New Discoveries Bring Hope for Garden Isle's Rare Flora

by Michelle Clark

Uhiuhi was thought to be extinct on Kauai when the last known individual died after Hurricane Iniki. *Photo Credit: Natalia Tangalin, NTBG*

Kauai is a botanist's dream. Aptly nicknamed the Garden Isle, Kauai's floristic diversity is unparalleled.

"Kauai, the oldest island of the main Hawaiian Islands, has been called a 'treasure trove of biodiversity,' and is believed to house the greatest diversity of plants in the state," says Patrick Leonard, the former Field Supervisor for the U.S. Fish and Wildlife Service's (Service) Pacific Islands Fish and Wildlife Office.

Hawaiian flowering plants exhibit the highest rate of endemism, or uniqueness, in the world—almost 90 percent. Kauai has the highest number – 495 – of endemic plant species in the Hawaiian Archipelago. The island's native plants are in trouble, however. Over 140 of them are listed as federally endangered, and of these, 70 are on the verge of extinction with less than 50 reproductive individuals remaining in the wild.

There has been much excitement and hope generated by the recent rediscoveries of three extremely rare Kauai plant species – *Lysimachia venosa*, uhiuhi (*Caesalpinia kavaiensis*), and kokio ula (*Hibiscus clayi*) – by National Tropical Botanical Garden (NTBG) staff. The NTBG, based in Kauai, is an internationally renowned leader in plant conservation, and is the only tropical botanical garden with a charter from the United States Congress.

Lysimachia venosa, a plant known only from Kauai was thought to be extinct, until it was rediscovered earlier this year by NTBG staff. This strikingly beautiful plant, a member of the evening primrose family, was originally discovered by Heinrich W. Wawra in 1870. It was documented only one other time by Joseph Rock in 1911. In 1991, a NTBG botanist found a small branch at the base of a 3,000-foot (900-meter) cliff, but it was unknown where the branch came from or if any living plants remained. The mystery was finally solved in 2012, when 30 individuals were discovered in the montane wet forests of Kauai's rugged interior. Funding for the botanical survey was provided by the Service's Conservation Partnerships and Endangered Species Recovery Programs. Support for the project was also provided by the Kauai Watershed Alliance, a partnership of local large landowners that work together to manage and protect large tracts of land in Kauai's central mountains. NTBG is working with the Hawaii Plant Extinction Prevention Program to collect

seeds from the population for ex situ, or off site, storage, propagation, and reintroduction of the species into areas protected from feral ungulates, such as pigs, goats, and deer.

A single individual of uhiuhi, a flowering tree that was once abundant on the islands of Hawaii, was discovered with seeds in the Waimea Canyon on Kauai's west side in December 2011. Its wood was highly valued by Hawaiian natives, who used it to make spears and as well as a fishing implement known as la'au melomelo. The species' endangered status was not the result of overharvest for these tools, however. Uhiuhi started to decline more recently, after the dry and mesic forest habitats that it thrives in were degraded throughout the Hawaiian Islands by grazing animals, aggressive foreign plants, landslides, and wildfire. The last known wild tree on Kauai (there are three known on Oahu and around 75 on the Big Island) occurred in an exclosure maintained by the Hawaii Division of Forestry and Wildlife in Poomau Canyon. The tree died after suffering damage from Hurricane Iniki in 1992. The discovery of the single uhiuhi tree bearing seeds gives hope for the survival of the species.

Steve Perlman, NTBG Research Biologist rappelling to collect seeds and cuttings from rare plants from the 3,000 ft. cliffs of Kalalau Valley.
Photo Credit: Michelle Clark, USFWS

Hibiscus clayi, the rarest of the kokio ula, the Hawaiian name for all red flowered hibiscus, became the poster child for endangered species in Hawaii after its brilliant scarlet blossom graced the cover of the National Geographic's Remains of Rainbow: Rare Plants and Animals of Hawaii, which published in 2003. The species – known only to Kauai – had dwindled to four individuals on a single mountain in a degraded forest on the east side of the island. Merlin Edmonds, the Restoration Collections Assistant for NTBG, happened across a new population of over 50 individuals while hiking along a ridge on the island's northeastern side in summer 2011. The individuals in this population range from one-inch (2.5-centimeter) tall seedlings to large sprawling small trees up to 20 feet (6 meters) in height. Different size classes or age groups indicate a healthy population.

The recent rediscoveries of these three plant species on the Kauaii landscape has opened up the possibility of maintaining them.

With support from the Service's Pacific Islands Fish and Wildlife Office, NTBG is currently surveying Kauai's landscape for 10 other Kauai plant species whose last known individuals have recently died. The charismatic *Hibiscadelphus woodii* is among this list of plants that botanists hope to find in the wild. This plant garnered international recognition when it was listed in the International Union for the Conservation of Nature and Zoological Society of London's 2012 publication "*Priceless or Worthless: The World's Most Threatened Species*." Its Hawaiian name, hau kuahiwi, which means "mountain hibiscus," is telling of where it was once found. This member of the hibiscus family is unique to Hawaii. It was first discovered in the 1990s, and only seven individuals were documented since—all from the cliffs of Kalalau

Merlin Edmonds, the Restoration Collections Assistant for NTBG, with the new population of Hibiscus clayi that he discovered in summer 2011.
Photo Credit: Michelle Clark, USFWS

Valley. The discovery of new individuals is the last hope for this goregous plant, since past attempts at propagation failed. Suitable habitat remains intact along the cliffs of Kalalau, so if additional individuals are found and captive reproduction is successful, the plant may one day be restored to the landscape.

Much effort is being made to protect and conserve Hawaii's native biodiversity. These species, and the ecosystems that they form, are irreplaceable treasures– each a reflection of millions of years of evolutionary processes and a true expression of its natural environment.

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