



FMP

Ecosystem Management Program Bulletin

Volume 47

Autumn 2009

Reintroduced *Pritchardia kaalae* Flowers for the First Time

By Michelle Elmore

THE VERY FIRST *Pritchardia kaalae* to reach maturity in a reintroduction site, (where rare plants grown from seed are planted back into the wild), was observed in July on ʻŌhikilolo Ridge, above Mākua Valley.



First documented flower buds on a reintroduced *Pritchardia kaalae*. (Photo by Kapua Kawelo, OANRP)

This represents a milestone for conservation efforts for this species, as scientists had no prior knowledge of how long it takes these plants to flower in a natural setting. Now there is potential for reintroduced *P. kaalae* plants to begin producing offspring.

Pritchardia kaalae is an endangered palm endemic to the Waiʻanae Mountains of Oʻahu, where only a little more than 300 known wild plants exist. This species faces a number of threats that must be

addressed in conservation efforts, namely rats, goats, and pigs.

Rats prey on and destroy the plant's fruits, thereby preventing the survival of new generations of plants.

There is paleological evidence that *Pritchardia* species, also known as Loulu, or native Hawaiian fan-palms, were much more prevalent prior to the arrival of humans and rats in Hawaiʻi. Populations of *Pritchardia* on Oʻahu may have disappeared in areas uninhabited by humans as

Inside this issue:

Reintroduced <i>Pritchardia kaalae</i> Flowers for the First Time, By Michelle Elmore.....	1
Sorry Miss Jackson, I am For Real, By Amanda Hardman.....	2
PTA Monitors Nēnē Activity at Range 1, By John Polehmus.....	3
Rat Attack - A Series, By Candace Russo.....	5
ʻTis the Season.....	6
Volunteer Opportunities.....	6

a result of Polynesian rats (Athens et al., 2002). Additional rat species were introduced to Hawaiʻi following Western contact, which could have also adversely affected *Pritchardia*.

Wild goats and pigs also pose a threat to the *Pritchardia*'s habitat, potentially trampling, uprooting or grazing on seedlings or young plants.

Before management of *P. kaalae* began, only mature trees were found in the wild, with no observed seedlings or immature plants. Following rodent control at ʻŌhikilolo by the Oʻahu Army Natural Resources Program (OANRP), along with fence construction around wild plant populations and goat removal, abundant seedlings began to appear around the wild plants.



Wild *Pritchardia kaalae* at ʻŌhikilolo, above Mākua Valley, Oʻahu. (Photo by OANRP staff)

In an effort to boost the numbers of *P. kaalae* in the wild, OANRP staff have grown over 500 individuals from collected seed, and planted these seedlings in the Wai`anae Mountains since 1999. Part of the goal of this effort is to produce populations that will begin to reproduce on their own.

Until now, the number of years it takes for a *P. kaalae* plant to reach maturity, begin flowering and produce fruit had been undocumented. A single plant at Waimea Botanical Garden that was grown from seed and planted at the garden was estimated to have flowered after seven years. Yet because this plant received supplemental water and care in cultivation, it was unknown if the number of years it took to flower would be comparable to plants grown in the wild, nourished solely by rainwater.

During a camp trip at `Ōhikilolo in July, one of the OANRP's field crews conducted annual monitoring of *P. kaalae*, documenting size, health, maturity, and presence of flowers or fruits. While monitoring the *P. kaalae* in July, a



First mature *Pritchardia kaalae* from a reintroduction site, with OANRP natural resources management coordinator Julia Lee. (Photo by Kapua Kawelo, OANRP)

single plant standing over 7 feet tall was discovered with flower buds.

This plant was initially collected from seed in 1998 and cultivated in the OANRP greenhouse until it was reintroduced, or planted back into the wild, at `Ōhikilolo in December 2001.

From this discovery, we now know that it takes at least 11 years for *P. kaalae* to reach maturity following reintroduction. This is not the oldest reintroduced plant, as several others were planted prior to this individual. The OANRP

staff anticipates additional mature plants will be discovered next year, along with the creation of a new generation of plants in the years to come! •

ARTICLE REFERENCE:

Athens, J. S., Tuggle, H. D., Ward, J. V. & Welch, D. J. 2002. Avifaunal extinctions, vegetation change, and Polynesian impacts in prehistoric Hawai'i. *Archaeology in Oceania* 37:57-78.

