



Native Hawaiian Plant Society

Nanea Nā Pua O Ka 'Āina Aloha

NHPS Newsletter

February 2015

2014 Highlights in Botanical Research & Conservation

By Chuck Chimera

The past year saw some exciting developments in the world of Hawaiian botany and conservation, including a promising restoration success story, some important taxonomic and biogeographic findings, an amazing new plant discovery and some notable news on Hawaiian honeycreepers. For those who do not have access to scientific journals, or the time (or desire) to slog through an entire technical publication, but would still like to hear about these new developments, the following is a brief sampling of five scientific papers published in 2014.

Hope, and native vegetation, restored in iconic dry forest: Hawaiian dry forests are among the most endangered native plant communities in the islands, reduced to less than 10% of their original cover. What little remains is highly degraded, beset by invasive weeds and voracious animals, and thought by some to be beyond repair. Fortunately, conservation biologist Art Medeiros, his crew and an army of community volunteers begged to differ. After fifteen years of planting, weeding and protection from ungulates, Dr. Medeiros and colleagues report that the Auwahi dry forest, on the leeward slopes of Haleakalā, is starting to show real signs of life and may be turning back into a self-sustaining ecosystem. Invasive grass cover, once dominating 75% of the area, has been reduced to about 3%, while native shrub and tree cover has dramatically increased from 3% to 82%. Even more inspiring, several native trees and shrubs have started to produce natural (i.e., not planted) seedlings, including seven rare dry forest trees that, until now, have rarely produced seedlings in the wild. If you are unable to attend one of the monthly Auwahi volunteer trips, you can still see the results of Art and company's success (now being duplicated in two other exclosures) from an aerial view captured on Google Earth.

Medeiros, A. C., Allmen, E. V., & Chimera, C. G. (2014). Dry Forest Restoration and Unassisted Native Tree Seedling Recruitment at Auwahi, Maui. *Pacific Science*, 68(1), 33-45.

The three Auwahi restoration areas visible from Google Earth.

Restored native dry forest vegetation (dark green) surrounded by invasive grasses (light green).



Google earth

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Fig. 1



Fig. 2

Fig. 1: *Acacia heterophylla* on Reunion Island.¹

Fig. 2: *Acacia koa* on Maui (Waikamoi).
Photo by Forest & Kim Starr

¹Fig. 1 Photo: "Acacia heterophylla (flowers) 2". Licensed under CC BY-SA 3.0 via Wikimedia Commons - [http://commons.wikimedia.org/wiki/File:Acacia_heterophylla_\(flowers\)_2.JPG](http://commons.wikimedia.org/wiki/File:Acacia_heterophylla_(flowers)_2.JPG)



The yellow, tubular flowers of the halapepe (*Chrysodracon auwahiensis*), Hawai'i's golden-flowered dragon tree (Image courtesy of Maui Native Nursery www.mauinativenursery.com)

'A. koa by any other name...': In the world of plant taxonomy and biogeography, an international group of scientists, including University of Hawai'i's own Dr. Cliff Morden, examined the phylogeny (i.e., history of the evolution of a species or group), genetic structure and ecological niches of what were believed to be two separate, but related island endemics: *Acacia heterophylla* from Reunion Island and *Acacia koa* from the Hawaiian Islands. It was previously hypothesized that these two very similar looking species were the result of independent colonization events from Australia. The results of this recent study suggest that *Acacia koa* evolved from an ancestral species and then colonized Reunion Island, over 11,000 miles away! Even more interesting, the authors believe that the two individually described species probably represent a single species, despite the huge distances separating them. Aside from changing the status of koa from endemic to indigenous, this publication may result in a taxonomic name change to our beloved native. Even though koa is the source of the Reunion Island colonization, due to the rules of botanical nomenclature, the species that was named first gets priority. In this case, *Acacia koa*, which was described in 1854, would have its scientific name changed to *Acacia heterophylla*, first described in 1806. Whatever the taxonomists decide, the Hawaiian name will remain the same, and the tree we all know and love as koa will continue to reign as one of the most important trees in Hawaiian forests and culture.

