

**2004-06-08 FONSI  
KUIA NATURAL AREA RESERVE  
UNGULATE-PROOF FENCING**

JUN 8 2004  
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FINAL ENVIRONMENTAL ASSESSMENT

NATURAL RESOURCES CONSERVATION PROJECT:  
CONSTRUCTION OF UNGULATE-PROOF FENCING

Kuia Natural Area Reserve & Na Pali-Kona Forest Reserve  
Waimea District  
Island of Kaua'i

In accordance with  
Chapter 343, Hawai'i Revised Statutes

Proposed by:

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

1151 Punchbowl Street, Room 325  
Honolulu, Hawai'i 96813

June 2004

**UNGLATE-PROOF FENCING  
KUIA NATURAL AREA RESERVE  
2004-06-08 FONSI**

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I. SUMMARY

Project Name Kuia Natural Area Reserve Resource Conservation Project

Project Location Kuia Natural Area Reserve & Na Pali-Kona Forest Reserve  
Waimea District  
Island of Kaua'i  
TMK 1-4-001-020 Kuia NAR  
1-4-001-014 Na Pali-Kona FR

Land Use Conservation District  
Protective & Resource Subzones

Proposing Agency State of Hawai'i  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
Natural Area Reserves System

Approving Agency State of Hawai'i  
Department of Land and Natural Resources

Anticipated Determination Finding of No Significant Impact

Agencies Consulted

Federal: U.S. Department of Agriculture,  
Natural Resources Conservation Service  
U.S. Department of Interior, Fish and Wildlife Service  
U.S. Geological Survey, Biological Resources Division  
U.S. Navy, Pacific Missile Range Facility

State: Department of Defense  
Department of Health  
Department of Land and Natural Resources  
Division of Conservation & Resource Enforcement  
Division of Forestry and Wildlife  
Historic Preservation Division  
Land Division  
Office of Conservation and Coastal Lands  
State Parks  
Office of Environmental Quality Control  
Office of Hawaiian Affairs  
University of Hawai'i, Environmental Center

County: Kaua'i County Department of Planning  
Kaua'i County Department of Water

Other: Bishop Museum, Hawaii Biological Survey  
Conservation Council of Hawaii

Earthjustice Legal Defense Fund  
Gay & Robinson  
Grove Farm Properties  
Hawaii Audubon Society  
Hawaiian Civic Club of Hanalei  
Hawaiian Civic Club of Kauai  
Hawaiian Civic Club of Kaunualii  
Historic Hawaii Foundation  
Ilio'ulaokalani Coalition  
Kahea – the Hawaiian Environmental Coalition  
Kamehameha Schools  
Kaua'i Aquatic Life & Wildlife Advisory Committee  
Kaua'i Hunting Association  
Kaua'i Ranch, LLC  
Kaua'i Resource Conservation Program  
Kaua'i Watershed Alliance  
Kokee Natural History Museum  
McBryde Sugar Company, A&B Properties, Inc.  
Namahana Farms  
Princeville Corporation  
Sierra Club, Kaua'i Group  
National Tropical Botanical Garden  
The Nature Conservancy of Hawai'i  
Dr. Stephen Weller, University of California, Irvine  
Dr. Robert Cabin, Plattsburgh State  
Keith Robinson  
Elton Ushio  
George Coates  
Jeffrey Bryant  
Paul Massey  
Billy DeCosta  
Kevin Iwai  
Keith Hardy  
Jay Perreira  
Earl Ozaki  
Ronald Ozaki  
Jarvin Peralta  
Joey Silva  
Scott Bukoski  
Keith & Gabriela Silva  
Reid & Lois Fujishige  
Bae Dela Cruz

Summary of Proposed Action

The Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife, proposes to construct fencing in the southwest corner of the Kuia Natural Area Reserve, extending into the Na Pali-Kona Forest Reserve, on the island of Kaua'i. The proposed fencing is a series of five

exclosures, ranging in size from four to 57 acres. Combined, these fences would enclose approximately 137 acres of quality native forest containing some rare and endangered plant populations, protecting them from the destructive impact of feral animals, including pigs, goat and deer. These protected areas would also provide opportunities for outplanting species of rare plants found in the general area, supporting the long-term recovery of several plants currently found only in areas of degraded habitat.

Fence construction would involve hand clearing of a corridor no more than six feet wide and erecting a fence line. The planned fence would be approximately seven feet tall, made of hogwire. Where necessary, the outside of the fence would be skirted along the base with a hogwire apron. Management activities planned after the fence is completed include feral animal and weed control and outplanting of native species.

Potential impacts include short-term increase in soil disturbance along the fence line, disturbance and damage to common native plants along the fence line, introduction of invasive species into the project area, and reduction in hunting acreage. Impact mitigation measures include conducting expert surveys of the fence route to ensure that no botanical resources are within the fence clearing corridor, implementing measures to decrease the potential for accidental introduction of non-native species, and including gates at strategic locations in the fencing to ensure continued access into and through the project area.

## II. PROJECT PURPOSE AND NEED

The Hawaiian Islands are known as the endangered species capital of the world. Approximately half the native rain forest and 90 percent of the native dry forest in Hawai'i have been lost. Over one-third of the threatened and endangered species in the United States are unique to Hawai'i, and more plant and bird extinctions have been recorded from the islands than anywhere else in the country.

The Natural Area Reserves System was established in 1970 by the State Legislature to "preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawai'i." Chapter 195, HRS. There are currently 19 Reserves covering approximately 109,000 acres on Kaua'i, O'ahu, Moloka'i, Maui, and the Big Island. Although the Natural Area Reserve System encompasses less than three percent of the State's land area, it represents the greatest concentration of protected biodiversity in the nation.

The 1,636-acre Kuia Natural Area Reserve was established in 1981. It is a diverse Reserve with mixed mesic and dry forest and shrublands. Native natural communities protected by the Preserve include koa 'ohi'a mixed montane and lowland mesic forests, Kaua'i diverse lowland mesic forest (known only in the west Kokee area) and kawelu lowland mesic grassland. The Kuia Natural Area Reserve also supports the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Kaua'i thrush (*Myadestes palmeri*),

at least 25 species of endangered or threatened plants, candidate plants, and plant species of concern.

Management policies for the Natural Area Reserves System (NARS) recognize that "the removal of feral ungulates is an overriding consideration in the management of NARS ecosystems" and state that "in Reserves, strategies to reduce populations of non-native animals to the lowest possible level will be employed." In the past, however, funding has not been available to fully support the active management needed to protect natural resources in Kuia Natural Area Reserve from damage by feral animals or from the spread of invasive species.

Feral animals such as pigs, goats and deer can cause widespread damage to native plants that evolved in the absence of any large native grazing animals. These animals pose a major threat by consuming and trampling native understory plants, creating conditions favoring non-native plant infestation and establishment, preventing the establishment of ground-rooting native plants, and disrupting soil nutrient cycling. Many non-native plants grow quickly in areas of natural and animal disturbance and may eventually crowd out the native plants. The cumulative effect of these activities is the decline of native forests, watersheds, and suitable habitat for native plants and animals.

The proposed action takes affirmative steps to protect one of the best examples of mesic forest in the Hawaiian Islands. Rather than simply protecting individual populations of threatened or endangered plants, the proposal encloses a larger area of intact native forest with ungulate-proof fencing. By protecting intact areas, the proposed action increases the likelihood of success of intensive weed control and ungulate removal actions. The proposed action also provides the opportunity for future outplantings of native plants, including endangered species found in the hunting areas that were removed from critical habitat designation as well as rare plant species that require additional attention to prevent formal listing as endangered. Overall, the project is anticipated to have a positive impact on the long-term recovery of threatened and endangered plant populations and on the general health of the native forest and the watershed.

The Kuia Natural Area Reserve and the Na Pali-Kona Forest Reserve are State owned lands within the Conservation District and State funding will be used to implement this project. These conditions trigger the need for an Environmental Assessment to be written in accordance with Chapter 343, HRS.

### III. SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT

#### *Location*

The project area is located in the Kuia Natural Area Reserve and the Na Pali-Kona Forest Reserve in northwestern Kaua'i. The Kuia Natural Area Reserve occupies 1,636 acres, surrounded by the Na Pali-Kona Forest Reserve and Kokee State Park. State-owned land in the Na Pali-Kona Forest Reserve occupies approximately 13,100 acres.

The project area is bounded on the east by Kokee State Park, Milolii Ridge road to the south, sheer cliffs and the Pacific Ocean to the west, and Nualolo Trail on the north. The project area includes the valleys of Kawaiula, Poopooiki, Paaiki, Kuia, and Mahanaloa, and is within the Resource and Protective Subzones of the Conservation District. A map of the project area, illustrating the proposed and alternative fence lines, is included in Appendix A.

Kuia Natural Area Reserve ranges in elevation from approximately 2,000 to 3,900 feet, encompassing lowland and montane vegetation types, and receives an average annual rainfall of 40 to 80 inches. Valleys and ridges cross the Reserve from west to east. The terrain in the project area is mostly steep valley walls with narrow intermittent stream bottoms. The soils are erodible and loose with rock outcroppings scattered within the project area. Environmental conditions for the portion of Na Pali-Kona Forest Reserve within the project area are similar to those of Kuia Natural Area Reserve.

Kuia Natural Area Reserve is accessible to the public by way of Nualolo Trail, which traverses the northeastern portion of the Reserve, and Milolii Ridge Road, a four-wheel drive road located just south of the Reserve. Nualolo Trail is frequently used by both hikers and hunters, while Milolii Ridge Road is primarily used by hunters accessing the forest regions for pig, deer and goats.

Activities that are compatible with the NARS mandate are allowed in the project area, including scientific research, hiking on designated trails, public hunting, and cultural practices. Some of these activities require permits. Motorized vehicles and mountain bikes are not permitted.

#### *Flora*

The Kuia Natural Area Reserve protects some of the best mesic forest remaining in the Hawaiian Islands. Native natural communities within the reserve include koa'ohi'a (*Acacia koa*/*Metrosideros polymorpha*) mixed montane mesic forest, Kaua'i diverse lowland mesic forest (known only from the west Kokee area of Kaua'i), koa'ohi'a lowland mesic forest, and kawelu (*Eragrostis variabilis*) lowland mesic grassland. The best-known example of the Kaua'i diverse lowland mesic forest is located in Mahanaloa Valley, within the project area.

At least 20 endangered plant species, one threatened plant species, one candidate plant species, and six plant species of concern have been observed within the project area, with 'akoko (*Euphorbia haeleeleana*) and koki'o (hau hele'ula; *Kokia kauaiensis*) as the more notable of these rare Hawaiian plant species. Appendix C contains a species list of endangered plants, threatened plants, candidate plants, and plant species of concern known from the project area. Common native plants include 'ohi'a (*Metrosideros polymorpha*), koa (*Acacia koa*), 'a'ali'i (*Dodonaea viscosa*), pukiawe (*Styphelia tameiameia*), pilo (*Coprosma* sp.), kopiko (*Psychotria* sp.), lama (*Diospyros sandwicensis*), and olopuu (*Nestegis sandwicensis*).

Non-native vegetation is found in Kuia Natural Area Reserve at all elevations. Hurricanes Iwa in 1982 and Iniki in 1992 severely damaged the forest canopy in Kuia and contributed to an increase in cover of several non-

native plants. Feral pig and deer activity, including browsing and uprooting native plants and transportation of noxious weeds, has had an additional negative impact on the vegetation. Predominate invasive weed species include lantana (*Lantana camara*), guava (*Psidium guajava*), fayatree (*Myrica faya*), bush beardgrass (*Schizachyrium condensatum*), daisy fleabane (*Erigeron karvinskianus*), blackberry (*Rubus argutus*), molasses grass (*Melinis minutiflora*), silk oak (*Grevillea robusta*), Karaka nut (*Corynocarpus laevigatus*), and thimbleberry (*Rubus rosifolius*). Appendix B contains a species list of plants, both native and non-native, observed within or adjacent to the project area.

#### *Fauna*

Native birds observed in or near the Kuia Natural Area Reserve include the 'i'iwi (*Vestiaria coccinea*), 'apapane (*Himatione sanguinea*), Kaua'i 'amakihi (*Hemignathus stejnegeri*), 'elepaio (*Chasiempis sandwichensis sclateri*), 'anianiau (*Hemignathus parvus*), Kaua'i 'akepa (*Loxops caeruleirostris*), and pueo (*Asio flammeus sandwichensis*). Both the 'akepa and the pueo are considered species of concern by the U.S. Fish and Wildlife Service. In addition, it is likely that both the threatened Newell's Shearwater ('a'o; *Puffinus auricularis newelli*) and the endangered Hawaiian Petrel ('ua'u; *Pterodroma sandwichensis*) fly over the area. These birds may possibly nest within the Reserve in areas of uluhe (*Sticherus owhyensis*), though this has not been informally observed or confirmed by formal surveys.

Given the relatively intact condition of the native forests in the project area, the associated native invertebrate diversity is also high. Native insects and spiders have been observed in the project area, and it is suspected that Kuia Natural Area Reserve would yield new species of native arthropods if intensive surveys were conducted. Some of the insects thought to be within Kuia Natural Area Reserve include species of concern such as the koa bug (*Coleotichus blackburniae*) and the Wilkesia plant bug (*Engytatus sp. 3*).

Kuia Natural Area Reserve also supports the endangered Hawaiian hoary bat ('ope'ape'a; *Lasiurus cinereus semotus*), but the bat is typically found closer to Kokee State Park and has not been observed within the project area.

Non-native birds, including the Japanese white-eye (*Zosterops japonicus*), the Melodius laughing thrush (*Garrulax canorus*), and the Red jungle-fowl (*Gallus gallus*) are commonly sighted in the Reserve. Other non-native animals include feral pigs, deer, rats, yellow jackets (*Vespula sp.*) and ants. Based on annual aerial surveys, there are no feral goats within the Natural Area Reserve, but there may be signs of goat activity within the project area outside the Reserve. Appendix E contains a species list of fauna known or suspected within the project area.

#### *Significant and Sensitive Habitats*

The entire Kuia Natural Area Reserve is considered to be a sensitive habitat by virtue of being a Natural Area Reserve. In addition, the project area overlaps with federally designated critical habitat for 24 threatened and endangered plants on Kaua'i. A list of these plants is included in Appendix D.