~Michelle Elmore is a natural resources management technician with RCUH/PCSU working for the O`ahu Army Natural Resources Program.

Sorry Miss Jackson, I am For Real...

By Amanda Hardman

YOU ARE OFFICIALLY no longer welcomed on O`ahu. Jackson's chameleons, undeniably charismatic critters native to Kenya and Tanzania in East Africa, have perhaps laid their final straw.

In late June, O`ahu Army Natural Resources Program (OANRP) staff Vincent Costello and Michael Walker collected two Jackson's chameleons on pu`u Kūmakali'i directly behind Schofield west range after a day spent surveying the many Kāhuli snails located there.



Native to East Africa, Jackson's chameleons were initially introduced to the Hawaiian Islands in the 1970s, as pets. Male chameleon pictured here. (Photo by Stephanie Joe, OANRP)

The final straw? These two Jackson's were found to have feasted on one of O`ahu's own charismatic critters: endangered Kāhuli tree snails.

For years, Brenden Holland, director of the endangered Hawaiian tree snail captive breeding and conservation genetics lab at the University of Hawai'i, has been collecting Jackson's



Fragments of endangered Kāhuli tree snail shells recovered from the stomach of one of the Kūmakali'i Jackson chameleons. (Photo by Anita Manning)

chameleons to dissect, based on the belief that they may enjoy endangered Kāhuli tree snails as part of their diverse diet. More than 400 Jackson's have been dissected with no sign of ingested Kāhuli. That is until the two chameleons found at pu'u Kūmakali'i were studied.

Although the Kūmakali'i population of Kāhuli snails is not specifically managed by the OANRP, it is very closely monitored by staff. For nearly a decade, the snails' population has remained constant. Signs of rat predation are minimal, and the carnivorous rosy wolf snail, another predator of Kāhuli, has yet to be seen at Kūmakali'i.

OANRP staff have noted abundant keiki snails with each visit to pu'u Kūmakali'i, and there is still a host of native vegetation for the Kāhuli snails to enjoy at this site. In fact, Kūmakali'i is one of the few places on O'ahu where threats to the Kāhuli snails were thought to be minimal. That is until the recent discovery of a Kāhuli shell in a Jackson's belly, along with two other types of native Hawaiian snails.

With this new-found information, there is reason for concern. Therefore, approximately two weeks after the discovery, two more OANRP staff joined Costello, a.k.a. "snail man," for a return visit to Kūmakali'i to investigate the Jackson's density around the Kāhuli snail population.

After an intense two-day and one-night search, four more Jackson's chameleons were discovered and removed from the mountain.

Fortunately, none of the Jackson's contained Kāhuli shells; however, OANRP staff remains concerned about the potential threat Jackson's chameleons have to the endangered Kāhuli.

OANRP staff will continue to survey the neighboring areas in order to get a better idea of the Jackson's chameleons' extent and dietary preferences. If Jackson's are thought to be a large enough threat to the Kāhuli snail, OANRP will look to innovative management strategies to control for Jackson's in snail territories.

If you find a Jackson's chameleon while hiking in the Wai'anāe mountains, please place it in a container (a backpack pocket will work), and notify Vince Costello or Brenden Holland (contacts listed below). •

CONTACTS:

Vince Costello: vincent.costello1@us.army.mil

Brenden Holland: bholland@hawaii.edu

~Amanda Hardman is a natural resources management technician with RCUH/PCSU working for the O'ahu Army Natural Resources Program.

PTA Monitors Nēnē Activity at Range 1

By John Polehmus

THE RANGE 1 complex at Pōhaku Loa Training Area (PTA) has long served military training needs for troops stationed in Hawai'i and the Pacific. In recent years, training operations are under greater scrutiny due to what appears to be the seasonal presence of the Hawaiian goose (nēnē).

Range 1 plays a key role in the progression of military training exercises, serving as the second of a three-tiered training regimen employed at PTA. Because Range 1 is considered a vital training asset, PTA's Natural Resources Office (NRO) has stepped up its monitoring efforts to better understand the role of Range 1 in the life history of nēnē.



