

# PROPOSAL FOR THE KALUANUI NATURAL AREA RESERVE

June 2012

## I EXECUTIVE SUMMARY

The *mauka* (upland) portion of Sacred Falls State Park, on the island of Oʻahu, is proposed for inclusion in the State of Hawaiʻi Natural Area Reserve System (NARS). This area does not include the Sacred Falls trail and will not affect the closed status of that trail. The Kaluanui NAR will contain unique lowland wet ecosystems in the windward Koʻolau mountains, including a stream with outstanding biodiversity.

## II INTRODUCTION (General)

This Reserve would include an area of approximately 376 acres of the Kaluanui valley *mauka* of Kaliuwaʻa falls (Sacred Falls) up to and over the Koʻolau crest in the Koʻolauloa and Waialua districts, in portion of TMK 5-3-001:009 (See attached map).

Kaluanui stream is very biologically rich as one of the few unaltered streams on Oʻahu, and contains the full assortment of native fishes. The proposed NAR contains ʻōhiʻa and uluhe-dominated forests (US Dept. of Interior, 2006).

The inclusion of this area into the NARS would increase the representation of Oʻahu's lowland wet and wet cliff ecosystems which are found in only tiny sections of existing Oʻahu Reserves (Ecoregional Planning Team, TNC, 2006).

There are records of twenty-two endangered, candidate, or species of concern in the area (See Appendix 1). The proposed Reserve falls within Federally designated Critical Habitat for twelve plant species.

Geologically, this area is a steep amphitheater-headed valley. Four small tributaries feed Kaluanui stream. From the headwaters, the valley becomes much steeper around the 487m (1600ft) elevation, where a series of large waterfalls begin, which is the *makai* (lowest elevation) boundary of the proposed Reserve.

## III BACKGROUND AND HISTORY

### *Past Land Use and Conservation History*

While the lower section of Kaluanui valley outside of the proposed Reserve has many archeological signs of inhabitation and cultivation from pre-European times, there is little evidence of use *mauka* of Kaliuwaʻa falls (Yent, et al. 1981).

The Castle Trail which leads through the area was blazed in 1906, which was extended throughout the summit in the 1930s (Ball, 2000).

The State acquired the park from Bishop Estate in 1977 after proposed private development plans led to the Legislature appropriating funds for the acquisition.

Since the designation of the park, the area has been monitored by various scientists from DLNR, as well as the U.S. Army's Natural Resources Program, Bishop Museum, and other conservation and data-collection entities. In 1990 the Hawaiʻi Stream Assessment ranked Kaluanui an "Outstanding" stream, and following in 1998, was nominated by the Multi-Attribute Prioritization of Streams as a Potential Heritage Stream (Hawaiʻi Watershed Atlas, 2008). In 1999, after a fatal rockslide in the lower section, the

park became closed. Subsequently, the Division of State Parks has involved the community as well as contracted Oceanit Laboratories to assess the risks and to plan for the future of the park.

Recently, portions of the very southernmost tip at the Ko'olau crest have been fenced to remove feral pigs as part of the U.S. Army's Natural Resources Program's Pe'ahināi'a and Helemano Enclosures. These adjacent enclosures, which together enclose an area of 275 acres, cover approximately 64 acres of State Park land.

#### *Present Land Use and Access*

State Parks has conducted a community planning process for the Park, which has focused mainly on the lower section of the park. However the Kaluanui Master Plan recommends that the "DLNR and community designate a large portion of the park a NAR" (Oceanit, 2004, p. 15).

Access to all areas of Sacred Falls State Park is closed to the general public. Access to the proposed Reserve requires at the minimum a five-mile round-trip hike and an elevation gain of 2,200 ft through various unofficial, unmaintained, long, and difficult trails. These accesses require landowner permission as they traverse private property.

#### *Cultural/Recreational Uses*

This area contains plants and animals that Hawaiians traditionally collect for practical, medicinal, decorative, and spiritual uses (Gutmanis, 1979, Krohn, 1978). Some of these plants and animals are considered sacred to certain gods or because they are associated with cultural practices (Kanahele, 1986). Preservation of these species is essential to the continuation of traditional Hawaiian cultural practice.

Lower in the valley, outside of the proposed Reserve is Sacred Falls or Kaliuwa`a. The Kaliuwa`a chute is legendary as originating from Kamapua`a, who leaned on the side of the valley to escape from Olopana, the King of O`ahu.