The Reserve includes lowland native mesic and dry forests, which are becoming increasingly rare in Hawai'i.

#### *Archaeological Sites and Cultural Practices*

Based on a review of publicly available information and consultation with State Historic Preservation and Hawaiian organizations, there are no known archaeological or cultural sites in the project area. The State Historic Preservation Division has indicated that it believes that there are no historic properties present based on research of their library and site inventory data base, review of the USGS maps and aerial photographs (see Appendix G).

A search for relevant studies at the University of Hawai'i Library and in the Hawaiian and Pacific Collection did not turn up any historical information regarding known sites or cultural use of the project area. During pre-consultation, the Office of Hawaiian Affairs, the Ilio'ulaokalani Coalition, and Kahea – the Hawaiian Environmental Alliance were contacted and invited to share any information they had regarding historical sites or traditional use of the area or to identify persons or groups who may have such information. No traditional or cultural practices occurring in the project area were identified through this process.

Under current Natural Area Reserve administrative rules, traditional and cultural gathering requires a Special Use Permit, and there is no history of requests for a Special Use Permit for traditional and cultural activities within Kuia Natural Area Reserve. It remains possible, however, that the project area was used in the past by Native Hawaiians for activities such as gathering forest plants. Kuia Natural Area Reserve contains many native plants historically used by Native Hawaiians for ethnobotanical or medicinal purposes. For example, koa (*Acacia koa*) was the best wood for canoe-making, and Native Hawaiians also used the wood for non-food containers, weapons and tools, and house posts. 'Ahakea (*Bobea brevipes*), lama (*Disporos spp.*), kalia (*Elaeocarpus bifidus*), and olopua (*Nestegis sandwicensis*) were used in the construction of homes. 'A'ali'i (*Dodonaea viscosa*) wood was used for spears and the leaves for medicine. Maile (*Alyxia oliviformis*) was used to perfume kapa, in lei-making, and represents Laka, the goddess of hula. Mokiha (*Melicope anisata*) berries are traditionally picked with maile for lei-making. Appendix F contains a list of traditional uses for many of the native plants found in the project area.

However, as the project site is in remote wilderness, visitation to the area apart from hunters is primarily limited to the edges of the project area, in the vicinity of the Nualolo Trail and Milolii Ridge Road, and there is no visible evidence of gathering activities in the project area. Based on the available information, there are no known traditional and cultural gathering activities associated with the project area that might be impacted by fence construction.

#### *Scientific Research*

The diversity of native vegetation and the existence of several species of rare and endangered plants within Kuia Natural Area Reserve provide a natural laboratory for scientific research on Hawaiian ecosystems. Dr. Stephen Weller, of the University of California-Irvine, has an ongoing experiment investigating

the effects of fencing on native and alien species, with five small fenced and five unfenced plots outside the proposed fencing, in Mahanaloa Gulch. Other research within Kuia Natural Area Reserve involves insects, spiders, snails, birds, and native plants.

#### IV. PROJECT DESCRIPTION

##### *General*

The Division of Forestry and Wildlife (DOFAW) proposes to construct ungulate-proof fencing in the southwest corner of the Kuia Natural Area Reserve, extending partially into the Na Pali-Kona Forest Reserve, on the island of Kaua'i. All land in the project area is owned by the State of Hawai'i and is located within the Conservation District. A map of the project area and proposed fence lines is included in Appendix A.

The goal of the fencing project is to protect intact native forest, watershed, and habitat for native species from feral pigs, goats and deer and to secure good areas for future outplanting efforts. The proposed action involves constructing a new wire mesh and barbwire fence to enclose approximately 137 acres in the Kuia Natural Area Reserve. The fences would be approximately seven feet high with a combined length of approximately 4.75 miles and would be constructed between the 1,900 and 3,100 feet elevation.

The proposed fencing is located primarily within Kuia Natural Area Reserve, but extends into the Na Pali-Kona Forest Reserve. The preferred route for the fence line was selected based on the following goals: (1) protect intact areas of native vegetation; (2) provide protection for an area large enough to support outplanting of several rare plant species, including those found in hunting areas that were removed from critical habitat designation; (3) enclose an area of manageable size, given staffing and fiscal constraints, so that weed control, animal removal, and fence maintenance can be successfully conducted; and (4) protect existing rare plant populations, including threatened and endangered species as well as candidate species and species of concern.

Helicopters and existing trails and roads would be used to transport fence materials and crews. Access to the fencing sites would be by foot, 4X4 vehicles, or helicopter. At least two helispots within the project area would be prepared for emergency access and to transport equipment, supplies and personnel to the project area. Helispots in the project area will be selected for safety and accessibility. Ideally, helispots will be located on ridgetops or exposed knobs, with a level landing area and minimal obstructions. Staging areas for helicopter transport will be near the Puu Hina Hina lookout, in Waimea Canyon State Park.

Fence corridors will be delineated with flagging tape by staff from the Department of Land and Natural Resources. It is anticipated that a corridor no wider than six feet along the proposed fence line would be cleared by hand and with small power tools as necessary for fence construction.

Once the fences have been installed, feral pigs, goats and deer would be removed from the fenced areas through use of volunteer hunters and then through staff control. On-going maintenance of the fence would include regular visits to repair damage, to check for animal incursion, and to control non-native weeds that may colonize the disturbed area along the fence corridor. Long-term management of the area inside the fence would include such actions as outplanting of appropriate native species (both rare and common), control of non-native weeds, and control of other non-native organisms such as insects, rodents, plant disease, etc. that may be adversely affecting forest health and the regeneration process. A list of potential species for outplanting is included in Appendix H. These actions are included under the list of normal DOFAW program activities exempt from the environmental review process.

#### *Fencing Specifications*

The fences would be made of galvanized steel and wood posts, hog wire, and a single strand of barbed wire along the bottom of the fence to prevent feral pigs from entering the fenced areas. Fence construction would involve driving steel T-posts and treated wood posts into the ground no more than 10 feet apart along the fence route using tubular post drivers or driving caps. High tensile steel woven wire mesh would be attached to the outside of the posts. Wire mesh skirting would be used in areas of uneven or rocky ground and secured with anchor pins. One strand of 12½ gauge barbed wire would be installed at the bottom of the wire mesh fence. The bottom of the woven wire fence and the barbed wire strand would be within two inches of the ground and fastened to the ground with a T-post anchor. Minor changes may be made to these specifications as needed based on the terrain, conditions, and professional judgment of DOFAW staff to improve the effectiveness and/or the life span of the fencing. Pass-through gates would be incorporated in appropriate locations to allow hunters access into and through the enclosure.

#### *Timing & Costs*

The fencing is expected to take approximately 8 to 12 months to complete and to cost approximately \$350,000. Funds for fence clearing and construction are provided through a Candidate Conservation Agreement Grant from the U.S. Fish & Wildlife Service and from the State Natural Area Reserve Special Fund. Construction would proceed as soon as all necessary approvals have been granted and is estimated to commence in 2004.

## **V. ALTERNATIVES CONSIDERED**

*Preferred Alternative: Construct a series of five fenced exclosures, ranging in size from four to 57 acres in size, protecting good-quality intact native forest.*

This alternative involves the construction of five fenced exclosures around good-quality intact native forest containing some rare and endangered plant populations. Approximately 4.75 miles of fencing would enclose a total of 137 acres.

This alternative was developed as a result of a public informational meeting on Kaua'i in July 2003 (see Appendix I) where Alternative #2 was presented to the public. During the meeting, those present expressed concern over the size of the proposed fencing, the maintenance challenges, the difficulty in eradicating animals from the enclosure, the potential for weed overgrowth, and the interference with traditional hunter routes through the area. After the meeting, Division of Forestry and Wildlife staff conducted additional fieldwork to identify the areas of best native forest in the general project area, to identify areas of degraded habitat, and to evaluate the feasibility of managing Alternative #2.

The information gathered contributed to the development of this preferred alternative. Areas with significant lantana infestation or other invasive weeds and areas of increased habitat degradation to the west were avoided, while areas with high quality native forest were retained or included. Due to the smaller size of the enclosures, removal of animals, weed control, and other management activities would occur faster than under the Alternative #2, providing protection sooner and allowing outplanting to occur more quickly. In addition, primary access routes used by hunters to cross from Milolii Ridge Road to Nualolo Trail and to move from upper Kuia Natural Area Reserve to the lower portion of the Natural Area Reserve would remain open and unobstructed.

DOFAW believes that fencing medium-sized areas would focus recovery and restoration efforts on the most intact and biologically significant areas of the Natural Area Reserve. It also provides an opportunity for the Division to evaluate the level of effort needed to conduct effective management actions within fenced enclosures in Kuia Natural Area Reserve (such as weed control, fence maintenance, and animal removal).

*Alternative #2: Construct approximately 3.67 miles of fencing to enclose approximately 547 acres of Kuia Natural Area Reserve.*

This alternative was the initially proposed fence line and involves the construction of approximately 3.67 miles of fencing to enclose approximately 547 acres in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve. The alignment of this alternative was selected to maximize ease of construction and minimize impact on the resource and costs, and at the same time, protect a large area of the Natural Area Reserve containing several rare native species.

This alternative is not preferred because DOFAW believes that it contains an area that is too large to maintain effectively at this time. Due to the topography and number of large trees, fence maintenance would require significant management attention to prevent animal intrusion through spaces under the fence from erosion or through holes from fallen trees or limbs. Due to the large size of the fencing, the amount of vegetation cover, and the steepness of the west side, removal of animals would require intensive effort and might not ever be successful. And given the extensive spread of many invasive weeds within the area enclosed by this alternative, such as lantana, weed removal or control would be difficult. Because of these conditions, the full benefit of protective fencing would not be realized for years, if ever.

*Alternative #3. No action.*

The no action alternative maintains the status quo of no fence construction within the project area. Other actions like weed control might still take place. The no-action alternative is not preferred as it does not provide any significant long-term protection to the unique natural resources of the Natural Area Reserve. It would not protect the ecosystem from the impacts of feral animals nor would it allow for large-scale outplanting or restoration efforts. Further, by allowing continued degradation of the Natural Area Reserve, it could reduce the long-term viability of many species found within the project area.

An alternative of no action is inconsistent with the NARS mandate to protect native ecosystems and geological sites in perpetuity, pursuant to Chapter 195, HRS, and is contrary to the State's legal obligation to protect and recover threatened and endangered species, as required by Chapter 195D, HRS. The no-action alternative effectively accepts the deterioration and eventual loss of unique and rare native forest and watershed, and would preclude endangered species recovery efforts in the Reserve.

In addition, a no-action alternative could have a negative impact on hunting opportunities on Kaua'i. The State of Hawai'i currently receives Federal funds through the Pittman-Robertson Act to support the selection, restoration, rehabilitation, and improvement of wildlife habitat and wildlife management research. Without these Federal funds, the State would have difficulty administering a recreational hunting program and maintaining access to hunting areas due to competition for State funding and other mandates of the Department. The Fish and Wildlife Service removed certain hunting areas, including Hunting Unit A, that were initially considered for critical habitat designation, from critical habitat under the expectation that the State would take protective measures in other areas of higher biological quality, such as Kuia Natural Area Reserve. In addition, during last section 7 consultation for the Pittman-Robertson projects on Kaua'i, the State agreed to take management actions to protect and enhance plants in Kaua'i Hunting Unit A. These actions included outplanting eleven endangered plant species in specified areas including Kuia Natural Area Reserve. If the State fails to take action to provide protected areas for outplanting of rare species that remain threatened by feral animals in Hunting Unit A or in designated critical habitat, then the U.S. Fish and Wildlife Service could cease part or all of Pittman-Robertson Act funding, harming the hunting program on Kaua'i.

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

*Environmental Impacts*

The primary short-term environmental impacts of the proposed action are associated with fence construction and the preparation of helispots. Disturbance of soil and displacement of invasive species and some common native vegetation would occur in the immediate vicinity of the planned fence line and within planned helispots. Fence construction entails clearing a

corridor in the immediate vicinity of the planned fence line to remove potential hazards to fence construction crews and facilitate fence construction. Some common native plants may be damaged, but the total damage is not expected to be significant. Although most of the vegetation is expected to grow back, ongoing fence inspection and maintenance activities require that the fence line be kept cleared of vegetation. While soil would be disturbed along the proposed fence line and helispots, soil disturbance would be short-term, and no changes in the normal runoff or percolations patterns are expected. Areas with sensitive biological resources would be avoided. Finally, soil disturbance along the proposed fence line, as well as the transport of fence materials and crews, would increase the potential accidental introduction of non-native plants to the project site.

Noise and air pollution from helicopter sling loads and the use of small power tools would be unavoidable during fence construction. Increased human activity in the project area resulting from fence construction would be necessary and may disturb native birds in the immediate vicinity of construction.

The long-term environmental impacts of the proposed action associated with the proposed fencing are the long-term benefits associated with the removal of feral pigs, goats and deer. Native plant populations, including populations of endangered species, should increase in numbers once feral animals are removed from the fenced areas.

In addition, the project provides the opportunity to evaluate the success of fencing to exclude feral jungle-fowl. Feral jungle-fowl on Kaua'i are widespread, yet their impact on native plants is not well documented. Some field staff suspect that feral jungle-fowl in the Natural Area Reserve cause damage to understory regrowth and regeneration of native plants. Experimentation with different methods of control and removal of feral jungle-fowl within the fenced area and monitoring to determine the effectiveness of fencing at excluding feral jungle-fowl is a potential management activity once the fencing is constructed.

Finally, the project once complete would provide a secure outplanting site for threatened and endangered plant species. At least 23 rare plant species are present within the project area, and the planned fencing would protect designated critical habitat for 24 threatened and endangered plant species. Preserving this intact native ecosystem provides the opportunity for future restoration efforts.

#### *Socio-Economic Impacts*

The proposed action involves the expenditures of funds necessary to complete the project, including the purchase of fencing materials and the contracting of fence crews and helicopter operators. The estimated total cost of the fencing is approximately \$350,000. Positive economic impacts would result from the release of project funds into the State economy through the purchase of fence materials and employment of fence crews. The proposed action may attract additional funding for future outplanting and endangered species recovery efforts.

