BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

Timothy E. Johns
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
Janet E. Kawelo

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

RECEIVED
'99 MAR 22 A8:28
OFC. OF ENVTL.
QUALITY CONTR

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

March 16, 1999

Mr. Gary Gill, Acting Director
Office of Environmental Quality Control
235 South Beretania Street, Ste. 702
Honolulu, HI 96813

Dear Mr. Gill:

Subject: Finding of No Significant Impact (FONSI) for Fence Construction, Anunu Unit, Puu Makaala Natural Area Reserve
TMK: 1-8-12-3, `Ola`a, Puna, Hawai`I

The state Division of Forestry and Wildlife has reviewed the comments received during the 30-day public comment period which began on January 8, 1999. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the April 8, 1999 Environmental Notice.

We have enclosed a completed Environmental Notice Publication Form and four copies of the final EA. Please call Bill Stormont at 974-4221 if you have any questions.

Sincerely,

MICHAEL G. BUCK
Administrator

Attachments

28

1999-04-08-HA-FEA-

FINAL

ENVIRONMENTAL ASSESSMENT

for

FENCE CONSTRUCTION (2)

ANUNU UNIT, PU`U MAKA`ALA NATURAL AREA RESERVE (1)

in accordance with

CHAPTER 343, HAWAII REVISED STATUTES

Proposed By:

Natural Area Reserve Program
Division of Forestry and Wildlife, Hawai`i Branch
Department of Land and Natural Resources

March 1999

I. SUMMARY

Project Name: Fence Construction, Anunu Unit,
Pu`u Maka`ala Natural Area Reserve

Proposing Agency: State Department of Land and Natural Resources
Division of Forestry and Wildlife

Approving Agency: State Board of Land and Natural Resources

Project Location: `Ola`a, Puna, Hawai`i, TMK: 1-8-12-3

Agencies Consulted During EA Preparation:

Federal: U.S. Department of Agriculture
Natural Resources Conservation Service

U.S. Department of Interior
Fish and Wildlife Service
Geological Survey, Biological Resources Division
National Park Service

State: Department of Land and Natural Resources
Division of Forestry and Wildlife-Hawai`i
Land Division-Hawai`i
Historic Preservation Division-Hawai`i
Natural Area Reserve System Commission

County: Planning Department

Private: `Ahahui Malama I Ka Lokahi
Big Island Bird Hunters
Conservation Council for Hawai`i
Hawai`i Audubon Society
Hawai`i Hunting Association
Kamehameha Schools Bishop Estate
Native Hawaiian Advisory Council
Native Hawaiian Legal Corporation
Pig Hunters of Hawai`i
Sierra Club, Moku Loa Group
The Nature Conservancy of Hawai`i
Volcano Community Association
Wildlife Conservation Association of Hawai`i, Hilo Chapter

Project Action Summary:

The Division of Forestry and Wildlife (DOFAW), Natural Area Reserves program proposes constructing a 16,700 foot fenceline within the above parcel as part of ongoing efforts to protect native forest ecosystems, and rare, threatened, and/or endangered flora and fauna found within these ecosystems, from the effects of feral pigs (Sus scrofa). The project involves erecting a fence using galvanized six-and-one-half foot (6-1/2') long steel fence posts, thirty-nine inch (39") hog wire, and one strand of barbed wire along the bottom. These fences will run both along existing four-wheel drive roads and through a portion of undisturbed forest, creating a 290 acre fenced area. The fence corridor will be cleared by hand using small hand and power tools. The ultimate goal of the project is to completely exclude feral pigs from within the fenced area for ecosystem protection purposes.

The project proposed is within the Pu`u Maka`ala Natural Area Reserve (NAR) on the eastern slope of Mauna Loa. Adjacent lands include `Ola`a Tract of Hawaii Volcanoes National Park, Kulani Correctional Facility, and state forest reserve lands. Specifically, the project lies at the 3,600 foot contour approximately one (1) mile south of Stainback Highway, adjacent to a four-wheel drive road named both "Army" and "Disappointment" Road. All project lands are within the "P" sub-zone of the Conservation District. No other special designations apply. Maps indicating land ownership and the proposed fence line can be found in Appendix A. The 12,106-acre Pu`u Maka`ala NAR was designated in 1981 to protect high quality *`ohi`a-hapu`u* and *`ohi`a-koa* forests, and a large number of rare species, and provide an important ecosystem link between the lower elevation forests within `Ola`a Tract and higher elevation forests in Kulani and Upper Waiakea.

One of the described alternatives involves developing a new section of roadway to modify access to a portion of Army Road. This roadway will connect the northwestern corner of Army Road with Stainback Highway via approximately 700 feet of new roadway. A roadway component to the project is proposed to in turn allow closure of a separate section of Army Road, where the roadway will be used as the fence corridor. By doing so, we alleviate the need to clear a longer section of fence corridor, and make construction and subsequent maintenance much more efficient.

Project Purpose and Need:

The area proposed for fencing is home to one of three known remaining populations of the endangered *anunu*, Sicyos alba, a native member of the cucumber family, as well as several other rare plant species. Complete lists of the endangered, threatened, or rare plants and animals found within the project area can be found in Appendix B. Additionally, this fence will surround a pocket of forest characterized by taller stature *`ohi`a* (Metrosideros polymorpha) trees, high species diversity, and higher densities of particular plants, such as *olona* (Touchardia latifolia) and *loulu* palm (Pritchardia beccariana), not commonly found in other areas of the NAR.

Feral pigs pose one of the greatest threats to existing intact native wet forest areas. Pigs consume and trample understory plants, such as the *anunu*, create conditions for non-native plant infestation and establishment (another severe threat), prevent the establishment of ground-rooting native plants, serve as vectors for the dispersal of non-native plants, and disrupt soil nutrient cycling. The cumulative effects are the decline of intact native forest ecosystems, including the decline of suitable habitat for threatened and endangered forest birds, plants, and invertebrates. The project area is essential habitat for five (5) endangered forest bird species, and no less than fifteen (15) listed, proposed or candidate endangered plant species.

Projects such as this are aimed at protection of ecosystems, or plant and animal communities. There has been a movement away from the "single species" approach to protecting native resources. This particular project incorporates the entire pocket of this forest type along with the protection of an extemely rare native plant. It is recognized that if long-term viability of rare and endangered native organisms is to be achieved, large tracts of land need to be protected. This is in keeping with the USFWS policy of an "ecosystem approach" focusing on management of natural communities, and with the Natural Area Reserve Law, which mandates a system of reserves be established to "...preserve in perpetuity specific land and water areas which support communities, as unmodified as possible, of the natural flora and fauna..." (Chapter 195, Hawaii Revised Statutes). It is also recognized that this project encompasses only a small portion of the Natural Area Reserve. The long-term goal for the Reserve is further protection of ecosystem-wide areas to be maintained as animal free. Future protection efforts for adjoining and nearby areas of the Reserve will be in pursuit of this goal.

