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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY & WILDLIFE

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OFC. OF ENVIRONMENTAL
QUALITY CONTROL

*July 5, 1996*

*Mr. Gary Gill, Director*
*Office of Environmental Quality Control*
*220 S. King Street, 4th Floor*
*Honolulu, HI. 96813*

*Dear Mr. Gill:*

*Subject: Negative Declaration for Road Construction and Fencing in the Puu Waawaa Wildlife Sanctuary, Island of Hawaii*

*The Department of Land and Natural Resources has reviewed the comments received during the 30-day public comment period which began on May 23, 1996. The agency has determined that this proposal will not have significant environmental effects and has issued a negative declaration. Please publish this notice in the July 29, 1996 OEQC Bulletin.*

*We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final EA. Please contact Mr. Jon Giffin, Division of Forestry and Wildlife in Hilo, at 933-4221 should you have any questions.*

*Very truly yours,*

Lillian S. Coloma-Agaran
for *MICHAEL D. WILSON, Chairperson*
*Board of Land and Natural Resources*

*Enclosures*

*cc: J. Giffin*

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1996-08-08-HI-FEA-Road Construction and Fencing in the Puu Waawaa Wildlife Sanctuary



# DETERMINATION NOTICE OF NEGATIVE DECLARATION
# BOUNDARY FENCE CONSTRUCTION
# PORTION OF PUUWAAWAA WILDLIFE SANCTUARY
# TMK: 3-7-1-01-1

**I. Proposing Agency:** Department of Land and Natural Resources
Division of Forestry and Wildlife

**II. Approving Agency:** Department of Land and Natural Resources
Division of Forestry and Wildlife

**III. Agencies Consulted:** State Division of Land Management, U.S. Fish and Wildlife Service, National Biological Survey

**IV. *GENERAL DESCRIPTION:***

The land division or ahupua'a of Puuwaawaa is located on the western or leeward side of the Island of Hawaii (North Kona District, TMK 3-7-01, 02, 03, and 04). It lies on the northern flank of Hualalai volcano, extending from sea level to within a mile of the mountain summit. Most of the ahupua'a is State land with about 25,000 acres currently leased to Puuwaawaa Ranch. The land section is roughly bounded by the 1859 and Kaupulehu lava flows. A volcanic cinder cone known as Puu Waawaa (Hawaiian: furrowed hill) is the most prominent landmark in the area.

In October, 1984, the State Board of Land and Natural Resources set aside 3,806 acres of forested land at Puuwaawaa for the protection of native birds and their habitats( fig 1). This parcel was designated as the Puuwaawaa Wildlife Sanctuary (PWWS) and is administered by the state Division of Forestry and Wildlife. The sanctuary is located 18 miles from Kailua-Kona and 22 miles from Waimea, Hawaii. It lies above Puuwaawaa Ranch, between 4,000 and 6,500 feet elevation. Land parcels owned by Bishop Estate adjoin the sanctuary on the south and west. State lands extend to the east and north. Most of the sanctuary lies within the Conservation District (R Subzone), but a small portion (approx.800 acres) on the northern boundary is zoned Agriculture.

A. Purpose and Need for Proposed Action

The Division of Forestry and Wildlife (DOFAW) proposes to enclose the entire Puuwaawaa Wildlife Sanctuary with stock-proof fencing. This barrier will prevent the entry of domestic and feral livestock from outside, and facilitate feral animal control efforts within the sanctuary. The sanctuary is only partially fenced at the present time. Sections along the eastern boundary and the entire southern boundary are not enclosed by protective fencing. The goal of this project is to construct a boundary fence around the entire perimeter of the Puuwaawaa Wildlife Sanctuary. It will serve to protect native plant and forest bird

habitat from feral ungulate damage. Upon completion, all feral sheep, pigs and goats will be removed from the sanctuary area and an ungulate free environment will be maintained if possible.

The Puuwaawaa Wildlife Sanctuary supports many rare and endangered plants. It is also designated by the U.S. Fish and Wildlife Service as essential habitat for the recovery and management of endangered forest birds in the north Kona region, Island of Hawaii. Hawaii creeper *(Oreomystis mana)*, akepa *(Loxops coccineus coccineus)* and Hawaiian hawks or Io *((Buteo solitarius)* occur in the sanctuary. This area is one of the few places outside McCandless Ranch where the Hawaiian crow or alala *(Corvus hawaiiensis)* has been sighted in recent years. Forest bird surveys conducted in 1990 and 1991 suggest that populations of creeper and akepa are down from levels detected in 1978. Fencing, noxious vegetation control and native plant restoration are high priority tasks needed to protect, restore and manage native forest habitat to provide sufficient cover, food and nesting territory for these endangered birds. Providing secure and high quality habitat is required to stabilize and recover declining populations. Additionally, the U.S. Fish and Wildlife Service has prepared a long-term management plan for alala. This document calls for increased efforts in protection, restoration and management of habitat through the means proposed in this project. The plan calls for continued sanctuary habitat management in preparation for reintroduction of alala at this and other sites in the year 2000.

B. Proposed Actions:

1. Fence Alignment

Fences are currently needed along boundaries which are presently unfenced. This work will require the clearing of fence corridors and construction of roads for vehicular access. Fence construction is proposed along two sections of sanctuary boundary. This includes a 1.7 mile segment along the eastern boundary and a 3.2 mile segment along the southern boundary (fig. 2). Alignment of this latter segment cannot be determined until a metes and bounds survey is completed and the boundary line between State and Bishop Estate parcels is determined. All fences and road construction will be restricted to state lands. The eastern boundary is already served by an established four-wheel drive (4WD) road and was previously fenced. However, that fence has completely deteriorated. We proposed to remove the old fence, regrade the alignment and construct new fence. On the southern boundary, we propose to grade a fenceline corridor and construct an access road through native forest to facilitate fence line construction.

Fence construction activities may require the removal of trees along the fenceline corridor. Additionally, trees growing near the proposed alignment may need to be removed to prevent them from falling on the new fence. Width of the alignment to be

cleared will vary with the type of trees encountered. The general rule is that all trees will be removed along the fenceline up to a distance equal to their height plus 5 feet, except where it is apparent that they will not fall towards the fence. We know from past experience that being conservative in tree removal is counter productive. Stable appearing trees can be windthrown, damaging the fence and allowing livestock and feral animals to enter the protected area. At least two species of rare plants are known to exist in the vicinity of the proposed project. DOFAW botanists will survey the alignment prior to commencement of work to locate and mark any rare or endangered plants which are within the fence alignment. If rare plants are found, the fence alignment will be moved in order to prevent disturbance to the plants.

2. Grading of Fenceline

A minimum of five (5) feet on each side of the fence center line shall be cleared and graded to remove abrupt hills and dips in the terrain and to provide a smooth and even surface for fencing. This will facilitate construction and subsequent maintenance of the new fence. Grading will also make it possible to build a stronger fence and will reduce weak points (especially in low spots) where feral animals could pass under the wire. All cuts will be shaped to minimize potential problems with erosion of steep banks. The filling of natural drainage systems will be avoided whenever possible.

