

PROPOSAL FOR THE EXTENSION OF PU`U MAKA`ALA  
NATURAL AREA RESERVE

I EXECUTIVE SUMMARY

Approximately 342.24 undeveloped acres north of the former Kūlani Correctional Facility, TMK (3) 2-4-08:09, are proposed for inclusion in the State of Hawai`i Natural Area Reserve System (NARS). Extending the Pu`u Maka`ala NAR would afford long-term protection to restoration areas that provide habitat for endangered forest birds and plants.

II INTRODUCTION (General)

In November 2010, an approximately 6,600-acre portion of forested and undeveloped land near the former Kūlani Correctional Facility (KCF), in the South Hilo district of Hawai`i, was designated part of the Pu`u Maka`ala Natural Area Reserve. This proposal nominates an additional adjacent area that also provides important habitat for endangered species. This tract of land contains open areas for viewing rare native birds. NARS rules permit, among other activities, “Hiking and nature study of group size of ten or less are permitted except where restricted pursuant to sections 13-209-4.5 and 13-209-4.6.”

While this area was formerly used as a pasture, it is reforesting after ungulates were removed in 2005 and contains montane wet ecosystems. Federal Critical Habitat is designated for seven plant species within the parcel, and the proposed extension is part of a corridor of high elevation native forest that provides habitat for the endangered Hawaiian Goose, nēnē, (*Nesochen sandwichensis*), Hawaiian bat, `ope`ape`a, (*Lasiurus semotus cinereus*), Hawai`i creeper (*Oreomystis mana*), Hawai`i `akepa (*Loxops coccineus*), `akiapōlā`au (*Hemignathus munroi*), Hawaiian dark rumped petrel (*Pterodroma phaeopygia sandwichensis*), and band-rumped storm petrel (*Oceanodroma castro*) (Candidate) (OKP, 1999).

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) and the Three Mountain Alliance have partnered with the Kūlani Correctional Facility to co-manage this area on a landscape scale to protect the rare species and important natural habitats that span property boundaries.

III BACKGROUND AND HISTORY

*Past and Present Land Use*

The southern section of the Kūlani Correctional Facility (KCF) was established as the Upper Ola`a Forest Reserve in 1913, and the northern sections were proclaimed the Upper Waiākea Forest Reserve in 1923. In 1948, Executive Order (EO) 1224 withdrew 5,600 acres of the Upper Waiākea and Upper Ola`a Forest Reserves to be set aside as the Kūlani Prison Farm (EO 1225) under the control and management of the then-Department of Institutions. EO 1588 set aside an additional 2300.27 acres of Upper Waiākea Forest Reserve to add to the Prison Farm in 1953. In 1981, EO 3092 withdrew

656 acres of the southernmost part of the prison set aside that surrounds Kūlani cone to become part of the Pu`u Maka`ala Natural Area Reserve.

The 7,244.27-acre KCF began in 1946 and grew to include a 200-bed facility. For years, approximately 900 acres of the parcel were used as pastures for cattle grazing and a piggery for job training in agricultural industries. The general public had restricted access to this area as part of the management of the Correctional Facility.

The Department of Public Safety and the DLNR – Division of Forestry and Wildlife joined the Ola`a- Kīlauea Partnership in 1994 by signing a Memorandum of Understanding. In 2007, that partnership expanded to become the Three Mountain Alliance (TMA). TMA works through partnering to expand watershed protection and management to over one million acres across the volcanoes of Mauna Loa, Kīlauea and Hualālai, thus making it the largest cooperative land management effort in the state of Hawai`i. Three Mountain Alliance and the Department of Public Safety have implemented conservation projects to successfully protect Kūlani from ungulates and have worked to control invasive plant species. This includes fencing the entire Kūlani parcel combined with units in the Pu`u Maka`ala NAR and vicinity.

