



# FMP

## Ecosystem Management Program Bulletin

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### Special local needs registration for *Sluggo* approved in the state of Hawai'i through 2015

By Stephanie Joe

FOR THOSE OF you seeking to control slugs in forested areas for the protection of native plants, a new option has arrived. The Hawai'i Department of Agriculture (HDOA) has approved special local needs (SLN) labeling for *First Choice Sluggo Snail and Slug Bait* (EPA Reg. No. 67702-3-34704), a certified organic iron phosphate based product. The SLN label may be downloaded from HDOA at the following website:

[http://hawaii.gov/hdoa/labels/sln/1004\\_2015.pdf](http://hawaii.gov/hdoa/labels/sln/1004_2015.pdf)



Until now, young seedlings like these from the endangered plant *Cyanea superba*, had little defense against slugs, preventing them from growing beyond a small size. (Photo by OANRP staff)

As someone involved in the process of crafting this label, I wanted to provide further instructions on the proper use of *Sluggo* and call attention to some of the restrictions put in place to protect native snails. I am also interested in receiving feedback describing your experiences with this product so that I can modify the SLN label accordingly when it comes

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up for renewal.

The active ingredient in *Sluggo* (iron phosphate) is not a contact poison and must be ingested by the target pest to have an effect. It biodegrades and becomes a natural component of the soil. It is not a restricted use pesticide and therefore may be used by anyone (not just certified applicators). It is nontoxic to vertebrates.

Of particular importance are the following label instructions:

"Area must be thoroughly searched by experienced malacologists during the day and at least one night prior to application ...to ensure that non-target endemic Hawaiian snail species are not impacted. Do not apply in areas where it may come into contact with known

To provide feedback, or for any questions regarding interpretation of the new special local needs *Sluggo* label, please contact Stephanie Joe via email:

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*Limax maximus*, a non-native slug found in Hawaiian forests, can feed on native plant seedlings. (Photo by Steph Joe, OANRP)

populations of endemic Hawaiian snail species from the following rare families or subfamilies: Amastridae, Achatinellinae and Endodontidae.”

These restrictions mean that *Sluggo* cannot be applied where the following genera are present (family or subfamily in brackets): [Amastridae] *Amastra*, *Laminella*, *Leptachatina*; [Achatinellinae] *Achatinella*, *Partulina*, *Perdicella*; [Endodontidae] *Cookeconcha*. This list does not include all native



*Sluggo* bait cannot be applied where particular native snails, including *Leptachatina* (pictured above), are present. (Photo by OANRP staff)

snails. The intention of the label is to protect rare endemic snails while not preventing application in areas where common snails occur.

It is up to the user to decide at what intervals areas should be searched or re-visited prior to *Sluggo* application. Please be conservative when using this product and report to me any suspected non-target impacts to native snails. •

~Stephanie Joe is a Research Specialist with RCUH / PCSU working for the O’ahu Army Natural Resources Program.

## Pōhakuloa Training Area Natural Resource Office steps in to protect the endangered A’e from desperate ungulates

By Jen Lawson

**A**’E (*ZANTHOXYLUM HAWAIIENSE*) is a rare endemic Hawaiian tree belonging to the citrus family that has been federally listed as an endangered species since 1994. It is strong yet elegant, with an unmistakable sweet citrus smell to both leaves and flowers.



Joe Kern with an adult A’e. (Photo by Julia Parish, formerly with PTA-NRO)

Much of the remaining A’e occurs on the island of Hawai’i in Training Area 22 on the western side of Pōhakuloa Training Area (PTA), where a total of 645 trees have been located in the past decade. Unfortunately, feral ungulates (sheep and goats) also occupy the same areas and create a variety of threats such as habitat loss and depletion, trampling and browsing – threats that were exacerbated during the recent drought.

Large-scale fencing and measures to remove the threats to A’e have been implemented by the PTA Natural Resources Office (NRO)



A’e with recent bark stripping. (Photo by Joe Kern, PTA-NRO)



staff; but, in large areas like Training Area 22 (roughly 18,000 acres), this can be a lengthy process.