Le Roux, J. J., Strasberg, D., Rouget, M., Morden, C. W., Koordom, M., & Richardson, D. M. (2014). Relatedness defies biogeography: the tale of two island endemics (*Acacia heterophylla* and *A. koa*). *New Phytologist*, 204(1), 230-242.

Botanists recognize Hawai'i's unique golden-flowered dragon trees:

In another publication looking at evolutionary relationships, Cliff Morden and Pei-Luen Lu of the UH Botany Department used chloroplast DNA to explore the global evolutionary pattern among the dracaenoid plant genera *Dracaena*, *Pleomele* and *Sansevieria*. Aside from determining that the relationship is complicated and needs more study, they discovered that the Hawaiian halapepe species, formerly placed in the genus *Pleomele*, are more closely related to each other than to other *Pleomele* species found elsewhere, and that they deserve their own endemic genus, *Chrysodracon*. The name, which means "golden-flowered dragon tree," describes the yellow tubular flowers that are long and wide, and in hanging panicles, features that are unique to the Hawaiian species, and which may be adaptations for bird pollination. The authors also state that the Hawaiian taxa, previously thought to have originated from Central American species, are very different and most likely derived from an Asian ancestor that is now extinct. In fact, their research suggests that the Central American species may have actually originated from dispersal of a Hawaiian ancestor species or from an Asian species that had to disperse an even greater distance across the entire Pacific Ocean. In either case, the research once again confirms how Hawai'i's extreme isolation, along with a long time span, has resulted in one of the most unique and special floras in the world.

Lu, P. L., & Morden, C. W. (2014). Phylogenetic Relationships among Dracaenoid Genera (Asparagaceae: Nolinoideae) Inferred from Chloroplast DNA Loci. *Systematic Botany*, 39(1), 90-104.

President's Message

The goals of The Native Hawaiian Plant Society are to help save endangered Hawaiian native plants, protect their habitats and reduce threats to them. Only because of our volunteers can these projects continue.

Here is a brief account of the NHPS history:

- 1984 Rene Sylva, a Maui naturalist, developed a lowland native plant garden in Kahului with a volunteer support group. This became the present Maui Nui Botanical Gardens.
J.L.Gressitt Rare Plant Sanctuary lease on 65 acres signed, enclosed to protect existing rare plants, and new species to protect added.
- 1985 First small enclosure project on privately owned land near Ma' alaea, fenced *Hibiscus brackenridgei* to protect from goats and cattle.
Kaho'olawe restoration project built a water diversion ditch, dam gate and cistern. Ten native species outplanted on 300x300 foot area.
- 1987 Auwahi enclosure fences in 10 places around endangered rare trees in pasture land to stop cattle, goat and pig damage.
- 1988 Kanahā Pond Wildlife Sanctuary cooperation with State Department of Land & Natural Resources, State Division of Forestry & Wildlife to remove invasive plants.
- 1989 Weed wrench tools bought to pull woody stems and remove invasive plants without chemical controls.
- 1991 Exhibit at Maui County Fair: island model showing 57 mesic, dryland forest and coastal plants.
- 1992 Slide show program by guest speaker Marie L. McDonald, author of *Ka Lei*, on growing and using native plants for lei.
- 1993 Native plant garden in Kahului Public Library courtyard begun using lowland coastal plants.
- 1994 Slide show program on native mushrooms by guest speaker Dr. Don Hemmes of UH Hilo.