3. Construction of Access Road

A 1.1 mile long 4WD access road currently exists along a portion of the southern sanctuary boundary. The proposed project will extend this road another 3.2 miles along the upper sanctuary boundary. This road will provide access to isolated portions of the sanctuary and facilitate fence construction, inspection and maintenance activities. It will be located on the lower side of the fence and will follow the proposed fence alignment wherever practical. The roadway will be graded to provide adequate drainage. This will be done by building diversionary barriers on the access road to prevent run-off from eroding the roadbed. A maximum road width of 14 feet shall be maintained. Deviation in road location will not be permitted without the approval of the district wildlife biologist.

## V. DESCRIPTION OF AFFECTED ENVIRONMENT

### A. Physical Environment

Hualalai, an active shield volcano, is the third oldest of the five volcanoes on the Island of Hawaii. Its final summit caldera is buried, but the mountain rises to a height of 8,271 feet above sea level. The last eruption occurred in 1801, creating the Huehue lava flow. Soils are less than 10 inches deep on pahoehoe and no more than 20 inches deep on ʻaʻa lava flows.

They are generally organic with very little mineral content. Small amounts of volcanic ash are sometimes present, however.

Volcanic activity at Puuwaawaa has created many interesting geologic formation. These include lava flows, cinder cones, sinkholes, lava tubes and tree molds. The eastern half of the sanctuary is riddled with lava tubes that formed 1,500 to 5,000 years ago. These underground passages are a treasure chest of natural resources. Some contain human cultural features or subfossil remains of animals that died long ago. Caves also provide habitats for endemic plants, birds and cave-adapted arthropods.

Weather patterns at Puu Waawaa are similar to those found along the Kona coast. Mornings are generally clear and sunny. During the day, the surface of Hualalai absorbs large amounts of solar radiation. This heats air over the mountain and creates updrafts. The rising air mass draws in moist marine air which condenses as it moves upward. The result is afternoon cloud cover and /or rain. The cycle reverses in the evening. Cold air descends from the mountain summit and drives cloud cover out to sea. Rainfall in the wettest part of the sanctuary (Halepiula shed) averages 47 inches annually. Precipitation is greatest from November through February.

B. Flora and Fauna

1. Vegetation

Portions of Puuwaawaa have been grazed by livestock for over 100 years. Cattle were finally removed from the sanctuary in 1985, but the forest was already severely damaged. Little or no endemic plant regeneration was evident at that time. Old trees were dying without replacements and the entire forest was rapidly being converted to an open grassland. After cattle removal, native vegetation exhibited a remarkable recovery. Koa and ohia seedlings germinated by the thousands. Most of these exhibited vigorous growth and excellent survival. Several species of plants, not seen at Puuwaawaa since the 1930's, have reappeared and show signs of increased distribution (Giffin, 1995).

At least three native forest communities are represented in the wildlife sanctuary. They include koa/ohia montane mesic forest, ohia montane dry forest, and koa/mamane forest (Wagner et. al., 1990). Most of the area is within the koa/ohia mesic forest zone. As the name implies, koa (Acacia koa) and ohia (Metrosideros collina) are the dominant tree species in the overstory layer. Kolea (Myrsine lessertiana) dominates the mid-story layer while native short-stature trees and shrubs vegetate the understory. Introduced grasses (primarily Pennisetum clandestinum) and native ferns, especially the shuttlecock shaped laukahi (Dryopteris spp.), cover the ground in drier sections of the sanctuary. Other ferns such as hoio (Athyrium sandwichianum), akolea (Athyrium microphyllum), and palapalai (Microlepia setosa)

are common in wetter, shaded areas. No tree fern stratum exists although hapuu (Cibotium glaucum) is scattered throughout the forest. Over 100 species of endemic Hawaiian plants have been identified in the sanctuary to date (table 1).

Puuwaawaa is well known for its rare plants. At least four endangered species occur in the wildlife sanctuary. These include Hawaiian vetch *(Vicia menziesii)*, haha *(Cyanea stictophylla)*, aiea *(Nothocestrum breviflorum)*, and laukahi kuahiwi *(Plantago hawaiensis)*. Another two species are potential candidates for endangered species listing. These are a mint *(Phyllostegia velutina)* and a raspberry or akala *(Rubus macraei)*. In 1992, a palm-like lobelioid *(Delissea undulata)* was found growing in a lava tube opening near the lower sanctuary boundary. This species was thought to be extinct, having not been seen since 1971. Seeds from that single plant have produced over 300 nursery grown seedlings, some of which have been outplanted in sanctuary exclosures.

2. Wildlife

Birds are the primary form of wildlife found in the sanctuary today (table 2). The endemic species consist of five honeycreepers: common amakihi (Hemignathus virens), apapane (Himatione sanguinea), iiwi (Vestiaria coccinea), Hawaii akepa (Loxops coccineus), and Hawaii creeper (Oreomystis mana). Other endemic species include a flycatcher or elepaio (Chasiempis sandwichensis), a crow or alala (Corvus hawaiiensis), a hawk or io (Buteo solitarius), an owl or pueo (Asio flammeus sandwichensis) and a goose or nene (Nesochen sandwicensis). Additionally, the sanctuary supports many kinds of non-native game birds and songbirds (Giffin, 1990 & 1991). The native akepa, creeper, alala, io and nene are officially listed as endangered species. USFWS recovery plans identify the sanctuary and adjacent forests as essential habitat for some of the endangered species.

The bat or ope'ape'a *(Lasiurus cinereus semotus)* is Hawaii's only native land mammal. This mouse-like creature is a subspecies of the mainland hoary bat and is listed as endangered by the USFWS. Bats are occasionally seen in the sanctuary. They are most active at dusk as they forage on flying insects.

The sanctuary forest supports many kinds of native forest insects. Most are seldom seen because of their secretive habits or limited distribution. Others go unnoticed because of their small size. Several kinds of very specialized arthropods live underground in lava tubes. These invertebrates are usually blind and have lightly pigmented exoskeletons. They are adapted to perpetual darkness, high humidity and barren rock surfaces. Several of the forest and cave-adapted species are considered rare by the USFWS.

3. Social and Cultural Environment

Puuanahulu Homesteads is the only population center near the project site. This small village of about 20 permanent families and a few part-time residents was a former ranching community. The town is now undergoing drastic changes because of two new real estate developments in the area. A large residential subdivision (Puu Lani Estates) and a 21 hole golf course and club house (Big Island Country Club and Estates) are nearing completion. Both of these developments will stimulate population growth in the area and provide job opportunities for some big island families. The wildlife sanctuary and proposed project site is 5 miles south of Puuanahulu Village, but can only be reached by travelling over private, unimproved roads controlled by Puuwaawaa Ranch.

Most prehistoric human activity at Puuwaawaa was centered in coastal areas. However, evidence of early human use is also present at higher elevations. Ancient Hawaiian undoubtedly harvested koa and other forest products from the uplands in the vicinity of the wildlife sanctuary. Birds were collected for feathers and meat. There is some indication of an ancient trail or transportation corridor passing through Puuwaawaa to the summit of Hualalai. However, its exact location is not known. Lava tubes in the area were also used by early Hawaiians. Caves located in and around the wildlife sanctuary were used to collect drinking water and for shelter and other purposes. Some passages have man-made fire pits, rock walls and stone platforms.

4. Economic Environment

Since the early 1900's, Puuanahulu Homesteads has been inhabited primarily by Puuwaawaa Ranch employees. In recent years, the ranch has laid off all but three individuals and former employees have retired or moved away from the area to find work. The recent real estate developments will stimulate the local economy and provide some jobs for local residents. An influx of new people is expected once the residential subdivision is completed and sold. An increasing trend in employment is also expected. New house construction and a need for staffing the golf course and club house should create additional jobs in the area.