Further, in 2010 another factor was added to the equation: extreme drought (NWS 2010). Dry conditions are common at PTA but this extreme drought left feral sheep and goats scrambling for food and water, resulting in a noticeable increase in the number of A'e affected by ungulate browse and bark stripping – animals literally strip the bark off trees to get at the moist interior of the trunk. Bark stripping is a major concern because it reduces the transport of sugars from photosynthetic leaves to the roots of the tree, which reduces vigor (plant health). If the entire circumference of a tree is stripped, known as “girdling,” it will die.

The situation required immediate attention and the NRO implemented a plan to efficiently and effectively protect as many trees as possible – more than 200.

Tree trunk protectors made of durable plastic fencing were promptly employed to protect a subset of A'e. Since the trees occur in remote areas that are

difficult to access and have a relatively large distribution, it was important to prioritize efforts.

Male and female A'e flowers occur on different trees which means that it takes two trees in reasonable proximity to cross-pollinate and ultimately reproduce. With this in mind, trees in relatively dense clusters across the known distribution at PTA were chosen for protection. All trees within 100 m of a road or a managed “Area of Species Recovery” (ASR), where populations of threatened and endangered plants are currently managed, were also included in the protection plan.

The tree trunk protectors were installed quickly and easily by NRO staff, and have made it very dif-



Male A'e flower. (Photo by Joe Kern, PTA-NRO)

ficult for animals to chew on the bark and nearly impossible to girdle a tree. As of December 15th, 215 trees had been protected (approximately 1/3 of the known population).

Within the last few months a large fence surrounding the majority of PTA's A'e has also been completed, and animal removal in A'e habitat has begun, although complete removal will take about a year. Fortunately, some relief from the drought was felt at PTA in November and December. With any luck the rainy season will continue, hopefully helping to take A'e off of the menu for the goats and sheep of PTA. •

~Jen Lawson is a botanical crew leader with CEMML, working for the PTA Natural Resources Office.



Adult A'e (*Zanthoxylum hawaiiense*) with trunk protector. (Photo by Jen Lawson, PTA-NRO)

# A Strategic Partnership for the Conservation of O'ahu's Rarest Plants and Animals– the Mākua Implementation Team

By Kapua Kawelo

**T**HE O'AHU ARMY Natural Resource Program (OANRP) recently completed a series of meetings over three days aimed at reviewing and guiding the Army's natural resource conservation work with endangered species.

It is 8:00 am and OANRP staff are re-arranging tables and chairs, setting up computers and projectors – a change from the mountain forests, the usual backdrop for their daily activities. There is an underlying feeling of anticipation and excitement for the presentations and discussions that will ensue during the OANRP's most important series of meetings of the year. There is also a familiar and friendly feeling about this gathering. Members of the Mākua Implementation Team (MIT), which include biologists, botanists, geneticists, ecologists, resource managers, ornithologists and land owners have come together with a common sense of purpose.

What is this all about? How does this relate to the Army and Military Readiness?

The MIT first met in 1998 as a result of the Army's Endangered Species Act (ESA) Consultation with the U.S. Fish and Wildlife Service (USFWS) over training at Mākua Military Reservation (MMR). The USFWS instructed the Army to bring together a team of experts to write a step-by-step plan for protecting the endangered species at MMR in order to offset any potential impacts from Army training. This team included members of non-profit conservation organizations, academic specialists and government agency representatives.

The MIT prepared this step-wise conservation plan entitled the "Makua Implementation Plan" (MIP) through a series of workshops and meetings which took place over more than 150 days between 1998 and 2003. The MIP was finalized in May of 2003.

Included in the MIP are detailed fencing plans to protect native forests and endangered species from the damaging effects of wild pigs and goats. The MIP also prescribes how to control introduced plants (weeds) to favor native forest restoration within these fences. Further, a strategy for conducting rare plant reintroductions is covered in the MIP, including important details such as the best pot size for greenhouse production and the expected survivorship. This 1,000 page, three-volume plan also contains information about rare tree snail populations and identifies priorities for conservation.