Community Involvement

While the Division of Forestry and Wildlife is carrying out the project, it is the Upper Puna Volcano Regional Forest Management Advisory Council (UPV RFMAC) that has proposed this project be carried out. The UPV RFMAC is a DOFAW-led community group convened to try to find solutions to the various natural resource use and management conflicts that have risen in the region over the past five years. Concerns over management of feral pigs - the control of them in some places and in others the management of them as a game species - voiced by a variety of interests, has brought about the formation of this Council to work toward collective, collaborative solutions.

The Council consists of representatives from hunting organizations, the environmental community, government land management agencies, community associations, landowners, the forest industry, and cultural practitioners and gatherers. A primary guiding principle of the Council is that decisions are made on a consensus basis. That is, if not everyone agrees, the motion does not carry. What this does mean, though, is that if there are issues in which the Council does have consensus, there is a certain strength and power to it, because of the widely disparate views of the various interests involved in the process.

While on a Council field trip, this area and the Sicyos plant was visited. Following the trip, Council members began to push for more protection of this area immediately. Citing the rarity of Sicyos, the proximity to roads and public access, the "win-win" nature of a project

proposed by the Council, processed by the Division, constructed at least in part with volunteer labor organized by the Council, and identified fully as a project completed in a cooperative manner by all parties in the Council, this project has been made a high priority. The Council is in consensus on the desire to complete this project and protect the resources within the proposed fenced area.

Funding

Funding for the project is from two sources. The Division applied for and was awarded a grant from the U.S. Fish and Wildlife Service to buy all the fence materials needed for construction, at a cost of $19,484. This includes fence posts, woven wire fence, barbed wire, anchor posts, gates, and tie wire. The Division will provide heavy equipment for the access road construction, and field crews for corridor clearing and fence construction the Division will also organize volunteer labor crews from community and service organizations, to help build community support for these ecosystem protection efforts. Many have already committed to helping.

Permits/Approvals Required

Following completion of the Chapter 343 EA process, the project will be submitted for approval to begin construction from the Board of Land and Natural Resources. No other approvals or permits are required.

II. PROJECT DESCRIPTION

General

The proposed fenceline will be 16,700 feet in length, and encompass an area of 290 acres. It will be constructed utilizing 39" high galvanized hog wire fence fabric with a basal strand of galvanized barbed wire. The fencing fabric will be supported by galvanized steel fence posts placed no more than 10 feet apart along the entire length of the fence line. Shorter steel pins will be used as anchors within the 10 foot span. The fence alignment will be cleared using hand and small power tools (machete, chainsaws) to a width of no more than six (6) feet. No trees larger than six inches DBH (diameter at breast height) will be cut, and tree ferns (*hapu`u*, Cibotium sp.) removed will be replanted near the proposed line. All endangered, threatened, or rare, plant species along the fence alignment will be clearly marked and identified to field personnel to avoid any harm to them. The goal of this project is to exclude feral pigs from the 290 acre fenced area.

The proposed new access road will be 700 feet in length, 15 feet wide, and impact a total area of approximately two acres. It will run directly from the south side of Stainback Highway to the northwest corner of Army Road. This work will be done with a D-7 or D-8 size bulldozer.

Location

The project area is in the lands of `Ola`a, Puna, Hawaii, approximately 15 miles west of Highway 11, along Stainback Highway. Specifically, the project is along Army Road in the Pu`u Maka`ala NAR. Maps indicating the project area and related roads, boundaries, and topographic features are in Appendix A. Approximately two-thirds of the line will be on existing four-wheel drive roads, with the remainder being through forested land.

Referring to the Project Map in appendix A, the fence line is proposed for segments AB, BC, CD, and DA. Segment AB is a short, dead-end spur road approx. 880 feet long. Segment BC is "undisturbed" forest, though impacted by pigs and non-native plants. Segment DC is another dead-end road, approx. 3,300 feet in length. Segment DA is roadway. All road segments are 4-wheel drive only, approx. 12 feet wide, and used by hunters and other forest users. Turnouts along all segments of roadway are used for parking.

Project Progression

The first phase of the fence project will involve physically clearing the proposed fence alignment by crews using machetes, chainsaws, digging tools such as picks, o`o bars, and hazel hoes. Again, before this work ensues, any rare plants or other notable resources found along the alignment will be identified to ensure their protection. This work will take place along approximately 10,500 feet (approx. 2 mi.) of roadway, and 6,250 feet of undisturbed forest. Secondly, fence construction itself, including driving galvanized steel fence posts in and hanging one strand of barbed wire along the bottom of the posts, followed by 39" woven wire (hog wire) fence material. Where necessary, "skirts" of woven wire material will be added along the bottom of the fence to cover gaps between the bottom of the wire, the barbed wire, and the ground. Walk through gates will be placed along the fenceline for access into the unit.

If the new roadway alternative is selected, this phase will precede fence construction, and involve clearing of vegetation and creation of a roadbed no more than 15 feet wide with a bulldozer.

III. DESCRIPTION OF AFFECTED ENVIRONMENT

Flora

The forests in this region consist primarily of native vegetation, including scattered *`ohi`a* in the overstory, a variety of native trees in the mid-canopy, and tree ferns, native shrubs and ferns in the understory and ground layer. The density of the *`ohi`a* canopy varies within the area depending on the substrate, and can range from 20% to 75% cover. Likewise, the density of tree ferns varies with substrate as well. As mentioned above, the area is home to the endangered *anunu*, Sicyos alba.

This project will have a negative effect only on the 6 foot wide corridor that the fence will run on. In aligning the specific fenceline corridor, every effort will be made to ensure that larger trees and tree ferns will not be impacted, and no native trees of any species larger than 6 inches dbh (diameter at breast height) will be cut. Any tree ferns that need to be removed will be topped, and the tops will be planted off the line. Any rare, threatened or endangered plants encountered on or near the fence corridor will be marked, and field crews will be made abundantly aware of their presence and location, and work will steer clear of them.

Fauna

Several species of native and non-native birds are found within the project area. Native birds common in the area include the *apapane* (Himatione sanguinea), *`oma`o* (Myadestes obscura), *`i`iwi* (Vestiaria coccinea), and *`elepaio* (Chasiempis sandwichensis ridgewayi). Commonly occurring non-native birds include the Japanese White-eye (Zosterops japonicus) and Redbilled Leiothrix (Leiothrix lutea).

Five native birds listed by the federal and state governments as endangered are known from in or near the project area. They include the *`io*, or Hawaiian Hawk (Buteo solitarius), the *`akiapola`au* (Hemignathus munroi), Hawaii Creeper (Oreomystis mana), Hawaii *`akepa* (Loxops coccineus) and *`o`u* (Psittirostra psittacea). *`Io* is commonly seen specifically in the project area, while *`akiapola`au*, Hawaii *`akepa*, and Hawaii Creeper are generally found at higher elevations where *koa* (Acacia koa) is a major component of the overstory. However, there have been no confirmed sightings of *`o`u* in the area since 1986. No negative impacts to these species are anticipated either during or after the completion of this project.

