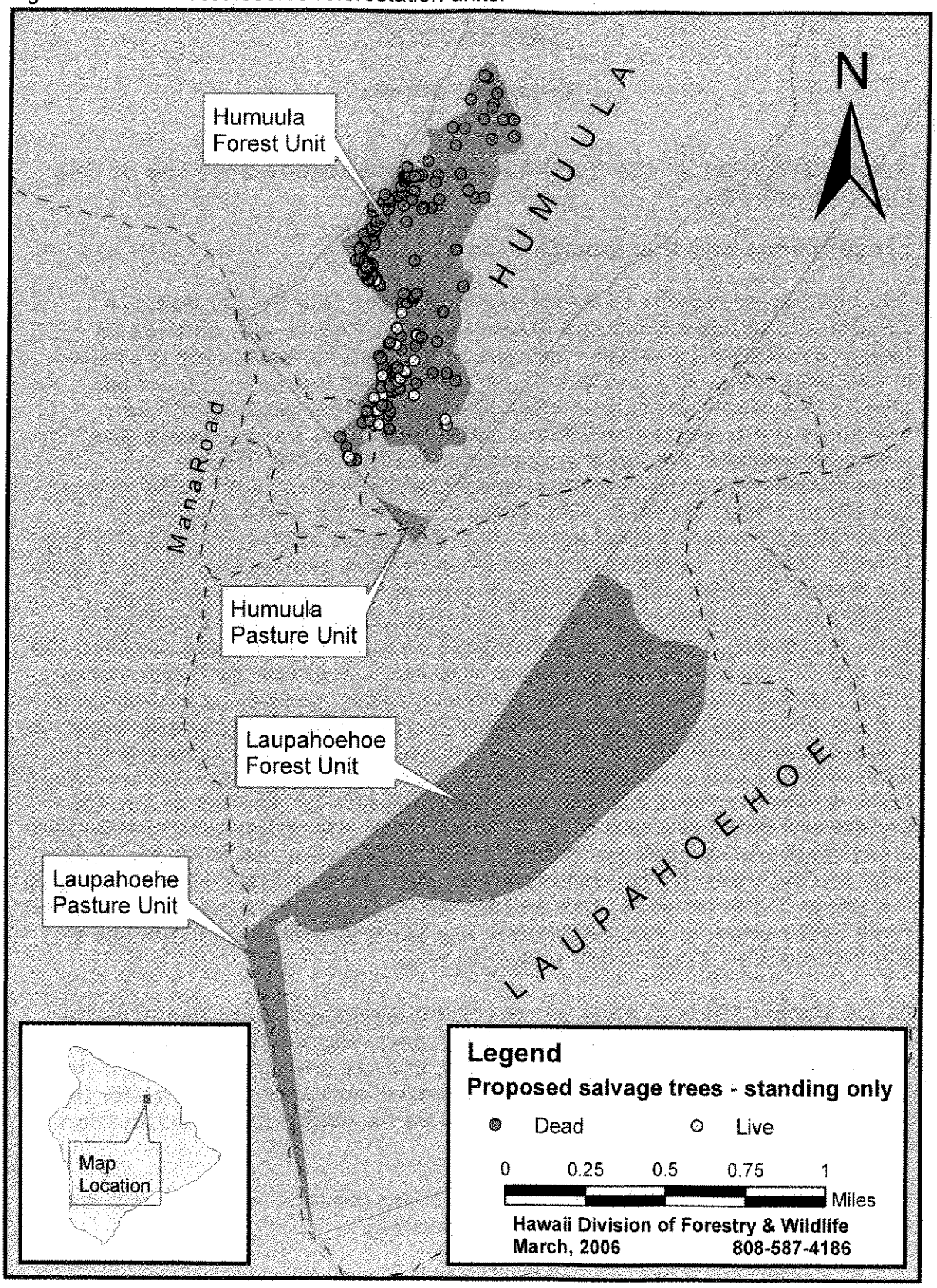
APPENDIX A

Maps of the Project Area

Figure 1. Hilo Forest Reserve reforestation units.