Appropriate public access to, and use of, the area would not be affected by the proposed action. The project area would remain open space and would continue to be managed as a Natural Area Reserve and Forest Reserve. Public hiking, nature study, research, cultural practices, and other permitted activities would still be allowed in the Kuia Natural Area Reserve. The proposed fence would not cross Nualolo Trail, so fence construction is not anticipated to interfere with public access for hikers, hunters, naturalists and others. For the most part, the fences would not be visible from the trail and would not impact any view planes. Finally, gates or cross-overs would be constructed in strategic locations as needed along the fence line to ensure access for hunters. The location and number of these gates would be determined in consultation with the hunting community.

Finally, the long-term socio-economic impacts of the proposed action include protecting native habitat on Kaua'i. The proposed fences would contribute to the recovery of unique and critically endangered Hawaiian species and create additional opportunities for nature appreciation, education, and research.

#### *Hunting Impacts*

The project area falls within State Hunting Unit H. Under the current hunting rules:

- **wild goats** may be hunted on eight consecutive weekends from mid-July through Mid-September with rifles, muzzleloaders, or bows and arrows, without dogs;
- **black-tailed deer** may be hunted with muzzleloaders only one weekend a year (the seventh full weekend preceding the last full weekend of October) and with rifles, muzzleloaders, or bows and arrows on six consecutive weekends, including and preceding the last full weekend of October;
- **wild pigs** may be hunted on weekends from Mid-July through the last full weekend of October by hunters with valid goat or deer permits and on weekends and State holidays from November through June with rifles, muzzleloaders, bow and arrows or dogs and knives.

Hunters for goat and deer must apply for permits and are assigned a hunting date by lottery one month before the open season. There is a bag limit of one goat per muzzleloader/rifle permit/tag issued and one deer per hunter per license year. Bag limits for wild pig are limited to one pig per hunter per day. The Division is currently considering liberalizing the hunting in some hunting units on Kaua'i, including Hunting Unit H.

Over the long-term, the proposed action would result in the loss of approximately 137 acres to public hunting. While the project area represents one of the more accessible portions of the total hunting area available in the immediate vicinity due to its location between Nualolo Trail and Milolii Ridge Road, the impact of the proposed fencing on hunting is expected to be minimal. Traditional hunter routes from Nualolo Trail to Milolii Ridge Road and from upper Kuia to lower Kuia would not be blocked by the fencing. In addition, the

balance of the acreage in Unit H outside the project area would remain open for public hunting in the foreseeable future, and alternative hunting areas for goat, deer and pig exist outside Unit H. Specifically, alternative hunting areas for wild goat on Kaua'i include State Hunting Units A, B, C, E, G, and K; alternative hunting areas for black-tailed deer on Kaua'i include State Hunting Units A, F, and J; and alternative hunting areas for pig hunting with dogs on Kaua'i include State Hunting Units B, C, D, E, and F.

The 1997 Management Policies for the Natural Area Reserves System clearly state that "the removal of feral ungulates is an overriding consideration in the management of NARS ecosystems" and state that "in Reserves, strategies to reduce populations of non-native animals to the lowest possible level will be employed." Although restricted public hunting currently occurs in the Kuia Natural Area Reserve and more liberalized hunting rules are expected in the near future, public hunting cannot keep the number of ungulates low enough to protect the Reserve and recover endangered species without physical barriers, such as fences, to restrict the movement of feral pigs, goats and deer. As long as the biologically sensitive areas remain unfenced, there will be ingress of feral pigs, goats and/or deer from adjacent areas. The best long-term solution to the feral animal problem in the project area is fencing and removal of feral pigs, goats and deer as quickly as possible.

#### *Cultural Impacts*

The proposed action is not expected to affect traditional or cultural practices. Because public access would not be affected in the long-term by the proposed action and gates or cross-overs would be constructed to allow access through the fenced area, the proposed action should not impact access for Native Hawaiian cultural practices that may be in existence but are currently unknown. Construction of fences would have no effect on existing regulations restricting the collection of plants in Natural Area Reserves, and thus should not affect Native Hawaiian gathering rights. Moreover, as the intent of the fence is to protect and restore native natural resources, the long-term impact on gathering rights may be positive. For example, the proposed action would protect and enhance the habitat for many native plant species that are used by Native Hawaiians, including maile (*Alyxia oliviformis*), mokihana (*Melicope anisata*), and koa (*Acacia koa*). As the forest and natural resources receive long-term protection, it may be possible to allow limited collecting of certain species (via special use permits) for traditional practices. In this way, the proposed action may enhance traditional and customary practices by protecting and actively managing the native forest and watershed.

During pre-consultation, the Division received comments and concerns about the potential impact of the project on hunting, a contemporary cultural practice (see Appendix I, summarizing concerns raised during a public meeting on Kauai in July 2003). The preferred alternative was developed after this public meeting. The alignment of the five fences was shared with the Kauai Aquatic Life and Wildlife Advisory Committee and a second public meeting was held in May 2004 to gather public comment on the Draft Environmental Assessment (see Appendix K for a meeting summary). DOFAW received no written comments expressing concern about the impact of the preferred alternative on hunting, and public concern expressed during the May meeting



was greatly reduced in comparison to the previous July meeting. As a result, DOFAW believes that the fencing, as proposed in the preferred alternative, will have a minimal impact on the contemporary cultural practice of hunting.

## VII. MITIGATION MEASURES

Although the proposed action is not expected to have any significant impacts on the environment, the following measures are proposed to mitigate any potential negative impacts resulting from the project.

Fence corridors will be delineated by staff from the State of Hawai'i Department of Land and Natural Resources with flagging tape. Prior to vegetation clearing and fence construction, DOFAW staff will re-survey the fence lines to identify and flag rare or endangered native Hawaiian plants and other potentially sensitive areas to prevent disturbance by crews. When necessary, minor changes in fence alignment will be made to avoid sensitive sites by a greater distance.

Selection of helispots within the project area will be based on safety and accessibility. Ideally, helispots will be located on ridgetops or exposed knobs, with a level landing area and minimal obstructions. These locations are likely to be barren of vegetation because of erosion. Minimal clearing of vegetation on these sites is anticipated for this reason, but every effort will be taken to avoid locating helispots in the immediate vicinity of rare and endangered plants.

All construction activities will incorporate applicable best management practices to minimize soil disturbance and prevent erosion. Practices relating to fencing from the Division of Forestry and Wildlife Best Management Practices for Maintaining Water Quality in Hawai'i are included as Appendix J.

To prevent the introduction of alien plants and insects during construction, boots, equipment and materials will be inspected for seeds, eggs, larvae, etc., prior to delivery and entry into the project area, and cleaned as necessary. All fence construction workers will be instructed on specific procedures to prevent the spread or introduction of noxious plants in the project area. In addition, precautions will be taken to prevent spreading alien plants already found at the fencing sites, and all food, refuse, tools, gear, and construction scrap will be removed upon completion of work at each fencing site. Plants may not be removed from the fencing sites.

While there are no known archaeological or cultural sites affected by the proposed action, should evidence of any archaeological or culturally significant sites be encountered during construction, vegetation clearing and fence construction would immediately cease and the Division of Historic Preservation will be consulted immediately. Cultural practices such as the gathering of plant material are already regulated by existing NARS rules, and construction of fences is not anticipated to affect these regulations.

Finally, gates or cross-overs will be constructed at appropriate intervals along the fence line to ensure access into and through the fenced enclosure for hunters and other users. The type of access and the locations will be developed through discussions with the hunting community.

#### VIII. ANTICIPATED DETERMINATION

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

#### IX. FINDINGS AND REASONS SUPPORTING EXPECTED DETERMINATION

The goal of the proposed action is to benefit native forests, watershed, and habitat for native species, including endangered species. Creating permanent barriers to exclude feral pigs, goats and deer enhances reforestation efforts and removes a major threat to the continued survival of rare and endangered species. Conservation efforts throughout Hawai'i have consistently shown that removing feral pigs and other invasive species is an important first step toward protecting and restoring native ecosystems. If animals are removed before the damage is widespread and severe, native vegetation is often able to recover naturally and the spread of invasive weeds is can be stopped. Unless the pervasive disturbance of feral pigs, goats and deer is removed, native resources in the Kuia Natural Area Reserve will continue to decline.

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 proposed fencing will provide long-term protection for native forest, watershed, and habitat for native plants and animals, including endangered species. The project is anticipated to secure future sites for outplanting of endangered species and support their eventual recovery. The positive results of the project are expected to more than offset any short-term damage incurred during fence construction.

- 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 improve and protect one of the best examples of mesic forest in the State of Hawai'i that also hosts many plants and animals, including endangered species. Fencing and actively managing the project area will help

to insure that the range of beneficial uses continue in Kuia Natural Area Reserve.

- 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 following: a) environmental policies established in Chapter 344, Hawai'i Revised Statutes (HRS); b) the State's mandate for the NARS set forth in Chapter 195, HRS and guidelines for activities in the Natural Area Reserves; and c) the State's mandate to conserve threatened and endangered species, as required by Chapter 195D, HRS. It is also consistent with Chapter 3 of the Kaua'i County General Plan, which sets policies for managing human activities to maintain the quality of the environment, particularly the quality of Kaua'i's waters and watersheds.

- 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-restoration goals of the project will directly benefit the economic, cultural, educational, and recreational interests of the community and State.

- 5) *Substantially affects public health.*

Public health will not be harmed by the proposed action. The proposed action will have a positive impact on public health by protecting native forest and plants and removing feral pigs, goats and deer from the area. Feral ungulates release pathogens into the environment that can cause diseases such as leptospirosis. Foraging by feral pigs results in soil erosion, threatens water quality, and creates wallows for breeding mosquitoes that can become vectors for potentially fatal human diseases. Removal of feral pigs, goats and deer from the watershed will reduce these public health risks.

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

The proposed action will not 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 will improve with the implementation of the proposed action. Fence construction and the removal of feral pigs, goats and deer will enhance environmental quality by improving the health of the native forest, watershed, and habitat for native species.

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

The proposed action is limited to fence construction and the removal of feral pigs, goats and deer. Regeneration of native plants after fencing and the removal of feral pigs, goats and deer will offset any short-term disturbance to vegetation or soil during fence construction.

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

The proposed action will positively affect the nineteen endangered plant species, one candidate plant species, and three plant species of concern found in the project area, as well as protect recently designated Federal critical habitat for threatened and endangered plants on Kaua'i. If no action is taken, further declines in endangered plant populations and potential extinction are likely to result. Exclusion of feral pigs, goats and deer with fencing has been shown repeatedly to be one of the most important actions that can be taken to protect rare, threatened, and endangered species in Hawai'i.

- 10) *Detrimentially 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. Water quality will be improved in the long-term by removing feral pigs, goats and deer from the watershed, reducing soil erosion, and limiting the input of pathogenic microorganisms into streams by feral pigs, goats and deer. Helicopter and fence 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 project is proposed in the southwest corner of the Kuia Natural Area Reserve between 1,900 and 3,100 feet elevations. There is a remote possibility that the fences could be damaged by a natural disaster or catastrophic event. No known geological hazards are present in the project area. The proposed action will not damage or adversely affect any environmentally sensitive areas. Instead, fencing and removing feral pigs, goats and deer from the watershed will have a positive effect on the watershed and water quality by protecting native forest from the impacts of feral animals.

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

The proposed action will not affect any vistas or view planes identified in county or state plans or studies. For the most part, the fence will not be visible to most people as the proposed fence is located in a remote area. While the fence may be visible in some locations to people hiking the Nualolo Trail, it is not anticipated to block scenic view planes or significantly affect scenic vistas.

- 13) *Requires substantial energy consumption.*

The proposed action does not require substantial energy consumption, but instead will consume small amounts of energy during fence construction and for transportation of fence materials and crews.

#### **X. LIST OF PERMITS REQUIRED FOR PROJECT**

Construction of this project requires approval by the Board of Land and Natural Resources. No other permits are anticipated.

#### **XI. ENVIRONMENTAL ASSESSMENT PREPARATION INFORMATION**

This Environmental Assessment was prepared by:

State of Hawai'i  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
Natural Area Reserves System Program  
1151 Punchbowl Street, Suite 224  
Honolulu, Hawai'i 96813  
Telephone (808) 587-0051, Facsimile (808) 587-0064