**VI. Probable Environmental Impacts of the Proposed Actions:**

A. Immediate Impact

The removal of trees for construction of fences and roads in the sanctuary will create a gap in the forest and damage understory vegetation. Limbs, branches and leaves from cut trees will be scattered on the ground and remain there until they decompose or are covered by vegetation. The roadway and fenceline corridor will be barren and subject to erosion until revegetated by grasses and other herbaceous plants. Construction noises, especially bulldozer and chain saw sounds, will

temporarily disturb wildlife in the area. The site is distantly removed from any populated area and, therefore, noise will not create any human disturbance. Scenic, recreational, air quality, economic and social values will not be significantly affected.

B. Long Range Impact

The proposed fence, when completed, will prevent cattle and feral ungulates from entering the sanctuary area. It will also delineate sanctuary boundaries and facilitate protection of the forest ecosystem. The removal of domestic and feral herbivores will stimulate recovery of forest vegetation and possibly allow it to revert back to a more natural state. Habitat for native birds and plants, including rare species, will be enhanced. Overall watershed quality will be improved and protected with a possible increase in ground water supply.

The proposed project will increase the Division's fence inspection and maintenance workload. However, fencing will more than offset the manpower and dollar cost that would be required for continued animal control activities. Removal of trees along the fenceline will eliminate a major cause of fence damage. Grading of the alignment to fill low spots and level rock outcrops will strengthen the fence and make it more difficult for feral pigs to dig underneath. The road will facilitate access for inspection and maintenance. Overall cost of protecting the sanctuary will be reduced by the proposed improvements.

C. Unavoidable Adverse Effects

The loss of trees and creation of a break in forest cover will be the major adverse effects created by the project. However, this action will not significantly impact habitat quality and will more than be offset by the protection created for remaining sanctuary vegetation. Soil in the graded corridor will be subject to erosion until grasses and other herbaceous vegetation become established. Measures will be taken to minimize erosion whenever possible.

D. Effects on Social and Cultural Environment

The project will primarily benefit those that are interested in the protection and preservation of Hawaii's native ecosystems. No negative impact is anticipated on the social or cultural environment of the area. No lava tubes will be collapsed or disturbed.

E. Effects on the Economic Environment

DOFAW has entered into a cooperative agreement with the U.S. Fish and Wildlife Service to fund this project under Section 6 grants (project number E-W-I-10 and 11). The proposed project will have no significant economic impact on the area.

**VII. Alternatives to the Proposed Action:**

A. No Project Alternative

No new fences or roads would be constructed and control of trespassing domestic and feral ungulates would be accomplished through continuous removal/eradication efforts. The manpower and dollar cost would be high and habitat damage would continue to occur, although at a lower intensity. This alternative is not cost effective and will not provide the level of protection necessary to meet long-term habitat management goals.

B. Minimal Disturbance Alternative

No new boundary roads would be built and only those trees directly in the path of the proposed fenceline would be removed. Clearing of the fenceline would be accomplished by hand with little or no grading. This alternative would subject the fence to damage by falling trees and branches and require frequent inspections and repairs. Weak points in the fence would allow herbivores to enter the sanctuary and destroy native vegetation. The frequency and cost of fence maintenance and animal control efforts required make this alternative unfeasible.

C. Irreversible and Irretrievable Commitments of Resource

Labor and capital invested are irretrievable. Trees removed along the fenceline can be considered lost in that regrowth will be controlled to keep the fencing corridor clear. Cutting and grading of a new boundary road along the fence must also be considered irreversible since a permanent scar will be left on the landscape.

**VIII. Proposed Mitigation Measures:**

Removal of large trees along the fenceline alignment will be accomplished with chain saws rather than pushing them over with a bulldozer. This will minimize disturbance to the substrate and understory vegetation. In grading the fenceline, cuts will be sloped to minimize erosion and low spots will be filled to prevent the damming of water. Water diversion structures will be formed on roads to adequately disperse runoff. Field work will be planned around the weather in order to avoid using heavy equipment on deep soil areas during wet periods.

**IX. Determination:**

The proposed project should have no significant impact on the environment. The area to be affected by tree removal and road construction is small when compared to the entire 3,800 acre sanctuary. Benefits to be realized by the improvements far outweigh the detrimental affects. Natural drainage will not be blocked or altered by the project.

Fencing is an established and essential means of protecting lands within wildlife sanctuaries, especially when they are adjacent to grazed pastures. Roads for repairing fences and surveying sanctuary boundaries are also important. All of the area to be protected by the proposed fence falls within the Resource (R) subzone of the Conservation District. The intent of this zoning designation is to ensure the sustained use of natural resources. The proposed project will be consistent with that objective.

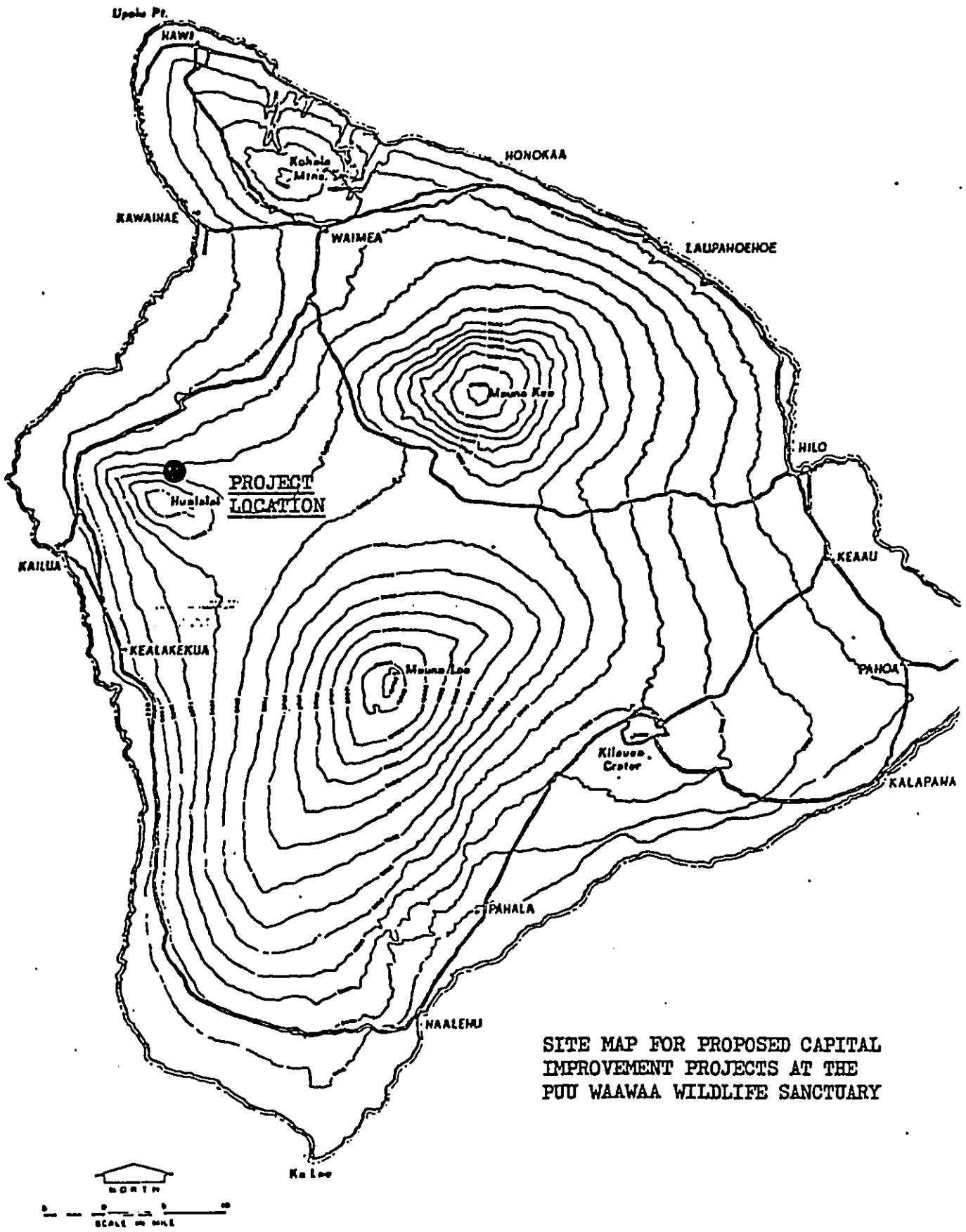
The Division of Forestry and Wildlife foresees no substantial damage to environmental quality as a result of the proposed actions. We, therefore, request that this document be accepted as a Determination Notice of Negative Declaration and the filing of an Environmental Impact Statement not be required.