Beginning in 1994, the Department of Public Safety provided important in-kind support for TMA projects by providing staff and inmate assistance with critical conservation activities. TMA and NARS work at Kūlani included fence maintenance, pig control, weed control, native habitat restoration, and providing work training to Kūlani inmates. Management success has already been demonstrated with koa and `ōhi`a forest restoration occurring in areas relieved from feral ungulate pressure and the removal of domestic cattle from former pastures in 2005.

In July 2009, the Department of Public Safety announced the closing of the correctional facility and a proposal with the State Department of Defense (DOD) to create a Youth Challenge Academy (YCA) in the facility, run by the Hawai`i National Guard. In November 2010, an approximately 600-acre tract of land that contained the facility was set aside as a YCA by then-Governor Lingle, however in 2011 the Senate cancelled that set aside and related easements through Senate Concurrent Resolution 14. DOFAW was granted a management right-of-entry for the remaining 342.24 acres, among other actions.

#### *Cultural/Recreational Uses*

The State Historical Preservation Division noted in 1998 that there were no known records of archeological surveys in this area, and predicted that few sites would be found in the forested area which is well inland of the zone of pre-contact Hawaiian permanent settlement (OKP, 1998).

In 2004, a cultural study of the Pu`u Maka`ala Natural Area Reserve was conducted for the NARS. This study included cultural information on uses, beliefs, etc that also could apply to Kūlani, such as:

Kū-ka-‘ōhi‘a-Laka, is a defied guardian of the ‘ōhi‘a growth of ‘Ōla‘a; Ua-kuahine, is the body form of a goddess of the rains in ‘Ōla‘a; and Kū-lili-ka-ua is the god of the thick mists that envelop the forests of the upper Puna.

(Kumu Pono Associates, 2004)

This cultural study also documents traditional accounts, bird catching practices, visitor descriptions from the historical period, land tenure documents, surveys and government communications about this area and may be found at:

<http://dlnr.hawaii.gov/ecosystems/nars/reserves/hawaii-island/puu-makaala/>

#### *Previous Studies*

This area has been surveyed for biological resources including vegetation and endangered plant species, forest bird populations, avian diseases, yellowjacket wasps, and alien plant and ungulate levels. More information may be found in the Long Range Management Plan for the Reserve, available at the above link.

## IV JUSTIFICATION (Specifics)

#### *Scientific Value*

Kūlani provides a study site to test the effectiveness of management activities such as outplanting, invasive weed control and predator control in areas protected from ungulates. This area also may serve as a test site to determine native regeneration in areas previously used as pasture.

#### *Representativeness*

Protecting additional areas of forest bird habitat is a major justification for designating this area as a NAR. The ecosystems of Kūlani are important for the representation of forest bird habitat, especially as climate change is forecasted to increase disease vector ranges. Kūlani has some of the highest densities of native forest birds areas on the island and is very important as most of the area is above 5,000 feet, where climate restricts mosquitoes and development of malarial parasites (US DOI, 2006). This area has been designated an “Important Bird Area” by the Audubon society, as one of the most important remaining concentrations of endemic Hawaiian birds, including populations of four species that are endemic to Hawai`i Island and are listed under the U.S. Endangered Species Act (National Audubon Society, 2009). This area is also a potential `alalā release site.

Researchers have documented various soil microarthropods, damselflies (*Megalagrion*), picture wing (*Drosophila*) flies, and common *Succenia* tree snails. Lava tubes may harbor additional undocumented invertebrates (OKP, 1999).

### *Natural Communities and their Status*

Large areas of native trees remain in some of the former pasture areas, and with cattle removal in 2005, regeneration of native forest is already occurring. This is an ongoing restoration site as the areas are surrounded by high-quality native forest.

### *Rarity*

Federal Critical Habitat is designated for seven species of plants in Kūlani. This area is also within the current ranges and Recovery Area for the Hawai`i creeper, `akiapōlā`au, and the Hawai`i `akepa (USFWS, 2006). The NAR has been identified as a priority site for `alala release. This area is adjacent to potential release sites. Addition to NAR would facilitate future `alala release efforts and provide additional protected habitat for this highly endangered species.