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Critically Endangered Genus Welcomes Newest Family Member: British rock stars, the Beatles, once sang "I get by with a little help from my friends," and thanks to a little help from a trio of Hawaii's botanical rock stars, the future for the newest species of the critically endangered Hawaiian genus, *Hibiscadelphus*, looks a whole lot brighter. In what has to be one of the most exciting botanical discoveries in some time, botanists Hank Oppenheimer, Keahi Bustamante and Steve Perlman, all with the Plant Extinction Prevention Program (PEPP), report on their discovery and describe the new species *Hibiscadelphus stellatus*, which they located while doing plant surveys in a remote and rugged valley on West Maui. Aside from how amazing it is to discover a new species, perhaps what is most astounding is how well this new plant is doing compared to other members in the endemic genus. Of the seven previously described *Hibiscadelphus* species, four are now extinct, two only exist in cultivation, and just one remains in the wild. In contrast, *Hibiscadelphus stellatus* has three wild populations totaling 99 plants in all sizes, from mature adult trees to saplings, and including the only naturally occurring seedlings in the genus. Despite the health of these thriving populations, the species is still critically endangered and threatened by fire, competition with invasive plants and browsing by rats, slugs and ungulates. In addition to protecting the wild plants, PEPP botanists have collected seeds from the populations to ensure that the newest member of the genus will continue to survive for generations to come. To read more and to see pictures of their amazing find, visit the on-line journal PhytoKeys (<http://phytokeys.pensoft.net/>) with open access to the public.



Hibiscadelphus stellatus. Photo Courtesy Hank Oppenheimer, Plant Extinction Prevention Program

Oppenheimer, H. L., Bustamante, K. M., & Perlman, S. P. (2014). A new species of *Hibiscadelphus* Rock (Malvaceae, Hibisceae) from Maui, Hawaiian Islands. *PhytoKeys*, (39), 65.

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Hybrid honeycreeper—offspring of a female 'i'iwi and a male 'apapane. (Image: http://www.newswise.com/images/uploads/2011/08/22/Hybrid_Honeycreeper.jpg)

Lonely male bird, into lehua blossoms, seeks single female. Genus unimportant: Despite this being a botanical newsletter, the finding reported in the following study is just too cool to pass up. With over 50 species in 21 genera, Hawaiian honeycreepers are world-renowned as the preeminent example of speciation and adaptive radiation on an oceanic archipelago. Biologists have long known that hybridization plays an important role in the evolution of new species. Despite this fact, no confirmed examples of honeycreeper hybrids have ever been found, that is until now. Ornithologists working in the Waiakea Forest Reserve on Hawai'i Island report on their discovery of the first known hybrid between an 'i'iwi (*Vestiaria coccinea*) and 'apapane (*Himatione sanguinea*). The hybrid status of the bird, the son of a female 'i'iwi and male 'apapane, was confirmed using genetic and morphological analyses. The authors do not know why hybrids are not more common between honeycreepers, but speculate that the similarities in courtship behavior between the two species, their overlapping breeding seasons, and the abundance of 'apapane (four times as common as 'i'iwi at the study site), may have contributed to the otherwise rare hybridization event. They also wonder whether these hybrids will become more common in areas where 'i'iwi populations are declining. The only thing for certain is that the discovery of the first ever honeycreeper hybrid is completely unrelated to the advent and ubiquity of on-line dating sites.

Knowlton, J. L., Flaspohler, D. J., Mcinerney, N. R., & Fleischer, R. C. (2014). First Record of Hybridization in the Hawaiian Honeycreepers: 'I'iwi (*Vestiaria coccinea*) × 'Apapane (*Himatione sanguinea*). *The Wilson Journal of Ornithology*, 126(3), 562-568. 🌿