Currently, some intrepid hikers visit this area. As this area is not part of a hunting unit, no information is known about poaching in the park above the falls.

#### *Previous Studies*

Kaluanui stream has been surveyed at least a dozen times since 1929; however most have sampled the lower reaches of the stream outside the NAR boundary (Parham et. al., 2008).

Biological and archeological survey efforts for the Division of State Parks have focused on the lower section of the park. However, botanical surveys over the years have located various rare plant and snail population data, which is listed in Appendix 1. Ko'olau Mountains Watershed Partnership has obtained high resolution aerial mapping of the area, which aids in determining invasive species populations.

## IV JUSTIFICATION (Specifics)

#### *Scientific Value*

Kaluanui is scientifically significant for its perennial undiverted stream, and largely intact lowland wet forests and cliffs, which contain rare plant, damselfly, and snail populations. Preservation of these biological resources will allow future generations to study and learn

about a native Hawaiian ecosystem in the windward Ko`olau mountains.

### *Representativeness*

Kaluanui NAR represents a windward Ko`olau mountain stream and forest ecosystem. Hawai`i Revised Statutes Chapter 195 established the NARS “to preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawai`i.” Currently, no NARS exist in the Ko`olau mountains, however an area on the leeward Ko`olau Mountains, named Poamoho has also been nominated as a NAR.

The current and proposed O`ahu NARS do not contain the stream resources and many of the rare plant and snail species found in the proposed Kaluanui NAR.

### *Natural Communities and their Status*

Lower portions of the proposed reserve have been invaded by *Psidium cattleianum* (Strawberry Guava), which thins out further *mauka* and is only occasionally seen as individual trees at the Ko`olau crest. *Clidemia hirta* is also prevalent in the lower sections, especially near the stream bed, and can be found throughout the proposed Reserve. Despite these major threats, as well as the threats posed by less established alien species, a relatively intact native ecosystem remains, especially in the *mauka* regions.

The lower and middle reaches of Kaluanui stream have been invaded by 23 recorded alien aquatic species. However, only one – *Macrobrachium lar* (Tahitian prawn) has been recorded in the upper reaches of the stream, and none from the headwaters (Parham et. al, 2008). It is likely that waterfalls such as Kaliuwa`a act as natural barriers to the spread of many of these non-native species.

### *Rarity*

Appendix 1 lists the 22 rare plant and invertebrate species that have been recorded in the proposed Reserve. The stream ecosystem itself is rare, as one of the only undiverted and unchannelized streams left on O`ahu.

### *Biological/Ecological Design*

The boundaries of the proposed Reserve were designed to include where native – dominated vegetation exists and follows natural boundaries of ridgelines. The lower boundary terminates at the first large waterfall of Kaluanui stream.

### *Location and Size*

The east side roughly follows a ridge separating Punalu`u valley, and a 64-acre sliver of the parcel also extends over the Ko`olau crest over to the leeward side. From there, the parcel’s boundary does not follow natural features until approximately the 2,600 ft elevation, which is also at the point of the intersection of the Castle Trail. From there, the boundary roughly follows the ridge that divides Kaluanui Valley from Punaiki gulch to the West.

The *makai* boundaries terminate at two prominent hills at the 2,260 ft elevation on the west side of Kaluanui valley, and 2,440 ft elevation on the east side of the valley. These boundaries include most of the portion of the Castle Trail that is within the valley.

### *Threats (Human/Biological)*

High priority threats to Kaluanui ecosystems are invasive plant species and feral pigs. Additionally, rats and predatory invertebrates such as the *Euglandina rosea* threaten the native snail species, and native plants. Introduction of aquatic insects and fishes is also a threat to the high quality stream.

The Koʻolau Mountains Watershed Partnership (KMWP) has specifically prioritized the protection of the Kaluanui drainage from feral ungulates. Their management plan's summary of recommended actions for their feral animal program includes "Expand upon established fencing exclosures, in areas such as... Upper Kaluanui" (KMWP, 2002).

### *Present Level of Protection*

The proposed NAR is in the Conservation District, Protective and Limited subzones.

In 1999, the area became part of the Koʻolau Mountains Watershed Partnership, a voluntary alliance of landowners and land managers committed to the common value of protecting forested watersheds for water recharge, and other ecosystem services through collaborative management.