Each year since 2003, the MIT has gathered to review progress made by the Army in executing the MIP conservation measures and to trouble-shoot any unexpected challenges.

In 2005, the Army completed an O'ahu Implementation Plan (OIP) for conserving rare species potentially affected by training at all the other O'ahu ranges, outside of MMR. The OIP was reviewed by



Founding members of the Mākua Implementation Team visiting Mākua Military Reservation in 1998. (Photo by OANRP staff)

the MIT and both plans were wrapped into the same annual review process.

At annual MIT meetings, OANRP staff prepare brief presentations which highlight successes, raise questions and ask for advice. This year, staff presentations highlighted the completion of 5.5 kilometers of pig and goat fencing, 150 acres of weed control, the reintroduction of more than 1,500 endangered plants, and rat control around 75 pairs of nesting Elepaio birds.

"I'm incredibly proud of the accomplishments of our OANRP," said Alvin Char, Chief of the Army's Directorate of Public Works' (DPW) Environmental Division. "When we first started this program back in the mid-90's, I said at the time that there was a tremendous amount of work that needed to be done towards ecosystem management on Army lands. The challenge is still there today. But we can all be proud of what we've done and what we've accomplished over the years."

The OANRP staff also summarized the extraordinary progress made on the research and development front, including work with paint-ball equipment to deliver herbicide to target weeds from a helicopter, use of a wood chipper in large-scale weed control projects, state of the art rat control approaches and the approval of a slug bait for application in the forest to protect endangered plant seedlings.

The MIT is the Army's sounding board for its natural resource program and also serves as a regulatory monitor of the Army's progress in meeting ESA requirements. The USFWS, who had a large presence at this year's meeting with five staff in attendance, considered the gathering a great success. "We are very happy with the progress the Army is making towards satisfying the goals and objectives of the Implementation Plans," said Patrice Ashfield, USFWS Section 7 Program Leader.

Other attendees reflected the same views of the meetings and are incredibly pleased with the massive effort the Army is putting toward the conservation of Hawai'i's imperiled plants and animals.

The OANRP has formed alliances with many conservation partners over the years to protect endangered species and the ecosystems upon which they depend. Partners include the State of Hawai'i, Department of Land and Natural Resources, the City

and County of Honolulu, the Navy, Kamehameha Schools, Hawai'i Reserves Inc., the Ko'olau and Wai'anae Mountains Watershed Partnerships, The Nature Conservancy, the USFWS and many private individuals who generously volunteer their time.

"We appreciate the amount of effort the staff from these various agencies and organizations have put in to help us make our efforts as scientifically sound as possible," said Michelle Mansker, Natural Resource Program Manager with the Army's DPW Environmental Division. "Without them, we would have had a hard time achieving the success we have seen to date."

The Army thanks all of these partners and is proud of what we have been able to accomplish together! •

~Kapua Kawelo is a biologist with the U.S. Army, Directorate of Public Works, Environmental Division.

## Fire control efforts blossom to protect the endangered Ma'ohau hele (*Hibiscus brackenridgei* subsp. *mokuleianus*)

By Kim Welch

ON THE NORTHERN slopes of the Wai'anae mountain range, above the town of Waialua, there remains one of only three known wild O'ahu populations of the endangered Ma'ohau hele (*Hibiscus brackenridgei* subsp. *mokuleianus*). This rare representative of the Hawai'i state flower is under constant threat of wildfire, unfortunately a frequent occurrence in the current habitat of Ma'ohau hele. In 2007, nearly two-thirds of these Waialua plants were destroyed in a wildfire that burned for seven days.



Ma'ohau hele (*Hibiscus brackenridgei* subsp. *mokuleianus*). (Photo by OANRP staff)



Historically, these hibiscus have thrived in sunny, low-elevation native dry forests, but such landscapes today have been largely altered in exchange for agriculture, grazing lands and development. The Waialua population of hibiscus is currently growing in an area dominated by invasive guinea grass (*Panicum maximum*), one of the world's fastest burning natural fuels.