Endangered nēnē at PTA. (Photo by PTA NRO staff)

Data collection began in earnest in January, following the U.S. Fish and Wildlife Service issuance of a Biological Opinion (US FWS, December 2008). Field observations and other pertinent data collection

will continue through 2011, at which time a final recommendation will be presented by NRO as to the best approach to military training at Range 1.

Since 2005, a total of 62 tagged individual nēnē were identified at Range 1. To date, 42 individual geese have been recorded from nearly 700 total observations at the site. In July, 34 geese were seen on the ground at Range 1, the largest number of individual geese ever observed in a single day.

While a more in-depth analysis of the data is needed, it appears that the Range 1 complex may serve as an important summer flocking area where birds come to feed, rest, socialize, and, in the case of at least two individuals, undergo their annual molt. There is as yet no evidence that Range 1 serves as a nēnē nesting site.

Preliminary cross-referencing of band information from other nēnē managers on Hawai'i Island shows that a large proportion of the birds that utilize Range 1 are from the Hakalau National Wildlife Refuge (located roughly 29 km to the northeast of PTA) where the resident population is approximately 130 birds. The remaining birds that visit Range 01 originate from a smaller population of approximately 75 birds, located in Pu'u Anahulu and Pu'u Wa'a wa'a, some 35 km to the southwest of PTA.

To date, there have been no observations of birds at Range 1 that originated from the Hawai'i Volcanoes National Park (HVNO) on the

east side of Hawai'i Island. The HVNO sub-population, estimated to be approximately 200 birds (40% of the island population), remains localized in and around the park, while the Hakalau and Pu'u Anahulu birds exploit a wider range of habitat.

To better understand the patterns of habitat preference of Hawai'i Island nēnē, the NRO is collaborating with the U.S. Geological Survey on a project that will track individual nēnē over a period of two years using GPS telemetry units. While the main focus of this project is a better understanding of the role played by the newly acquired Kahuku section of HVNO, it is expected to yield important information about preferred habitat on and around PTA, as well.

In addition to monitoring nēnē at Range 1, the NRO is set to begin exploration of methods to draw nēnē away from critical areas of the training complex, to enable training to continue without interruption. The 13-acre area will be fenced to exclude sheep and other mammals that may be present. A variety of temporary and long-term attractants, including shade, water, and forage will be deployed within the fenced area.

The area will be monitored to determine the effectiveness of enticements to draw nēnē away from the Range 1 areas that are actively used for training exercises.

The NRO continues to fulfill the requirements set forth in the 2008 Biological Opinion. Ongoing monitoring of nēnē activity and periodic analysis of behavioral patterns through 2011 will help determine a final recommendation by NRO, which is expected to guide the military's approach to future use of the Range 1 complex. •

~John Polehmus, of J.T. Productions, is a consultant employed by the PTA

Natural Resources Office to assist program biologists with nēnē field research.



Endangered nēnē at PTA. (Photo by PTA NRO staff)

Rat Attack A Series



By Candace Russo
with information based on the
Partnership to Protect Hawaii's
Native Species Project Fact Sheet,
"Our Kuleana: Remove Rats for Restoration"

MOST PEOPLE LIVING on the Hawaiian Islands are aware that we share our home with the highest number of endangered species in the nation. Our native plants and animals, many of which are found nowhere else on Earth, are suffering from threats that are diminishing their numbers at an alarming rate.

One of the greatest threats? Rats and mice. Not native to Hawaii, rats and mice devastate ecosystems throughout the Pacific, feeding upon native plants and animals, and competing with native species for habitat and food resources.

In the series "Rat Attack" we will explore the effects of these ubiquitous predators on Hawaii's natural resources.

One of these resources is the Kāhuli tree snail. Portrayed in many Hawaiian *oli*, or chants, Kāhuli were once plentiful in our native forests, hanging from leaves like "bunches of grapes," as described in Bishop Museum archives.

Today these colorful "jewels" grace the U.S. Endangered Species List due to threats that include over-collection, introduced carnivorous snails, and one of the biggest threats - destruction by rats.

