



Legacy Program Update

The Legacy Program to meet with DoD decision

makers: The Legacy Program will present the results of the FY 2010 proposals review meeting to senior DoD decision makers the week of November 16. We expect to begin making selection announcements by the end of December.

Legacy Project Highlight of the Month

Legacy Project 07-364: Intensive Plant Conservation Training Workshop

The six-day workshops focused on 17 different topics, including rare and imperiled plants, plant protection and legislation, how to measure success, and how to inventory and monitor imperiled plants. Nearly 40 experienced botanists from academia, agencies and non-governmental organizations helped to develop the workshop. These botanists also worked collaboratively to put together take-home resource materials for attendees.



Workshop participants complete an exercise in monitoring.
Photo: Center for Plant Conservation

The workshop instructors are among the top plant conservation practitioners in the country. They provided

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In The News

Endangered *Cyanea superba* Responds Positively to the Strategic Management Efforts of the Army Garrison Hawaii's Natural Resources Program

By Kim Welch¹ and Michelle Mansker²

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The rough crunching sounds of spiked hiking shoes mixed with morning bird calls, as a crew of field technicians from the Army Garrison Hawaii's Natural Resources Program (NRP) made their way into the native forest at the back of Makua Valley, Oahu. The crew walked at a brisk pace, anxious to get in position to receive a delivery of precious air cargo that had taken years to prepare. Today, 29 endangered *Cyanea superba* plants would be re-introduced to the forest of their origin.

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Since 1998, when less than 10 wild *Cyanea superba* remained on the planet, NRP staff has taken proactive measures to improve the plant's chances for survival. The remaining wild plants were closely monitored, year after year. Although they would produce flowers and fruit, the lack of new seedlings on the forest floor did not bode well for the future of wild *Cyanea superba* in Hawaii. Recognizing this sure path to extinction, NRP intervened.

Fences were built to keep pigs and goats from damaging the *Cyanea*'s fragile roots and seedlings. Invasive weeds were kept in check. Slug deterrents were put in place to keep these non-native plant predators from nibbling up precious *Cyanea* seedlings. Rat-traps and rat bait stations were put in place to keep rodents from decimating the *Cyanea* fruit. And if the NRP staff could get to the plants before the rats, they would collect fruit and bring the seeds back to the seed lab.



Cyanea superba seedlings discovered growing in the wild beneath plants that had been re-introduced into Kahanahaiki by NRP staff.



Helicopter delivers a plant box filled with endangered plants to a remote native forest where NRP staff re-introduce them to the wild.

The precious seeds were placed in petri dishes and grown in incubators. From there, seedlings were moved into the nurseries where they were nurtured and monitored until they reached a full meter in height, a process that normally takes up to three years. Unfortunately, during these ten years of intensive management, the last remaining *Cyanea superba* went extinct in the wild. But NRP anticipated this sad day and the *Cyanea* seedlings that were growing in NRP nurseries would soon fill the void in the native forest of Makua. To date, over 250 *Cyanea superba* plants have been grown and returned to Makua by NRP staff and this week's delivery would raise the number by an additional 29 plants.

This week the endangered *Cyanea* were loaded into a plant box designed for transport by helicopter to the remote out-planting site. Matt Keir, NRP Rare Plant Manager, guided the incoming helicopter to the nearby landing zone on the rim of Makua. The plant box was hooked up to a cable and within minutes it was airborne beneath the helicopter and carried into the Makua forest. The awaiting field crew in the forest unloaded each plant and packed them on their backs into shady gulches for planting.

Did You Know?

With a whopping 317 threatened and endangered species, Hawaii is often referred to as the endangered species capitol of the world. There are more listed endangered species per square mile on these islands than any other place on the planet! Thirty percent of these endangered plants and animals can be found on Army lands.



Cyanea superba looking skyward.

Just this month, a researcher in the forests of Makua noticed seedlings beneath a handful of re-introduced *Cyanea*. In 10 years of working on this project, Keir said that had never happened. When asked why this particular re-introduction of *Cyanea superba* was unique, Keir could barely contain his enthusiasm. “We found seedlings for the first time, really ever. That’s huge,” said Keir. “That’s exactly what we’re trying to do. We’re trying to out-plant little seed-making machines, basically. We grow them up so they’ll survive well, put them out there, and we hope that they just dump seeds on the ground for the next 25 years.”

NRP staff is hopeful that this week’s re-introduction of *Cyanea superba* will be a significant boost to the seed making potential. “And if we can protect the forest around them,” says Keir, “then hopefully we can just step back and let it happen.”



Cyanea flower. The *Cyanea superba* is one of 73 federally-listed endangered species that the Army manages on Oahu.



NRP field technician, Kala Lindsey-Asing (right) and Hawaii Youth Conservation Corps volunteer, Koa Matsuoka (left), take measurements of an endangered *Cyanea superba* in Kahanahaiki.

Understanding the Pollination Ecology and Breeding Systems of the Endangered Plant, *Kadua coriacea*

By Christian Torres-Santana and Clifford W. Morden
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The endangered *Kadua coriacea* (formerly *Hedyotis coriacea*), or kio`ele, is a small, multi-branched shrub with leathery leaves and blooms white, perfect flowers. This endemic member of the coffee family (Rubiaceae) is now known only from the U.S. Army Pōhakuoloa Training Area (PTA) on the island of Hawai‘i, but is historically also known from the islands of Maui and O‘ahu. There are only 175 wild plants left that are scattered in five subpopulations of this subtropical, montane to subalpine dry forest, a very rare ecosystem worldwide. The risk of extinction for this species is exacerbated from direct browsing by introduced feral goat and sheep. Since this species was rediscovered in PTA, only a single seedling is known to have germinated and grown naturally despite the fact that the plants are flowering and fruiting annually and that browsing ungulates have been excluded. Consequently, the PTA Natural Resource Staff are working to increase wild grown plants by reintroducing several hundred individuals in PTA, Pu`u Wa`awa`a Forest Reserve, Koai`a Tree Sanctuary, and Pu`u Huluhulu.

A coalition is conducting field studies to better understand the reproductive mechanisms and the pollination ecology of *K. coriacea* since the beginning of January 2009. This work involves many collaborators, including U.S. Army