

The Bulletin

OF THE NATIONAL TROPICAL BOTANICAL GARDEN

Volume XXV, No. 5

Fall 2008



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ON THE
COVER:

NTBG field botanist Steve Perlman collects tiny seeds from one of the few remaining *Platanthera holochila*, a native orchid species which is on the Plant Extinction Prevention program's target list. (See article, page 6.) Location: Kamakou Preserve of The Nature Conservancy of Hawai'i. Photo by ©Hank Oppenheimer, Plant Extinction Prevention Coordinator, Maui Nui

The Bulletin is a publication for supporters of the National Tropical Botanical Garden, a not-for-profit institution dedicated to tropical plant conservation, scientific research, and education.

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NTBG field botanist gives a 'PEP' talk

*by Steve Perlman,
Research Biologist*

There is an extinction crisis going on in Hawai'i that is serious, alarming and, at the same time, sadly touching. With 90% of its native flora found nowhere else, Hawai'i has the highest rate of endemism in the world. But more than 100 of the roughly 1,200 native Hawaiian plant species have gone extinct since documentation of the flora began.

Hawai'i has 42% of all plant species on the Endangered Species List and even conservationists are shocked when

they learn there are 184 native Hawaiian plants with less than 50 individuals remaining in the wild. One of the primary mandates of NTBG is to prevent tropical plant extinction and is one of the main reasons NTBG was given a congressional charter in 1964. Since the organization's early years, it has grown species for the living collections as a way to counter such loss. It was as early as 1974 then-NTBG horticulturist Keith Woolliams grafted a piece of scion wood from the last known *Kokia cookei* just before the tree was lost in a fire on Moloka'i. The species survives today only because Keith recognized the urgency and acted quickly.

“Isn't extinction a natural process?” you ask. Haven't plants, especially on islands, gone extinct for millions of years anyway? Of course they have, but the unprecedented mass extinction we are witnessing today, due in large part to introduced grazing animals, noxious weeds, rats, and land conversion, has increased extinction rates to probably 10,000 times the natural rate.

In 36 years of rare plant fieldwork in Hawai'i, I have witnessed over a dozen species go extinct. I assure you, nothing is sadder than watching the last plant of a species die. These jewels of creation have grown successfully in the Hawaiian Islands, some for as many as 30 million years, and today they are making their last stand. Like the native insects and birds that they depend upon and which depend upon them, these plants are an integral part of Hawai'i's ecosystems.

In the late 1980s a major grant allowed NTBG to significantly expand its work to save critically endangered native flora, through collection, propagation, and education, and by putting seeds into storage. (See related story on page 13.)

The Hawai'i Rare Plant Restoration Group (HRPRG), a coalition of federal and state agencies, botanical gardens, private organizations, and landowners, was subsequently formed. From its inception, NTBG

► The 12 examples featured here are just some of the startling number of 184 native species with 50 or less plants left in the wild. Photos by NTBG field staff

has been an active member, working with the University of Hawai'i's Center for Conservation Research and Training Seed Storage Facility at Lyon Arboretum (Hawai'i's largest tissue culture and seed storage facility), as well as over 25 agencies that make up the group, to come up with strategies and protocols dealing with the extinction crisis.

With its core mission to save native plants, HRPRG helped establish a project called Plant Extinction Prevention (PEP) Program. Formerly known as the Genetic Safety Net Program, PEP uses the concept of a safety net to preserve genetic material of rare species, typically as seeds, with a focus on the rarest plants – those with less than fifty individuals, or in some cases only one plant, remaining in the wild.

PEP has five objectives: to monitor populations, to collect propagules, to survey new areas where additional plants may be discovered, to mitigate threats by building ungulate fences and controlling rats, and to establish new populations in protected areas with the ultimate goal of preventing further extinction. Such plant conservation must transcend land boundaries and so collaboration with private landowners is essential.

Once plants are grown in greenhouses, planned reintroductions must be implemented carefully. The ultimate goal of these objectives is to prevent further extinction by stabilizing reintroduced species. To do this successfully requires the establishment of at least three populations of a species, each population consisting of 25 long-lived plants or 50 short-lived plants.

PEP is the largest plant conservation program in Hawai'i today, in terms of breadth of species and spatially, covering all the main

COUNTING DOWN TO EXTINCTION



50 left*



50 left*



45 left*



40 left*



37 left*



20 left*



20 left*



20 left*



10 left*



5 left*



1 left*



1 left*

*estimated plants in known wild populations



◀ NTBG Field Botanist Natalia Tangalin bags flowers of *Cyanea magnicalyx* (opposite page ▶) to protect them from slugs and catch the fruit.

Photos by author

Hawaiian Islands, with a PEP coordinator for each of four island areas (Hawai'i Island, O'ahu, Kaua'i, and Maui Nui [Maui, Moloka'i, Lāna'i, and Kaho'olawe]).

With so much ground for each person to cover, it is our goal to help each coordinator in any way we can from leading them to rare plant locations, helping collect seed, and teaching collecting, cutting, and propagation techniques. These techniques include air layering, grafting, divisions, cloning, tissue culture, and embryo extraction. In some cases we hand-pollinate flowers to ensure seed production as natural pollinators maybe very rare or already extinct.

While ideally we want to protect these species in their natural environment, the reality is that we need to act quickly to collect plant material for propagation. I believe in the future we will be able to grow plants from even a small piece of a leaf, but regardless of the technology we develop this is something that can't be done if the plant goes extinct first. The PEP Program represents an immediate concentrated and collaborative effort to save Hawai'i's precious plants. I, for one, pledge to do all I can to make the program a success so that we don't lose another single species.



▲ O'ahu PEP program coordinator Ane Bakutis uses a fine paintbrush to pollinate *Hesperomannia arbuscula*. Photo by author



▲ Seeds of the *Cyanea maritae* in the Makawao Forest Reserve on East Maui are collected for propagation. Only about 50 plants of this species remain in known wild populations. *Photo by author*

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Michael Shea, NTBG's General Counsel, is available to confer with you and to help and advise in connection with gifts to support NTBG: bequests, endowment gifts, charitable remainder trusts, gifts of real estate, and other planned gift instruments.

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