



State of Hawai'i

Department of Land & Natural Resources

Division of Forestry & Wildlife

RARE PLANT PROGRAM



2023 was a banner year for rare plant conservation in Hawai'i! It is the 50th anniversary of the Endangered Species Act and the 20th anniversary of Hawai'i's Plant Extinction Prevention Program (PEPP). Hawai'i has more than half of all Endangered plants on the U.S. Endangered Species List (54%, 416/765). As a result, Hawai'i is a leader in plant conservation, as demonstrated by PEPP being recognized for its contribution to biodiversity conservation at a ceremony in Washington D.C.





Partners at The Nature Conservancy of Hawai'i discovered a previously unknown population of Kaluaha (*Astelia waialealae*) in a protected area of Wai'ale'ale on Kauai. This amazing discovery is a huge boost for the recovery of this critically rare species! Previously, it was only known from just a few locations with a maximum of five individual plants. The plants were found while conducting other work to protect the area from invasive species. The next steps are to monitor the plants for seeds to create another population. What an incredible find!



Astelia waialealae

Before 2021, *Adenophorus periens* had not been observed in the wild for almost 10 years. Since then, individuals have been observed in several locations on Kaua'i. This year, a plant was collected and brought to Lyon Arboretum, where the plant continues to grow and reproduce. Spores were also collected and propagated at the Lyon Arboretum Micropropagation Lab and the National Tropical Botanical Garden raising hopes of outplanting this once feared-to-be-lost species in the years to come. This is the first time this plant has been in cultivation and there is so much to learn about how to care for it. We are so grateful for all the amazing conservation horticulturists in Hawai'i!



Adenophorus periens



Fencing was completed around all known plants of a Loulu (*Pritchardia viscosa*). This Loulu is one of the rarest in the world, with only a single population of four trees remaining. With the introduction of the invasive Coconut Rhinoceros Beetle (CRB) from O'ahu to Kaua'i this year, the threat of extinction has never been more real for this species. Thankfully, this year also marks the completion of ungulate exclusion fencing around these precious trees, and with extensive rat control efforts in place, the possibility of seed production and seedling recruitment is more realistic than ever before since the introduction of these invasive vertebrates. Seed collections can now be made this coming year to secure plants at living collections to protect their progeny from the deadly CRB until control efforts for this new invasive threat can be developed. Once they are, these Loulu can make their way back into the forests.



Pritchardia viscosa

Propagation Projects

The field staff and horticulture crew on O'ahu successfully grew several species of rare native plants like A'e (*Zanthoxylum oahuensis*), Kāmakahala (*Labordia tinifolia* var. *lanaiense*), and Hulumoa (*Exocarpos gaudichaudii*). These important species are incredibly difficult to grow, and this breakthrough has resulted in some being secured in cultivation for the first time! Field

botanists and horticultural experts work together to prevent extinction in Hawai'i, and this is a great example. The next step is to multiply them and create new populations in protected habitats in the Ko'olau and Wai'anae Mountains.





A miniature fern *Asplenium hobdyi* was discovered on Ka'ala, where it had never been seen before! While conducting surveys of the Ka'ala Natural Area Reserve, staff from DOFAW and PEPP observed several unusual ferns on a rock outcrop next to a stream. Bishop Museum staff confirmed the identification of this species, which is also known from Kaua'i, Maui, Moloka'i, and Hawai'i Island.

Asplenium hobdyi



The species is named for Robert Hobdy, an expert local naturalist who passed away in the last year. The new plants are in a protected area where invasive species control is ongoing.

The last known plant of Nā'ū (*Gardenia brighamii*) on O'ahu was observed to have died in the last year. The only remaining wild plants are on Lāna'i, but an ambitious project to reintroduce it across the state is beginning. Collections secured from the last plants on O'ahu, Moloka'i, and Lāna'i will all be grown together to increase the diversity in new populations. This species grows in dry forests and the new populations will need to be protected from threats from rats, goats, weeds, and wildfire to survive. It is all worthwhile to ensure we do not lose this biocultural treasure.