**X. Literature Cited:**

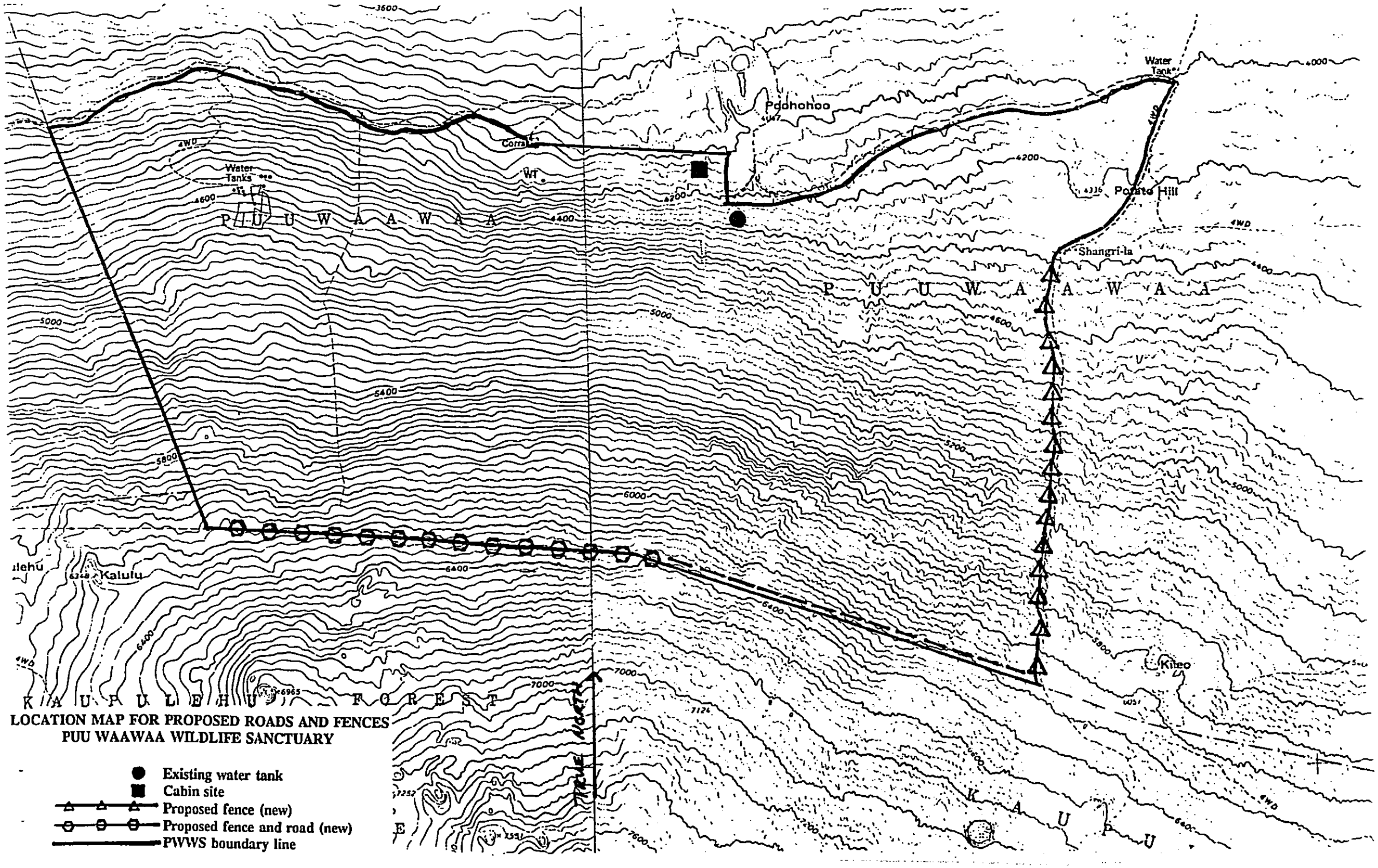
Giffin, J.G. 1991. Limited surveys of forest birds and their habitats in the state of Hawaii. PuuWaawaa wildlife sanctuary bird survey. Pittman-Robertson, project W-18-16, study R-II. Hawaii Dept. Land & Nat. Res., Honolulu. 10pp.

Giffin, J.G. 1995. Puuwaawaa wildlife sanctuary: Interpretive field manual. State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife. 30pp.

Wagner, W.L., D.R. Herbst and S.H. Sohmer. 1990. Manual of the flowering plants of Hawaii. University of Hawaii Press and Bishop Museum Press. 1,853 pp.




SITE MAP FOR PROPOSED CAPITAL IMPROVEMENT PROJECTS AT THE PUU WAAWAA WILDLIFE SANCTUARY




**LOCATION MAP FOR PROPOSED ROADS AND FENCES**
**PUU WAAWAA WILDLIFE SANCTUARY**

- Existing water tank
- Cabin site
- Proposed fence (new)
- Proposed fence and road (new)
- PWWS boundary line

**Table 1**
**Native Plant Species Checklist**
**Puuwaawaa Wildlife Sanctuary**

Plants are listed in groups and then alphabetically by family, genus and species. Species preceded by an addition (+) sign grow outside the sanctuary, but in similar habitat. Taxonomy follows the Manual of the Flowering Plants of Hawaii by Wagner et al. (1990) and Revised Checklist of Hawaiian Pteridophytes by Wagner and Wagner (1993).