Non-native fauna such as pigs, mongoose (Herpestes auropunctatus) and rats (Rattus spp.) are known to be in the area.

Sensitive Habitats

All of the project area could be considered sensitive habitat, for both native plants and birds. As has been stated above, any potential impact to rare, threatened or endangered flora or fauna will be mitigated through careful alignment of the fence corridor, clear marking of rare elements, and scheduling work so as not to interfere with the normal nesting season of forest birds within the area. There are no delineated wetlands within the project area. And again, this project is proposed to provide protection to the rare, threatened and/or endangered elements found within the project area.

Socio-Economic Impacts

Current public use of the project area includes hunting, public hiking, bird watching, and occasional illegal foliage harvesting (*maile*, *hapu`u* shoots). Hunters use the project area regularly to harvest feral pig, and have been very vocal in their opposition to other efforts to control feral pigs from other areas within the region. The opposition has been multifaceted,

with concern expressed over acres of public hunting area being cleared of animals, the method of removal, and the loss of game meat.

This project entails fencing only a small portion, 290 acres, of the larger accessible surrounding area, in excess of 30,000 acres, which will remain available for public hunting. Secondly, most, if not all, of the animals within the fenced area will be driven out before the fence is completed, to minimize the need for staff control of the animals, or other forms of control found objectionable by the hunting community. Regular monitoring of forest conditions within the unit will help determine if any pigs remain. If the monitoring shows fresh animal sign, efforts to remove them will involve local hunters first, then staff control if the last few animals cannot be caught quickly.

Additionally, if fence construction takes place on existing roadways, access will be hindered in the area around the project, particularly if segment DA is used.

One of the fence alignment alternatives calls for constructing the fence on roadways, wherever possible, rendering those roadways undrivable and accessible only on foot. As such, it is proposed that the new roadway access, segment XY on the project maps, be developed. This will enable access to the mauka, western portion of Army Road, as road segment YZ is undriveable for most vehicles, and is being done to minimize the impact of the closure of segment DA on regular users of the area, primarily hunters.

Impacts to other forest users is expected to be negligible. Having the fenced, protected unit will add to the educational value of the area, providing an interpretive opportunity for groups or individuals hiking in the area either on DOFAW-led hikes or other group sponsored activities. Hopefully information could be made available to help stem illegal picking in the area as well. And to reiterate, this is a project proposed by a broad-based community group, including hunters, to be completed in part with volunteer labor organized by the group and its various members. Working together on a fence project such as this would have been unthinkable several years ago, given the acrimony over the issue of fencing and animal control. Through facilitated dialog and regular meetings and field trips, there is more common understanding about the various needs and desires of different resource "users."

IV. ENVIRONMENTAL IMPACTS

Some impacts to the environment are inevitable. Installation of the fence will entail clearing a corridor through the forested portions of the alignment to clear the way for the construction. In the short-term this will result in vegetation being cut and removed, particularly ground level and understory vegetation. This will include ferns, shrubs, and small woody plants, as well as a large number of *hapu`u*. This corridor will also be exposed as a conduit for weed introductions, particularly in and around where fence material will be hauled to and handled. In the long-term, these impacts are expected to be minimal, and to be mitigated through the actions outlined below. Soil disturbance will be moderate during corridor clearing and construction, but is not expected to be severe, nor long-lasting.

The two acre area adjacent to Stainback Highway that would be used for the new access roadway will obviously be heavily impacted. The bulldozing will remove all vegetation within the roadway alignment, and create a level roadbed for vehicular access. A complete survey of the roadway alignment and adjacent area revealed no endangered, threatened or rare plant species. Survey results are available in Appendix B.

V. MITIGATION MEASURES

Short-Term Impacts

As stated above, short-term impacts will include disturbance associated with clearing of the corridor through the "undeveloped" portions of the proposed fenceline, and possible weed introductions, particularly where fence materials are deposited when flown in by helicopter. A large number of *hapu`u* are expected to be cut as well.

Mitigation measures for these disturbances will include clearing only the specified six-foot corridor, ensuring that all endangered, threatened, or rare plant species be amply marked and identified to field crew personnel and volunteers working on the project, and avoided. Additionally, the fence corridor itself will be carefully placed so as to take the "path of least resistance" from a clearing standpoint, while maintaining a relatively straight line. Secondly, any *hapu`u* cut will be topped and the tops replanted off the line. This effort has shown to be successful on other projects in the region, as cut *hapu`u* will reroot readily.

Weed introduction is inevitable when equipment, material, and humans are brought into previously "undisturbed" area. This is easily mitigated however, with regular maintenance of the new fencelines. Additionally, all equipment and gear used on site will be cleaned of any debris and dirt before comencing work, to avoid possible introduction of weeds on the project site. Regular checks of the fence condition will be done roughly monthly, facilitating detection of new weed introductions following project completion. Control of new weed introductions will be done by either hand-pulling or herbicide. This work would be done in concert with other weed control work that will be initiated within the fenced unit, as a follow-up to animal removal.

Long-Term Impacts

In the long term, negative impacts include change in access and off-road use patterns in the area, depending on the alternative selected, the possible loss of two acres of native forest, and the loss of 290 acres of available hunting area. Utilizing the roadways to construct the fence will close segment DA of the Army Road loop, leaving the mauka portions less accessible to hunters and other area users . As stated above, this will be mitigated by creating a short segment of new roadway allowing access to the mauka portion of Army Road. Long-term impacts associated with roadway development include the loss of approximately two acres of forest. We feel this is an acceptable loss given what it will provide in enabling fence construction on existing roadways for the majority of the fenceline's length, alleviating the

need to clear more fence corridor by hand. It will allow more efficient and effective construction and subsequent maintenance.

There are no expected long-term negative impacts associated with fence construction itself. Experience has shown that native vegetation in the immediate area along fence corridors readily re-establishes itself, except for right along the walking path adjacent to the fence.

Additionally, in the long-term, hunting will cease in the 290 acre fenced area. This loss of 290 acres is minimal, however, given the availability of over 30,000 acres of available public hunting area surrounding the project area. Efforts will be made to clear what animals are within the fenced area before fence completion, in the hopes that few, if any, will remain and need to be removed.

Positive long-term impacts of this project are the protection of a small, high-quality pocket of native ecosystem, including several rare plant species, and other notable biological resources. Benefits also include a resource for educational and interpretive opportunities, a protected area for outplanting of other rare plants known from the region, and the completion of a project supported by a broad-based community group trying to have some impact.

VI. ALTERNATIVES CONSIDERED

1. No action. Accept the continual decline of the native ecosystems within the area, and the eventual demise of the Sicyos alba individuals found within the area. With that, the known population of S. alba will drop by 1/3, and the species will be that much closer to extinction.

   This is not the alternative that either the Division or the Upper Puna Volcano RFMAC wants to pursue.