Ma'o Hau Hele (*Hibiscus brackenridgei*) Enclosure

By Hank Oppenheimer, Project Leader



Hibiscus brackenridgei

Photo Courtesy Hank Oppenheimer, Plant Extinction Prevention Program

2014 was a wet year, the first after several dry ones. Several trips to the enclosure had to be cancelled due to the wet conditions and an impassable, muddy road! I don't recall that ever happening, at least not in the recent past. Last month we managed a visit, and the fence was in good condition. There were several mature plants, with more immature saplings and seedlings. Some seeds were collected and provided to Flyin' Hawaiian Zipline for their restoration efforts nearby, which are part of their activity. Except for the guinea grass, the weeds weren't so bad, and our efforts to control the glycine vines are showing results, with very few immature plants. We managed to remove many *koa haole*, lions ear, and other priority weeds. With the back-to-back wet spring-summer-and fall, there are dozens of young *Schiedea salicaria* (an endangered shrub endemic to Mauna Kahalawai [West Maui], as well as *Achyranthes splendens*, also a rare shrub but not yet endangered. One highlight was watching and

hearing a pair of *nēnē* fly by a couple of times. Recently it was reported in the news that a nest and egg were found on the nearby golf course, where the geese have been seen for many years.

Mahalo to all the volunteers for your help, and to those whose trip unfortunately got cancelled due to bad weather, thanks for your interest and we hope to get you out there in 2015. And *Mahalo Nui Loa* to Duane Ting and Flyin' Hawaiian for the access and support—we couldn't do it without you folks. 🌿

NHPS Outings in 2014
See some of the places we went and things we did!



Weeded invasive pickleweed at 'Āhihi-Kīna'u...twice!

Removed blackberry at the Rare Plant Facility.



Helped the "Weed & Pot Club" at MNBG, and kept native plantings beautiful at Kahului Library & Haiku School.



Taught folks to make native plant lei at the Ha'ikū Ho'olaulea.

Toured native plant gardens at MISC and...



...at the home of Forest and Kim Starr.

And otherwise had a swinging good time!

Want to see more? Go to <http://nhps.smugmug.com>

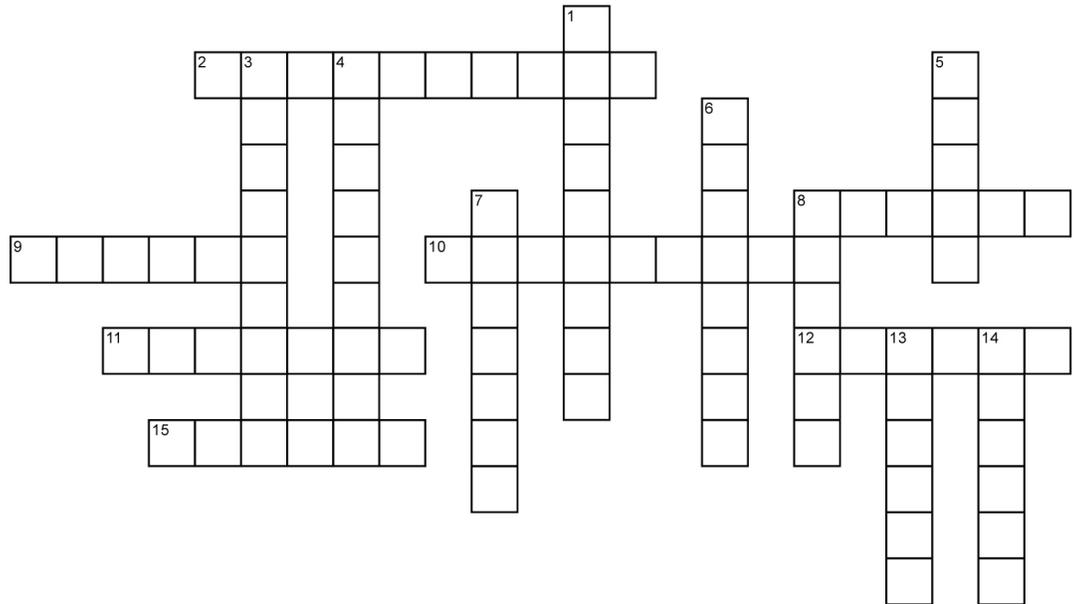
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Plant Puzzles!!!