#### **XII. REFERENCES**

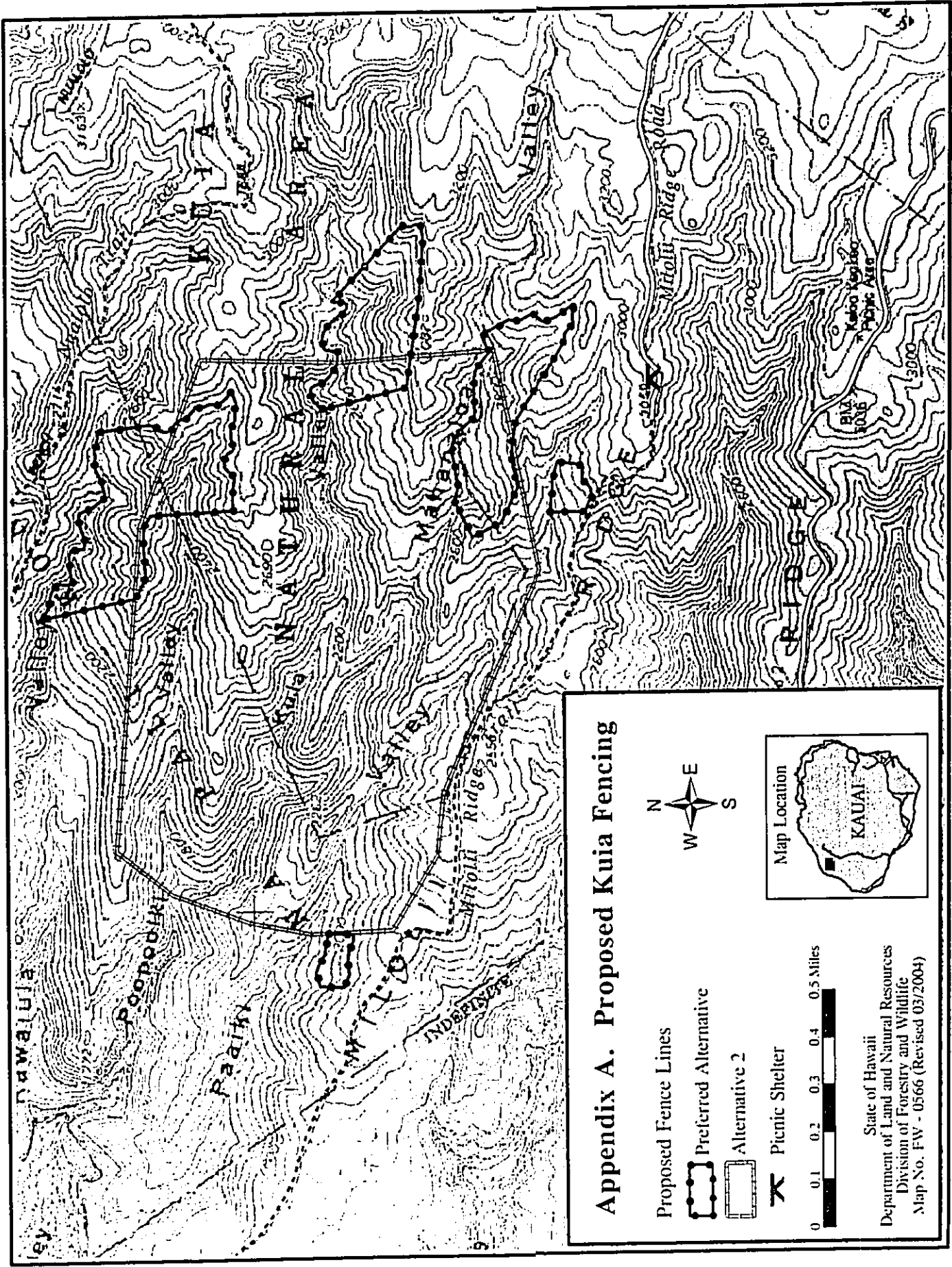
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- Personal Communications with Reggie David. Field notes. 2003.
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**XIII. LIST OF APPENDICES**

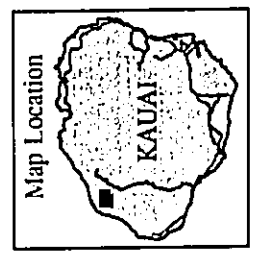
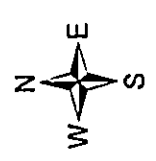
Appendix A	Map of Project Site and Fence Line Alternatives
Appendix B	Flora Observed Within or Adjacent to the Project Area
Appendix C	Endangered Plants, Threatened Plants, Candidate Plants, and Plant Species of Concern Known from the Project Area
Appendix D	Species with Designated Critical Habitat in the Project Area
Appendix E	Fauna Known from the Project Area
Appendix F	Examples of Cultural Use of Plants Found Within the Project Area
Appendix G	Pre-consultation Letter from State Historic Preservation Division
Appendix H	Potential Species for Outplanting in Proposed Kuia Fencing
Appendix I	Summary from Public Informational Meeting, July 2, 2003
Appendix J	Division of Forestry and Wildlife Best Management Practices for Maintaining Water Quality in Hawai'i: Fencing
Appendix K	Summary from Public Informational Meeting, May 5, 2004
Appendix L	Comments Received During Public Comment Period and Response Letters

**APPENDIX A**

**Map of Project Site and Fence Line**



### Appendix A. Proposed Kuia Fencing



- Proposed Fence Lines
- Preferred Alternative
- Alternative 2
- Picnic Shelter



State of Hawaii  
 Department of Land and Natural Resources  
 Division of Forestry and Wildlife  
 Map No. FW - 0566 (Revised 03/2004)



## APPENDIX B

### Flora Observed Within or Adjacent to the Project Area

Scientific Name	Common Name	Native or Non-native
<i>Acacia koa</i>	Koa	Native
<i>Aleurites moluccana</i>	Kukui	Non-native
<i>Alyxia oliviformis</i>	Maile	Native
<i>Antidesma platyphyllum</i> var. <i>hillebrandii</i>	Mehame	Native
<i>Athyrium sandwichianum</i>	Ho'i'o	Native
<i>Bobea brevipes</i>	'Ahakea	Native
<i>Bonamia menziesii</i>	Not known	Native
<i>Canthium odoratum</i>	Alahe'e	Native
<i>Carex wauensis</i>	Hawaiian sedge	Native
<i>Chamaesyce halemanui</i>	Not known	Native
<i>Claoxylon sandicense</i>	Po'ola	Native
<i>Coprosma</i> spp.	Pilo	Native
<i>Corynocarpus laevigatus</i>	Karaka nut	Non-native
<i>Cryptocarya mannii</i>	Holio	Native
<i>Delissea rhytidosperma</i>	Not known	Native
<i>Delissea undulata</i> ssp. <i>undulata</i>	Not known	Native
<i>Dicranopteris linearis</i>	Uluhe	Native
<i>Dianella sandicensis</i>	'Uki'uki	Native
<i>Diellia pallida</i>	Not known	Native
<i>Diospyros hillebrandii</i>	Lama	Native
<i>Diospyros sandwicensis</i>	Lama	Native
<i>Dodonaea viscosa</i>	'A'ali'i	Native
<i>Doodia kunthiana</i>	'Okupukupu lau'i'i	Native
<i>Dryopteris glabra</i>	Laukahi	Native
<i>Dryopteris wallichiana</i>	Laukahi	Native
<i>Dubautia latifolia</i>	Na'ena'e	Native
<i>Dubautia microcephala</i>	Na'enā'e	Native
<i>Elaeocarpus bifidus</i>	Kalia	Native
<i>Erigeron Canadensis</i>	Horseweed	Non-native
<i>Erigeron karvinskianus</i>	Daisy fleabane	Non-native
<i>Euphorbia haeleeleana</i>	'Akoko	Native
<i>Exocarpos luteolus</i>	Heau	Native
<i>Flueggea neowawraea</i>	Mehamehame	Native
<i>Gahnia beechyi</i>	Not known	Native
<i>Grevillea robusta</i>	Silk oak	Non-native
<i>Hedyotis flynii</i>	Not known	Native
<i>Hedyotis terminalis</i>	Manono	Native
<i>Hillebrandia sandwicensis</i>	Not known	Native
<i>Hypochoeris radicata</i>	Hairy Cat's Ear	Non-native
<i>Isodendrion laurifolium</i>	Aupaka	Native
<i>Isodendrion longifolium</i>	Aupaka	Native

APPENDIX B (cont'd)

Scientific Name	Common Name	Native or Non-native
Joinvillea ascendens ssp. ascendens	'Ohe	Native
Kalanchoe pinnata	Air plant	Non-native
Kokia kauaiensis	Kaua'i Koki'o	Native
Lantana camara	Lantana	Non-native
Lipochaeta fauriei	Nehe	Native
Lobelia yuccoides	Panaunau	Native
Melicope anisata	Mokihana	Native
Melicope knudsenii	Alani	Native
Melinis minutiflora	Molasses grass	Non-native
Metrosideros polymorpha	'Ohi'a	Native
Microlepia strigosa	Palapalai	Native
Myrica faya	Faya tree	Non-native
Myrsine fosbergii	Kolea	Native
Myrsine lanaiensis	Kolea	Native
Nephrolepis sp.	Sword fern	(depends on species)
Nestegis sandwicensis	Olopuu	Native
Paspalum conjugatum	Hilo grass	Non-native
Paspalum urvellei	Vasey grass	Non-native
Passiflora edulis	Purple passionfruit	Non-native
Passiflora mollissima	Banana poka	Non-native
Pelea ovata	Alani	Native
Peucedanum sandwicense	Makou	Native
Pisonia sandwicensis	Papala kepau	Native
Pittosporum gayanum	Ho'awa	Native
Pittosporum glabrum	Ho'awa	Native
Plantago lanceolata	Narrow-leafed plantain	Non-native
Platydesma spathulata	Pilokea	Native
Poa mannii	Mann's bluegrass	Native
Pouteria sandwicensis	'Ala'a	Native
Psidium cattleianum	Strawberry guava	Non-native
Psidium guajava	Guava	Non-native
Psilotum nudum	Moa	Native
Psychotria hobdyi	Kopiko	Native
Psychotria mariniana	Kopiko	Native
Pteralyxia kauaiensis	Kaulu	Native
Pteridium aquilinum	Braken fern	Non-native
Remya kauaiensis	Not known	Native
Rubus argutus	Blackberry	Non-native
Rubus rosifolius	Thimbleberry	Non-native
Scaevola procera	Naupaka	Native
Schiedea kauaiensis	Not known	Native
Schiedea membranacea	Not known	Native
Schiedea nuttalli	Not known	Native

APPENDIX B (cont'd)

Scientific Name	Common Name	Native or Non-native
Schizachyrium condensatum	Bush beardgrass	Non-native
Setaria glauca	Yellow foxtail grass	Non-native
Sphenomeris chusana	Lace fern (Pala'a)	Native
Styphelia tameiameia	Pukiawe	Native
Wikstroemia furcata	Akia	Native
Xylosma hawaiiense	Maua	Native
Zanthoxylum dipetalum var. dipetalum	Not known	Native

## APPENDIX C

### Endangered Plants, Threatened Plants, Candidate Plants, and Plant Species of Concern Known from the Project Area

Scientific Name	Common Name	Federal Status
<i>Bonamia menziesii</i>	None known	Endangered
<i>Chamaesyce halemanui</i>	None known	Endangered
<i>Delissea rhytidosperma</i>	None known	Endangered
<i>Delissea undulata</i> ssp. <i>undulata</i>	None known	Endangered
<i>Diellia pallida</i>	None known	Endangered
<i>Dubautia latifolia</i>	Na'ena'e	Endangered
<i>Euphorbia haeleeleana</i>	'Akoko	Endangered
<i>Exocarpos luteolus</i>	Heau	Endangered
<i>Flueggea neowawraea</i>	Mehamehame	Endangered
<i>Isodendrion laurifolium</i>	Aupaka	Endangered
<i>Kokia kauaiensis</i>	Kaua'i Koki'o	Endangered
<i>Lipochaeta fauriei</i>	Nehe	Endangered
<i>Melicope knudsenii</i>	Alani	Endangered
<i>Peucedanum sandwicense</i>	Makou	Endangered
<i>Poa mannii</i>	Mann's bluegrass	Endangered
<i>Pteralyxia kauaiensis</i>	Kaulu	Endangered
<i>Remya kauaiensis</i>	None known	Endangered
<i>Schiedea kauaiensis</i>	None known	Endangered
<i>Schiedea membranacea</i>	None known	Endangered
<i>Schiedea nuttalli</i>	None known	Endangered
<i>Isodendrion longifolium</i>	Aupaka	Threatened
<i>Psychotria hobdyi</i>	Kopiko	Candidate
<i>Dubautia microcephala</i>	Na'ena'e	Species of Concern
<i>Hillebrandia sandwicensis</i>	Not known	Species of Concern
<i>Hedyotis flynii</i>	Not known	Species of Concern
<i>Joinvillea ascendens</i> ssp. <i>ascendens</i>	'Ohe	Species of Concern
<i>Lobelia yuccoides</i>	Panaunau	Species of Concern
<i>Myrsine fosbergii</i>	Kolea	Species of Concern
<i>Zanthoxylum dipetalum</i> var. <i>dipetalum</i>	Not known	Species of Concern

## APPENDIX D

### Species with Designated Critical Habitat in the Project Area

Scientific Name	Common Name
<b>Plants</b>	
Chamaesyce halemanui	None known
Ctenitis squamigera	Pauoa
Delissea rhytidosperma	None known
Delissea undulata	None known
Diellia pallida	None known
Dubautia latifolia	None known
Euphorbia haeleeleana	'Akoko
Flueggea neowawraea	Mehamehame
Gouania meyenii	None known
Isodendron laurifolium	Aupaka
Kokia kauaiensis	Kaua'i Koki'o
Lipochaeta fauriei	Nehe
Mariscus pennatiformis	None known
Melicope knudsenii	Alani
Nothocestrum peltatum	'Aiea
Peucedanum sandwicense	Makou
Poa mannii	Mann's bluegrass
Poa siphonoglossa	None known
Pteralyxia kauaiensis	Kaulu
Remya kauaiensis	None known
Remya montgomeryi	None known
Schiedea kauaiensis	None known
Schiedea membranacea	None known
Solanum sandwicense	Popolo 'aiakeakua

## APPENDIX E

### Fauna Known From the Project Area

Scientific Name	Common Name	Federal Status
<b>Native Birds</b>		
<i>Puffinus auricularis newelli</i>	Newell's Shearwater ('a'o)	Threatened
<i>Pterodroma sandwichensis</i>	Hawaiian Petrel ('ua'u)	Endangered
<i>Vestiaria coccinea</i>	'i'iwi	
<i>Himatione sanguinea</i>	'apapane	
<i>Hemignathus stejnegeri</i>	Kaua'i 'amakihi	
<i>Chasiempis sandwichensis sclateri</i>	'elepaio	
<i>Hemignathus parvus</i>	'anianiau	
<i>Loxops caeruleirostris</i>	Kaua'i 'akepa	Species of Concern
<i>Asio flammeus sandwichensis</i>	pueo	Species of Concern
<b>Non-native Birds</b>		
<i>Phaethon lepturus dorothea</i>	White-tailed tropicbird	
<i>Bubulcus ibis</i>	Cattle egret	
<i>Francolinus erckelli</i>	Erckel's francolin	
<i>Gallus gallus</i>	Red junglefowl	
<i>Garrulax pectoralis</i>	Greater laughing thrush	
<i>Phasianus colchicus</i>	Ring-necked pheasant	
<i>Streptopelia chinensis</i>	Spotted dove	
<i>Geopelia striata</i>	Zebra dove	
<i>Tyto alba</i>	Barn owl	
<i>Alauda a. arvensis</i>	Sky lark	
<i>Cettia diphone</i>	Japanese bush-warbler	
<i>Copsychus malabaricus indicus</i>	White-rumped shama	
<i>Garrulax canorus</i>	Hwamei (Melodius laughing thrush)	
<i>Zosterops japonicus</i>	Japanese White-eye	
<i>Mimus polyglottos</i>	Northern mockingbird	
<i>Acridotheres tristis</i>	Common myna	
<i>Paroaria coronata</i>	Red-crested cardinal	
<i>Cardinalis cardinalis</i>	Northern cardinal	
<i>Carpodacus mexicanus frontalis</i>	House finch	
<i>Passer d. domesticus</i>	House sparrow	
<i>Amandava amandava</i>	Red avadavat	
<i>Lonchura punctulata topela</i>	Nutmeg mannikin	
<i>Lonchura atricapilla</i>	Chestnut munia	
<b>Native Mammals</b>		
<i>Lasiurus cineris semotus</i>	Hawaiian hoary bat	Endangered

