



EMP

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Slimy Residents Fill Gated Community

By Stefanie Gardin

ARMY STAFF WELCOMED incoming residents to a gated community high atop the Wai‘anae Mountains this February.

The O‘ahu Army Natural Resources Program (OANRP) staff, joined by personnel from the University of Hawai‘i’s Tree Snail Conservation Laboratory (UH snail lab) and the U.S. Fish and Wildlife Service,



Juvenile kähuli snails (*Achatinella mustelina*) climb their first tree! In 2010, their parents and 200 more kähuli were rescued from predators and brought to the UH snail lab for safe keeping. Within the two years time it took to construct an enclosure in the wild, this group of snails grew to 342. This February, all were returned to their ancestral home. (Photo by OANRP staff)

flew the remaining half of more than 300 kähuli tree snails (*Achatinella mustelina*) to their new home in a one-of-a-kind enclosure.

“It’s very satisfying. We’re bringing them back to either where they came from, or where their ancestors came from,” said Vince Costello, Rare Snail Conservation Specialist with the OANRP.

Costello and the group introduced the first half of the snails on February 8, and introduced the second half on February 21, to make sure the snails were



Kähuli (*Achatinella mustelina*) (Photo by OANRP staff)

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doing okay in their new habitat.

The habitat consists of an enclosure almost the size of a basketball court. Army and industry professionals designed it to safeguard the kähuli from the voracious predators that have pushed this tiny



OANRP’s Rare Snail Conservation Specialist, Vince Costello, places kähuli snails in one of several mesh baskets that have been tied to trees within the enclosure. The baskets allow snails to acclimate to their surroundings before venturing out into the trees. (Photo by Dept. of Defense U.S. Air Force Tech. Sgt. Michael R. Holzworth/Released)



Aerial view of OANRP's newest enclosure, built to protect an endangered population of kähuli snails in the Wai'anāe mountain range. (Photo by OANRP staff)

Hawaiian native to the brink of extinction.

Predators like the cannibal rosy wolf snail (*Euglandina rosea*), mice, rats and the Jackson's chameleon shouldn't be able to snack on the kähuli inside the enclosure, thanks to its 4-foot tall surrounding wall with multiple layers of built-in protection: a buried wall portion, curved fence hood, solid-wall construction, electric wiring and special sections of

wire bristles that cannibal snails can't cross.

"I describe it as the management tool of the future," Costello said. "It's a unique project—one that's never been built before—and we hope we'll learn from it and be able to build others."

The Army started monitoring the kähuli in 1995 as part of its mission to support soldier training through the management of threatened and endangered species. As the years passed, Army biologists noted an increase in snail predators and a nearly 50% decrease in the Wai'anāe Mountains kähuli population, spurring them to action. •



Several layers of wire bristles and a series of four 12-volt electric wires (inset) will serve as a non-lethal deterrent for the cannibalistic rosy wolf snail (*Euglandina rosea*). (Photos by OANRP staff)

Stefanie Gardin is Chief of External Communication at the U.S. Army Garrison-Hawai'i Public Affairs Office.

Natural Resources Program Wins Top Army Award

By Kimberly Welch

OUTSTANDING ENVIRONMENTAL MANAGEMENT actions carried out by the staff of the U.S. Army Garrison-Hawai‘i’s (USAG-HI) O‘ahu Army Natural Resources Program (OANRP) have garnered national attention.

Since 1962, the Secretary of Defense has honored individuals, teams, and installations for their achievements to conserve and sustain the natural and cultural resources entrusted to the Department of Defense. While teams from 45 other installations were eligible for recognition, the 2011 Secretary of the Army Natural Resource Team Award was bestowed upon the staff of OANRP.