Hawaiian Plant Crossword by Chuck Chimera

ACROSS

- 2 Established in 1973, this was the first reserve in the Natural Area Reserve System. Hot, dry and sparsely vegetated, the reserve is unique in that its boundaries contain the most recent 'a' lava flow on Maui.
- 8 The reserve protects a remnant of the native dryland forest that once covered the leeward slope of East Maui
- 9 This reserve contains a rare leeward *koa-‘ōhi‘a* forest and alpine shrublands on the south slope of East Maui. The reserve is potential reintroduction site for endangered birds.
- 10 This preserve climbs from almost dry lowland forest at 1,600 feet to wet forests and montane bogs at 5,400 feet. Within this range are 11 different natural communities and 24 rare plant species, including the spectacular West Maui silversword and the delicate Maui bog violet.
- 11 This section of the West Maui NAR includes a rare montane bog, as well as representative ‘*ōhi‘a* forests and shrublands, plus many rare plants.
- 12 Renowned botanist Joseph Rock singled out this dry forest site, on the island of Maui as one of the richest botanical regions in the islands, with more tree species than any Hawaiian rain forest.
- 15 This 691-acre wetland is home to the endangered Hawaiian stilt (*ae’o*) and Hawaiian coot (*‘alae ke oke’o*) and the adjacent beach is a nesting ground for the endangered hawksbill turtle.



DOWN

- 1 This portion of the West Maui NAR lies on wet, windward slopes of the West Maui Mountains. The plateau of ‘Eke Crater is still undisturbed by feral ungulates. This section includes the upper reaches of two perennial streams, and includes a rare montane bog surrounded by ‘*ōhi‘a* wet forests.
- 3 “House of the Sun” and home of the silversword
- 4 One of four sections that make up the West Maui NAR. This portion is on the wet upper northern slopes of the West Maui Mountains. Native communities include two kinds of rare bogs, as well as wet forests, shrublands and a montane lake.
- 5 The driest of the four sections of the West Maui Natural Area Reserve, this area is a steep-sloped volcanic remnant that extends from dry leeward lowlands to a wet summit with cliffs on all sides.
- 6 Its high-elevation rainforest and alpine shrubland are home to 12 different native bird species, as well as spectacular plants like the blue *ōpelu*, a native lobelia.
- 7 This 590-acre preserve on the west side of Lāna‘i is home to 48 species of native plants and contains the largest remnants of *olopua/lama* dry land forest in Hawai‘i.
- 8 A 143-acre wetland and famous waterfowl sanctuary, home to three endangered Hawaiian bird species, the Hawaiian coot, the Hawaiian duck, and the Hawaiian stilt
- 13 A 277-acre coastal refuge on the north shore of Maui with a quiet and pristine shoreline that is a favorite retreat for endangered Hawaiian monk seals and nesting green sea turtles. Off the coast, the extensive reef is one of the longest and widest on Maui.
- 14 This reserve, located on the wet slopes on the north flank of East Maui, contains a rare subalpine grassland as well as montane and lowland semi-wet and wet grasslands and forests. Rare plants and endangered birds are also protected by this reserve.



The delicate Maui bog violet, *Viola maviensis* (Crossword Puzzle #10, Across). Photo by: Bob Hobdy

(Puzzle answers on page 7)

Upcoming NHPS Events & Announcements

Annual NHPS Membership Meeting & Guest Speaker

February 27th (Friday) 7:00 pm

Speaker: Anna Palomino, horticulturist at the Olinda Rare Plant Facility, will speak on propagating rare plants.

Location: Hannibal Tavares Community Center, Poolside Room, Pukalani

The Annual NHPS Membership Meeting to elect the 2015 Board of Directors will be held at 6:45 pm, just prior to the lecture.