**E = Endemic  I = Indigenous  R = Rare  * = Endangered**

| TAXON | COMMON NAME | STATUS |
|---|---|---|
| **THALLOPHYTES (Algae, Fungi & Lichens)** | | |
| PORE FUNGI (Polypores) | | |
| POLYPORACEAE | | |
| Laetiporus sulphureus | sulphur shelf | I? |
| Trametes versicolor | turkey-tail fungi | I? |
| GILL FUNGI (Agarics) | | |
| TRICHOLOMATACEAE | | |
| Pleurotus cystidiosus | oyster mushrooms | I? |
| Marasmiellus spp. | pinwheel mushrooms | I? |
| **BRYOPHYTES (Mosses & Liverworts)** | | |
| NECTARACEAE | | |
| Homaliodendron flabellatum | moss | I? |
| MARCHANTIACEAE | | |
| Dumortiera hirsuta | thallose liverwort | I? |
| **PTERIDOPHYTES (Ferns & Fern Allies)** | | |
| ASPLENIACEAE | | |
| + Asplenium adiantum-nigrum | i'wa'iwa | I |

| | | | |
|---|---|---|---|
| | Asplenium contiguum | | E |
| | Asplenium cookii (A. polyodon) | | E |
| | Asplenium trichomanes | owali | I |
| + | Asplenium unilaterale | pamoho | I |
| | Asplenium praemorsum | | I |
| | | | |
| | BLECHNACEAE | | |
| | Sadleria cyatheoides | amau | E |
| | | | |
| | CYATHEACEAE | | |
| | Cibotium glaucum | hapu'u | E |
| | | | |
| | DENNSTAEDTIACEAE | | |
| | Hypolepis punctata ssp. hawaiiensis | | E |
| | Microlepia strigosa | palapalai | I |
| | Pteridium decompositum (P. aquilinum) | kilau, bracken fern | E |
| | | | |
| | DRYOPTERIDACEAE | | |
| | Athyrium microphyllum | 'akolea | E |
| | Cyrtomium caryotideum | kaapeape | I |
| | Diplazium sandwichianum (Athyrium) | ho'i'o | E |
| | Dryopteris fusco-atra | | E |
| | Dryopteris glabra | kilau | E |
| | Dryopteris hawaiiensis | | E |
| + | Dryopteris unidentata | | E |
| | Dryopteris wallichiana | laukahi | I |
| | Elaphoglossum paleaceum (E.hirtum) | 'ekaha-ula | I |
| + | Elaphoglossum wawrae | 'ekaha-ula | E |
| | Nothoperanema rubiginosa (Ctenitis rubiginosa) | | E |
| | Polystichum hillebrandii | | E,R |
| + | Tectaria cicutaria ssp. gaudichaudii | | E |
| | | | |
| | GRAMMITIDACEAE | | |
| | Grammitis hookeri | | I |
| | | | |
| | POLYPODIACEAE | | |
| | Lepisorus thunbergianus (Pleopeltis) | 'ekaha, akolea | I |
| | Polypodium pellucidum | 'ae | E |

| | | | |
|---|---|---|---|
| | PSILOTACEAE | | |
| | Psilotum nudum | moa | I |
| | PTERIDACEAE | | |
| | Coniogramme pilosa | lo'ulu | E |
| + | Pellaea ternifolia | lau-kahi, cliffbrake | I |
| | Pteris cretica | owali | I |
| | Pteris excelsa | waimakanui | I |
| | Pteris irregularis | | E |
| | THELYPTERIDACEAE | | |
| | Pseudophegopteris keraudreniana | waimaka-nui | E |
| | Thelypteris stegnogrammoides (Pneumatopteris sandwicensis) | | E |

**SPERMATOPHYTES (Flowering Plants)**

MONOCOTYLEDONS

| | | |
|---|---|---|
| CYPERACEAE (Sedge Family) | | |
| Carex alligata | alligator sedge | E |
| Carex macloviana | | I |
| Carex wahuensis | | E |
| Gahnia gahniiformis | | I |
| Uncinia uncinata | | I |
| IRIDACEAE (Iris Family) | | |
| Sisyrinchium acre | mau'u la'ili | E |
| JUNCACEAE (Rush Family) | | |
| Luzula hawaiiensis | wood rush | E |
| LILIACEAE (Lily Family) | | |
| Astelia menziesiana | pa'iniu, kaluaha | E |
| POACEAE (Grass Family) | | |
| Agrostis sandwicensis | grass | E |
| Deschampsia nubigena | grass | E |
| SMILACACEAE (Catbrier Family) | | |
| Smilax melastomifolia | hoi kuahiwi | E |

DICOTYLEDONS

| | | | |
|---|---|---|---|
| | AMARANTHACEAE (Amaranth Family) | | |
| | Charpentiera obovata | papala | E |
| + | Nototrichium sandwicense | kulu'i | E |
| | APOCYNACEAE (Dogbane Family) | | |
| | Alyxia oliviformis | maile | E |
| | AQUIFOLIACEAE (Holly Family) | | |
| | Ilex anomala | kawa'u | I |
| | ARALIACEAE (Ginseng Family) | | |
| | *Cheirodendron trigynum* | 'olapa | E |
| + | Tetraplasandra oahuensis | ohe mauka | E |
| | ASTERACEAE (Sunflower Family) | | |
| + | Bidens menziesii | ko'oko'olau, ko'olau | E |
| | Bidens menziesii x Bidens micrantha | ko'oko'olau | E |
| | Dubautia ciliolata | na'ena'e, kupaoa | E |
| | Dubautia linearis | na'ene'e, kupaoa | E |
| | Dubautia plantaginea | na'ene'e, kupaoa | E |
| | Dubautia scabra | na'ena'e, kupaoa | E |
| | Gnaphalium sandwicensium | 'ena'ena | E |
| | Lipochaeta subcordata | nehe | E |
| | Tetramolopium humile | | E |
| | CAMPANULACEAE (Bellflower Family) | | |
| | Clermontia clermontioides | oha wai | E |
| * | Cyanea stictophylla | haha | E,R |
| * | Delissea undulata ssp. undulata | | E,R |
| | CELASTRACEAE (Bittersweet Family) | | |
| | Perrottetia sandwicensis | olomea | E |
| | CONVOLVULACEAE (Morning Glory Family) | | |
| + | Ipomoea indica | morning glory | I |
| | CUCURBITACEAE (Gourd Family) | | |
| + | Sicyos macrophyllus | 'anunu | E,R |

| | | | |
|---|---|---|---|
| | EPACRIDACEAE (Epacris Family) | | |
| | Styphelia tameiameiae | pukiawe | I |
| | ERICACEAE (Heath Family) | | |
| | Vaccinium calycinum | ‘ohelo, ‘ohelo kau la‘au | E |
| | Vaccinium reticulatum | ‘ohelo, ‘ohelo ‘ai | E |
| | EUPHORBIACEAE (Spurge Family) | | |
| | Chamaesyce olowaluana | ‘akoko, koko, kokomalei | E,R |
| + | Claoxylon sandwicense | po‘ola | E |
| | FABACEAE (Pea Family) | | |
| | Acacia koa | koa | E |
| | Sophora chrysophylla | mamane | E |
| * | Vicia menziesii | Hawaiian vetch | E,R |
| | GERANIACEAE (Geranium Family) | | |
| | Geranium cuneatum | nohoanu, hinahina | E |
| | GESNERIACEAE (African Violet Family) | | |
| | Cyrtandra menziesii | ha‘iwale | E |
| | LAMIACEAE (Mint Family) | | |
| | Phyllostegia ambigua | mint | E |
| | Phyllostegia stachyoides | mint | E |
| | Phyllostegia velutina | mint | E,R |
| + | Plectranthus parviflorus | ‘ala‘ala wai nui | I |
| | Stenogyne macrantha | mint | E |
| | Stenogyne rugosa | ma‘ohi‘ohi | E |
| | Stenogyne sessilis | mint | E |
| | MALVACEAE (Mallow Family) | | |
| + | Hibiscadelphus hualalaiensis | hau kuahiwi | E,R |
| | MENISPERMACEAE (Moonseed Family) | | |
| | Cocculus trilobus | huehue | I |
| | MORACEAE (Mulberry Family) | | |
| + | Streblus pendulinus | a‘ia‘i | I |