“Recognition by the Secretary of the Army as having one of the finest natural resource programs in the Army is a public testament to the commitment, professionalism and dedication of the Natural Resource staff of USAG-HI. Their work allows the Army to continue to train here and prepare for any

wing flies (*Drosophila spp.*) have kept OANRP’s tight-knit staff on the go, perfecting management techniques as needed, in order to ensure the survival of these threatened and endangered O‘ahu species. What began as a small staff of four in 1995 has now grown to more than 50 personnel, comprised of support staff, a fence crew, three resource management crews, and a nursery/seed bank management crew. Ninety percent of the staff are in the field



OANRP’s Matt Keir and Lauren Weisenberger work with partner Talia Portner, O‘ahu Plant Extinction Prevention Program, to unload *Schiedea nutalii*. (Photo by OANRP staff)



OANRP staff William Weaver and Scott Heintzman plant hāhā (*Cyanea st.-johnii*) in the central Ko‘olau Mountains. (Photo by OANRP staff)

contingency our nation requires of its Soldiers,” said Col. Douglas Mulbury, commander, USAG-HI.

“This program, over many years, has not only stabilized threatened and endangered species here on O‘ahu, but it serves as the model across the Army and federal government on how to collaborate with state, federal and private organizations to manage fragile populations,” Mulbury added.

More than 80 native plants, seven kāhuli tree snails (*Achatinella spp.*), the O‘ahu ‘elepaio bird (*Chasiempis sandwichensis ibidis*), and two picture

daily, working with rare species in remote areas of the island across the Wai‘anae and Ko‘olau mountain ranges.

A wide range of management actions are required for each individual species that OANRP protects, with emphasis placed on controlling the numerous threats posed by invasive weeds and introduced species including pigs, goats, rats, and introduced reptiles! The first line of defense to protect Hawai‘i’s fragile forest resources is fencing out non-native pigs and goats. To date, OANRP has protected a total of 10,798 acres of endangered species habitat on O‘ahu with remote fencing projects. Populations of endangered ‘elepaio birds are protected with intensive rat control efforts, and some of the last remaining kāhuli tree snail populations are managed to keep out snail-eating carnivorous snails, rats, and

Jackson's chameleons. In addition, thousands of staff and volunteer hours are spent controlling the spread of invasive weeds around populations of rare plants.

To help boost the numbers of the 80+ endangered plants in their care, OANRP staff must traverse knife edge ridge lines or rappel down cliffs to monitor remote rare plants, and when possible, gather seeds or cuttings from these survivors. Back at the OANRP seed lab, some of these propagules are stored as a "genetic safety net" for each species, in case wild populations take a turn for the worse.

OANRP was able to save an endangered lobeloid (*Cyanea superba* ssp. *superba*) from extinction. Rat and pig damage to this plant ultimately eliminated it from the wild; however, thanks to stored seeds, over 900 plants have been successfully re-introduced.

The bulk of the seeds or cuttings gathered from the wild will be grown in the OANRP rare plant nurseries, and eventually returned to the forest. During this time of year (the rainy months), hundreds of these plants leave the nurseries each week. Staff coordinate helicopters to fly plants to remote locations in the mountains, where plants are unloaded and back-packed into valleys, or along ridge-lines, to be re-united with the forest. In 2011, OANRP staff planted just over 2,400 of these endangered plants in various locations across the island, adding to a grand-total of 8,319 endangered plants since 1995.

Michelle Mansker, Chief of the Natural Resource Section for USAG-HI exclaimed, "This award is a testament to the top notch effort and professionalism of the members of this team. It is their collective effort that makes this team the best in the Army!"

"I couldn't agree more," added Kapua Kawelo, who has been a federal biologist with OANRP since its inception. "We've come so far in conserving natural resources here on O'ahu and the great strides we have made are largely due to our staff's combined knowledge and skills for resource management, along with their shared passion for protecting Hawai'i's endangered species." •

Kimberly Welch is an Environmental Outreach Specialist with RCUH / PCSU, working for the O'ahu Army Natural Resources Program.

Army Restores Historic Site at Mākua

By Jaime Raduenzel

"Ua ho'ono ho niho 'ia...ho'oku'u ka hana: Only when the stones are properly stacked is the work done."