APPENDIX E (cont'd)

Scientific Name	Common Name	Federal Status
<b>Non-native Mammals</b>		
Canis familiaris	Wild dog	
Capra hircus hircus	Goat	
Felis catus	Feral cat	
Mus musculus	House mouse	
Odocoileus hemionus	Black-tailed deer	
Rattus exulans	Polynesian rat	
Rattus rattus rattus	Black rat	
Sus scrofa scrofa	Pig	
<b>Non-native Reptiles</b>		
Hemiphyllodactylus typus	Tree gecko	
Phyllopezus pollicaris	Rock gecko	
Lepidodactylus lugubris	Mourning gecko	
Lampropholis delicata	Metallic skink	
<b>Insects</b>		
Coleotichus blackburniae	Koa bug	Species of Concern
Engytatus sp. 3	Wilkesia plant bug	Species of Concern
Vespula sp.	Yellow-jackets	
	Ants	

## APPENDIX F

### Examples of Cultural Use of Plants Found Within the Project Area

Scientific Name	Common Name	Cultural Use
<i>Acacia koa</i>	Koa	Canoe making; Medicine; Containers; Tools; Weapons; House posts
<i>Aleurites moluccana</i>	Kukui	Medicine; Food; Oil; Lei-making; Dye
<i>Alyxia oliviformis</i>	Maile	Lei-making; Medicine
<i>Antidesma platyphyllum</i> var. <i>hillebrandii</i>	Mehame	Dye
<i>Athyrium sandwichianum</i>	Ho'i'o	Medicine; Food
<i>Bobea brevipes</i>	'Ahakea	Door frames
<i>Canthium odoratum</i>	Alahe'e	Tools
<i>Dicranopteris linearis</i>	Uluhe	Medicine
<i>Dianella sandwicensis</i>	'Uki'uki	Cordage; Lei-making
<i>Diospyros hillebrandii</i>	Lama	Housing rafters
<i>Diospyros sandwicensis</i>	Lama	Housing rafters
<i>Dodonaea viscosa</i>	'A'ali'i	Medicine; Dye; Weapons
<i>Elaeocarpus bifidus</i>	Kalia	Cordage; Housing rafters
<i>Melicope anisata</i>	Mokihana	Lei-making
<i>Metrosideros polymorpha</i>	'Ohi'a	Medicine; Lei-making; Tools
<i>Microlepia strigosa</i>	Palapalai	Medicine; Lei-making
<i>Nestegis sandwicensis</i>	Olopuā	House posts; Tools
<i>Pisonia sandwicensis</i>	Papala kepau	Gum (bird trap)
<i>Pittosporum gayanum</i>	Ho'awa	Medicine
<i>Pittosporum glabrum</i>	Ho'awa	Medicine
<i>Pouteria sandwicensis</i>	'Ala'a	Tools; Weapons
<i>Psilotum nudum</i>	Moa	Medicine; Lei-making
<i>Styphelia tameiameia</i>	Pukiawe	Medicine; Tools
<i>Wikstroemia furcata</i>	Akia	Cordage; Lei-making; Fishing



**APPENDIX G**

**Pre-consultation Letter from State Historic Preservation Division**

LIHUA I UKI, P  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
KAKUHIHEVA BUILDING, ROOM 198  
661 KAHAKULA BOULEVARD  
KAPOLEI, HAWAII 96707

HAWAII HISTORIC PRESERVATION  
DIVISION REVIEW

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

DEPUTY  
ERNEST Y. W. LAU

ADJUTANT GENERAL  
BOATING AND OCEAN RECREATION  
COMMISSION ON WATER RESOURCES  
MANAGEMENT  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND,  
STATE PARKS

TO: Galen Kawakami  
Name of Agency/Applicant: Kaui DOFAW

SUBJECT: Historic Preservation Review— Kuia Natural Area Fencing Project

District, Island: Na Pali, Kauai

1. We believe there are no historic properties present, based on our research of our library and our site inventory data base, review of the USGS maps and aerial photographs.
2. Thus, we believe that "no historic properties will be affected" by this undertaking.

NM  
Staff Nancy McMahon Date 03/18/03

Title: Archaeologist for Kauai

## APPENDIX H

### Potential Species for Outplanting in Proposed Kuia Fencing

Scientific Name	Common Name	Federal Status
Chamaesyce halemanui	None known	Endangered
Euphorbia haeleeleana	'Akoko	Endangered
Isodendron laurifolium	Aupaka	Endangered
Kokia kauaiensis	Kaua'i Koki'o	Endangered
Lipochaeta fauriei	Nehe	Endangered
Peucedanum sandwicense	Makou	Endangered
Pteralyxia kauaiensis	Kaulu	Endangered
Remya kauaiensis	None known	Endangered
Psychotria hobdyi	Kopiko	Candidate
Canavalia napaliensis	'Awikiwiki	Candidate
Platydesma rostrata	Pilo kea lau li'i	Candidate
Ranunculus mauiensis	Makou	Candidate
Lobelia yuccoides	Panaunau	Species of Concern
Neraudia kauaiensis	Ma'aloa, Ma'oloa, 'Oloa	Species of Concern
Neraudia melastomifolia	Ma'aloa, Ma'oloa, 'Oloa	Species of Concern
Nesoluma polynesianum	Keahi	Species of Concern

## APPENDIX I

### Summary of Public Comment Received Public Informational Meeting Kekaha Neighborhood Center, 7:00 pm July 2, 2003

In attendance:  
DLNR Staff

Alvin Kyono, DLNR DOFAW Branch Manager, Kaua'i  
Galen Kawakami, DLNR NARS Forestry, Kaua'i  
Thomas Kaiakapu, DLNR Wildlife Biologist, Kaua'i  
Jahmaal Webb, DLNR NARS Technician, Kaua'i  
Randall Kennedy, DLNR Native Resources Program Manager,  
O'ahu  
Christen Mitchell, DLNR NARS Project Coordinator, O'ahu

Public (signed in): Kevin Iwai  
Jay Perreira  
Billy DeCosta  
Keith Hardy  
Earl Ozaki  
Ronald Ozaki  
Jarvin Peralta  
Joey Silva  
Scott Bukoski  
Keith Silva  
Gabriela Silva  
Reid & Lois Fujishige  
Bae Dela Cruz  
Keith Robinson  
Katie Cassel

DLNR gave a brief presentation about the reasons for the fencing proposal and outlined the proposed project. This presentation was followed by a public forum where those in attendance were encouraged to ask questions or share concerns.

(Q = Question or Comment; A = Answer or Response)

Q: What was the recent count on plant populations?

A: DLNR checks the known listed plant populations at least twice a year, but the existence of some of the outlying plant populations need to be confirmed.

Q: When was the last time DLNR staff was in the area of the horse trail? Was DLNR aware of the downed fence?

A: DLNR was there last week and in April and is aware of the fence damage.

Q: What endangered plants are protected by the existing small enclosures?

A: Euphorbia, Delissea, Schiedea, ferns, and others.

Q: I hunt and notice no improvement to the plants within existing fenced areas.

Q: If DLNR just builds fences, without other management actions, there will be no improvement to plants.

Q: Who benefits from fencing?

A: The protection of native plants benefits everyone.

Q: More fencing means less area in which to hunt. I hunt to feed my family and the rare plants being protected don't feed my family. It would make more sense if the fencing was to protect food plants. I don't care about plants. Also, the plants within fencing off Nualolo are all dead.

Q: I am disappointed by the proposed fencing. I pay \$30 for a hunting license so that I can hunt for a living, and the roads accessing the hunting areas aren't even fixed.

A: Focusing conservation on small discrete areas, such as this proposal, allows other areas to be used for activities other than conservation.

Q: Unit H is used by the same set of guys every weekend. With this fencing proposal, these guys will have to hunt somewhere else.

Q: I hunt and see no threat to plants because of animals. The pig numbers are low. I want to know about the extent of the pig damage in this area.

A: From past experience with fencing similar areas, grasses grow first in the fenced area with no animals to eat it, but the native plants come back over time and the grasses die off as the native canopy emerges.

Q: Who surveys the area and how often do they go?

A: DLNR monitors sites within the Natural Area Reserve about once a month.

Q: What about molasses grass? Without pigs, molasses grass will overgrow the plants the fencing is designed to protect.

Q: Kaua'i is a small island and the recreation is limited. I hunt for recreation every weekend, and this fencing proposal impacts my recreational opportunities since I hunt in this area.

Q: I went to a meeting a while ago regarding hunting deer with dogs. When deer were first introduced to Milolii, hunters could hunt deer or pig with dogs. When this stopped, the deer wiped out all the plants. There wouldn't be the need to protect plants if DLNR hadn't tampered with the hunting regulations. The restrictions on hunting have caused problems. Goats are a problem. DLNR keeps taking away hunting areas – where will it stop?

A: More liberalized hunting within the Natural Area Reserve would be great.

Q: DLNR cannot jump to conclusions – it cannot simply fence areas to protect plants. DLNR also needs to cultivate areas and maintain them. A fence is short-term. There is no need to fence such a large area to protect such a small number of plants. Hunting and working in nature as a child was a good influence on me and can be for the next generation. What do these plants do for the community? Hunters need the area. Culture is dying, and hunting is part of culture. DLNR could do a few small enclosures instead of a big fenced

area. There are hunters not present at tonight's meeting who are angry and who will cut any large fence with bolt cutters. Fencing also harms wildlife – animals can be trapped on the fence, constituting cruelty to animals. I offer the following solution: maintain and repair existing fences; for future fences, make the areas workable and manageable, like 5, 10 or 20 acres; and talk to experts like Mr. Robinson on how best to protect and conserve plants. Pigs congregate around fruit, so I planted avocado and mango trees to attract pigs. Someone destroyed these trees, so that only 5 of 26 remain. If the concern is to put the area back in a natural state, why don't we also return Hawai'i to a natural state and remove alien people? There is no common sense in the proposal. Gathering rights exist for pig hunting, and the pig is not necessarily a feral animal since the Polynesian pig is native.

A: There has been a study regarding the genetic makeup of pigs in Hawai'i, and there are no Polynesian pig genes left in the pigs on Maui and the Big Island.

Q: Why not have additional smaller enclosures considered as an alternative in the Environmental Assessment? A helicopter pad has already been cut along Milolii. There is fencing equipment left inside – either this is trash or DLNR already plans to build this fence.

A: The fencing material was left behind from construction to facilitate repair and maintenance of existing fences. No final determination has been made on this fencing proposal; the meeting tonight is for informational purposes and to gather public input.

Q: How many years have the existing fenced enclosures been there? What type of success rate is there with these enclosures?

A: The first was constructed in 1989, the most recent in 1998. In the earlier fences, DLNR can see improvement. For some species, the improvement is about 10%.

Q: The impacts of this fencing proposal are too large for only a 10% improvement. There will be a big harm to the public with little benefit. Why doesn't DLNR improve the access road to the hunting area?

Q: If this fencing is built, would it be possible to open new areas for hunting?

A: DLNR has a variety of audiences – hikers, hunters, plants. The State is committed to hunting and increasing opportunities and just signed the lease with DHHL for Kekaha GMA. With critical habitat, DLNR decided to focus conservation activities in areas like the Natural Area Reserve and leave areas like the GMA for hunting.

Q: It may take 5 years to build this fence. But the Kekaha GMA is only a 10 - year lease. It could be that after the fence is built, that lease isn't renewed and then hunters lose out twice.

Q: Because of the rules and regulations, if another area is opened for hunting, it may not actually replace the loss of this area. This area allows hunting with dogs; a replacement area might not.

Q: If DLNR fences now, what is to prevent more and more fencing? There seems to be a trend towards bigger fencing.

A: The Fish & Wildlife Service does not tell the State what to do, but it does provide funding and the funding provided for this project is a lot of money that will provide an economic benefit. DLNR does not anticipate additional fences after this one because of the difficulty in maintaining them.

Q: What alternatives are available? Hunters do a good job keeping animal numbers down. For example, Unit E and D near the Alakai Swamp Trail shows little pig damage mainly due to hunting activity. But in Unit D during the closed season, there is significant pig damage along the Ditch Trail, so one can tell hunters are not poaching. Can Kaua'i work together to develop an innovative solution because fencing is a big cost and maintenance will be required into the future? We need to develop a system that works.

Q: If fences cannot be maintained, then why does DLNR propose to build them? How can we trust that there will not be more fences in the future? What happens after fencing? Will the alien species be controlled? That is a significant amount of work.

Q: The fencing proposal anticipated clearing a 6-foot corridor. There could be damage to birds' nests with this type of clearing. There is also a rat population within the existing enclosures – this fence proposal could cause rat populations to explode because the weeds will create a rat habitat. This could hurt birds in the area.

A: The cleared corridor may not be 6 foot the entire time – it will depend upon the terrain. DLNR will survey to ensure that there are no bird nests disturbed.

Q: Why not do an alternative that fences only the known plant populations? Or, why not do a botanical garden at Kokee rather than this fencing?