2. Fence off a larger portion of the region, enclosing the entire Army Road Complex with a total of six miles of fence, running predominantly along the roadway, including the area to be fenced in Alternative 3 with S. alba.

   This alternative, while encompassing a larger area, which would be in keeping with the concept of ecosystem protection over large tracts of land, would not be an alternative the entire Upper Puna Volcano RFMAC could come to consensus on. It is also beyond current funding ability. It does, however, remain a viable option for later resource protection if funding and public will become available.

3. Proceed as described above. Fence off the portion adjacent to Army Road that encompasses the S. alba, along with several other endangered, threatened or rare plant species. This "pocket" of forest also houses several species not commonly found in other portions of the Reserve, and would encompass roughly 290 acres of forest, utilizing 16,700 feet of fencing. Several different

layout scenarios are possible:

a) Construct the fence entirely through undisturbed forest along a line cleared by hand and power tools directly adjacent to, but not on, the existing roadways, along all segments of the proposed project area. This will entail the most effort in clearing the fenceline, as all 16,700 feet of proposed fence alignment will have to be cleared by hand. Additionally, it will add to the effort of building the fence itself, allowing less room for personnel to move around in during construction. It will also make it more difficult to get fence materials on site. This will, however, keep the existing roadways open, alleviating the need to develop the new roadway.

b) Using a bulldozer, scrape four to six feet of roadside area, effectively widening the roadway along segment DA, and building the fence directly beside the road. Build the fence directly on the dead-end roadway segments of AB, and CD, effectively shutting those roadways down, and hand clear the fence corridor on segment BC. This alternative allows segment DA to remain driveable, again alleviating the need for the new roadway. It also make construction, and subsequent maintenance, of the segments along roadways much more efficient.

   This alternative, however, will disturb a larger total area than will the development of the new roadway, including individuals of several rare plant species.

c) Utilize existing roadways along segments AB, CD, and DA to construct the fence, placing the fenceline directly on the roadways. Hand clear segment BC. Create the new roadway segment XY to ensure access to the mauka portions of Army Road.

   This alternative allows fence construction to be the most efficient, and makes long-term maintenance the simplest possible. Utilizing the existing roadways keeps the toughest part of building this type of fence, hand clearing of fence corridor, to a minimum, and eliminates the disturbance of a two-mile segment of undisturbed forest.

   This is the preferred alternative of both the Upper Puna Volcano Forest Management Council, and the Division of Forestry and Wildlife.

VII. EA PREPARATION INFORMATION

This Environmental Assessment was prepared by:

William T. Stormont
Natural Area Manager
DLNR, Division of Forestry and Wildlife
19 E. Kawili Street
P.O. Box 4849
Hilo, HI 96720-0849
(808) 974-4221

VIII. LIST OF APPENDICES

Appendix A — Maps of Project Area

- Figure 1. Map of Region
- Figure 2. Map of Project Area

Appendix B — Botanical Survey Information

- Figure 1. Rare Plant Species In Project Area
- Figure 2. Plant Checklist, Proposed Roadway Alignment

IX. DETERMINATION

Proposing Agency: State Department of Land and Natural Resources
Division of Forestry and Wildlife

Approving Agency: State Board of Land and Natural Resources

Description:

The State Division of Forestry and Wildlife proposes construction of a 16,700 foot fence line in the Pu`u Maka`ala Natural Area Reserve, to protect 290 acres of unique native Hawaiian ecosystems, including several species of rare Hawaiian biota. The fence will be built using 6-1/2 foot galvanized steel fence posts, 39" high woven wire, and one strand of barbed wire on the bottom. The fence will be constructed primarily on four-wheel drive roads, though one stretch of fence will go through undisturbed forest. The fence line will be

built with a combination of staff and volunteer labor, using materials provided by the U.S. Fish and Wildlife Service in a cooperative management effort.

Determination:

After a review of the Draft Environmental Assessment, and having addressed comments received during the Draft EA review period, we declare a Finding of No Significant Impact for the prefered alternative, No. 3(c) listed above, and will publish this as a Final Environmental Assessment. Copies of the comments received and the response of the Preparer are attached.

Reasons for Determination:

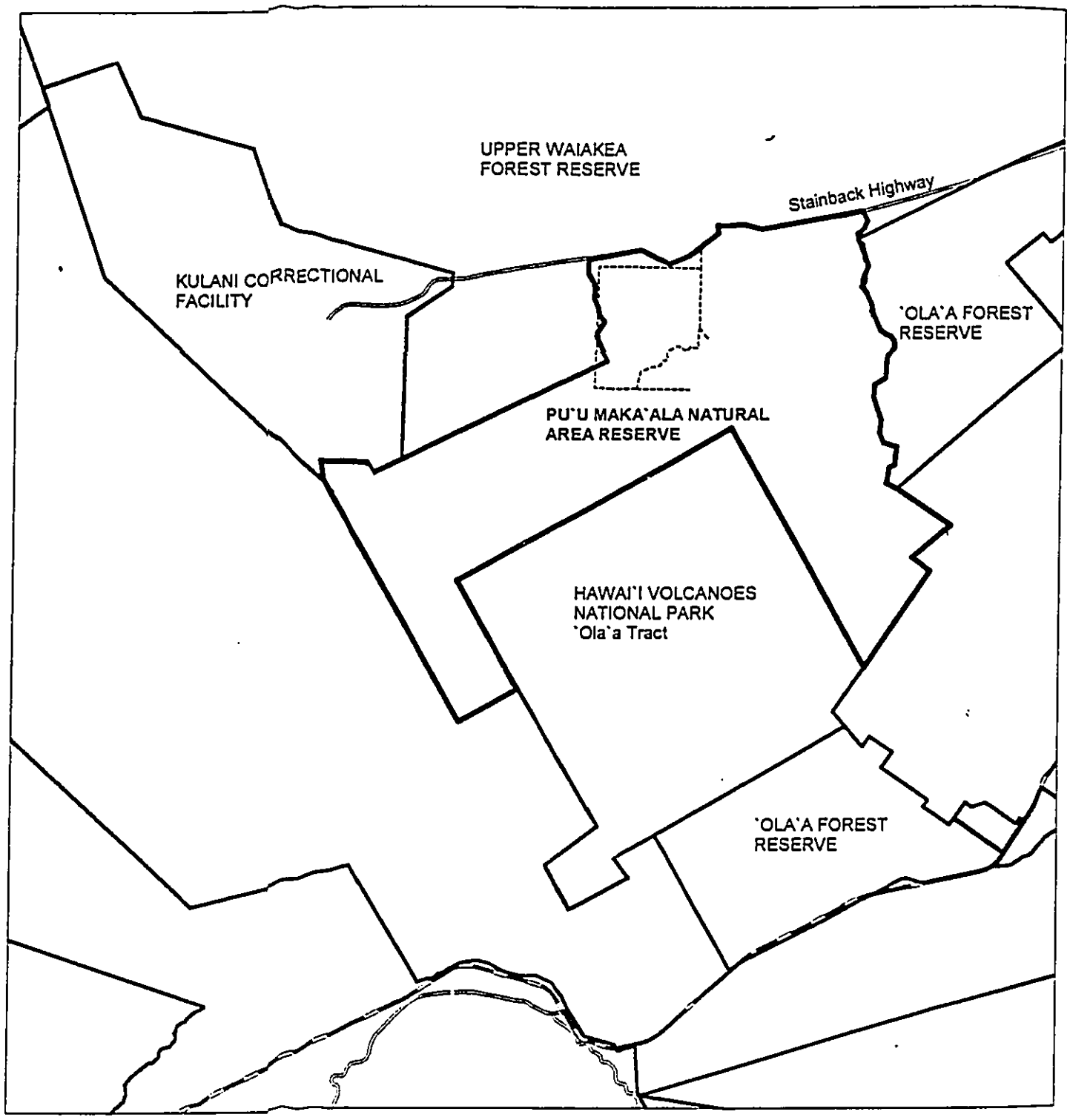
The Division finds that the Environmental Assessment adequately describes and discusses the various impacts the proposed project will have, and feels its impact will not, in the long run, be significant. It also feels the alternatives described were sound and thorough, and the selected alternative is the best course of action causing the least overall amount of impact. All respondents to the draft EA review process were in favor of the project and the indentified preferred alternative.