-Mary Kawena Pukui
'Ōlelo No'eau

"Water is life," Billy Fields replied when asked about the importance of restoring a historic well at Mākua Military Reservation. A large portion of this four-walled enclosure collapsed due to natural causes, including erosion. The structure was probably built during the ranching period at Mākua and captured drinking water for cattle. The Army Cultural Resources Program contracted Fields Masonry, a company founded by well-known dry stack mason Billy Fields, to repair the damage. This project is the first rock wall restoration completed on Army lands.



Billy Fields (right) relied on photo documentation from a 1992 archaeological survey to rebuild the walls, using only rocks found within the site. (Photo by Army Cultural Resources staff)

Fields has been restoring cultural sites for many years, including significant sites like Hāpaiali'i and Ke'ekū Heiau at Keauhou, Kūka'ō'ō Heiau in Mānoa, and numerous walls, fish ponds, and burial platforms across the state. Uhaumu pōhaku, or dry stack

New Invasive Grass Discoveries Increase Fire Threat to Army Training Areas on O‘ahu

By Jane Reppun Beachy

IN NOVEMBER 2011, O‘ahu Army Natural Resources Program (OANRP) staff monitoring the ‘Ōhikilolo fenceline in Mākua Military Reservation found *Pennisetum setaceum*, or fountain grass. This find spawned a flurry of activity, as fountain grass poses a major fire threat to the Wai‘anae Mountains. Fountain grass is highly adapted to fire, recovering quickly after a burn and promoting future fires by providing a ready source of fuel. The Wai‘anae coast suffers from numerous fires every summer, and if fountain grass were to spread from Mākua to the rest of Wai‘anae, the incidence, severity, and spread of fires could increase. While fountain grass is widespread at Lēahi (Diamond Head) and Ka‘iwa ridge in Kailua (Lanikai), no established populations are known from Wai‘anae. OANRP is working



The Wai‘anae coast is prime habitat for fountain grass (*Pennisetum setaceum*), and eradication of the infestation on the steep cliffs of ‘Ōhikilolo ridge will be a challenge. (Photo by OANRP staff)

with the O‘ahu Invasive Species Committee (OISC) to control the Mākua infestation. The partners are optimistic that this relatively small infestation can be eradicated before it spreads to other areas. However, it won’t be easy, as hundreds of plants on steep terrain must be treated.

Staff conducting an annual road survey on Schofield Barracks East Range got an unwelcome sense of déjà vu when they found more fountain grass along a well-used training road. Fortunately, only nine plants were found, and staff are confident that



Collapsed sections of the well prior to restoration. (Photos by Army Cultural Resources staff)



Post-restoration, the walls are intact. (Photos by Army Cultural Resources staff)

masonry, is called dry because no mortar or cement is used to keep the stones together. The mason must rely on his skills in “setting” the stones to keep the wall from tumbling down. Some stone walls have lasted for hundreds of years.

Fields believes that the knowledge of building with rocks is an important part of Hawaiian culture and should be preserved. “Stones are really the foundation of our culture,” Fields said. “When we’re working on an existing site, we only use the stones that are already there. If you do it wrong, the stones will let you know about it right away.” •

Jaime Raduenzel is a Cultural Resources Outreach Specialist with RCUH / PCSU, working for the Army Cultural Resources Program.



FOUNTAIN GRASS STATS

- Hawai'i Noxious Weed
- Scores 26 on the Hawai'i Weed Risk Assessment (HWRA), which evaluates the invasive potential of alien plants (weeds that score 7+ are considered high risk)
- Fast-growing bunch grass
- Prefers dry areas, but can grow from sea-level to mountain-summit
- Produces many wind-dispersed seeds
- Fire-adapted and fire-promoting
- Degrades natural areas and pastures (not palatable for livestock)
- Native to Africa
- Introduced to Big Island in 1914, where it now covers more than 200,000 acres. It has been found on all eight of the main Hawaiian islands.