### *Biological/Ecological Design*

The boundaries of this proposed NAR are meant to extend the current Pu`u Maka`ala NAR into areas that demonstrate the ability of disturbed areas to reforest after ungulate removal. With reforestation, this area provides a habitat corridor for high densities of forest birds, and unique endangered plant species. This will allow the Pu`u Maka`ala NAR to be more defensible as a larger contiguous area is designated and managed for long-term ecosystem preservation.

### *Location and Size*

The area is approximately 342.24 acres within the area formerly set aside to the DOD (approximately 622 acres), however only undeveloped and reforesting portions of the property are proposed as a NAR extension. The NAR proposal does not include the developed site of the facility. The area is identified by TMK (3) 2-4-08:09, and is approximately 1.5 miles long and 0.5 miles wide. The elevational gradient is from approximately 5,100 ft elevation to 5,800 ft.

To the south is the developed area of the facility. The Pu`u Maka`ala NAR almost entirely surrounds the proposed extension. Stainback Highway accesses the parcel, and terminates in the prison facility. An unpaved road goes north from the facility that bisects the proposed NAR, and other unpaved roads and fencelines follow other sections of the boundaries of the proposed NAR extension.

### *Threats (Human/Biological)*

Grazing cattle in this area in the future or other land uses inconsistent with conservation is a major threat. While the area is fenced and pig free, mouflon sheep and goats may be a threat as their numbers increase in the State lands to the north (OKP, 2003). Pigs are still a threat to the area if fences are not regularly maintained as high populations of pigs occur in Forest Reserve lands to the east.

The TMA has identified the following high priority weeds for the entire partnership area: miconia (*Miconia calvescens*), firetree (*Morella faya*), banana poka (*Passiflora tarminiana*), yellow Himalayan raspberry (*Rubus ellipticus*), and strawberry guava (*Psidium cattleianum*). The NAR is also threatened by palm grass (*Setaria*

*palmaefolia*), blackberry (*Rubus argutus*), kāhili ginger (*Hecyichium gardnerianum*) and clidemia (*Clidemia hirta*), and Firetree (*Myrica Faya*) as priority weed threats. Recovering native species will compete with the established pasture grasses present in the area. Invertebrates are threatened by the yellowjacket wasp and extermination of plant species that are specifically needed to complete their life cycle (OKP, 2003).

Studies of bird populations since 1977 have shown that at least five native birds (ʻakiapōlāʻau , creeper, ʻelepaio, ʻomaʻo and iʻiwi) in this area may be declining in occurrence and/or density (Gorresen *et al*, 2005). ʻAkepa trends were variable, which may leave a downward trend undetected (Gorresen *at al*, 2005). ʻAmakihi and ʻapapane were the only birds that showed increasing or stable trends in this area (Gorreson, *et al*, 2005). Native forest birds are threatened by mosquitoes (*Culex quinquefasciatus*) which transmit avian malaria and pox, and increases in the density and impacts of predator populations, particularly rats (*Rattus rattus*, *R. exulans*) (OKP, 2003). Small mammal predators also are threats to native plants, as they devour seeds and seedlings. Habitat degradation as well as the loss of genetic diversity also cause the decline of these birds. Observed birds such as the Japanese white-eye (*Zosterops japonicus*) and redbilled leiothrix (*Leiothrix lutea*) may also compete, spread invasive species, and act as disease reservoirs. The Japanese bush warbler (*Cettia diphone*) is present nearby in Waiākea but has not been recorded in Kūlani (Gorreson *et al*, 2005). Non-native forest birds exhibited declines in occurrence/and or density in Kūlani since 1977 (Gorreson *et al*, 2005).

#### *Present Level of Protection*

Development is regulated by the rules of the State Conservation District (in the General and Resource Subzones) as well as State and Federal endangered species rules.