| | | | |
|---|---|---|---|
| | MYOPORACEAE (Myoporum Family) | | |
| | Myoporum sandwicense | naio, bastard sandalwood | I |
| | MYRSINACEAE (Myrsine Family) | | |
| | Myrsine lanaiensis | kolea | E |
| | Myrsine lessertiana | kolea lau nui | E |
| | MYRTACEAE (Myrtle Family) | | |
| | Metrosideros polymorpha | ʻohiʻa, ʻohiʻa lehua | E |
| | NYCTAGINACEAE (Four-O'Clock Family) | | |
| | Pisonia brunoniana | papala kepau | I |
| | OLEACEAE (Olive Family) | | |
| + | Nestegis sandwicensis | olopua | E |
| | PAPAVERACEAE (Poppy Family) | | |
| + | Argemone glauca | pua kala | E |
| | PHYTOLACCACEAE (Pokeweed Family) | | |
| + | Phytolacca sandwicensis | popolo, pokeberry | E |
| | PIPERACEAE (Pepper Family) | | |
| | Peperomia cookiana | ʻalaʻala wai nui | E |
| | Peperomia macraeana | ʻalaʻala wai nui | E |
| | PITTOSPORACEAE (Pittosporum Family) | | |
| | Pittosporum hosmeri | hoʻawa | E |
| | PLANTAGINACEAE (Plantain Family) | | |
| * | Plantago hawaiensis | laukahi kuahiwi | E,R |
| | POLYGONACEAE (Buckwheat Family) | | |
| | Rumex giganteus | pawale | E |
| | ROSACEAE (Rose Family) | | |
| | Fragaria chiloensis | ʻohelo papa | I |
| | Osteomeles anthyllidifolia | ʻulei | I |
| | Rubus hawaiensis | ʻakala | E |
| | Rubus macraei | ʻakala | E,R |

| | | | |
|---|---|---|---|
| | RUBIACEAE (Coffee Family) | | |
| | Coprosma ernodeoides | kukaenene | E |
| | Coprosma menziesii | pilo | E |
| | Coprosma montana | pilo | E |
| | Coprosma rhynchocarpa | pilo | E |
| | Hedyotis terminalis (Gouldia) | manono | E |
| | Psychotria hawaiiensis | kopiko ʻula, ʻopiko | E |
| | RUTACEAE (Rue Family) | | |
| | Melicope clusiifolia | alani | E |
| + | Melicope hawaiensis | alani | E,R |
| | Melicope volcanica | alani | E |
| + | Zanthoxylum dipetalum var. tomentosum | kawaʻu | E,R |
| | SANTALACEAE (Sandalwood Family) | | |
| | Santalum paniculatum | ʻiliahi, sandalwood | E |
| | SAPINDACEAE (Soapberry Family) | | |
| | Dodonaea viscosa | ʻaʻaliʻi | I |
| | SOLANACEAE (Nightshade Family) | | |
| * | Nothocestrum breviflorum | ʻaiea | E,R |
| | Nothocestrum longifolium | ʻaiea | E |
| | THYMELAEACEAE (Akia Family) | | |
| + | Wikstroemia sandwicensis | ʻakia | E |
| | URTICACEAE (Nettle Family) | | |
| | Pipturus albidus | mamaki | E |
| | Urera glabra | opuhe | E |
| | VISCACEAE (Mistletoe Family) | | |
| | Korthalsella complanata | hulumoa | I |

**Table 2**
**Bird Species Checklist**
**Puuwaawaa Wildlife Sanctuary**

The birds listed below have been observed in the sanctuary. Birds are listed alphabetically by family and then by genus and species. Taxonomy follows Sibley and Monroe, 1990 and Clements, 1990.

E = Endemic (found only in Hawaiian Islands)
I = Indigenous (found in the Hawaiian Island and elsewhere)
N = Non-native
* = Endangered

| COMMON NAME | SCIENTIFIC NAME | STATUS |
|---|---|---|
| ACCIPITRIDAE (hawks and eagles) | | |
| * 'Io or Hawaiian hawk | Buteo solitarius | E |
| ALAUDIDAE (larks) | | |
| Eurasian skylark | Alauda arvensis | N |
| ANATIDAE (ducks, geese and swans) | | |
| * Nene | Nesochen sandwicensis | E |
| CHARADRIIDAE (plovers and lapwings) | | |
| Pacific golden plover | Pluvialis fulva | I |
| COLUMBIDAE (pigeons and doves) | | |
| Zebra dove | Geopelia striata | N |
| Spotted dove | Streptopelia chinensis | N |
| CORVIDAE (jays, crows and magpies) | | |
| * 'Alala or Hawaiian crow | Corvus hawaiiensis | E |
| DREPANIDIDAE (Hawaiian honeycreepers) | | |
| Common 'amakihi | Hemignathus virens virens | E |
| 'Apapane | Himatione sanguinea | E |
| * Hawaii 'Akepa | Loxops coccineus coccineus | E |
| * Hawaii creeper | Oreomystis mana | E |
| 'I'iwi | Vestiaria coccinea | E |

| | | |
|---|---|---|
| EMBERIZIDAE (EMBERIZIDS) | | |
| Northern cardinal | Cardinalis cardinalis | N |
| Saffron finch | Sicalis flaveola | N |
| ESTRILDIDAE (waxbills and mannikins) | | |
| Warbling silverbill (white-throated munia) | Lonchura malabarica | N |
| Nutmeg mannikin (scaly-breasted munia) | Lonchura punctulata | N |
| FRINGILLIDAE (cardueline finches) | | |
| House finch | Carpodacus mexicanus | N |
| Yellow-fronted canary | Serinus mozambicus | N |
| MONARCHIDAE (monarch flycatchers) | | |
| 'Elepaio | Chasiempis sandwichensis | E |
| PHASIANIDAE (francolins, pheasants and quails) | | |
| Chukar | Alectoris chukar | N |
| Erckel's francolin | Francolinus erckelii | N |
| Kalij pheasant | Lophura leucomelana | N |
| Wild turkey | Meleagris gallopavo | N |
| Common Peafowl | Pavo cristatus | N |
| Ring-necked pheasant | Phasianus colchicus | N |
| PSITTACIDAE (parrots and parakeets) | | |
| Mitred parakeet | Aratinga mitrata | N |
| Scarlet-fronted parakeet | Aratinga wagleri | N |
| Burrowing parrot | Cyanoliseus patagonus | N |
| STRIGIDAE (typical owls) | | |
| Pueo | Asio flammeus sandwichensis | E |
| STURNIDAE (Starlings and mynas) | | |
| Common myna | Acridotheres tristis | N |
| TIMALIIDAE (Babblers) | | |
| Red-billed leiothrix | Leiothrix lutea | N |

| | | |
|---|---|---|
| TYTONIDAE (barn owls) | | |
| Barn owl | Tyto alba | N |
| ZOSTEROPIDAE (silvereyes) | | |
| Japanese white-eye | Zosterops japonicus | N |

APPENDIX TO PUUWAAWAA ENVIRONMENTAL ASSESSMENT

Comments on the environmental assessment (EA) for boundary fence construction at the Puuwaawaa Wildlife Sanctuary were solicited from various organizations and individuals. These included the Hawaii County Department of Planning, Pig Hunters of Hawaii, The Peregrine Fund, National Biological Service, U.S. Fish and Wildlife Service, Hawaii Audubon Society, The Nature Conservancy of Hawaii, and Sierra Club Legal Defense Fund, Inc. Comments were received from three sources. The Hawaii Audubon Society and Peregrine Fund were in favor of the proposed project. A hunter, Mrs. Diane Kimura-Sugiyama, was not in favor of the proposed actions. All correspondence is attached to the final environmental assessment.

