

THE HAWAII STRATEGY FOR PLANT CONSERVATION

IMPLEMENTING PHASE 1: IN SITU COLLECTING AND EX SITU CAPACITY BUILDING

Hawaii is home to some of the most unique and diverse ecosystems on our planet. Yet these ecosystems are also among the most threatened of any in the world, with hundreds of native plant species in danger of extinction. Conservation programs in our state have long collaborated to preserve and restore the plant life essential to the natural and cultural heritage of our island home. We know that working together will advance plant conservation faster than individual efforts can alone.

The Hawaii Strategy for Plant Conservation (Strategy), completed in 2014, describes an emerging effort to coordinate and prioritize actions that reduce threats to native plants species. The Strategy is built on a statewide assessment of capacity and needs for ex situ conservation and aligned with global conservation goals. Fifteen organizations contributed feedback to develop the Strategy, which promotes a collective vision and lays out a framework to progress toward common goals.

The Strategy calls for the establishment of the Laukahi Network, an emerging effort to formalize coordination and increase impact on conservation goals. Laukahi – translated as “single leaf” in the Hawaiian language – is our effort to unite our work and respond to urgent threats to native plants and our island ecosystems. The network aims to convene and coordinate conservation programs across our islands

to implement the Strategy. Diverse participants from across Hawaii’s plant conservation community will be invited to gather and work together toward the shared conservation targets in the Strategy.

Phase 1 of the Strategy focuses on ex situ conservation efforts, including building capacity and increasing the quality and quantity of collections at seed banks, botanical gardens, nurseries and other facilities working to prevent plant extinction. A two-year Laukahi Action Plan identifies the short-term steps for launching the Laukahi network and beginning to implement Phase 1 of the Strategy.

Heightened coordination and a statewide conservation strategy can stem the ever-mounting threats to Hawaii’s native plants and the ecosystems they inhabit. Strengthening relationships within Hawaii and connecting with the global conservation movement will increase the quality, efficiency and ultimate impact of conservation efforts in our islands. With greater collaboration, we can protect our unique native plants and their habitats for many generations to come.

**I OLA 'OE, I OLA MĀKOU NEI -
MY LIFE IS DEPENDENT ON
YOURS, AND YOUR LIFE IS
DEPENDENT ON MINE.**



Balance of Life

The native plants of Hawai'i are among the most unique and precious flora in the world and a vital part of our health, Hawaiian culture, and our island home. Yet the alarming rate of environmental degradation has already earned Hawai'i a reputation as the extinction capital of the world. Without bold action, our islands will lose native plant species at an even faster pace.

Every native Hawaiian plant has value. No matter how small or large, common or rare, popular or unknown, each is unique and precious. When plant populations decline, organisms that depend on them also decline. Severing these ecological relationships can have consequences that cascade through the natural environment. Native plants, their histories and relationships with other organisms have much to teach us about how life has been and should be balanced in our islands.

Flourishing habitats for native plants protect our watersheds, which provide us with safe drinking water, prevent runoff from polluting our oceans, minimize dangerous flooding, and buffer us against harmful effects of climate change. Native plants are the foundation for native ecosystems, home to countless other unique native animals, such as snails, bats, birds and insects. Loss of plant life degrades precious ecosystems that sustain all life, including humans.

Native plants also have a fundamental role in Hawaiian culture. Conserving them supports traditional practices of Native Hawaiians and preserves spiritual connections between all people and our land. As the olelo noeau, or Hawaiian proverb states: I ola 'oe, i ola mākou nei – My life is dependent on yours, and your life is dependent on mine.

Our Vulnerable Islands

The diverse and unique native flora in Hawai'i has evolved with our geographic isolation, unique geology and island terrain. Yet native plants and native habitats are disappearing at alarming rates. Vast habitat destruction and degradation has made native ecosystems highly susceptible to invasions of introduced plants and animals.

These introductions have consequently deteriorated Hawai'i's watershed health and function. The pace and frequency of biological invasions have grown rapidly as human travel between the Hawaiian Islands and other landmasses has increased. Invading species

trample, eat, and out-compete native plants for limited resources and alter native soils. As native plant populations decrease, they face additional threats such as dwindling genetic variation and reduced ability to propagate themselves.

The Hawaiian Islands are part of the Polynesia/Micronesia biodiversity hotspot. Hotspots are regions recommended by conservation groups as global priorities because they hold over 1500 endemic plants, yet 30% or less of native habitat remains intact. Our islands lie within one of these 35 biologically rich and highly threatened global hotspots.

Active conservation agencies and organizations on every island have been working to preserve native ecosystems and rare species for decades. Continued conservation efforts are essential to preserve Hawai'i's unique flora, native ecosystems, cultural practices, and the balance of life on our islands.

Hawai'i's Flora: Rare and Vulnerable

1370 total taxa – or number of native plants native to Hawai'i

89% of native flowering plants are found only in Hawai'i

74% of native ferns are found nowhere else in the world

>30% of native plants are federally listed as endangered or threatened

10% of native plants are already extinct

240 estimated number of plants with fewer than 50 wild plants left

724 plants are considered Species of Conservation Importance when identified as priorities due to high extinction vulnerability, habitat restoration value, and cultural significance



In Situ: A Race Against Time

The ultimate intent of plant conservation is to maintain or restore thriving populations in their natural habitat so rare plants can continue their roles in native ecosystems. Conservation in Hawai'i strives to protect native plants in situ – “on-site” or in the field – by excluding and controlling invasive species and then restoring habitats and outplanting new populations. In situ conservation efforts are critical, but habitat restoration can often take decades. Given the rapid degradation of native ecosystems, the increasing impact from invasive species and climate change, and lack of adequate funding to support necessary efforts, in situ conservation alone may not be enough to prevent the loss of native plants.