Regular Service Trips

Kanahā Pond (1st and 3rd Thursdays 8:30-11am)

Contact Becky Lau (808) 575-2369

Ha'ikū School (Every Sunday 8:30 am)

Contact Becky Lau (808) 575-2369

Kahului Library (2nd Thursday 9am-12 noon)

Contact Lorna Hazen (808) 572-6338 or email lornajack@clearwire.net

NHPS service trips, hikes and other events are scheduled frequently.

For up-to-date information, contact Irene Newhouse at einew@hotmail.com (808) 264-6977

Mahalo Nui Loa

Donors

NHPS extends a special *mahalo* to the following donors for their generous contributions in 2014:

Hawaiian Legacy Reforestation Initiative
Raymond Higashi
Walter Tokushige

Corporate , Government & Exclosure Partners:

Maui County Parks and Recreation for the use of Hannibal Tavares Community Center Pool Room.
Maui Nui Botanical Gardens for propagating plants
Haiku Elementary School
Exclosure Partners:
Duane Ting and family and Flyin' Hawaiian Zipline,
Hawai'i State Department of Land and Natural Resources,
Ulupalakua Ranch

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- 1995 Slide show program *New Plants: Friends or Foes* by Dr. Isabella Abbott, UH Manoa, urged protecting forests from invasive plants.
- 1996 *Makaloa Weaving Workshop* on the natural and cultural history of makaloa and weaving workshop.
- 1997 *Ecosystem Conservation on Maui* slideshow by Art Medeiros, HNP biologist.
- 1998 Kahakuloa exclosure fence constructed around native species.
- 1999 Gressitt Plant Sanctuary project ended after wildfire burned protected native plants beyond recovery and invasive weeds increased greatly.
- 2005 Native plant landscaping project begun at Ha'ikū Public Elementary School.
- 2006 Native plant landscape garden tours.
Yearly booth at Ha'ikū School Flower Festival to make your own free lei.

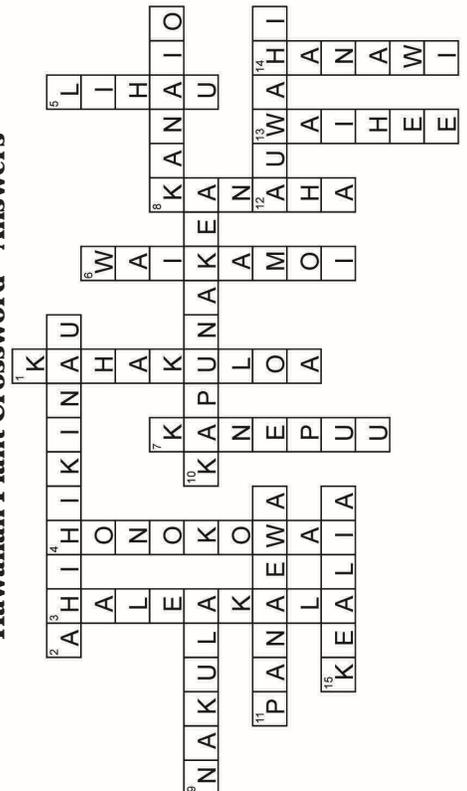
Our founders started ambitious projects. The need to work on their goals is still important, for only by continued efforts can native Hawaiian plants survive.

All the current officers have worked for the programs to continue. It has been my privilege to serve as your president with the help of members and friends.

If you can help on old or new projects, please join in!

Thank you,
Martha E. Martin

Hawaiian Plant Crossword—Answers



Native Hawaiian Plant Society

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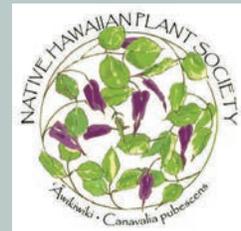
Website: www.nativehawaiianplantsociety.org



Lobelia Gloria-montis
Photo by Shannon Paapanen



NHPS Logo Shirts



'Āwikiwiki flower design
by NHPS member Muffie Davis

DON'T FORGET TO RENEW!

Membership Form

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