We anticipate that the subject project will commence on August 1, 1996 and be completed by June 30, 1997.

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186



May 24, 1996

Michael D. Wilson, Director
Department of Land and Natural Resources
PO Box 621
Honolulu, Hawaii 96809

Attention: Paul Conry

Dear Mr. Wilson:

Subject: Draft Environmental Assessment (EA) for Boundary Fence Construction, Puuwaawaa Wildlife Sanctuary, North Kona; TMK 3-7-1, 2, 3, 4

Please include the following in the final EA:

1. Contact the Hawaii County Department of Planning and include documentation of your contact.

2. Contact any community or special interest groups and include documentation of your contacts.

3. The anticipated start and end dates of this project.

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

Sincerely,

GARY GILL
Director

c: Jon Giffin, DLNR/DOFAW

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY & WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 933-4221
FAX (808) 933-4495

June 7, 1996

Ms. Virginia Goldstein
Planning Director
County of Hawaii
25 Aupuni St., Suite 109
Hilo, HI 96720

Dear Ms. Goldstein:

Subject: Draft Environmental Assessment (EA) for Boundary Fence Construction, Puu Waawaa Wildlife Sanctuary, North Kona, TMK: 3-7-1,2,3,4

The State Division of Forestry and Wildlife has prepared a draft environmental assessment for the subject project, and anticipates a negative declaration determination. A notice of availability for this project was published in the OEQC Bulletin on May 23, 1996.

Enclosed is a summary of the proposed project. Please review this summary and provide us with any concerns or comments you may have regarding the project. A complete copy of the draft environmental assessment is available from our office upon request.

Very Truly yours,

JON G. GIFFIN
Forestry and Wildlife Manager

Enclosures

# The Peregrine Fund

HAWAIIAN ENDANGERED BIRD CONSERVATION PROGRAM

11 June, 1996

Jon Giffin
Forestry and Wildlife Manager
Department of Land and Natural Resources
P.O. Box 4849
Hilo, HI 96720

Dear Mr. Giffin,

Thank you for affording me the opportunity to review the summary of the plan to erect a boundary fence to effectively enclose the Puu Waawaa Wildlife Sanctuary in North Kona.

As you are aware, there is an ongoing cooperative project enlisting the efforts of The Peregrine Fund, the National Biological Service, the U.S. Fish and Wildlife Service, and the Hawaii Division of Forestry and Wildlife which has as its primary goal the reestablishment of the Omao, or Hawaiian Thrush, on the leeward side of the Big Island. The site chosen for the experimental release of this species is the Puu Waawaa Wildlife Sanctuary.

The protection afforded by the proposed perimeter fence in this sanctuary, which will exclude feral and domestic ungulates from this sensitive area will greatly benefit our release efforts by protecting those native plants critical to the survival of the native species of birds, to include the newly released Omao. The long-term success of this release project, as well as the continued existence of those native bird species that persist in this forest are integrally linked to the health and welfare of the forest. This fence project will help to protect this habitat for the future.

We are pleased to see this project planned for the near future, and endorse its implementation.

Thank you again for the opportunity to review and comment on this the project.

Sincerely,

Alan Lieberman, Program Director

P.O. Box 39 • Volcano, Hawai'i 96785
Telephone / Fax 808-985-7137

RECEIVED
June 17, 1996
JUN 26 1 59 PM '96

FORESTRY & WILDLIFE
HAWAII DISTRICT

DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Forestry and Wildlife
1151 Punchbowl Street
Honolulu, Hi. 96813

Dear Sir:

Enclosed please find a copy of the news release printed in West Hawaii Today, a newspaper of general circulation on the island of Hawaii. This letter is in response to your news releas

In regards to the term in paragraph 1 of the news release, "Puuwaawaa Wildlife Sanctuary": What is the meaning of the term "wildlife"? To me, wildlife refers to all animals and birds in the sanctuary. Prior to this idea of fencing, it was not allowable to hunt any feral animals in the sanctuary. What is the meaning of the word "sanctuary"? The word sanctuary is defined in the dictionary as a "sacred place, a place of refuge." I attended the public hearings where hunters questioned the use of the money derived from the sale of wildlife stamps. Many of them felt it would be used solely for the protection of endangered species and not to benefit hunters who would be paying for these stamps. I, as a hunter, do not think it is right for us to pay the bills for eradicating certain species to save other species.

Paragraph 2 says you hope to erect these fences to keep domestic and feral animals from entering this area. Are these fences able to keep rats, wild cats, and the mongoose out? I have seen many wild cats climb trees, and scale chain link fences without hesistance. What about the rats and mongoose? Will this fence keep them out? I strongly believe that these animals can have a drastic effect on these native birds and their chances of reproduction.

Paragraph 3 states that after the fence is installed, animals within the habitat would be removed? How would you remove them? What is your definition of the word removed? Hawaii is known for our "aloha spirit". Do we practice that on animals that have been here longer than many of us? I realize the sheep and goats are introduced species, however they all play a balance in nature. Look what has happened on Mauna Kea after the sheep were totally eradicated. The grass has grown so tall that it is a dangerous fire hazard. They have put the palila habitat in more serious danger than it was before. Look at the gorse and how it is rapidly spreading on the slopes. The sheep used to eat the young gorse and that kept it under pretty good control. Man messes too much with nature sometimes and it can possibly create more problems than before. Everyone wants to see our endangered species survive, but study the problems first before making radical decisions. I think everything on earth is there for a reason and no species should be eradicated to save another. You should work on control of populations, not eradicating them.

Paragraph 4 claims you will be building roads for vehicular access. Why does man have to tamper with nature? Do people disinfect themselves before visiting these areas? Viruses are carried on shoes as well as dirty hands. If it is a place of refuge for these animals that are endangered, why do we have to mess with them? Why can't we just monitor their survival rate by working on predator control? If numbers dwindle, then man needs to get involved by collecting eggs for hatching etc. But, the predators are the main problem with birds.

Thank you for allowing us to give some public comment and thoughts. However, I don't think it matters what we hunters have to say. You have already made up your minds and will not listen to anyone, so why bother even asking? I have one final comment. Where did the State find the money to do all of this? This is all so very interesting, yet very puzzling.

A response is requested.

Sincerely,
Diane Kimura-Sugiyama

CC: U.S. Representative Patsy T. Mink
U.S. Senator Daniel Inouye
U.S. Senator Daniel Akaka
P.E.T.A.

# Puuwaawaa fence planned

The state has proposed to enclose the Puuwaawaa Wildlife Sanctuary with stock-proof fencing.