Contact:

William T. Stormont, Natural Area Manager
Division of Forestry and Wildlife, Hawaii Branch
P.O. Box 4849
Hilo, HI 96720-0849
(808) 974-4221

Appendix A

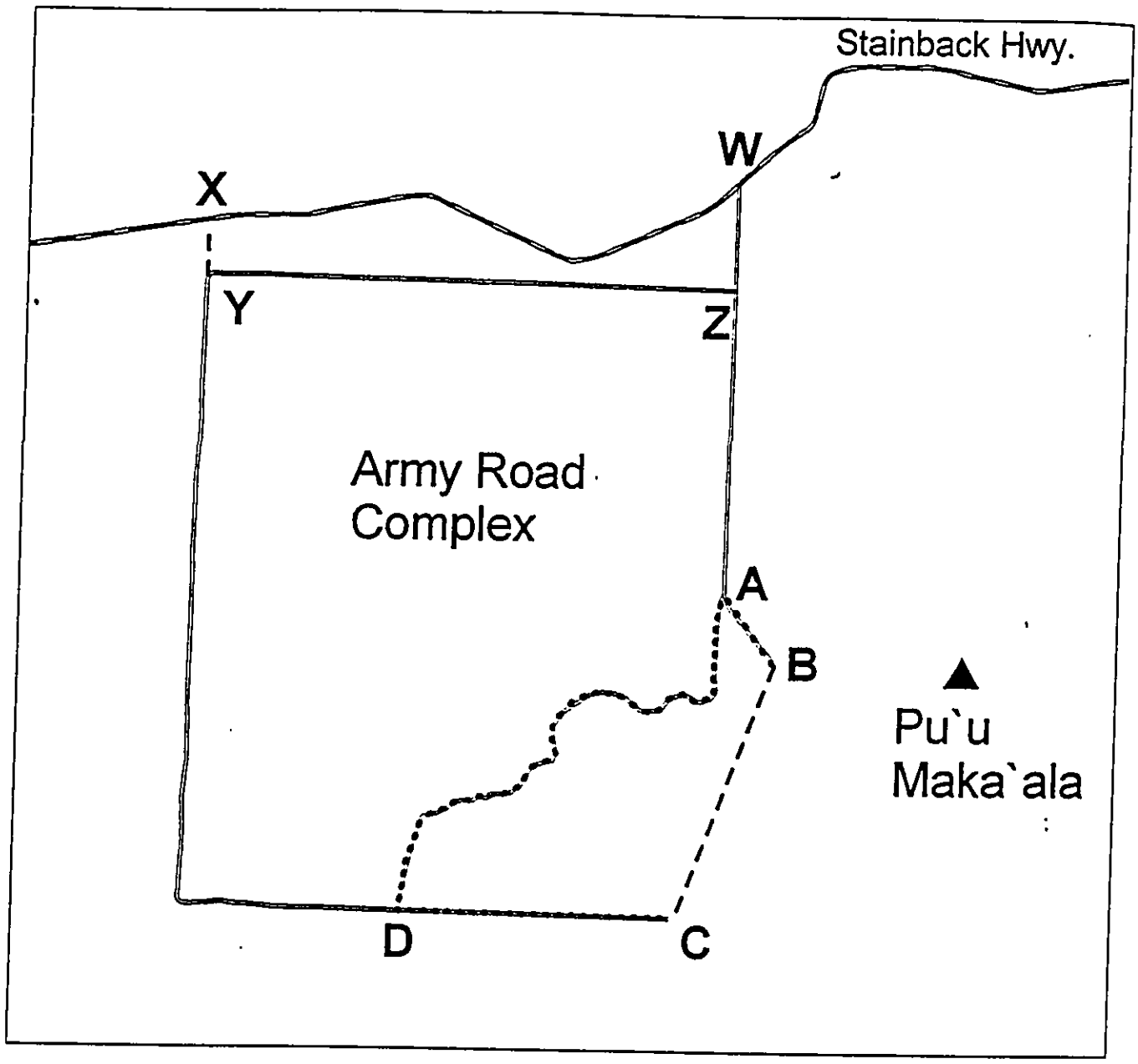
Project Area Maps

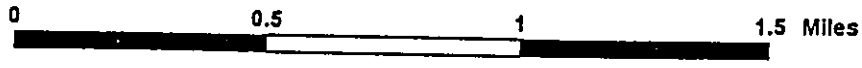


Project Region

N

0 2 4 6 Miles





Anunu Unit Fence Proposal

Appendix B

Biological Survey Information

Legally Protected and Uncommon Plant Species

Anunu Fenceline Project Area
Pu`u Maka`ala Natural Area Reserve

Species	Common Names	Status*
Cyanea tritomantha	*`Aku*	Recommended candidate for listing
Cyrtandra giffardii	*ha`iwale*	Endangered
Phyllostegia floribunda	none	Recommended candidate for listing
Phyllostegia vestita	none	Species of Concern
Phytolacca sandwicensis	pokeweed, *popolo*	Species of Concern
Sicyos alba	*anunu*	Endangered
Marattia douglasii	*pala*	Uncommon
Platydesma spathulata	*pilo kea*	Uncommon
Tetraplasandra oahuensis	*`ohe mauka*	Uncommon
Touchardia latifolia	*olona*	Uncommon
Urera glabra	*opuhe*	Uncommon

* Endangered, Species of Concern, and Recommended candidate for listing are legal terms used by the federal and state governments. Uncommon refers to the plants' general abundance, and is not a legal term.

Plant Checklist For Proposed Reallignment of Army Road in Pu'u Maka'ala N.A.R., Hi.