Gardenia brighamii

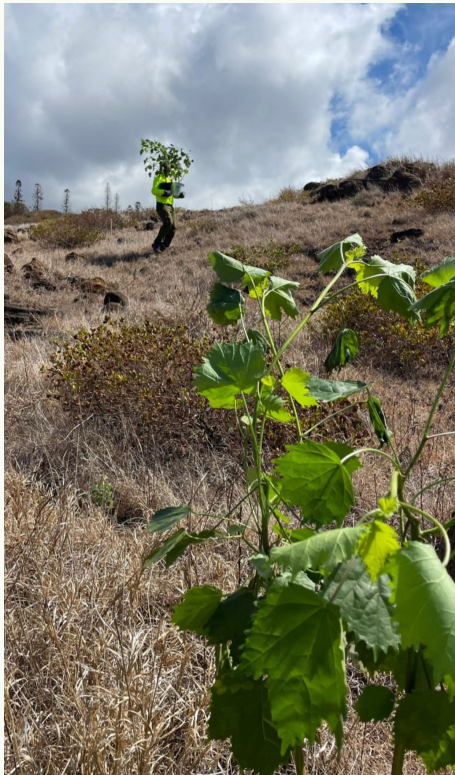
Kadua cordata subsp. *remyi*



The last known wild plant of the Lāna‘i Kopa (*Kadua cordata* subsp. *remyi*) was observed to have died a couple of years ago. However, seeds that were collected from the last known plants and held in storage at the Lyon Arboretum and National Tropical Botanical Garden Seed Banks were withdrawn and germinated on Maui. Until now, the only living plant produced pollen but never produced seeds.

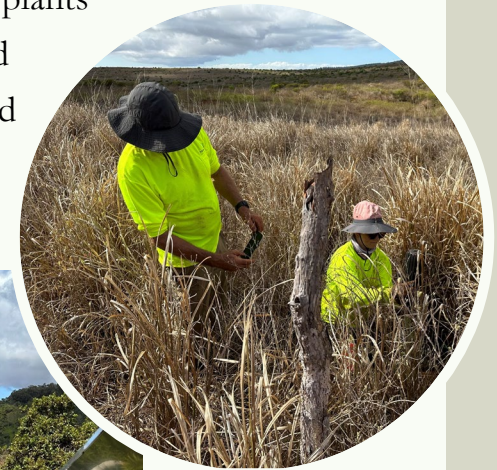
With all these new plants from the stored seeds growing in the nursery, the next step is to wait for them to flower, then hand-pollinate the plants to get more seeds.





Outplanting Projects

The conservation teams from Pūlama Lāna‘i and PEPP got together this year to outplant dozens of individual plants of Ma‘o hau hele (*Hibiscus brackenridgei*), Halapepe (*Dracaena fernaldii*), Kāmakahala (*Geniostoma tinifolium* var. *lanaiense*), and other rare species in to protected areas. The plants were grown on island and carefully returned to sites where they can thrive.



Ma‘o hau hele (*Hibiscus brackenridgei* subsp. *brackenridgei*) is the State Flower of Hawai‘i and an Endangered species. Restoration projects to recover this important plant are happening across the state and we got some good news about seedlings being observed in a protected area on Lāna‘i where it has been planted and protected. The goal of these restoration projects is to create self-sustaining populations and these keiki are the first sign of that happening!



Hibiscus brackenridgei subsp. *brackenridgei*

Maiapilo (*Capparis sandwichiana*) is a short shrub found near the coast across the Hawaiian Islands with large white flowers that bloom at night. It was used in lā'au lapa'au, or traditional Hawaiian medicine to treat broken or fractured bones. There are only a handful of plants on Moloka'i, so the PEPP team has been focused on securing seed collections from them in the last year. After many visits to control threats, watch for flowers, protect the maturing fruit, and install bags to catch seeds: we got the seeds! There are a few hundred plants known on other islands, this collection will be used to create new populations in coastal areas of Moloka'i.



Capparis sandwichiana



Where coastal areas have not been transformed for other uses, there is a rich community of native plants that protect reefs from erosion and buffer the growing impacts of climate change. These natural areas also provide habitat for rare species like *Ischaemum byrone*, a rare grass that is found on several islands. On Molokaʻi, where there are still places that are protected from many of its threats, over 1,000 plants were discovered on the weathered rocky coastline and sea cliffs of the north shore. These areas provide refuge for rare plants but also provide an opportunity for recovery when seeds are collected for restoration.



Ischaemum byrone



Drone Surveys

Over the last year, specialists from PEPP and the National Tropical Botanical Garden worked together to explore the tallest sea cliffs in the world on Moloka'i. The cliffs are thousands of feet tall and are home to plants with a spectacular view and found nowhere else in the world. New drone technology is providing a glimpse of areas that are otherwise inaccessible to botanists. While other populations of Pua'ala (*Brighamia rockii*), Koki'o ke'o ke'o (*Hibiscus arnottianus* subsp. *immaculatus*), and Hōawa (*Pittosporum halophilum*) have been lost to browsing by goats and deer, they are kept out of these places by the steep cliffs. Images from the drones revealed several small keiki plants that had never been seen before!