Q: In this area, over time we have lost native species to non-natives. In the past 25 years, three-fourths of the native stuff in the area proposed for fencing has died out. The existing enclosures are good and commendable, but in time, nothing will survive here. Fencing may prolong plant life, but these plants will be gone in 10-20 years. Insects are the greatest threat, not pigs. Insects can only be addressed through strong poison that is expensive and dangerous. Rats are also doing a lot of damage. Rat poison is eaten by pigs, and while the poison is not supposed to transfer among animals, a cat that ate a poisoned rat looked affected. So, if rat poison is used, extra efforts have to be made to ensure the pig does not eat it. Fencing may not be effective to protect plants, but environmentalists are pressuring the State for action. Plants require full-time care to survive and are unlikely to make it in the wild.

Q: What if the proposal doesn't work and no restoration of the native plants occurs. What happens to the fence?

A: Monitoring is part of the management of a Natural Area Reserve, so DLNR will continue to look at the area and evaluate the success. Some areas have success, while others do not.

Q: What is considered success? On Kaua'i?

A: There is no equivalent large-scale restoration on Kaua'i to compare to. The 10% noted earlier was the success rate for certain threatened and endangered

plants and means that 10 percent of the keiki grew up into adult plants. Other native plants have also recovered inside the small exclosures. Some threatened and endangered plants require significant amounts of care and may die anyway, but many other native plants, such as ferns, will do great if fenced.

Q: The drought has also harmed plants; it's not just pigs that can cause them harm.

Q: DLNR may be on the same side as the hunting community, but has its hands tied by regulations. *Kokia kuiensis* inside the Pahiki exclosure will probably do fine as long as it remains in shade, but it needs to get in full sunlight to seed and once in direct sun, it becomes susceptible to the leaf-hopper and dies. The plant may appear healthy now, but in the long run, the population will not survive.

Q: Can DLNR use the funds to regenerate plants in a botanical garden environment instead of fencing?

A: DLNR has planted *Kokia* seeds from many plants inside existing exclosures, such as the 10-acre exclosure along Kalalau Rim and the 1-acre exclosure along the contour road. These *Kokia* plants did flower.

Q: So why fence 500 acres if DLNR has had success at 10 acre plots? If you gave 5 acres to the 19 plants found inside the project area, that would only total 95 acres. Cut the proposal down in size. Tourists don't see these fences, only hunters do. DLNR must make sure that the galvanized wire used does not contain trace elements of lead since this is a watershed. Extinction happens as part of nature. Cooperate with hunters and build smaller enclosures. Work with volunteers and school groups to assist in weed control.

Q: If DLNR is concerned about fence maintenance, why proposed this fence?

A: No final decisions have been made. But part of the reasoning for this fence is that there were plants in Hiele Valley in Unit A and this area was proposed for critical habitat designation. To remove Unit A from designation, DLNR had to develop alternative locations for these plants. DLNR looked at other areas with similar habitats and decided on Kuia as a place to outplant keiki of the plants in Hiele Valley. Successful outplanting requires a protected fenced area.

Q: Why not fence in Unit A? Why do the plants have to go into Unit H? Why did Unit A have precedence over Unit H? Unit A doesn't allow dogs but Unit H does.

A: Unit A was not considered over Unit H. Rather, Unit A is considered a sustained yield area and having this area designated as critical habitat would restrict the amount of hunting allowed and make it more difficult for DLNR to manage this area for hunting. Unit H has better habitat than Unit A, plus the Natural Area Reserve exists in Unit H. Kuia NAR has good intact native forest, and while it does have some alien species, it's the best example of mesic forest we have in the State. Protection of large ecosystems rather than discrete areas is the best bet for long-term protection. If DLNR manages this area on an ecosystem-scale, DLNR will want to address the rat problem and it cannot do that with pigs present. In addition, outplanting sometimes requires an



additional water source for newly planted plants, which attracts pigs and other animals to the restoration area.

Q: Why is the proposed fence area so large? Quality versus quantity – DLNR should build a smaller enclosure with better maintenance. There has not been enough time to assess the consequences of this proposal, so DLNR should not act yet. It would not be good if hunters are out with their kids and run across animals caught in the fencing. Animals have a purpose in the ecosystem – they keep invasive species in check. A reduction in deer means more lantana and molasses grass. Small enclosures are the best bet.

Q: On the Big Island, hunters, conservationists, and ranchers are all working together to identify areas where hunting, ranching and conservation can occur and to improve overall opportunities for each activity. The Fish & Wildlife Service has given funding to support this effort. Many native plants have cultural value and deer are hard on maile. This proposal attempts to protect a representative area. We need to do conservation to ensure that in the future we don't have to import maile from Samoa.

Q: During the critical habitat meetings, the Fish & Wildlife Service promised that no fences would be built as a result of critical habitat, but here's a fence proposal. Each island should decide how their resources will be used. Environmentalists from DC shouldn't arbitrarily fence out the hunters. This area is not private land – it's always been used for public hunting. Fencing won't save any of these plants. Hawaiian threatened and endangered species are rare because they are biologically incompetent. We should try to protect these in managed gardens, but protection is a full-time job. Protection is well intentioned but not practical. Since the Fish & Wildlife Service promised critical habitat would not be used to fence people out, the community feels lied to. Fences are a hardship for the local hunter. Hunting trails pass through the middle of the proposed fencing – someone with dogs either has to go around, wait for the dogs to catch up with him at each gate, or leave the gate open. If this fencing goes through, environmentalists could come back later with a proposal for something larger – where does it stop? There are especially concerns since this project was funded either before or during the hearings on critical habitat.

A: DLNR applied for a series of Fish & Wildlife Service grants about 2 years ago. The State received funding for NARS management. DLNR brought together the managers on each island to brainstorm projects and prioritize them, and the idea of protecting Kuia NAR and ultimately this fencing proposal arose out of that brainstorming. During the critical habitat hearings, the Fish and Wildlife Service knew that they were funding fences. A statement that no fences would be built was misleading, because DLNR does fence and has fenced in the past. DLNR has resource maps that show areas that DLNR considers prime for protection. Kuia NAR is one of those, and DLNR has to do what is necessary to protect this area, as opposed to the GMA, where DLNR has to protect hunting. The Forest Reserves fall in the middle. DLNR is mandated to do protection in the NARS – not by the Feds but by State law. The Fish & Wildlife Service simply provided funding that makes it easier to conduct needed management activities to protect the biological resources.

Q: Will DLNR remove the smaller enclosures if the larger proposed fence is built? What if the plants die – does this mean the fencing will no longer be necessary?

A: The proposed fencing will protect other native species, not just threatened and endangered plants.

Q: Many plants are located on cliffs, making it difficult to fence. Valley floors are typically degraded with invasive species. Mahanaloa And Pahiki Valleys are ideal for growing threatened and endangered plants because of the soil conditions, although there seems to be limited water. Growing plants there will require management – water, fertilization, and manpower.

A: Even though it's difficult, outplanting within the project area is still easier than other places, due to the proximity of facilities, the road, the existing volunteer network in Kokee. These qualities make the project area particularly attractive for protection and restoration.

Q: The project area is a nesting and watering area for pigs in the larger area. Fencing will impact the surrounding area outside the fence – pigs may not find water and go elsewhere, and pig populations in other locations could increase causing harm because they are not longer spread through this area. A smaller fence will reduce this impact.

Q: Current fenced enclosures are left alone, so DLNR is on good terms with the hunting community so far. Let's work together to develop alternatives. Hunters are willing to donate time to walk trails and show DLNR where existing pig routes are as a way to develop an alternative of reduced fencing.

A: DLNR will develop the Draft Environmental Assessment including a third alternative of smaller enclosures.

**APPENDIX J**

**Division of Forestry and Wildlife Best Management Practices for  
Maintaining Water Quality in Hawai'i: Fencing**

**BEST MANAGEMENT PRACTICES  
FOR  
MAINTAINING WATER QUALITY  
IN HAWAII**



State of Hawaii  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
February 1996

- (11) Designate SMZs to provide stream shading, soil stabilization, sediment and water filtering effects, and wildlife habitat.
- (12) Strive to protect the forest floor and understory vegetation from unnecessary damage. Do not remove (harvest) trees from banks, beds or slopes if it will destabilize the soil. Trees on the south and west banks provide the most critical shading of water.
- (13) Access roads should cross perennial or intermittent streams at or near a right angle.
- (14) Drainage structures such as ditches, cross drain culverts, water bars, rolling dips, and broad-based dips should be used on all roads prior to their entrance into an SMZ to intercept and properly discharge runoff waters.
- (15) SMZs may be desirable on intermittent streams for large drainage areas where wildlife is a major landowner concern or for other reasons.

## 5.0 Fencing

- (1) Fencing out livestock, pigs, and other animals in certain areas will help to prevent water quality degradation of streams, protect threatened and endangered plants, reduce soil compaction and maintain soil productivity. Fencing is applicable where desired forest reproduction, soil hydrologic values, existing vegetation, aesthetic values, and recreation are prevented or damaged by these animals.
- (2) Pastures should be fenced separately from woodlands. Consider maintenance as well as ease of construction when planning a fence location. By taking advantage of natural barriers such as cliffs, the cost of animal exclusion can be reduced. Also consider use of fences to protect vegetation that provides wildlife food and cover.
- (3) Fences should be permanent stock fences built in accordance with good construction principles and workmanship.

## 6.0 Wildfire Damage Control and Reclamation/Prescribed Burn

The prevention, control, and extinguishment of all wildfires on grass, brush, and watershed lands and the implementation of a prescribed fire program is a desirable goal. Where wildfires do occur, the first and foremost concern is to control the fire and limit the damage. Fire suppression activities can add to the problem of water quality protection.

The loss of vegetative cover, destruction of soil-holding feature of root masses, the exposure of bare mineral soil, is a combination that makes the area burned a highly erodible one. The effects of suppression efforts and equipment operations necessary to control and stop the fire can magnify the erosion problem.

## APPENDIX K

### Summary from Public Informational Meeting of May 5, 2004

The Division of Forestry and Wildlife hosted a public informational meeting to receive public comment on the Draft Environmental Assessment on May 5, 2004, at the Kekaha Neighborhood Center. In attendance were the following DLNR staff:

- Alvin Kyono, DLNR DOFAW Branch Manager, Kaua'i
- Galen Kawakami, DLNR Forestry Supervisor, Kaua'i
- Thomas Kaiakapu, DLNR Wildlife Manager, Kaua'i
- Kawika Smith, DLNR Forester, Kaua'i
- Jahmaal Webb, DLNR NARS Technician, Kaua'i
- Vickie Caraway, DLNR Botanist, O'ahu
- Christen Mitchell, DLNR NARS Project Coordinator, O'ahu

Nine members of the public attended the meeting: Keith Robinson; R. Taketa; Tony Wong; Sam Berg; Earl Ozaki; Kimo Lazaro; Richard Kanahale; Wayne Silva; Jose Estacio.

DOFAW staff gave a brief presentation about the history of the project and what was proposed. DOFAW staff then took questions from the audience. The following points were raised:

- Why is fencing proposed? The mountain is fine. These plants lived in the forest long before our time. Animals did not eat them before. Why do you think that they will now?  
Response: There is clear evidence in Kuia Natural Area Reserve of damage to native plants due to browsing by deer and goats and grubbing by feral pigs. Further, any outplanting of critically endangered species must occur within fencing for a higher chance of success.
- Fences look bad, especially ones that are not maintained.  
Response: The preferred fencing alternative is located in a remote area and is not expected to be visible to most people. Part of the reason for selecting the preferred alternative is that DOFAW believes that it can maintain and manage the proposed five fences better than the other alternative of one large fence.
- Is DOFAW required to fence by law?  
Response: There is no specific law requiring DOFAW to build this fence. However, DOFAW does have a mandate to preserve the Natural Area Reserve system (HRS 195) as well as a mandate to protect and conserve threatened and endangered species (HRS 195D). In addition, hunting occurs in areas designated as critical habitat by the US Fish and Wildlife Service. In order to continue to receive Federal funding, DOFAW must take action to reduce the threat from game animals to listed species and their habitat. The proposed Kuia fencing is one action to protect the Natural Area Reserve, protect listed species, and provide a protected area for outplanting of species found within hunting units.

- Thank you for protecting native plants. We are losing too many of them. Many already have cultural value, and some may one day have medicinal value.
- If the Kuia fence is built, will the State get more Pittman -Robertson funds (federal funds used to support hunting programs)?  
Response: By fencing, DOFAW hopes to secure the amount of funding it currently receives and reduce the possibility of losing funding.
- The forest is dying off. Is DOFAW looking into this?  
Response: The Makaha Ridge pines are subject to a root disease, in part due to the long drought.
- The Endangered Species Act is flawed but the State must do things like building fences to avoid losing funding. The State is under pressure by eco-nazis to take these actions.
- Increase the hunting pressure by opening the area further to hunters. Remove the bag limits. Hold special hunts. Hunters will remove the animals if the hunting restrictions are removed.  
Response: DOFAW is looking into revising the hunting regulations covering the project area, especially Kuia Natural Area Reserve. However, public hunting alone is insufficient to prevent degradation of the native forest and to protect listed species.
- A seven foot fence is too low to provide protection from deer.  
Response: Based on experiences on other islands, seven feet should be sufficient height to exclude deer. However, DOFAW will monitor the fencing after construction to ensure that deer are not getting into the enclosure.
- Don't block any hunter access paths through Kuia Natural Area Reserve.  
Response: DOFAW intends to build gates or cross-overs at appropriate locations to ensure that hunter access is not blocked.

DOFAW staff offered pre-printed comment sheets to anyone present who wished to submit their comments in writing, explaining that these comments would be included in the Final Environmental Assessment that each one written comment would receive a written response. As of May 14, 2004, no written comments were received from attendees at the meeting.

**Appendix L**  
**Comments Received During Public Comment Period and Responses**

Written comments were received from the following agencies and individuals during the public comment period:

- State of Hawaii, Department of Health
- State of Hawaii, Department of Land and Natural Resources, Historic Preservation Division
- State of Hawaii, Department of Land and Natural Resources, Land Division
- State of Hawaii, Office of Environmental Quality Control
- State of Hawaii, Office of Hawaiian Affairs
- County of Kauai Department of Water
- Ms. Ruth Aguraiuja



LINDA LINGLE  
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. Box 3378  
HONOLULU, HAWAII 96801-3378

In reply, please refer to:  
EPO-04-079

April 23, 2004

Ms. Christen Mitchell  
Division of Forestry and Wildlife  
Department of Land and Natural Resources  
1151 Punchbowl Street, Room 325  
Honolulu, Hawaii 96813

Dear Ms. Mitchell:

SUBJECT: Construction of Ungulate Proof Fencing, Kuia Natural Area Reserve  
And Napali-Kona Forest Reserve  
Waimea, Kauai, TMK: 1-4--1-020; 1-4-001-014

Thank you for allowing us to review and comment on the subject document. We have the following comments to offer. If you have any questions about these comments please contact Ryan Davenport at 586-4346.