November 30, 1998

Surveyed by N. Agorastos

Origins

END - Endemic, native to only the Hawaiian Islands
IND - Indigenous, native to the Hawaiian Islands and elsewhere
PC - Post Contact, introduced to the Hawaiian Islands, non-native
* - Designates plant taxa under review for endangered or threatened status (candidates)

Scientific Name	Common Name(s)	Origin	Family
Centella asiatica	Asiatic pennywort, pohekula	PC	Apiaceae
Alyxia oliviformis	maile	END	Apocynaceae
Ilex anomala	kawa'u	IND	Aquifoliaceae
Cheirodendron trigynum ssp. trigynum	'olapa	END	Araliaceae
Crassocephalum crepidioides		PC	Asteraceae
Erechtites valerianifolia		PC	Asteraceae
Sadleria cyatheoides	'ama'u, ama'uma'u	END	Blechnaceae
Sadleria pallida	'ama'u-i'i	END	Blechnaceae
Clermontia montis-loa		END	Campanulaceae
Clermontia parviflora		END	Campanulaceae
Cyanea degeneriana		END	Campanulaceae
Cyanea pilosa ssp. pilosa		END	Campanulaceae
Hypericum mutilum		PC	Clusiaceae
Cibotium chamissoi	hapu'u, hapu'u-i'i	END	Cyatheaceae
Cibotium glaucum	hapu'u	END	Cyatheaceae
Carex alligata		END	Cyperaceae
Cyperus halpan		PC	Cyperaceae
Pycreus polystachyos ssp. polystachyos		IND	Cyperaceae
Rhynchospora caduca		PC	Cyperaceae
Uncinia uncinata		IND	Cyperaceae
Athyrium microphyllum	'akolea	END	Dryopteridaceae
Deparia petersenii		PC	Dryopteridaceae
Dryopteris wallichiana	lau-kahi, i'o nui	IND	Dryopteridaceae
Elaphoglossum hirtum var. micans	maku`	IND	Dryopteridaceae
Styphelia tameiameiae	pukiawe	IND	Epacridaceae
Vaccinium calycinum	'ohelo-kau-la'au	END	Ericaceae
Lotus uliginosus		PC	Fabaceae
Cyrtandra lysiosepala		END	Gesneriaceae
Cyrtandra platyphylla	'ilihia	END	Gesneriaceae
Dicranopteris linearis	uluhe	IND	Gleicheniaceae
Sticherus owhyhensis	uluhe	END	Gleicheniaceae
Broussaisia arguta	kanawao, pu'aha-nui	END	Hydrangeaceae
Crocosmia x crocosmiiflora		PC	Iridaceae
Juncus planifolius		PC	Juncaceae
Stenogyne calaminthoides		END	Lamiaceae
Astelia menziesiana	pa'iniu, kaluaha	END	Liliaceae
Dianella sandwicensis	'uki	IND	Liliaceae
Labordia hedyosmifolia	kamakahala	END	Loganiaceae
Lycopodium cernuum	wawae-'iole	IND	Lycopodiaceae
Myoporum sandwicense	naio	IND	Myoporaceae
Myrsine lessertiana	kolea	END	Myrsinaceae
Myrsine sandwicensis	kolea-lau-li'i	END	Myrsinaceae
Metrosideros polymorpha	'ohi'a, 'ohi'a-lehua	END	Myrtaceae
Psidium cattleianum	strawberry guava, waiawi	PC	Myrtaceae
Arundina graminifolia	bamboo orchid	PC	Orchidaceae
Phaius tankarvilleae		PC	Orchidaceae
Freycinetia arborea	'ie'ie	IND	Pandanaceae
Peperomia cookiana	'ala'ala-wai-nui	END	Piperaceae
Peperomia hypoleuca		END	Piperaceae
Peperomia membranacea	'ala'ala-wai-nui	END	Piperaceae
Plantago major	broad-leaved plantain, laukahi-nunui	PC	Plantaginaceae
Axonopus fissifolius	narrow-leaved carpetgrass	PC	Poaceae
Ehrharta stipoides	meadow ricegrass, pu'u-lehua	PC	Poaceae
Isachne distichophylla		END	Poaceae
Paspalum conjugatum	Hilo grass, mau'u-hilo	PC	Poaceae
Paspalum dilatatum	dallis grass	PC	Poaceae
Sacciolepis indica	Glenwood grass	PC	Poaceae
Pleopeltis thunbergiana	pakahakaha, 'ekaha-'akolea	IND	Polypodiaceae
Polypodium pellucidum		END	Polypodiaceae

Scientific Name	Common Name(s)	Origin	Family
Pteris excelsa	waimaka-nui	IND	Pteridaceae
Anemone hupehensis var. japonica		PC	Ranunculaceae
Rubus hawaiensis	'akala	END	Rosaceae
Rubus rosifolius	thimbleberry, 'ola'a	PC	Rosaceae
Coprosma ochracea	pilo	END	Rubiaceae
Coprosma pubens	pilo	END	Rubiaceae
Hedyotis centranthoides		END	Rubiaceae
Hedyotis terminalis		END	Rubiaceae
Melicope clusiifolia	alani	END	Rutaceae
Torenia asiatica		PC	Scrophulariaceae
Thelypteris stegnogrammoides		END	Thelypteridaceae
Pipturus albidus	mamaki	END	Urticaceae

Sunrise, Mt. McKinley Ansel Adams

Earthjustice
SIERRA CLUB LEGAL DEFENSE FUND, INC.
The Law Firm for the Environmental Movement

223 South King Street, 4th Fl., Honolulu, HI 96813 (808) 599-2436 FAX (808) 521-6841

February 8, 1999

Via Facsimile Transmittal (808) 974-4226

Bill Stormont, Natural Area Manager
Division of Forestry and Wildlife
P.O. Box 4849
Hilo, Hawai`i 96720-0849

Re: Pu`u Maka`ala Natural Area Reserve

Dear Bill:

Aloha! We provide the following comments on the Draft Environmental Assessment for the fence construction in the `Ānunu Unit of the Pu`u Maka`ala Natural Area Reserve. The Pu`u Maka`ala reserve is a biological and cultural treasure, which deserves special protection and management for future generations to enjoy. Ecosystem and watershed management is clearly the highest and best use of this area, and we appreciate the Division's efforts to fence the `Ānunu unit. However, the proposed fence will protect less than 3 percent of the reserve, and we are concerned about the fate of the remaining area. What is the Division's long-term plan for the reserve? Will feral pigs be maintained in unfenced portions of the NAR? How does the Division propose to avoid the inevitable degradation of this area in the absence of responsible game management and containment of these animals?