A new species of native plant has been discovered and described from Mauna Kahālāwai, Maui. *Clermontia hanaulaensis* is a beautiful shrub with candelabra-like branching and pale violet-purple and white flowers. A single population was found during the course of regular field work spanning several ridges and gullies. After careful study, it was determined to be unlike any other known species and is only found on Maui.

Clermontia hanaulaensis



Seeds have been collected and stored at the Lyon Arboretum and invasive species control in the area is ongoing.

Phyllostegia bracteata is a critically endangered species that has only ever been found on Maui. It is a small plant with bright white flowers and grows in the understory of wet forests, subalpine forests, and in wet cliff ecosystems. Around 2013, the last known plants were lost. Even though seeds collected from the last individuals had been saved, it was thought to be extinct in the wild. Over the last two years, five new sites have been found during field surveys! With collections to bolster the diversity in hand, there is a better chance of recovery.



Phyllostegia bracteata



Eleven new plants of
‘Ōhā wai (*Clermontia*
samuelii subsp. *samuelii*) were discovered
in a remote area of protected native
forest, increasing the total population by
25 percent!

Clermontia samuelii subsp. *samuelii*



These new plants will be monitored and
protected by a team from PEPP and
Haleakalā National Park, who are
creating new populations of this species.
These outplantings will continue to be
conducted and monitored, and to
date over 125 new plants were returned
to the forest where they can be a part of
the ecosystem for years to come.



At least 90% of Hawai‘i’s dry forests have been lost to impacts from invasive species, wildfires, and urban development. The forests that remain are refugia for important native trees like luma and wiliwili and are the only habitat left for rare species like *Gouania vitifolia* a woody vine with small white flowers. The population on Maui has been lost, but there are still live plants on O‘ahu and Hawai‘i Island, where a long-known population in Manukā was protected with a new fence to keep goats and pigs away. While building the fence the team from Hawai‘i Natural Area Reserves System (NARS), Kohala Watershed Partnership, and PEPP found a previously unknown population in the next kīpuka to the north! The next steps are to collect from all plants and create a small seed orchard to harvest seeds for more planting.



Gouania vitifolia

Argyroxiphium sandwicense subsp. *sandwicense*

DOFAW and PEPP are working with the Center for Mauna Kea Stewardship to restore and protect 'Āhinahina (*Argyroxiphium sandwicense* subsp. *sandwicense*). This year was especially exciting because they planted the first seedlings grown at their high-elevation nursery! The nursery is a great place to prepare them for life at the summit. The new keiki plants are from seeds produced over 10 years of careful work hand-pollinating wild plants. Many of these new seedlings originate from mother plants that had not previously contributed to outplantings, bringing a new boost of diversity.



‘Awapuhiakanaloa (*Liparis hawaiiensis*) is the smallest of Hawai‘i’s three native orchids. It grows on trees and the mossy ground of bogs and wet forests of all the main Hawaiian Islands. It is vulnerable to trampling and invasive slugs but can still be found in protected areas where threats are controlled. However, it is especially rare on Hawai‘i Island, where the crew from PEPP, DOFAW NARS, and Lyon Arboretum are working to conserve it. A few plants were brought in from the wild and grown at the Volcano Rare Plant Nursery and Lyon Arboretum where the seeds can be harvested and grown. Once they are large enough to travel, they will go back home to be planted.



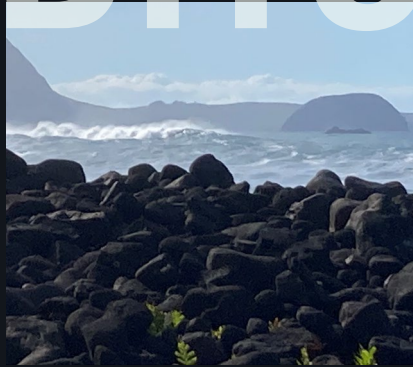
Liparis hawaiiensis

MAHALO



to all our conservation partners

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Adenophorus periens

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Pritchardia viscosa

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Propagation projects

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Asplenium hobdyi

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Gardenia brighamii

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Kadua cordata subsp. *remyi*

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Outplanting partnerships

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Hibiscus brackenridgei
subsp. *brackenridgei*

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Capparis sandwichiana

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Clermontia bananulaensis

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Phyllostegia bracteata

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Clermontia samuelii subsp. *samuelii*

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Gouania vitifolia

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Argyroxiphium sandwicense subsp.
sandwicense

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Liparis hawaiiensis

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