The Division of Forestry and Wildlife hopes to erect the barrier in order to prevent domestic and feral animals from entering the area, which is a native plant and forest bird habitat. The area is only partially fenced.

After the fence is installed, animals within the habitat would be removed. State officials say a 1.7-mile segment along the eastern boundary and a 3.2-mile segment along the southern boundary would be installed.

The project would consist of clearing fence corridors and the building of roads for vehicular access. The deadline for public comment is June 24. Comments may be made to the Department of Land and Natural Resources, 1151 Punchbowl St., Honolulu, HI 96813.

West Hi. Today 6-6-96

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY & WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 933-4221
FAX (808) 933-4495

*July 1, 1996*

*Mrs. Diane Kimura-Sugiyama*
*P. O. Box 2*
*Kamuela, HI. 96743*

*Dear Diane:*

*Your letter of June 17, 1996 addressed to the Department of Land and Natural Resources was forwarded to me by our Honolulu office. I am responding to your request for information about the Puuwaawaa Wildlife Sanctuary fencing project described in the June 6, 1996 West Hawaii Today news release.*

*Prior to 1984, the area now designated as the Puuwaawaa Wildlife Sanctuary was leased by the state to Puuwaawaa Ranch for pasture purposes. In October of that year, 3,806 acres of ranch land was withdrawn from the lease and set aside by the Department specifically for protecting native forest birds and their habitats. Perhaps the term "wildlife sanctuary" is misleading since this area was never intended to serve as a refuge for introduced animals such as feral sheep, goats and pigs.*

*The Division of Forestry and Wildlife (DOFAW) is currently engaged in several resource management programs at the sanctuary site. These include planting of rare and endangered plants, trapping of rats and mongooses, feral animal control through public hunting, and fencing to exclude domestic livestock and feral animals. Several research projects are also underway.*

*The sanctuary forest has been grazed by Puuwaawaa Ranch livestock since the turn of the century. During that time, the ranch constructed many miles of roads through the sanctuary and fenced the forest to create smaller paddocks. The ranch also released many species of game and non-game birds as well as introduced exotic pasture grasses and other plants. Illegal harvesting of koa and other native trees also occurred. This influx of introduced organisms and removal of forest cover was drastically reduced once the area was*

*designated as a wildlife sanctuary. The protective status given this area has allowed the forest to partially regenerate and has greatly increased the possibility that native plants and animals will survive into the future. New roads and fences proposed by DOFAW are only being constructed along the perimeter of the sanctuary, not inside the protected area. Once the entire 12 mile sanctuary perimeter is fenced, we will attempt to remove all remaining feral animals. This will be done through public hunting and by trapping and transplanting.*

*DOFAW began controlling feral animals at the sanctuary in 1992. Special hunts for reducing feral pig numbers have been held annually since then. All hunting has been done by the public and hunters were advised that these hunting seasons were intended to reduce the number of pigs in the sanctuary.*

*Finally, you asked about the source of funds for the proposed fencing and road construction project. This project will be funded by a U.S. Fish and Wildlife Service grant (Section 6 federal funds). These funds will pay for a metes and bounds land survey, grading of the proposed fence alignment, and fencing materials ( wire, posts and gates). The state's contribution to this project will be in the form of technical assistance and labor for actual fence construction.*

*Thank you for your interest in the Puuwaawaa Wildlife Sanctuary development project. If you have any additional concerns, please give me a call at 933-4221.*

*Sincerely yours,*

Jon G. Giffin

*JON G. GIFFIN*
*Forestry and Wildlife Manager*

*cc: M. Buck*

June 23, 1996

Jon G. Giffin, Forestry and Wildlife Manager
Dept. Of Land and Natural Resources
Division of Forestry and Wildlife.
1151 Punchbowl Street, Room 325
Honolulu, Hawaii 96813

Dan Sailer, Conservation Chair
Hawaii Audubon Society
1088 Bishop Street, Suite 808
Honolulu, Hawaii 96813

Dear Mr. Giffin,

We have prepared the following comments on the Puuwaawaa Wildlife Sanctuary Boundary Fence Construction project. I hope you will find them useful and instructive for the proposed project. The Hawaii Audubon Society is a non-profit organization dedicated to the conservation of Hawaii's wildlife and the ecosystems which suppport them.

The Hawaii Audubon Society strongly supports the project as proposed. Fencing and feral ungulate removal are a welcome management strategy for the protection and recovery of our endangered forest bird and plant communities. Nonetheless, we have a few minor concerns regarding the impacts of the fence and road construction as well as a question regarding the project's timetable.

Tree Removal

Removing large trees which may provide important food resources for endemic forest birds in periods of relative scarcity (e.g. `olapa; Cheirodendron trigynum) would be an unfortunate loss. Perhaps in conjunction with the survey of fenceline areas for rare or endangered plants, any particularly significant food resource trees could also be noted for fenceline re-alignment where feasible.

Alien Plant Control

While the draft environmental assesment does not give a full indication of the types and densities of introduced plants already in and around the Sanctuary, we hope that some measure of weed control is performed during fence construction and follow up maintanence work. Cleaning all gear carried into the work areas would help to prevent the introduction of any new weeds or pests. Additionally we hope that disturbed areas are monitored for any expanding populations of weeds and controlled using non-herbicidal means. We trust the applicant will find the appropriate balance between erosion control and weed control in areas disturbed by road and fence construction.

Timetable

With the anticipated re-introduction of the alala in the year 2000, we hope that the fence and road construction work is completed well beforehand. Could the applicant provide a rough timetable for the project as well as give an indication of when all remaining feral ungulates are scheduled to be removed from the Sanctuary?

Thank you for this opportunity to participate in the management of our valued endemic plant and animal communities.

Sincerely,

Dan Sailer, Conservation Chair
Hawaii Audubon Society

cc: Paul Conry, DLNR
OEQC

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY & WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 933-4221
FAX (808) 933-4495

*July 1, 1996*

*Mr. Dan Sailer, Conservation Chair*
*Hawaii Audubon Society*
*1088 Bishop Street, Suite 808*
*Honolulu, Hawaii 96813*

*Dear Mr. Sailer:*

*Thank you for your letter of June 23, 1996 and your comments on the Puuwaawaa Wildlife Sanctuary boundary fence construction project. We appreciate your support of the proposed project.*

*Regarding tree removal, please be assured that our fencing activities will avoid large native trees whenever possible. Not only are these an important food source for endemic birds, they also require an inordinate amount of work to remove.*

*Weed control is an ongoing activity at the Puuwaawaa Wildlife Sanctuary. We will continue to monitor and control the spread of noxious vegetation, especially along newly constructed fencing corridors.*

*Federal funds (U.S. Fish and Wildlife Service Section 6 grant) available for the proposed fencing project will expire on June 30, 1997. We intend to complete the project by that time. There is no deadline for total removal of feral pigs, however. Even though the sanctuary will be enclosed by hog wire once this project is completed, some segments of fence are old and almost impossible to pig proof. We will probably have to contend with a small number of pigs until old fences are replaced.*

*Thank you for your interest in the Puuwaawaa Wildlife Sanctuary development project. If you have any further concerns, please call me at 933-4221.*

*Sincerely,*

*JON G. GIFFIN*
*Forestry and Wildlife Manager*

*cc: P. Conry*