**Environmental Planning Office**

Preferred alternative contains 5 parcels; 4 of which contain stream areas. Fencing description needs to contain information regarding how fencing crosses streams, and what areas within the riparian zone of the stream the fence will disturb (at least initially). Specific details about each parcel and approach to be utilized for each site would be helpful.

No mention is made of the aquatic communities within project areas. These need to be included.

There is no mention of plans for erosion control.

If there are any questions please contact Linda Koch at 586-4337

Sincerely,

*June F. Harrigan-Lum*  
JUNE F. HARRIGAN-LUM, MANAGER  
Environmental Planning Office

c: EPO  
OEQC

LINDA LINGLE  
GOVERNOR OF HAWAII



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

PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
DAN DAVIDSON  
DEPUTY DIRECTOR FOR LAND  
ERNEST Y.W. LAU  
DEPUTY DIRECTOR FOR  
THE COMMISSION ON  
WATER RESOURCE MANAGEMENT

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
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MANAGEMENT  
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CORREYANES  
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HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE  
COMMISSION  
LAND MANAGEMENT  
STATE PARKS

Ms. June Harrigan-Lum  
Manager, Environmental Planning Office  
Department of Health  
P.O. Box 3378  
Honolulu, HI 96801-3378

MAY 27 2004

Re: EPO-04-079 Comment Letter on Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

Dear Ms. Harrigan-Lum:

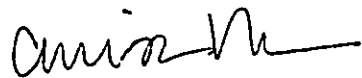
Thank you and your staff for taking the time to review the Draft Environmental Assessment (Draft EA) for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i.

Your comments requested additional information regarding how fencing crosses streams, what areas with the riparian zone of the stream the fence will disturb, and what aquatic communities are found within the streams. First, although the USGS topographical map used as a baselayer for the map in the Draft EA indicates that streams are present in the project area, field observations indicate that these are all dry streambeds that do not even flow intermittently during storms. Second, the planned fencing will only cross two dry streambeds (at the head of Poopooiki Valley and in mid-Mahanaloa Valley). In the other locations, the fencing is planned to remain on one side of the dry streambed, above the valley bottom, to ensure continued hunter access along the valley bottoms. Because these are dry streambeds, there are no aquatic communities associated with them.

In response to your comment requesting additional information regarding erosion control: All construction activities will incorporate applicable best management practices to minimize soil disturbance and prevent erosion. In addition, any relevant practices relating to fencing from the Division of Forestry and Wildlife Best Management Practices for Maintaining Water Quality in Hawai'i will be incorporated (these Best Management Practices can be found on-line at [http://www.state.hi.us/dlnr/dofaw/pubs/BMPs\\_bestmanagement.pdf](http://www.state.hi.us/dlnr/dofaw/pubs/BMPs_bestmanagement.pdf)). Based on the limited amount of rain in the project area, erosion outside that caused by animal movement or routine maintenance adjacent to the fencelines is not anticipated. However, during routine inspection and maintenance of the fencelines, the Division will monitor the area adjacent for signs of erosion and will construct water bars or other erosion control measures if needed.

Thank you and your staff again for taking the time to provide comments on the Draft EA for the construction of ungulate-proof fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve. If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,



Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife

LINDA LINGLE  
GOVERNOR OF HAWAII



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**

HISTORIC PRESERVATION DIVISION  
KAKUHIHEWA BUILDING, ROOM 555  
601 KAMOKILA BOULEVARD  
KAPOLEI, HAWAII 96707

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

DAN DAVIDSON  
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCE  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAIKOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

**HAWAII HISTORIC PRESERVATION  
DIVISION REVIEW**

Log #: 2004.1156  
Doc #: 0404NM19.doc

Applicant/Agency: Christen Mitchell

Address: DLNR Division of Forestry and Wildlife, 1151 Punchbowl St., Room 325  
Honolulu, HI 96813

SUBJECT: Historic Preservation Review - EA Construction of Ungulate Proof  
Fencing, Kuia Naural Area Reserve and NaPali Kona Forest Reserve

Ahupua'a: Kokee  
District, Island: Waimua, Kauai  
TMK: (4) 1-4-1: 20 1-4-01: 14

1. We believe there are no historic properties present, because:
  - a) intensive cultivation has altered the land
  - b) residential development/urbanization has altered the land
  - c) previous grubbing/grading has altered the land.
  - d) an acceptable archaeological assessment or inventory survey found no historic properties
  - e) other: Based on previous research, there are no historic properties but if sites are found then rerouting the fence to avoid the site would be the preferred mitigation.
2. This project has already gone through the historic preservation review process, and mitigation has been completed.

Thus, we believe that "no historic properties will be affected" by this undertaking

Staff: Nancy McMahon *NM* Date: 4/21/04

Title: Archaeologist for Kauai

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII

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

PETER T. YOUNG  
CHAIRPERSON  
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DEPUTY DIRECTOR FOR LAND

ERNEST Y.W. LAU  
DEPUTY DIRECTOR FOR  
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WATER RESOURCE MANAGEMENT

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CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE  
COMMISSION  
LAND MANAGEMENT  
STATE PARKS

Ms. Holly McEldowney  
State Historic Preservation Officer  
DLNR, Historic Preservation Division  
601 Kamokila Blvd., Room 555  
Kapolei, HI 96707

MAY 27 2004

Re: Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

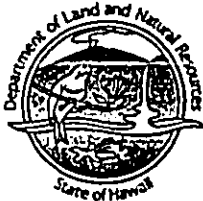
Dear Ms. McEldowney:

Thank you and your staff for taking the time to review the Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i. We understand that based on previous research, the State Historic Preservation Division believes that there are no historic properties and that "no historic properties will be affected" by this undertaking. We acknowledge your recommendation that if sites are found, then re-routing the fence to avoid the site would be the preferred mitigation. If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,

Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

April 29, 2004

FENCEKAUAIDOF AW.RCM  
LD-NAV

Christen Mitchell  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Ms. Mitchell:

SUBJECT: Draft Environmental Assessment for Construction of Ungulate Proof Fencing at  
Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve, Waimea District,  
Island of Kauai, Hawaii

Thank you for the opportunity to review and comment on the subject matter.

A copy of the document was transmitted to the following Land Division Branches for their  
review and comment:

- Planning and Development
- Hawaii District Land Office

The Land Division has no comment to offer.

Should you have any questions, please contact Nicholas A. Vaccaro of the Land Division  
Support Services Branch at 587-0384.

Very truly yours,

A handwritten signature in black ink, appearing to read "Dierdre S. Mamiya".

DIERDRE S. MAMIYA  
Administrator

C: KDLO

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

DAN DAVIDSON  
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU  
DEPUTY DIRECTOR - WATER

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LAND  
STATE PARKS

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FORESTRY AND WILDLIFE

1151 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

PETER T. YOUNG  
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COMMISSION  
LAND MANAGEMENT  
STATE PARKS

Ms. Dierdre S. Mamiya  
Administrator  
Department of Land and Natural Resources  
Land Division  
1151 Punchbowl Street  
Honolulu, HI 96813

MAY 27 2004

Re: Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

Dear Ms. Mamiya:

Thank you and your staff for taking the time to review the Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i. We understand that a copy of the Draft EA was distributed to the Planning and Development and the Kauai District Land Office for review, and that Land Division has no comments at this time. If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,

A handwritten signature in cursive script, appearing to read "Christen Mitchell".

Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife

LINDA LINGLE  
GOVERNOR OF HAWAII



GENEVIEVE SALMONSON  
DIRECTOR

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET  
SUITE 702  
HONOLULU, HAWAII 96813  
TELEPHONE (808) 586-4185  
FACSIMILE (808) 596-4186  
E-mail: oeqc@health.state.hi.us

April 24, 2004

Ms. Christen Mitchell  
Division of Forestry and Wildlife  
Department of Land and Natural Resources, State of Hawaii  
1151 Punchbowl Street, Room 325  
Honolulu, Hawaii 96813

Dear Ms. Mitchell:

The Office of Environmental Quality Control (OEQC) has reviewed the draft environmental assessment for the Construction of Ungulate-Proof Fencing in the Kuia Natural Area Reserve and the Na Pali Kona Forest Reserve, Tax Map Keys 1-4-1-02, and 1-4-1-14, in the judicial of Waimea. We offer the following comment for your consideration and response.

**Cultural Impacts:** On page 15, the draft environmental assessment notes that the proposed action is not expected to affect "traditional or cultural practices." Act 50, Session Laws of Hawaii, 2000, was amended to require that impacts to cultural resources or practices (traditional and contemporary) be disclosed and discussed in an environmental assessment. These practices need not be native Hawaiian or traditional. While we support the intent of the project, clearly, Appendix I to the environmental assessment demonstrates various citizens' concern over hunting, a contemporary cultural practice. To comply with Act 50, SLH 2000, please include on page 15, references to Appendix I.

Thank you for the opportunity to comment. If there are any questions, please call Mr. Leslie Segundo at (808) 586-4185.

Sincerely,

*Genevieve Salmonson*  
GENEVIEVE SALMONSON  
Director

RECEIVED  
LAND DIVISION  
2004 APR 29 P 3:21  
DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII



LINDA LINGLE  
GOVERNOR OF HAWAII



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

PETER T. YOUNG  
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DEPUTY DIRECTOR FOR  
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HISTORIC PRESERVATION  
KAOIOLAIVE ISLAND RESERVE  
COMMISSION  
LAND MANAGEMENT  
STATE PARKS

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

MAY 27 2004

Re: Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

Dear Ms. Salmonson:

Thank you and your staff for taking the time to review the Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i. We appreciate your support of the intent of the project.

Based on your comments, we have made changes to the discussion on cultural impacts to reflect that these practices need not be strictly Native Hawaiian or traditional but may also include contemporary cultural practice, and to include reference to Appendix I and citizens' concerns over hunting, a contemporary cultural practice.

We would note that our conclusion that the project is not anticipated to affect traditional or cultural practices remains the same. After the public meeting in July 2003 expressing concern about the impact on hunting, the preferred alternative was developed. This alternative was then shared with the Kaua'i Aquatic Life and Wildlife Advisory Committee for their input and comment prior to the release of the Draft EA. The Draft EA was distributed to each person who signed in at the July 2003 public meeting, and a second public meeting was held on May 5, 2004. DOFAW received no written comments expressing concern over how the preferred alternative would impact hunting or other cultural practices and believes that the fencing, as proposed in the preferred alternative, will have a minimal impact on hunting.

If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,

Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife



**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

HRD04/1359

May 7, 2004

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

**RE: Request for Comment on Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve, Waimea, Kaua'i, TMKs: 1-4-001:020 & 014**

Dear Christen Mitchell,

The Office of Hawaiian Affairs is in receipt of your April 5, 2004, request for comments on the above project, which would entail the construction of five enclosures that would range in size from four to 57 acres, using approximately 4.75 miles of fencing to enclose a total of 137 acres. OHA offers the following comments and recommendations.

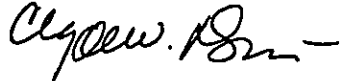
OHA supports the concept of fencing to protect native, rare and endangered plants – further protecting the birds that depend on those plants – from ungulates. We also support weed control efforts and removal of existing, damaging ungulates from the areas to be enclosed.

We will rely on the applicant's assurances that the project will continue to afford Native Hawaiian gathering and cultural access rights to the area via the pass-through gates created for hunter access.

OHA also will rely on assurances from the applicant that should this project go forward, and should iwi or Native Hawaiian cultural or traditional deposits be found during ground disturbance or excavation by and for transport vehicles/helicopters and during fence installation, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have any questions, please contact Heidi Guth at 594-1962 or e-mail her at [heidig@oha.org](mailto:heidig@oha.org).

Sincerely,



Clyde W. Namu'o  
Administrator

CC: Office of Environmental Quality Control  
235 S. Beretania Street  
Suite 702  
Honolulu, HI 96813

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FORESTRY AND WILDLIFE

1151 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

PETER T. YOUNG  
CHAIRPERSON  
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DEPUTY DIRECTOR FOR LAND

ERNEST Y.W. LAU  
DEPUTY DIRECTOR FOR  
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HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE  
COMMISSION  
LAND MANAGEMENT  
STATE PARKS

Mr. Clyde Namu'o  
Administrator  
Office of Hawaiian Affairs  
711 Kapiolani Boulevard, Suite 500  
Honolulu, HI 96813

MAY 27 2004

Re: Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

Dear Mr. Namu'o:

Thank you and your staff for taking the time to review the Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i. We appreciate your support of the concept of fencing to protect native, rare and endangered plants, weed control efforts, and removal of ungulates.

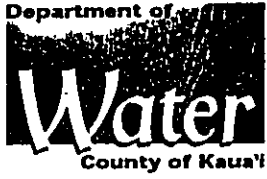
We confirm our belief that the planned pass-through gates will continue to permit Native Hawaiian gathering and cultural rights to the area. In addition, we confirm that should any iwi or Native Hawaiian cultural or traditional deposits be found during construction, work will cease and the appropriate agencies will be contacted pursuant to applicable law.

If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,

A handwritten signature in black ink, appearing to read "Christen Mitchell".

Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife



*Water has no substitute.....Conserve it*

April 19, 2004

Ms. Christen Mitchell  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
1151 Punchbowl Street, Room 325  
Honolulu, HI 96813

Dear Ms. Mitchell

Subject: Draft Environmental Assessment (DEA) - Construction of Ungulate Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve, Waimea, Kaua'i, TMK:1-4-1:020; 1-4-001:014

Thank you for the opportunity to comment on the subject DEA.

The project is not located within any County water system service areas on the island. We do not have any objections to the project at this time. We understand that the project is intended to preserve the quality of the forest and watershed.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward Tschupp".