APPENDIX B

Botanical Survey

Botanical Survey of the Humuula and Laupahoehoe Sections of Hilo Forest Reserve

Laupahoehoe and Humuula Sections:

The uppermost regions of these sections of the Hilo Forest Reserve consist of degraded Koa/Ohia Montane Mesic Forest with patches of forest interrupted by larger openings dominated by introduced grasses mixed with young koa and akala. The areas that are open but not too steep are suitable for scarification and subsequent planting of koa seedlings if it is warranted. Above 5800 feet in the Laupahoehoe and Humuula sections are open areas dominated by akala (*Rubus hawaiiensis*) and banana poka (*Passiflora mollissima*) with some young koa (*Acacia koa*) present . Also present are pasture-type openings dominated by sweet vernal grass (*Anthoxanthum odoratum*), velvet grass (*Holcus lanatus*), and kikuyu grass (*Pennisetum clandestinum.*), and near the mauka boundary of the forest reserve are planted stands of sugi (*Cryptomeria japonica*), redwood (*Macrocarpa cupressus*), Eucalyptus spp., ironwood (*Casuarina equisetifolia*) and other introduced conifers. On the steeper slopes where cattle are less likely to graze the forest has a closed to open canopy up to 35 meters in height, consisting of emergent koa (*Acacia koa*) over ohia (*Metrosideros polymorpha*), kolea (*Myrsine lessertiana*), and pilo (*Coprosma rhynchocarpa*), with a subcanopy of aweoweo (*Chenopodium oahuense*). Scattered in the subcanopy are olapa (*Cheirodendron trigynum*) and manono (*Hedyotis terminalis*) and in the understory are occasional ferns such as ho`io (*Diplazium sandwichianum*) and *Dryopteris wallichiana*. Other native constituents found in this forest type are the vines *Sicyos macrophyllus*, and maile (*Alyxia oliviformis*), and the sedge *Carex alligata*. This forest type is present in a mosaic with more open areas down to about 4900 feet elevation in both the Laupahoehoe and Humuula sections of the forest reserve.

Below about 4900 feet elevation the forest becomes more dominated by ohia and as it is wetter, slightly different understory species are present, including Kanawao (*Brousaissia arguta*) and hapu`u (*Cibotium* spp.). In this region the forest becomes more densely vegetated and is wetter than above; presumably this area is not suitable for larger-scale scarification and koa planting.

A map has been prepared detailing the areas that are most suitable for scarification and subsequent koa tree planting.

Species encountered on Survey
Native Species:
Trees:
Acacia koa - common
Cheirodendron trigynum - occasional
Chenopodium oahuense - common
Coprosma rhynchocarpa - common
Dodonaea viscosa - occasional (tree ecotype found here)
Hedyotis terminalis - occasional
Ilex anomala - occasional
Melicope spp. - uncommon (only in wetter areas of survey)
Metrosideros polymorpha - common
Myoporum sandwicense - occasional
Myrsine lessertiana - common
Sophora chrysophylla - common in the uppermost elevations

Shrubs:
Brousaissia arguta - occasional
Phytolacca sandwicensis - occasional
Pipturus albidus - uncommon (only in wetter areas of survey)
Rubus hawaiiensis - common
Styphelia tameiameiae - occasional
Vaccinium calycinum - occasional

Ferns, Sedges and Vines:
Asplenium trichomanes - occasional
Athyrium microphyllum - uncommon (only in wetter areas of survey)
Diplazium sandwichianum - uncommon
Dryopteris fusco-atra - uncommon
Dryopteris glabra - uncommon
Dryopteris wallichiana - occasional
Elaphoglossum crassifolium - occasional
Pneumatopteris sandwicensis - uncommon (only in wetter areas of survey)

Carex alligata - occasional

Alyxia oliviformis - occasional
Sicyos macrophyllus - uncommon

Non-native Species:
Trees:
Eucalyptus spp. - occasional
Cryptomeria japonica - common
Macrocarpa cupressus - occasional
Casuarina equisetifolia - occasional

Shrubs:
Rubus argutus - common
Rubus rosifolius - occasional

Vines:
Passiflora mollissima – common

Herbs, grasses and ferns:
Geranium homeanum - occasional
Ludwigia octovalvis - occasional
Melilotus alba - occasional
Physalis peruviana - occasional
Polygonum punctatum - occasional
Rumex crispus - occasional
Senecio madagascariensis - occasional
Senecio sylvaticus - common

Dactylis glomerata - occasional
Ehrharta stipoides - occasional
Holcus lanatus - common
Pennisetum clandestinum - common
Sporobolus africanus - occasional

Pteridium aquilinum - occasional

APPENDIX C

Faunal Survey

Surveys of fauna were conducted in the subject parcels on March 25, May 23 and June 10.