With the threat of fire ever present, OANRP continues to implement innovative protection efforts in the altered Waialua landscape, to ensure the survival of the hibiscus.

Since the Spring of 2010, OANRP has received permission from landowners along Waialua's Kaukonahua Rd. (a.k.a. "snake road") to control guinea grass in fallow agricultural fields. OANRP contracts equipment operators to plow under the guinea grass (using disc attachments) several times a year, maintaining a large-scale firebreak between the road and the forest.



Local equipment operators (contracted by OANRP) use a disc attachment pulled behind their tractor to plow under guinea grass along Kaukonahua road to provide a firebreak between the road and forest. (Photo by OANRP staff)

Further down the hill, protection for the hibiscus comes from a partnership with some motivated teachers, Waimea Valley Staff, and OANRP. Thanks to everyone's efforts, Waialua high school's campus now serves as a genetic safety-net for the Waialua Ma'o hau hele. In late February, 24 hibiscus were planted on the high school grounds, an effort organized by Waimea Valley staff. These plants were



Cuttings like these were planted at Waialua high school to help provide a genetic safety net for the Waialua Ma'o hau hele population. (Photo by OANRP staff)

grown from cuttings collected from the wild Waialua hibiscus population by OANRP staff and grown in OANRP and Waimea Valley nurseries. Should there ever be another fire in the hills above Waialua, these plants provide an additional back-up for the wild Waialua population.

The OANRP staff have worked diligently to protect these endangered hibiscus for the past 16 years – but the threat of fire is constant. Innovative fuel control practices and partnerships with community members are critical parts of these protection efforts. •

~Kim Welch is an environmental outreach specialist with RCUH / PCSU working for the O'ahu Army Natural Resources Program.

## 'Tis the Season...

...for outplanting!  
Ample seasonal rains provide needed moisture for young plants as they graduate from the controlled environment of the endangered plant nurseries to "real life" in the forest.

Beginning from seed, endangered plants are propagated in growth chambers – refrigerator-looking devices that provide specific levels of light and humidity. Once the seeds germinate, the young seedlings (often only a few centimeters tall) are moved to mist benches in plant nurseries. Here, they have more exposure, but are watered with misters at frequent intervals. Their next step is to move to the main nursery benches where regular hand-watering and pest control schedules are maintained by natural resources horticultural staff. They can be cared for on these benches for up to three years prior to reintroduction into the forest.

When ready for outplanting, natural resource management coordinators work to organize what can be elaborate outplanting field days to get these endangered plants back to their natural habitat. These can entail multiple outplanting sites and hundreds of plants, which may require staff-sharing between crews. Thankfully, everyone is willing and eager to help out. Returning these plants to the wild, thus boosting endangered plant populations, is one of the most rewarding activities for conservationists.

Outplanted *Hesperomonia arbuscula*. (Photo by OANRP staff)

# EARTH WEEK EVENTS!

Learn more about the O'ahu Army Natural Resources Program and what you can do to help protect endangered species at one of these upcoming events:

## APRIL



**EVENT:** Earth Day Festival at Schofield  
**DATE/TIME:** Wednesday, Apr. 20,  
1:00 - 4:00 p.m.  
**LOCATION:** Sills Field, Schofield Barracks



**EVENT:** University of Hawai'i Earth Day  
**DATE/TIME:** Thursday, Apr. 21,  
10:00 a.m. - 2:00 p.m.  
**LOCATION:** UH Mānoa Campus



**EVENT:** MWR Fun Festival at Schofield  
**DATE/TIME:** Saturday, Apr. 23,  
9:00 - 4:00 p.m.  
**LOCATION:** Sills Field, Schofield Barracks

**For more information about  
O'ahu Army  
Natural Resource Program  
earth week events or volunteer  
opportunities please contact  
Kim Welch or Candace Russo:  
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Kaleo Wong, natural resource management coordinator for the OANRP, outplants an endangered loulu palm, *Pritchardia kaalae*. (Photo by OANRP staff)

# 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 EMP Bulletin, please feel free to contact us! The deadline to submit articles for the next issue is **May 23, 2011**.*



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