We are also concerned that, while the Division has conducted an environmental assessment of the proposed action, it has never assessed the impacts of game management (or lack thereof) on land use, natural resources, and cultural values on public and private land in the region. Several plants on the Big Island have been listed as threatened or endangered species in the last five years. Habitat that may be important to recover these plants was recently identified, and critical habitat designation is currently being considered. The presence of introduced mammals is one of the most significant impediments to maintaining native Hawaiian ecosystems. It is entirely appropriate for the Division to step back and assess the impacts of its game management and hunting program on these plants and the ecosystems on which they depend. The Division's failure to segregate incompatible uses on public land will result in further degradation of native ecosystems, species declines, and conflict between interest groups. Notwithstanding these concerns, we offer the following comments in support of the proposed action.

The proposed action will increase the protection of native ecosystems and watershed, and will enhance the likelihood of recovering endangered species in the region. The general area has been identified as potential important habitat for the recovery of endangered plants.[1] The proposed action is consistent with necessary recovery actions for endangered plants in the area:[2]

- ◊ *Consider eradication* program for control of ungulates
- ◊ Construct and maintain fences, wherever possible
- ◊ Conduct alien plant control
- ◊ Expand existing wild populations, and create new populations within historic range, as necessary

The proposed action will benefit endangered forest birds. The general area includes relatively intact native forest and essential habitat identified by the United States Fish and Wildlife Service for four endangered forest birds: Hawai`i `ākepa, Hawai`i creeper, `akiapōlā`au, and `ō`ū.[3] We are particularly concerned about the presence of feral pigs, mosquitoes, and avian diseases in Hawaiian natural areas. The proposed action is consistent with necessary recovery actions for endangered forest birds on Hawai`i:[4]

- ◊ Preserve habitat for endangered forest birds, and reduce effects of factors limiting forest bird use of habitat
- ◊ Apply prescribed management practices in areas of essential habitat
- ◊ Reduce feral pig populations in essential habitat and adjacent areas
- ◊ Reduce breeding sites for mosquitoes in areas adjacent to and within essential habitat
- ◊ Reduce breeding sites for *Culex* in essential habitat and adjacent areas; and
- ◊ Create a habitat mosaic in historic range of upper montane koa forest so as to guarantee long-term survival of this essential habitat

---

[1] Draft Recovery Plan for the Multi-Island Plants, September 1998.
[2] Recovery Plan for the Big Island Plant Cluster, September 1996; Big Island II: Addendum to the Recovery Plan for the Big Island Plant Cluster, May 1998.
[3] Hawai`i Forest Bird Recovery Plan, 1983.
[4] Hawai`i Forest Bird Recovery Plan, 1983.

The proposed action is consistent with State's program for threatened and endangered plants and animals:[5]

- ◊ Protect, manage, develop, and maintain existing and future habitats to improve condition, long-range viability
- ◊ Control noxious animals (herbivores) damaging to habitat
- ◊ Control noxious plants (exotics) damaging to habitat

The proposed action is consistent with the actions necessary to reverse Hawai`i's extinction crisis, as identified by the United States Fish and Wildlife Service, Hawai`i Department of Land and Natural Resources, and The Nature Conservancy of Hawai`i:[6]

- ◊ Protect essential habitat for native species
- ◊ Fund active, long-term stewardship of essential habitats in publicly owned natural areas, National Parks and Refuges, State Forest Reserves, Natural Area Reserves, and Sanctuaries
- ◊ Further integrate government and private citizen conservation efforts

Fencing and actively managing the reserve for native Hawaiian species and ecosystems are also consistent with the Natural Areas Working Group's guiding principle that some areas on the Big Island be managed for few or no pigs/ungulates so native ecosystems can thrive, and that other areas be managed for game animals so hunting opportunities are enhanced.[7] We are happy to see support for the proposed action by the Upper Puna/Volcano Regional Forest Management Advisory Council. Unless intact native ecosystems and essential habitat are secured, captive breeding of birds and plant propagation efforts are pointless.

Mahalo for considering our comments.

Sincerely,

Marjorie

Marjorie Ziegler

cc: Tim Johns

---

[5] Threatened & Endangered Species Plan for Wildlife, Plants & Invertebrates, 1988.
[6] Hawai`i Extinction Crisis: A Call to Action, 1992.
[7] Report & Recommendations of the Natural Areas Working Group (NAWG), March 31, 1995.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: MR

FEB - 5 1999

Mr. Bill Stormont,
Natural Area Manager
Division of Forestry and Wildlife
P.O. Box 4849
Hilo, HI 96720-9849

Re: Draft Environmental Assessment for Fence Construction, Anunu Unit, Pu'u Maka'ala Natural Area Reserve, Hawaii Island, Hawaii

Dear Mr. Stormont:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (DEA) for Fence Construction, Anunu Unit, Pu'u, Maka'ala Natural Area Reserve (NAR), Hawaii Island, Hawaii. The project sponsor is Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife. The proposed project involves erecting approximately 16,700 feet of galvanized metal fencing in the NAR to exclude feral pigs from 290 acres of sensitive native plant and bird habitat. The materials to be used for fence construction will include 39-inch hog wire and one strand of barbed wire along the bottom. The exclosure fence will be located along existing four-wheel drive roads and through a portion of undisturbed forest. The Service offers the following comments for your consideration.

The Service believes the DEA adequately describes the scope of the proposed project and identifies the existing resources involved. The DEA also sufficiently analyzes reasonable alternatives to the preferred action and evaluates their anticipated impacts to plant and wildlife resources. The Service believes the least damaging practicable alternative has been selected as the preferred action and significant adverse impacts to plant and wildlife resources are not expected. However, we recommend that potential impacts be minimized by requiring fence construction and maintenance personnel to scrub/clean their footwear prior to entering the project site to prevent the introduction of alien plant seeds. Also, we recommend the exclosure fence be checked during the life of the enclosure to ensure it remains structurally sound. Provided the foregoing recommendations are incorporated into the proposed project, the Service would concur with a Finding of No Significant Impact (FONSI) for the project.

The Service appreciates the opportunity to comment on the DEA. If you have any questions regarding these comments, please contact Fish and Wildlife Biologist Mike Richardson by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,

Barbara A. Maxfield, acting

Robert P. Smith
Pacific Islands Manager

Stephen K. Yamashiro
Mayor

Virginia Goldstein
Director

Russell Kokubun
Deputy Director

County of Hawaii

PLANNING DEPARTMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8288 • Fax (808) 961-8742

January 13, 1999

Mr. William Stormont
Natural Area Manager
Division of Forestry and Wildlife
Department of Land and Natural Resources
P.O. Box 4849
Hilo, HI 96720-0849

Dear Mr. Stormont:

Draft Environmental Assessment for Fence Construction, Anunu Unit
Pu'u Maka'ala Natural Area Reserve
TMK: 1-8-12: Portion of 3; Ola'a, Puna, Hawaii

Thank you for your letter dated December 30, 1998, requesting our review and comment upon the above-described draft environmental assessment (DEA). We have completed our review and have the following comment to offer.