BUSH BEARDGRASS STATS

- Scores 13 on the HWRA (weeds that score 7+ are considered high risk)
- Fast-growing, it can begin reproducing within a year
- Prefers mesic to wet areas
- Produces wind-dispersed seeds
- Colonizes disturbed areas and roadsides; easily spread by human activity
- Fire-adapted and fire-promoting
- Degrades both natural areas and pastures (not palatable for livestock)
- Native to South America
- Known in Hawai'i only on the Big Island, and now, O'ahu.

eradication can be achieved at this small site. However, on the same survey, staff found another grass pest. Tall and tufted, it turned out to be *Schizachyrium condensatum*, bush beardgrass. This is the first record of bush beardgrass on O'ahu, but it is a major



OANRP natural resource management technicians Makanani Akiona and Jessica Hawkins work with Danielle Frohlich and Alex Lau, both with O'ahu Early Detection, to identify defining characteristics of bush beardgrass. (Photo by OANRP staff)

habitat threat at Hawai'i Volcanoes National Park. Bush beardgrass is well-adapted to fire and regenerates even after high-intensity burns. So far, it is only known to exist in a small area, and OANRP staff are already collaborating with OISC to begin control. If uncontrolled, both fountain grass and bush beardgrass pose major fire threats to Army Training lands and adjacent areas on O'ahu. •

References & recommendations for more information:

- www.hear.org
- www.hear.org/pier
- www.sites.google.com/site/weedriskassessment/home
- www.ctahr.hawaii.edu/inweed/weedlinks.html
- www.ctahr.hawaii.edu/rnre/Downloads/SLIDES_HawaiiDOA_Noxious_Weed_List.pdf

Jane Reppun Beachy is the Ecosystem Restoration Program Manager with RCUH / PCSU, working for the O'ahu Army Natural Resources Program.

What is a Hawai'i State Noxious Weed?



A Hawai'i State Noxious Weed is an alien species which has highly invasive characteristics, is only found in a restricted area, and most importantly, has a demonstrated record of posing a significant threat to agricultural industries, endangered plants

and animals, conservation areas, public recreation areas, or human health. 'Noxious Weed' is a legal term. It is illegal to move a Noxious Weed or its seeds into any area where it is not already present. In the last year, OANRP found two other Noxious Weeds, besides fountain grass, on Army lands: devil weed (*Chromolaena odorata*) and swordgrass (*Miscanthus floridulus*). Both are brand new to Hawai'i.

Things Are Looking Up for Schofield's O'ahu 'Elepaio

By Phil Taylor

JUST BEYOND THE FIRING RANGES in the gulches of the Schofield Barracks West Range, lives a small bird called the O'ahu 'elepaio (*Chasiempis sandwichensis ibidis*), or Hawaiian flycatcher. Considered the guardian spirit of canoe-builders, 'elepaio are found on three of the Hawaiian islands and biologically classified into three distinct species. While fairly common on Kaua'i and the island of Hawai'i, the O'ahu 'elepaio is federally endangered, with a population of less than 1,000 birds.

The first bird to sing in the morning and the last to stop singing at night, the O'ahu 'elepaio has an appetite for insects and displays a brown, black and white plumage with a long tail. The O'ahu 'elepaio is also very territorial, willing to fight and die for its small stretch of land, less than two acres in size. Within these territories, between the months of January and June, an 'elepaio pair builds a cup-shaped nest in the fork of a tree branch and lays up to three eggs. One or two young typically survive and adults will have as many as two successful nests per season.

'Elepaio face a number of threats, including mosquito-borne diseases, shrinking habitat, and non-native tree climbing rats, that are capable of devouring adult 'elepaio and their young. Though diseases and loss of habitat are nearly impossible to control, the O'ahu Army Natural Resources Program (OANRP) has been very successful with controlling rodents in 'elepaio territories. Since OANRP started rodent control in 2005, there has been a significant increase in adult and nestling survivorship. In the last six years, the

O'ahu 'elepaio (*Chasiempis sandwichensis ibidis*) (Photo by OANRP staff)