Empty Kāhuli shells found in the forest that are jagged and broken are often a tell-tale sign of rat predation. Rats easily invade trees where a Kāhuli snail may spend its entire 10-year lifespan, and feast on the soft bodies



by biting through the striped, multi-hued shells, leaving shell remnants to fade on the forest floor.

How can we assure future generations that the Kāhuli depicted in stories and *oli* can still be found in Hawaii's forests? A project titled "Partnership to Protect Hawaii's Native Species" is being coordinated by various state and federal agencies and non-profit organizations including the U.S. Fish & Wildlife Service, the Natural Resources Section of the U.S. Army Environmental Division, the State of Hawaii Department of Land & Natural Resources, the Coordinating Group on Alien Pest Species, and The Nature Conservancy.

Working to "Remove Rats for Restoration," this partnership is currently conducting statewide education and outreach to raise public awareness about rat impacts on our native species and the available conservation tools that could be used as possible solutions.

The next "Rat Attack" article will include more information about the Partnership to Protect Hawaii's Native Species and will feature another native species under attack by the rat. •



Kāhuli shells crushed
by rats.

All kāhuli photos by OANRP staff.

'Tis the Season...

A

For mist to blanket the mountains! In Hawai'i, the mist veiling the forests is recognized as either *`ohu* or *noe*. *`Ohu* is a warmer mist that rises, while *noe* is a cooler, descending mist.

U

As days shorten, temperatures cool, and rain increases, the forest plants and animals enjoy frequent visits from *`ohu* and *noe*.

T

`Ohi`a, known as a tree of the hula goddess Laka, reveals her abilities as a *pahuwai*, or container of water, when *ohu* or *noe* are present. Using aerial roots, or the many tiny leaf hairs found on some forms, the *`Ohi`a* gathers and holds on to water from the mist in the surrounding air.

U

Visitors to the summit of Ka`ala in autumn will likely experience the sensation of *ohu* or *noe* on their faces, while witnessing *`ohi`a*, and the mosses that blanket their branches, gathering this mist.

M

N



VOLUNTEER OPPORTUNITIES

OCTOBER

▶ **EVENT:** Common native plant monitoring in Kahanahāiki

DATE: Tuesday, Oct. 13

PURPOSE: To measure and record growth information about reintroduced native plants.

TERRAIN: Some steep terrain; moderately difficult hike

▶ **EVENT:** Common native plant monitoring in Kahanahāiki

DATE: Thursday, Oct. 22

PURPOSE: To measure and record growth information about reintroduced native plants.

TERRAIN: Some steep terrain; moderately difficult hike

NOVEMBER

▶ **EVENT:** Weeding at 3-points

DATE: Friday, Nov. 13

PURPOSE: To remove invasive weeds around endangered plants.

TERRAIN: Some very steep terrain with drop-offs; difficult hike

▶ **EVENT:** Weeding at Palikea

DATE: Tuesday, Nov. 24

PURPOSE: To remove invasive weeds around endangered plants.

TERRAIN: Some steep terrain; moderately difficult hike

For more information about O'ahu Army Natural Resource Program volunteer opportunities, or to be added to our monthly e-mail posting of all public events, please contact

Kim Welch or Candace Russo:

kmwelch@hawaii.edu

candace.r.russo@us.army.mil

EMP Bulletin

Editors

Candace Russo and Kim Welch
Environmental outreach specialists
O`ahu Army Natural Resources Program
RCUH / PCSU

Directorate of Public Works
U.S. Army Garrison - Hawai`i
Schofield Barracks, HI 96857-5013

candace.r.russo@us.army.mil
kmwelch@hawaii.edu

The success of this newsletter depends on article contributions from the staff of the O`ahu Army Natural Resources Program, O`ahu Army Cultural Resources Program, PTA Army Natural Resources Program, and PTA Army Cultural Resources Program. Mahalo to all staff who have contributed to this issue.

*If you wish to contribute an article or have an idea for an article you`d like featured in the next EMP Bulletin, please feel free to contact us! The deadline to submit articles for the next issue is **November 24, 2009.***



Robert Eastwood
Director of Public Works
U.S. Army Garrison - Hawai`i