The project site is situated within an area designated as "Conservation" by the State Land Use Commission. The County of Hawaii has not applied a zoning designation to the project site. Therefore, we defer all land use authority to the **Department of Land and Natural Resources.**

We have no objections to the proposed fencing project. However, we are aware of the vocal local opposition to such types of feral pig control. While the DEA states that the surrounding 30,000 acres will remain available to public hunting, we are concerned about the cumulative impacts the total feral pig control program will have upon public hunting areas. The DEA should provide a brief discussion of the State's comprehensive feral pig control program in order to gain a perspective of how this project, one of possibly many projects, will co-exist with on-going use of the surrounding areas for public hunting.

Thank you for allowing our office to comment. Please contact staff planner Daryn Arai should you have any questions.

Sincerely,

VIRGINIA GOLDSTEIN
Planning Director

DSA:gp
f:\wp60\Ch343\1999\LMakaa01.dsa

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

Ref:PB:THE

File: CDUP SW-672

FEB -9 1999

MEMORANDUM

TO: Bill Stormont, Natural Area Manager
Division of Forestry and Wildlife (Hilo)

FROM: Tom Eisen, Planner Tom Eisen
Planning Branch, Land Division

SUBJECT: Draft Environmental Assessment (EA) for Fence Construction, Anunu Unit, Pu'u Maka'ala Natural Area Reserve

Our Planning Branch has reviewed the subject draft EA, and has the following comments.

We understand the project appears to enjoy a broad base of consensual support, and we hope that you will be able to implement your preferred alternative and thereby protect the high-quality native ecosystem in this area.

We additionally note that, although the draft EA was generally quite informative, it did not include a list of all permits and approvals required, pursuant to the EA content requirements listed in Section 11-200-10, Hawaii Administrative Rules (HAR). To assist you in fulfilling this requirement, especially as it relates a Conservation District Use Permit (CDUP), we would like to note that in 1975, the Board approved CDUP SW-672 for state-wide fence construction and maintenance within State Forest Reserves. Therefore, a separate CDUP is not required for the currently proposed project. A copy of a relevent DOFAW memorandum is attached for your information and use. References to the "old" Rule 4 should now be directed to the standard conditions detailed in Section 13-5-42, HAR.

Please contact our office at 587-0386 should you have any further questions.

Attachment

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 974-4221
FAX (808) 974-4226

March 2, 1999

Earthjustice Legal Defense Fund, Inc.
223 South King Street, 4th Floor
Honolulu, HI 96813
Attn: Marjorie Ziegler

RE: Draft Environmental Assessment, Fence Construction, Anunu Unit
Pu`u Maka`ala Natural Area Reserve, Ola`a, Puna, Hawaii.

Aloha Marjorie!

Thanks for your thoughtful and thorough review and comments on the subject Draft Environmental Assessment. We are pleased you find favor with the proposed project.

In your comments you raise several questions regarding management of larger portions of the Reserve, and about the impacts of game mammals on the island. Our plans remain the same. We will continue to do what we can in fencing and animal control with the pittance we receive in funding, and work hard to ensure this work is planned through an open, community- and information-based decision making process. Funding is critically low, and the collaborative process is painfully slow. We do the best we can to play the hand we are dealt.

I have forwarded a copy of your letter to Jon Giffin for his consideration regarding your questions on the status of an environmental assessment for the game management program on the Big Island. I welcome you to call or write him to discuss this issue.

Once again, thanks for your review and comments.

Aloha,

WILLIAM T. STORMONT
Natural Area Manager

c: Jon Giffin

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 974-4221
FAX (808) 974-4226

March 1, 1999

Mr. Robert Smith
Pacific Islands Manager
U.S. Fish and Wildlife Service
P.O. Box 50088
Honolulu, HI 96850

RE: Draft Environmental Assessment, Fence Construction, Anunu Unit
Pu`u Maka`ala Natural Area Reserve, Ola`a, Puna, Hawaii.

Dear Mr. Smith:

Thank you for your comments on the subject Draft Environmental Assessment and your endorsement of the project. We do take to heart your comments regarding the sanitization of workers footwear and equipment on projects such as this, and already work to ensure these potential accidental introductions are kept to a minimum. Additionally, we work hard to inspect our fences monthly, providing ample opportunity to ensure incipient weed populations are dealt with quickly and surely.

I'd also like to thank you, on behalf of the Upper Puna Volcano RFMAC, for the support your office has provided the Council, including staff participation, technical support, and most recently, funding for the Anunu Unit fence materials. This assistance and support comes, as you know, at a most opportune time, and it is much appreciated.

Once again, thanks for your comments and support of these efforts..

Aloha,

W.T. S

WILLIAM T. STORMONT
Natural Area Manager

c: Upper Puna Volcano RFMAC Members

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 974-4221
FAX (808) 974-4226

March 1, 1999

Ms. Virginia Goldstein
Planning Director
County of Hawaii
25 Aupuni Street
Hilo, HI 96720

Dear Ms. Goldstein:

Draft Environmental Assessment for Fence Construction, Anunu Unit
Pu`u Maka`ala Natural Area Reserve
TMK: 1-8-12: Portion of 3; Ola`a, Puna, Hawai`i

Thank you for your letter dated January 13, 1999 in response to our request for comments on the subject Draft Environmental Assessment.

Regarding your comments expressing concern over the "cumulative impacts" of feral pig control efforts in the area upon public hunting areas, we respond that we are, frankly, far more concerned with the cumulative impacts of feral pigs on native ecosystems than we are with the loss of 290 acres of available public hunting area. The Natural Area Reserve System was established to protect unique Hawaiian ecosystems, not ensure public hunting. The adjacent, available public hunting lands represent a bucket, of which this 290 acres is but a drop.

Additionally, as the DEA mentions, we have developed a community-based group to discuss and sort through the issues surrounding use of public land in the region, the Upper Puna Volcano Regional Forest Management Advisory Council. Your current Deputy Director, Russell Kokubun, is a former participant. Recently his plate has gotten fuller, rendering his participation difficult. We welcome your Departments participation in the Council, however, so that the county may be involved and see that we are indeed working to try to ensure the hunting community is involved in these decisions. Our next Council field trip is scheduled for Sunday, March 7, and our next scheduled meeting is March 31. Please join us. Feel free to contact me for details if you'd like.

Once again, thank you for your comments. If there are any further thoughts or comments, please feel free to call.

Aloha,

WILLIAM T. STORMONT
Natural Area Manager

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
P.O. BOX 4849
HILO, HAWAII 96720
(808) 974-4221
FAX (808) 974-4226

March 2, 1999

Mr. Tom Eisen
Land Division
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Eisen:

Draft Environmental Assessment, Fence Construction, Anunu Unit
Pu`u Maka`ala Natural Area Reserve, Ola`a, Puna, Hawaii.

Thank you for your comments on the subject Draft Environmental Assessment. We note that we did not include the "trail" the approval process for this project follows, and will indeed add to the Final EA a description of other permits required. That path includes the issuing of a Finding of No Significant Impact (FONSI), and subsequently a board submittal for approval by the Board of Land and Natural Resources.

Once again, thank you for your comments.

Aloha,

WILLIAM T. STORMONT
Natural Area Manager