ABOVE A pair of O'ahu 'elepaio have received leg bands to aid in monitoring the long-term health and safety of the birds. In 2011 OANRP staff successfully banded 70. **LEFT** The 'elepaio's cup-shaped nest hosts up to three eggs during the breeding season. (Photos by OANRP staff)

number of managed 'elepaio pairs at Schofield Barracks has increased from 16 to 31. 2011 proved to be a great year for 'elepaio young, with 48 observed throughout the breeding season. That's an increase of twenty young from last year alone. Along with the 'elepaio at Schofield Barracks, OANRP continues to manage three other populations on O'ahu. Population numbers are responding positively to rodent control in all three of these 'elepaio territories. •

Phil Taylor is an Avian Conservation Specialist with RCUH / PCSU, working for the O'ahu Army Natural Resources Program.

A Tale of TWO

By Sara Stuart-Currier



The 3rd Battalion, 25th Aviation Regiment of Schofield Barracks delivers a load of fence materials above Koloa gulch. (Photo by OANRP staff)

2000 feet above the small town of Hau'ula in the Ko'olau mountains, Koloa gulch reaches up to the cloud-swept summit. Here, the forest is practically impervious due to thick native vegetation. Eight endangered plant species—plus two proposed endangered – and one species of endangered O'ahu tree snail can be found in this area. Rare plants such as 'akoko (*Chamaesyce rockii*) can be spotted by their bright red fruits, while hāhā (*Cyanea koolauensis*) poke their Dr. Seuss-like heads up through ferns, flashing their tubular, deep purple flowers. Native birds such as the 'apapane (*Himatione sanguinea*) dance around these and other native plants filled with nectar laden blossoms.



'Akoko (*Chamaesyce rockii*) (Photo by OANRP staff)

Unfortunately, this forest is threatened by non-native pigs that dig up the ground and destroy native habitat. The O'ahu Army Natural Resources Program (OANRP), in cooperation with Hawai'i Reserves Inc. and the Ko'olau Mountains Watershed Partnership, is in the process of constructing a fence to protect the upper reaches of Koloa gulch. The fence will be built on land owned by Hawai'i Reserves Inc. and will encompass 200 acres of wet forest habitat and critical watershed.

Building a fence in this remote area is no easy feat. The total length of the fence proposed for construction is about 4,434 meters (14,547 ft.) and traverses diverse terrain. Transportation of fence materials and tools would have typically required 40 Hughes helicopter sling-load flights. Luckily, OANRP received support from members of the 3rd Battalion, 25th Aviation Regiment, 25th Combat Aviation Brigade (CAB), based out of Schofield Barracks. With the use of a Boeing CH-47, tandem rotor Chinook helicopter, it took only three trips to fly 80,000 pounds of fencing materials into the mountains.

A fence project such as this helps to ensure that endangered plants like the 'akoko and the kāhuli tree snails are protected in a safe, enclosed habitat where they can flourish, while providing useful training to the Army aviation crew. We at OANRP hope to continue working with the CAB Soldiers in the future in the name of Hawaiian conservation.

Sara Stuart-Currier is a Natural Resources Management Technician with RCUH/PCSU, working for the O'ahu Army Natural Resources Program.

MAHALO NUI LOA

to the 3rd Battalion, 25th Aviation Regiment for hauling the fencing materials. Instead of 40 trips on a Hughes helicopter, the Soldiers hauled all materials in just 3 trips with the Chinook, saving OANRP approximately \$65,000!

FENCES

and Jessica Hawkins

Reports from the Field

AS WITH MOST of our native forests on O'ahu, non-native pigs are wreaking havoc on the plants and animals that dwell in the beautiful gulches at the base of Ka'ala. The continued existence of endangered species such as kähuli tree snails (*Achatinella mustellina*), the O'ahu 'elepaio (*Chasiempis sandwichensis ibidis*), and spectacular plants such as the fragrant nānū (*Gardenia manni*) and the delicate hāhā (*Delissea subcodata*) depends on successful ungulate control.