In Kūlani, conservation management activities have been ongoing since 1992, and it currently has one of the highest levels of management protection in Hawaiʻi. The inclusion of this area in the Olaʻa-Kīlauea Partnership, which later became the Three Mountain Alliance, resulted in a major increase in conservation activities in this area, as Kūlani is in the core of the partnership. However, TMA members are bound by a Memorandum of Understanding that is voluntary and can be terminated at any time.

NAR designation would best allow partners to follow through on the current path to protect this recovering forest and the endangered species that it sustains.

#### *Long-term Ecological Viability*

While this area was formerly pasture, the complete fencing and ongoing management of the area greatly increases the long-term viability of this forest. There has been extensive native forest recovery in the area since cattle were removed in 2005. Surrounding areas have high habitat quality and will aid in the restoration of the area as native seeds spread naturally in the property. Additionally, the presence of the Three Mountain Alliance and the management efforts on adjacent lands will also benefit Kūlani. However, without binding commitments for continued access and management capabilities, the future of this area is uncertain.

#### *Environmental Consequences of No Action/Urgency*

The environmental consequences of no action would be to lose an opportunity to designate an important conservation area during a key time of transition. Environmental consequences of no action would mean less long-term management protection and future hurdles to implement proactive conservation projects such as active efforts to increase existing populations of endangered species.

## V. MANAGEMENT NEEDS

### *Threats Requiring Management*

Management needs include:

- Fence and infrastructure maintenance.
- Maintenance of ungulate-free management units.
- Weed control.
- Predator (e.g. small mammals and predatory non-native invertebrates) control.
- Native habitat restoration, natural and managed (including monitoring of rare species).
- Continue vocational training: Horticulture program/greenhouse, native species restoration.

A Long Range Management Plan was completed for the Reserve in September 2013, available at: <http://dlnr.hawaii.gov/ecosystems/nars/reserves/hawaii-island/puu-makaala/>

## VI. PUBLIC OUTREACH

### *Agencies, Organizations, and Individuals Notified*

The Natural Area Reserves System Commission recommended this extension during its public meeting on May 5, 2010. The Board of Land and Natural Resources approved a request to conduct a public hearing on January 13, 2012.

### **FEDERAL AGENCIES**

US Fish & Wildlife Service

US Geological Survey

US National Park System - Hawaii Volcanoes National Park

### **STATE AGENCIES**

Office of Hawaiian Affairs

Senator Gilbert Kahele

Senator Josh Green

Representative Richard Onishi

Representative Richard Creagan

Governor Neil Abercrombie

Department of Public Safety

### **COUNTY**

Office of the Mayor

Councilmember J Yoshimoto  
Councilmember Brenda Ford  
Game Management Advisory Commission

## **ORGANIZATIONS**

Three Mountains Alliance Watershed Partnership  
Sierra Club  
Conservation Council of Hawaii  
The Nature Conservancy of Hawaii  
Hawaii Audubon Society  
Hawaii Conservation Alliance  
Hawaiian Botanical Society  
Association of Hawaiian Civic Clubs  
Plant Extinction Prevention Program  
Aha Kiole Council  
Yee Hop Ltd.  
Kamehameha Schools

## **VII. BIBLIOGRAPHY/REFERENCES**

Atkinson, C.T., K.L. Woods, R.J. Dusek, L.S. Sileo and W.M. Iko. 1995. Wildlife disease and conservation in Hawai'i: Pathogenicity of avian malaria (*Plasmodium relictum*) in experimentally infected i'iwi (*Vestiaria coccinea*). Parasitology (111):S59-S69.

LaPointe, D.A. Distribution and disease vector potential of mosquitoes in Hawaiian forest bird habitat. Final Report to National Biological Service, Pacific Islands Science Center. 1996.

Lease, J.K., R.J. Dusek, and C.T. Atkinson. 1996. Feral pig control is effective in reducing mosquito populations. Hawai'i Conservation Conference 1996 Poster.