The Laupahoehoe section was surveyed by Joey Mello and Steve Bergfeld on May 23. A transect was done starting at the Blair Road gate at elev.5430ft. in a Southwesterly direction along the boundary of the Forest Reserve. A second transect was done approximately 3-400m to the southeast, paralleling the first in a Northeasterly direction back to Blair Road. All fauna detected by sight, sound and sign are noted below.

native birds
Amakihi *(Hemignathus virens)*
Apapane *(Himatione sanguinea)*
Iiwi *(Vestiaria coccinea)*
Omao (Myadestes obscurus)
I'o *(Buteo solitarius)*

non-native birds
Japanese White Eye *(Zosterops japonicus)*
House Finch *(Carpodacus mexicanus)*
Northern Cardinal *(Cardinalis cardinalis)*

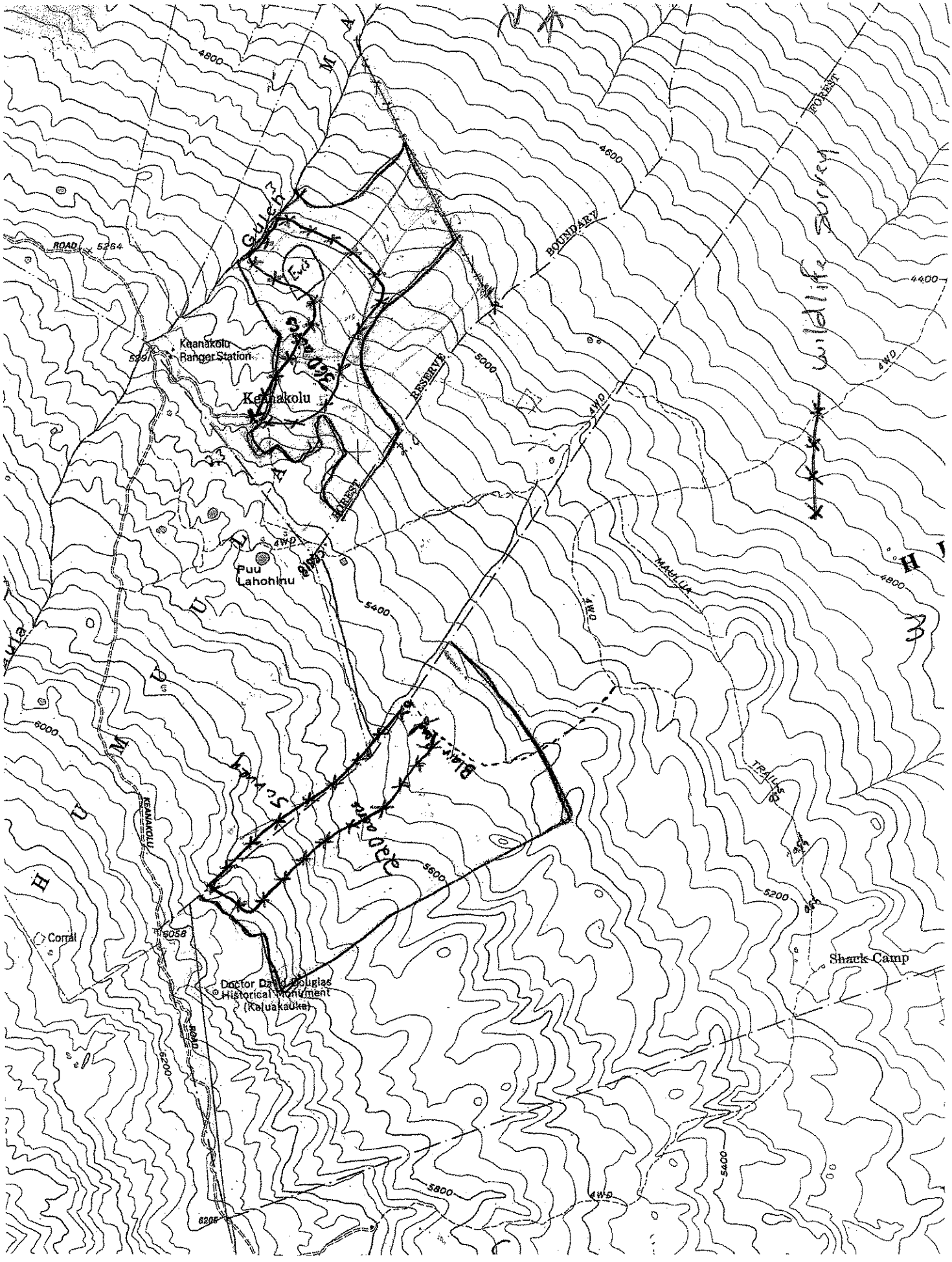
other
mongoose (*Herpestes auropunctatus)*
feral pig *(sus scrofa)*
feral dog *(Canus familiaris)*
cattle *(Bos taurus)*