OANRP contracted Stuart Wellington Fencing to construct a fence that will encompass all of the gulches within Schofield Barracks West Range (SBWR) and when completed, will protect approximately 1,764 acres ranging from 1,600-3,400 feet. This will be the largest fence dedicated to conservation on O'ahu.

No matter the size, before a fence is built, Army staff from both the natural and cultural resources programs must first survey the proposed route. During an initial survey hike along the Kamaohanui ridge, OANRP staff Vince Costello and Daniel "Skeeter" Adamski, discovered a quaint community of approximately 50 kähuli tree snails just a few hundred feet down from the summit of Ka'ala. This was a sizeable population considering the snails' endangered status!

In August 2011, a small group of OANRP staff camped at Pu'u Kamaohanui, close to the recently discovered kähuli population. The camping trip included daytime and nighttime kähuli searches and a delicate translocation of the endangered snails from trees that could be directly impacted by the fence line construction. On the first night, several snails were safely transferred to new native trees that will be well within the protected fence area. The following night, OANRP staff donned their headlamps to observe the snails in their new trees, to ensure the move had been successful. With the Kamaohanui kähuli successfully re-located, fence workers can now proceed with confidence and carefully clear a narrow corridor through the vegetation in preparation for the fence that will soon protect this area from feral pig damage. The fence is expected to be complete by the end of 2012.



OANRP staff translocate kähuli (*Achatinella mustellina*) to trees within the protected fence area. (Photo by OANRP staff)



A misty view of Kamaohanui ridge. (Photo by OANRP staff)

In 2011...

OANRP built more than 8,200 meters (26,902 feet) of fence! These fences enclose approximately 362 acres, ensuring the protection of numerous endangered plants, animals and their habitat.

Jessica Hawkins is a Natural Resources Management Technician with RCUH/PCSU, working for the O'ahu Army Natural Resources Program.

Kāmakahala (*Labordia cyrtandrae*) (Photo by OANRP staff)

*'Tis the Season...
...for outplanting!*

W I N T E R

DECEMBER 2011-MARCH 2012 OANRP OUTPLANTING SEASON

Staff and volunteers planted more than 2,400 endangered plants at 50 different sites!

Highlights:

Mēhamehame (*Flueggea neowawraea*)

- Planted 68 saplings into Kahanahāiki, Mākaha, Kapuna and Pahole
- Now 167 total outplants, which is about 4.5 times the current number of wild plants (37)

Kāmakahala (*Labordia cyrtandrae*)

- 104 mature and immature plants outplanted at Ka‘ala, making this the largest kāmakahala outplanting for OANRP to date

Hesperomannia arbuscula

- Started a new site in Mākaha
- Now a total of 158 immature outplants which is 22.5 times the number of wild plants (7)

OANRP's Kahale Pali helps a *Hesperomannia arbuscula* settle into its new home in Mākaha. (Photo by OANRP staff)

VOLUNTEER Opportunities AND UPCOMING EVENTS

April

- ▶ **EVENT:** Earth Day Festival
DATE: Saturday, April 28
TIME: 10 a.m. - 2 p.m.
LOCATION: Fort Shafter Flats Parade Field

May

- ▶ **EVENT:** Kaunala (Kahuku) volunteer service trip
DATE: Thursday, May 17
PURPOSE: Invasive weed control
TERRAIN: Some steep slopes, moderate difficulty
- ▶ **EVENT:** Endangered Species Day
DATE: Saturday, May 19
TIME: 9 a.m. - 2 p.m.
LOCATION: Honolulu Zoo

**For more information about the O‘ahu
Army Natural Resources Program
or volunteer opportunities please contact
Kim Welch or Celeste Ventresca:**

kmwelch@hawaii.edu
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or visit

[http://www.garrison.hawaii.army.mil/
sustainability/NaturalResources.aspx](http://www.garrison.hawaii.army.mil/sustainability/NaturalResources.aspx)

EMP *Bulletin*

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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 Ecosystem Management Program Bulletin, please feel free to contact us! The deadline to submit articles for the next issue is **June 12, 2012**.*



Robert Eastwood
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