On-the-ground conservation efforts have been concentrated at the Koʻolau summit crest region of the proposed Reserve, which includes the work done by KMWP and the Oʻahu Army's Natural Resources Program.

### *Long-term Ecological Viability/Environmental Consequences of No Action/Urgency*

Designating this important core section of lowland wet forest, cliff, and stream as a NAR would enhance the ability of the System to participate and contribute to conservation and restoration actions across the entire watershed.

As this area has already experienced native species extinctions, and contains many species that are in danger of extinction, it is projected that no management action would lead to eventual loss of additional species.

## V. MANAGEMENT NEEDS

### *Threats Requiring Management*

Management priorities include removing non-native feral pigs, which trample and devour vegetation and spread the seeds of invasive weeds. Removal of invasive plant species is also a very high priority management action. Removing or reducing the amounts of predatory mammals and invertebrates, such as rates and the cannibal snail *Euglandia rosea*, is needed near the existing snail and rare plant populations. Outplanting may be needed to preserve populations of very rare and endangered species. Infrastructure to support management may also be required, including helicopter landing zones, weatherports/cabins, monitoring equipment, and trails.

## VI. PUBLIC SUPPORT

### *Agencies, Organizations, and Individuals Contacted\**

\*If this parcel is recommended as a Natural Area Reserve by the NARS Commission, interested parties will be notified and a formal public hearing and comment period will occur for this nomination pursuant to Hawaii Revised Statutes § 195-4.

## VII. BIBLIOGRAPHY/REFERENCES

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## Appendix 1

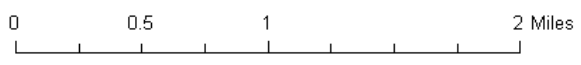
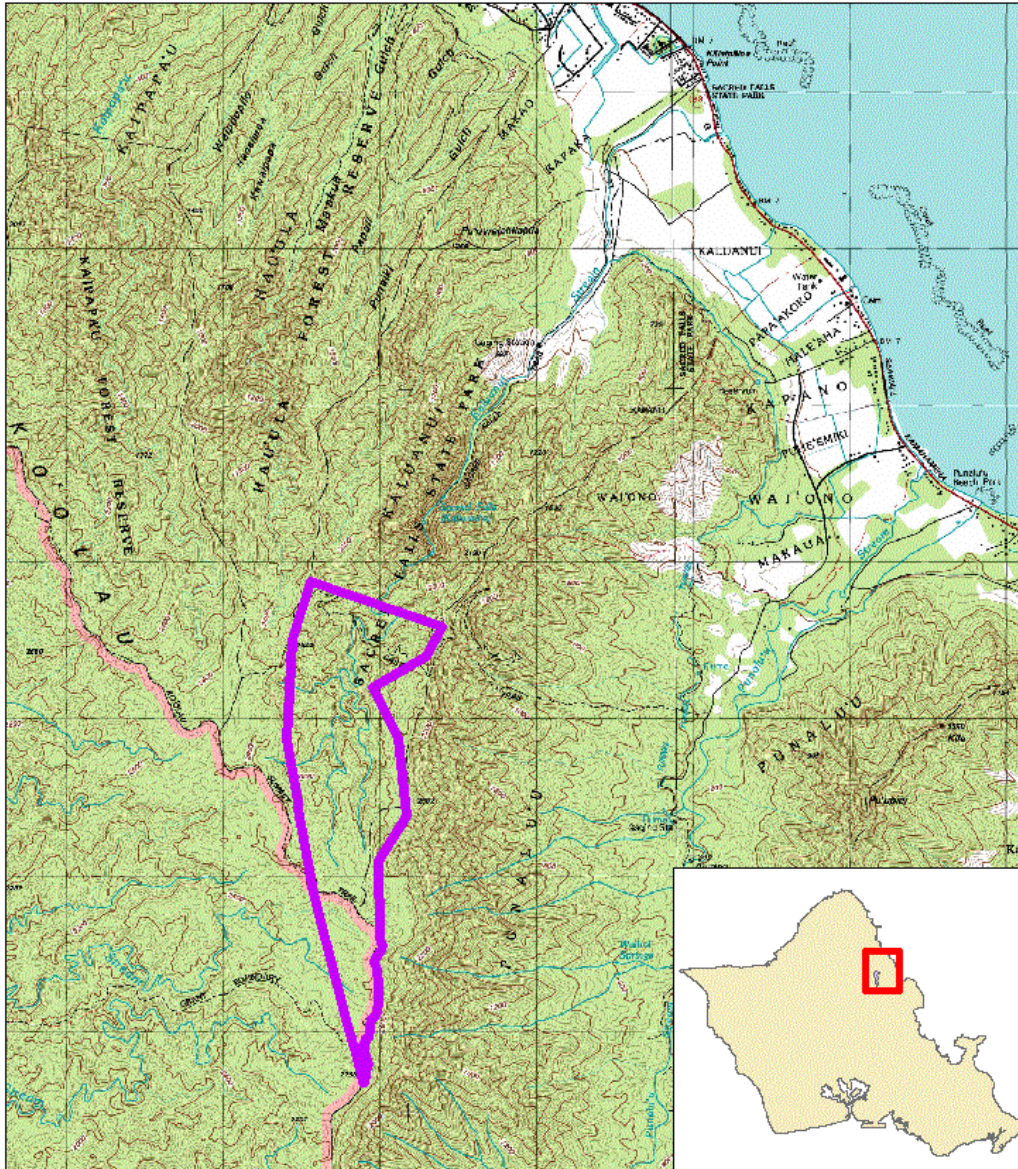
### Rare Species Recorded in the Proposed Kaluanui NAR