National Audubon Society 2009. Important Bird Areas in the U.S.  
Available at <http://www.audubon.org/bird/iba> 08/2009

U.S. Dept of the Interior, US Geological Survey. 2006. *A Gap Analysis of Hawai'i*, Final Report.  
<http://higap.org>

Division of Forestry and Wildlife (DOFAW) 2009. DOFAW Management Guidelines. Accessed on August 12, 2009 from: <http://Hawai'i.gov/dlnr/dofaw/guidelines>.

U.S. Fish and Wildlife Service (USFWS), 2006. Revised Recovery Plan for Hawaiian Forest Birds. Region 1, USFWS. Portland, OR

Ecoregional Planning Team, The Nature Conservancy Hawai'i. 2006. *An Ecoregional Assessment of Biodiversity Conservation for the Hawaiian High Islands*.  
<http://www.Hawai'iecoregionplan.info/home.html>

Division of Forestry and Wildlife, 1989. Management Plan for the Pu'u Maka'ala Natural Area Reserve. Accessed on August 12, 2009 at: <http://Hawai'i.gov/dlnr/dofaw/nars/reserves/big-island/Pu'uMaka'alamp.PDF>

Kumu Pono Associates, 2004. He Moolelo Aina: A Cultural Study of Pu`u Maka`ala Natural Area Reserve, Districts of Hilo and Puna, Island of Hawai`i. Accessible at:

<http://Hawai`i.gov/dlnr/dofaw/nars/reserves/big-island/Pu`uMaka`ala>

Gorresen, M., R. Camp, T. Pratt, B. Woodworth. 2005. Status of Forest Birds in the Central Windward Region of Hawai`i Island: Population Trends and Power Analyses: U.S. Geological Survey, Biological Resources Discipline, Open-File Report 2005-1141, 81 p.

Hawai`i National Guard (HING), 2009. About Us: Hawai`i National Guard Youth Challenge Program. Accessed on August 13, 2009 at <http://www.ngycp.org/site/state/hi/node/2262>

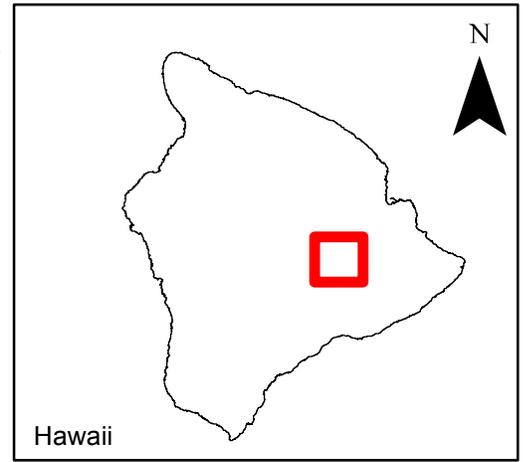
Olaa-Kīlauea Partnership (OKP), 2003. Olaa Kīlauea Accomplishments Report at Kūlani Correctional Facility.

Olaa-Kīlauea Partnership (OKP), 1999. Final Environmental Assessment for the Olaa Kīlauea Management Area Natural Resources Management Plan. Published in the July 23, 1999 *OEQC Bulletin*. Accessible at: [http://oeqc.doh.Hawai`i.gov/Shared%20Documents/EA\\_and\\_EIS\\_Online\\_Library/Hawai`i/1990s/1999-07-23-HA-FEA-OLAA-KĪLAUEA-MANAGEMENT-AREA.pdf](http://oeqc.doh.Hawai`i.gov/Shared%20Documents/EA_and_EIS_Online_Library/Hawai`i/1990s/1999-07-23-HA-FEA-OLAA-KĪLAUEA-MANAGEMENT-AREA.pdf)

Mitchell, C, C Ogura, DW Meadows, A Kane, L Strommer, S Fretz, D Leonard, and A McClung. October 2005. *Hawai`i's Comprehensive Wildlife Conservation Strategy*. Department of Land and Natural Resources. Honolulu, H. 722pp.



# Proposed Puu Makaala Natural Area Reserve Extension



-  Stainback Highway
-  Proposed NAR Extension
-  Puu Makaala NAR
-  Area Excluded from NAR (Facility)