Edward Tschupp  
Manager and Chief Engineer

GF:emi

c: OEQC  
(235 S. Beretania St., Suite 702, Honolulu, HI, 96813)

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII

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

PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

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DEPUTY DIRECTOR FOR LAND

ERNEST Y.W. LAU  
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KAHOOLAWE ISLAND RESERVE  
COMMISSION  
LAND MANAGEMENT  
STATE PARKS

Mr. Edward Tschupp  
Manager and Chief Engineer  
County of Kaua'i Department of Water  
P.O. Box 1706  
Lihue, HI 96766

MAY 27 2004

Re: Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

Dear Mr. Tschupp:

Thank you and your staff for taking the time to review the Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i. We understand that you have no objections to the project at this time. If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,

Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife

RECEIVED

'04 MAY 13 P1:45

May 10, 2004

FOREST & WILDLIFE  
STATE OF HAWAII

Dear Christen Mitchell,

I do not belong to the list of specialists and agencies to be consulted, but I certainly feel myself being interested party, as I do the research of critically endangered Hawaiian endemic fern species in the area Mahanaloa - Kuia, and for this reason send my comments for the "Draft Environmental Assessment. Natural Resources Conservation Project: Construction of ungulate-proof fencing. Kuia Natural Area Reserve & Na Pali-Kona Forest Reserve, Waimea District, Island of Kauai's". First, I heard about wonderful huge fencing project on Conservation Conference 2002 in Honolulu. What a great idea it was to construct one big fence what could solve so many conservation problems not only for endangered species, but also for unique endangered endemic communities on Kaua'i!!! Now occasionally, I happened to read this new draft of fencing project, what instead of one big fence proposes to build five small ones. The goats are laughing over me in Mahanaloa, as all the population patches of globally critically endangered endemic fern species *Diellia pallida* (together with many other endangered species) would be out of the fence again!!! These small population patches of *Diellia pallida* are the last ones and very close to extinction.

I have studied *Diellia pallida* populations for some years now already: assessed the species status and the condition of populations, learned a lot about species life cycle, ecology and population dynamics on the landscape, found the researches for international collaboration for propagation and breeding system studies, worked out the fastest way for species recovery and enhancement and got prepared for practical conservation action to do it, worked hard to get the permits to put the cages on few still extant individuals in highly disturbed habitat, reported the research results and the critical condition of the populations all these years while doing this research... and the official proposal of fencing will exclude *Diellia* populations together with so many other rare plants growing in this area. Well, I still hope that this great plan of building the big fence around whole project area could take place, critically endangered species saved from the extinction and invaluable mesic forest communities of Kaua'i will be protected.

My research is focused to work out conservation methods for critically endangered species. When I started my work on endangered ferns in 1990, I was very interested in re-introduction problems. I really wanted to learn is it actually possible to use this method for conservation and how. Research on Hawaiian critically endangered fern species and experiencing the conservation problems here, have changed my focus. I have learned that species recovery and restoration in their natural habitat, based on the research of population (and community) structure and dynamics, are the priority for conservation on these islands. We all know that there is no enough manpower and funding available for site management, but still the protection of the species and communities (communities as habitats for the species what they include) should be priority, and considering the time

scale and efficiency, the other methods (*ex situ* propagation, reintroduction etc.) should be combined. Please excuse my opinion, but it seems as critically endangered species IN THEIR HABITAT are somehow abandoned here... Very small numbers in highly disturbed areas, which too often are excluded as the areas of not worth to work on... The conservation management on the sites is missing in too many cases... What makes people think that all *ex situ* conservation methods are less expensive than building and maintaining the fences? Especially when we don't have enough knowledge about biology and ecology of the species under consideration. Why don't we use the simplest methods of restoration ecology - learn what is wrong and try to create the changes what could help the forest to self-recover - that means the elementary conservation management on the sites.

The islands are different and native communities on them in very different condition. The mesic forests of Kaua'i, as critically endangered unique forest communities need full attention and concern right now, or it will be too late. I'm very concerned about the critically endangered Hawaiian endemic fern populations of *Diellia pallida*, as well about all the other rare plant species of the area and about mesic forest communities in general. It is certainly the area what should be protected with bigger fence, as initially has been planned and as proposed as alternative 2 on the map of this draft. For the authors of current draft I would have following questions:

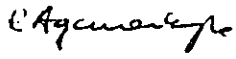
- 1) The appendixes of the draft proposal contain the biological information over the general project area of Alternative 2, what would have been surrounded with one big fence. What part of this biodiversity would be protected with five smaller fences of Preferred alternative? What species? How many species and populations?
- 2) What were the criteria used by the authors of the draft to identify and choose five small areas as the "quality native forest"? What data were analyzed and how?
- 3) How habitat quality was assessed and what were the criteria for "intact native forest" used by the authors for selection of five smaller fencing areas? Did the authors consider the bigger edge effect and increased fragmentation of the native forest by building five smaller fences instead one big fence?
- 4) Is there enough knowledge available of propagation and species biology of the rare plant species of the area? Are these species already in propagation and do they have detailed recovery and management plans?
- 5) The bigger fence of Alternative 2 would give chance to improve the habitat quality for all the native species growing in this area and protect the unique communities of mesic forest. Did the authors consider that the plant species of the area have very different spatial dynamics and bigger fence would protect more suitable habitat for bigger number of native species? Do the authors of the draft see a difference between ecosystem protection and protection of the habitat of rare endemic species forming the rare and endemic community?



5) Replacing the bigger fenced area with five small fences makes it questionable how effectively the funds available have been used for CONSERVATION!!! As written in the draft "The best-known example of the Kaua'i diverse lowland mesic forest is located in Mahanaloa Valley, within project area". Yes, it's there, in the project area, and would be protected only by the Alternative 2 of the draft. The statements that "the entire Kuia Natural Area Reserve is considered to be a sensitive habitat by virtue of being a Natural Area Reserve" and "the project area overlaps with federally designated critical habitat for 24 threatened and endangered plants of Kauai" are also valid for Alternative 2 and the actual analyze for Preferred Alternative of five smaller fences is missing!!!

With the hope that available funds would be used for conservation in most efficient way and decisions made would really benefit the unique and endangered species and forest communities of Kaua'i

Sincerely,

Ruth Agurajuja   
Institute of Botany and Ecology, University Tartu

Contact address:  
Koke'e Natural History Museum  
P.O. Box 100, Kekaha, Kauai, HI 96 752  
Phone: 1-808- 335 9975

LINDA LINGLE  
GOVERNOR OF HAWAII



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

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LAND MANAGEMENT  
STATE PARKS

Ms. Ruth Agurauja  
Institute of Botany and Ecology, University Tartu  
C/o Kokee Natural History Museum  
PO Box 100  
Kekaha, HI 96752

MAY 27 2004

Re: Draft Environmental Assessment, Natural Resources Conservation Project: Construction of Ungulate-Proof Fencing, Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve

Dear Ms. Agurauja:

Thank you for taking the time to review the Draft Environmental Assessment for the Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i.

We appreciate your concern for the endangered fern *Diellia pallida* and your preference for alternative #2 (fencing approximately 547 acres). While smaller in size, we believe that the preferred alternative will more effectively protect native forest and endangered species than alternative #2. As noted in the Draft Environmental Assessment, we believe that it will be easier and more cost-effective to remove feral animals from five smaller enclosures than one large enclosure. Over time, the Division of Forestry and Wildlife (DOFAW) believes that it will be able to maintain the five enclosures more successfully than one large enclosure.

Unfortunately, with limited budgets and staffing, DOFAW cannot construct and maintain fencing to protect all rare species. However, DOFAW is aware of the existing *Diellia* populations, will continue to monitor their status, and will consider fencing these plants in the future or incorporate their habitat into a future large-scale fencing project.

We have the following responses to your specific questions:

- 1) The appendixes of the draft proposal contain the biological information over the general project area of Alternative 2, what would have been surrounded with one big fence. What part of this biodiversity would be protected with five smaller fences of Preferred alternative? What species? How many species and populations?

The biological information included in the Draft EA pertains to both fencing alternatives. Based on DOFAW staff experience and field observations, it is believed that both alternatives will protect essentially identical ecosystems, the preferred alternative protecting areas with higher

percentages of native biodiversity. DOFAW has not surveyed the areas inside the five enclosures or of the larger enclosure to the extent that a determination of the exact numbers of species or populations found within either alternative is possible. Rather than spend limited funding on extensive surveys, DOFAW prefers to rely on field surveys and staff knowledge and experience and utilize the limited funds on fencing material and/or fencing contracts.

- 2) *What were the criteria used by the authors of the draft to identify and choose five small areas as the "quality native forest"? What data were analyzed and how?*

DOFAW staff relied on nearly 30 years of field experience in the dry mesic forest on Kauai to identify the areas to be fenced under the preferred alternative. Staff evaluated the overstory first, identifying areas of 'ohi'a and koa canopy. Historical data was also used to identify areas likely to contain rare plants. Staff then conducted field reconnaissance in these areas, evaluating the quality of the native forest and looking for rare plants. Exposure and aspect were taken into consideration. The subjective determination of what constituted quality native forest and where to place fencing was developed based on years of experience in the native forest on Kauai, combined with consideration of ease of fence construction. In addition, the existence of existing protective fences in areas such as Mahanaloa Valley was considered – so that the planned fencing could maximize protection for currently unprotected species and unprotected areas.

- 3) *How habitat quality was assessed and what were the criteria for "intact native forest" used by the authors for selection of five smaller fencing areas? Did the authors consider the bigger edge effect and increased fragmentation of the native forest by building five smaller fences instead one big fence?*

As noted above, the subjective determination of what constituted quality habitat and where to place fencing for the preferred alternative was developed based on years of experience in the dry mesic forest of Kauai. While edge effect and fragmentation of native forest are relevant considerations, DOFAW believes that the manageability of fencing, which directly impacts the long-term success of the fencing, is a more important consideration. Given limited budgets and staffing and the remarkable hiding ability of feral deer, goats and pigs, it might not be possible to remove all the animals from the larger enclosure. Moreover, maintaining the fence lines to prevent animal incursions would prove more difficult with the larger enclosure option than with the five fenced enclosures. Under the preferred alternative, animal incursions into one fenced area would not jeopardize plant species found in another fenced area, as would occur with the one large fenced option.

- 4) *Is there enough knowledge available of propagation and species biology of the rare plant species of the area? Are these species already in propagation and do they have detailed recovery and management plans?*

DOFAW will work with the knowledge currently available on propagation and species biology. Of the 29 rare plant species listed in Appendix C of the Draft Environmental Assessment, propagation of fifty percent of the species (14 species) has been successfully accomplished at the Kokee, Pahole, or Volcano Rare Plant Facilities or at the Micropropagation Laboratory at Lyon Arboretum. The intent of fencing intact native areas is to protect many species in their habitat, and at the same time, provide secure outplanting opportunities for additional rare plant species. Specific species for outplanting in Kuia will be determined later, depending on species availability and the appropriateness of the sites.

- 5) *The bigger fence of Alternative 2 would give chance to improve the habitat quality for all the native species growing in this area and protect the unique communities of mesic forest. Did the authors consider that the plant species of the area have very different spatial dynamics and bigger fence would protect more suitable habitat for bigger number of native species? Do the authors of the draft see a difference between ecosystem protection and protection of the habitat of rare endemic species forming the rare and endemic community?*

Again, DOFAW believes that it will be easier and more cost-effective to remove feral animals from five smaller enclosures than one large enclosure. Given limited budgets and staffing and the remarkable hiding ability of feral deer, goats and pigs, it might not be possible to remove all the animals from the larger enclosure. Moreover, maintaining the fence lines to prevent animal incursions would prove more difficult with the larger enclosure option than with the five fenced enclosures. Under the preferred alternative, animal incursions into one fenced area would not jeopardize plant species found in another fenced area, as would occur with the one large fenced option. In addition, many areas within Alternative 2 are covered with invasive species such as *Lantana camara*, *Grevillea robusta*, *Melinis minutiflora*, and *Psidium* species. It would be difficult to remove these invasive species and prevent their spread within one large fenced area; however, under the five fenced enclosure option, it will be easier to remove and monitor these species. Under ideal circumstances, with unlimited funds and staffing for management, a larger fence would provide greater protection. However, without sufficient reliable support, the large fencing cannot be managed effectively – with maintained fence lines, all ungulates removed, invasive species contained, plus an on-going outplanting/monitoring program. Given the current resources available, DOFAW does not believe that the larger fence alternative would provide greater protection.

DOFAW does see a difference between general ecosystem protection and protection of the habitat of rare endemic species forming the rare and endemic community. The preferred alternative, though smaller than alternative 2, will provide benefits to both the ecosystem and to communities of rare and endemic species.


- 6) *Replacing the bigger fenced area with five small fences makes it questionable how effectively the funds available have been used for CONSERVATION!!! As written in the draft 'The best-known example of the Kaua'i diverse lowland mesic forest is located in Mahanaloa Valley, within project area.' Yes, it's there, in the project area, and would be protected only by the Alternative 2 of the draft. The statements that 'the entire Kuia Natural Area Reserve is considered to be a sensitive habitat by virtue of being a Natural Area Reserve' and 'the project area overlaps with federally designated critical habitat for 24 threatened and endangered plants of Kaua'i' are also valid for Alternative 2 and the actual analyze of Preferred Alternative of five smaller fences is missing!!!*

DOFAW believes that successful small fences have more conservation value than unmanageable large fencing. Because of existing smaller fences within Mahanaloa Valley, the DOFAW did not consider this area as high a priority for fencing as the locations selected. However, due to the number of rare species in this valley and the intact nature of forest canopy, especially on north-facing slopes, it remains a potential area for future protective fencing.

Both the preferred alternative and alternative 2 overlap with critical habitat for the same 24 threatened and endangered species.

Again, thank you for taking the time to review the Draft Environmental Assessment for Construction of Ungulate-Proof Fencing in Kuia Natural Area Reserve and Na Pali-Kona Forest Reserve on Kaua'i. If you have any future questions or concerns about this project, please feel free to contact me at 587-0051.

Sincerely,



Christen Mitchell  
Natural Area Reserves Planner, Division of Forestry and Wildlife

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