Scientific Name	Common Name	Federal Status*	Last Obs.	Type	PEP* *
<i>Plantago princeps</i> var. <i>longibracteata</i>	Ale	E	1976	Plant	
<i>Viola oahuensis</i>		E	2009	Plant	
<i>Myrsine juddii</i>	Kōlea	E	1997	Plant	
<i>Pteris lidgatei</i>		E	2011	Plant	PEP
<i>Hesperomannia arborescens</i>		E	1997	Plant	
<i>Cyanea acuminata</i>	‘Ōhā, Hāhā, ‘Ōhā wai	E	2011	Plant	
<i>Tetraplasandra gymnocarpa</i>	‘Ohe‘ohe	E	2009	Plant	
<i>Gardenia manni</i>	Nānū, Nā‘ū	E	2001	Plant	
<i>Chamaesyce rockii</i>	‘Akoko	E	2011	Plant	
<i>Cyrtandra viridiflora</i>	Ha‘iwale, Kanawao Ke‘oke‘o	E	2001	Plant	
<i>Phyllostegia hirsuta</i>		E	2011	Plant	PEP
<i>Pteralyxia macrocarpa</i>	Kaulu	C	1995	Plant	
<i>Cyanea lanceolata</i> ssp. <i>Calycina</i>		C	2009	Plant	
<i>Cyanea calycina</i>	‘Ōhā, Hāhā, ‘Ōhā wai	C	2011	Plant	
<i>Joinvillea ascendens</i> ssp. <i>Ascendens</i>	‘Ohe	C	1999	Plant	
<i>Platydesma cornuta</i> var. <i>cornuta</i>	Pilo kea	C	1997	Plant	
<i>Bidens campylotheca</i> ssp. <i>Campylotheca</i>	Ko‘oko‘olau, Kōko‘olau	SOC	1988	Plant	
<i>Cyanea purpurellifolia</i>	‘Ōhā, Hāhā, ‘Ōhā wai	SOC	1997	Plant	PEP
<i>Lobelia gaudichaudii</i> ssp. <i>Gaudichaudii</i>		SOC	2001	Plant	
<i>Lentipes concolor</i>		SOC	1990	Fish	
<i>Megalagrion nigrohamatum nigrolineatum</i>		C	2011	Insect	
<i>Achatinella pulcherrima</i>		E	1993	Snail	
<i>Achatinella sowerbyana</i>		E	2011	Snail	
<i>Cyanea st. johnii</i>		E	2011	Plant	PEP
<i>Megalagrion oceanicum</i>		C	2011	Insect	
<i>Lobelia oahuensis</i>		E	2009	Plant	
<i>Anoechtochilus sandvicensis</i>		SOC	2011	Plant	

**Federal Status\*** E = Endangered, C = Candidate for Listing, SOC = Species of concern  
**PEP:\*\*** Plant Extinction Prevention species (fewer than 50 individuals remaining in the wild)



# Proposed Kaluanui NAR



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**Legend**

■ Proposed Kaluanui NAR