The Humuula section was surveyed by Joey Mello and Raymond Mizuba on March 25, A transect was done on the loop trail below the log at Keanakolu orchard #1, continuing down slope to approximately 5040ft elevation, then along 5040 contour toward the northwest boundary of the parcel, then down to 5000ft elevation, then southeast approximate center of Humuula Forest Reserve, then southwest back to orchard #1. All species identified by sight, sound and sign are noted below.

native birds
Amakihi *(Hemignathus virens)*
Apapane *(Himatione sanguinea)*
Iiwi *(Vestiaria coccinea)*
Omao (Myadestes obscurus)
I'o *(Buteo solitarius)*

non-native birds
Japanese White Eye *(Zosterops japonicus)*
House Finch *(Carpodacus mexicanus)*
Northern Cardinal *(Cardinalis cardinalis)*
Common Myna *(Acidotheris tristis)*

other
mongoose (*Herpestes auropunctatus)*
feral pig *(sus scrofa)*


Kaanakolu
Ranger Station
Kaanakolu
Puu
Lahohinu
Corral
Doctor David Douglas
Historical Monument
(Kaluakauka)
Shack Camp
BOUNDARY
RESERVE
FOREST
TRAILS
ROAD
4WD
5264
5058
6205

APPENDIX D

Letters Received During Pre-consultation

USDA

United States Department of Agriculture

Forest Service Pacific Southwest Research Station

Institute Of Pacific Islands Forestry

P.O. Box 4370
Hilo, HI 96820-0370
(808) 933-8121
FAX (808) 933-8120

File Code: 4100

Date: September 19, 2005

Mr. Robert T. Otomo
Resource Management Forester
Department of Land and Natural Resources
Division of Forestry and Wildlife
P.O. Box 4849
Hilo HI 96720

Dear Mr. Otomo:

We received your letter of August 10, 2005 regarding pre-consultation on environmental assessment for koa reforestation by scarification and planting of seedlings and road construction. We share your interest in koa reforestation of degraded landscapes, and support the State's efforts toward that end.

We would be interested in working with DOFAW in planning and implementing the proposed reforestation activities. As you may know Governor Lingle and U.S. Secretary of Agriculture, Mike Johanns, are committed to establishing two Hawaii Experimental Tropical Forest units on the island of Hawaii. Paul Conry, Roger Imoto, and Michael Constantinides have been involved with us and other State, Federal, and non-government agencies in identifying potential areas for the Experimental Forest. The Laupahoehoe section of the Hilo Forest Reserve is a leading candidate on the windward side of the island. Close collaboration now in planning reforestation efforts in what will likely become an Experimental Forest in the next year or two seems very appropriate.

I suggest that we meet soon after you have gotten all the responses to your August 10 letter, and discuss how we might work toward our mutual goal of koa reforestation and management in Laupahoehoe as well as elsewhere. I look forward to meeting you.

Sincerely yours,

Julie S. Denslow for JBK

J. Boone Kauffman
Director, Institute of Pacific Islands Forestry

Cc.: Roger Imoto
Paul Conry
Michael Constantinides
Paul Scowcroft