Ex Situ: An Insurance Policy

Conserving native plants also includes harvesting fruits, seeds, and clonal materials from naturally-occurring plants (i.e. in situ collecting), storing seeds and plants, and growing plants for outplanting into protected habitat. These ex situ techniques build a foundation for preventing extinction of many threatened plants. Ex situ literally means “off-site.” In plant conservation, the term identifies methods used in facilities like seed banks, botanical gardens, nurseries, cryopreservation gene banks and micropropagation (tissue culture).

Ex situ efforts buy time for in situ conservation efforts to be effective; they are insurance policies against plant extinction. When propagules from wild populations are harvested and stored or grown in protected environments, they can be safely replanted back into the wild. Ex situ collections preserve genetic biodiversity of species, which is integral to ensuring natural populations are adaptable in the future. Collections also provide the foundation for large-scale

restoration projects, and in situ and ex situ approaches are often carried out together to build thriving populations of native plants.

Species of Conservation Importance

In 2012, an assessment of ex situ plant conservation programs identified the most vulnerable and urgently important species for protection. More than half of Hawai'i's native plants – or 724 species – rose to the top of the plant conservation community's priorities. These plants are important for a variety of reasons, including extinction vulnerability, habitat restoration, and cultural significance. Collectively called “Species of Conservation Importance” (SCI), these plants have been the focus of early coordinated ex situ conservation efforts.

Protecting species of conservation importance requires both in situ and ex situ efforts. In the last twenty years, Hawai'i's plant conservationists successfully secured hundreds of rare native plants and prevented the extinction of many species in situ and ex situ. On the ex situ front, field botanists urgently harvested from rapidly declining populations, and local horticulturalists developed methods to grow and hold collections of these plants. While almost three-quarters of Species of Conservation Importance have now been secured in ex situ facilities, much work is needed to build collections large enough to prevent extinction. Conservation goals include increasing the size of ex situ plant collections to provide plants for restoration and safeguard against extinction, and building collections that represent genetic diversity found across wild populations. Ex situ collections of Species of Conservation Importance should be replicated and secured in multiple places to hedge against natural disaster.

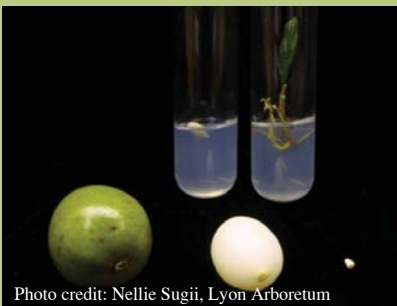


Photo credit: Nellie Sugii, Lyon Arboretum

The endangered Hawaiian loulu palm, know as *Pritchardia kaalae*, is endemic to the west side of O'ahu. Ex situ methods like micropropagation (pictured to the left) collect and secure species by propagating plants to support in situ management. These facilities conduct research and keep careful records to ensure plants are available for restoration and outplanting projects (pictured to the right).



Photo credit: O'ahu Army Natural Resources Program

A History of Partnerships

Federal, state, and county agencies, non-profit organizations, community groups, and private individuals are instrumental to plant conservation – in situ and ex situ efforts – in Hawai‘i. Partnerships like the Hawai‘i Conservation Alliance (HCA) and the Hawai‘i Rare Plant Restoration Group (HRPRG) are advancing conservation work through collaboration. The HRPRG has made significant strides by creating collection, outplanting, reintroduction, and nursery sanitation protocols. The HRPRG has also established population codes to standardize statewide data collection, developed the mid-elevation rare plant nursery system and launched the Plant Extinction Prevention Program (PEPP) protecting species with 50 or fewer plants remaining in the wild.

In addition to naming Species of Conservation Importance, the 2012 assessment summarized collections to date and identified limiting factors to Hawai‘i’s ex situ plant conservation efforts. The assessment surfaced the need for a comprehensive plant conservation strategy with goals to unite and guide continued endeavors. Despite decades of progress and accomplishments, and millions of dollars dedicated, current efforts will not be enough to save all native plant species. Coordinating more efforts to efficiently use resources is the best way to make a meaningful impact on conservation goals.

Joining a Global Movement

Hawai‘i’s plant conservation community has aligned itself with global efforts to confront the loss of biodiversity. The Global Strategy for Plant Conservation (GSPC), adopted by world governments in 2002 and updated in 2010, calls on countries and regions to build their own strategies and define goals prioritized for local needs. The GSPC provided the basis for Hawai‘i plant conservation groups to develop the the Hawai‘i Strategy for Plant Conservation in 2014.

Hawai‘i’s statewide strategy shares the GSPC’s five main objectives and identifies 20 outcome-oriented targets both directly from the GSPC and adapted to Hawai‘i’s unique conservation goals. The targets, listed on the opposite page, will guide implementation of the strategy.

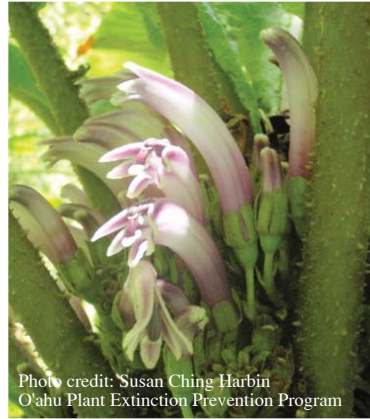


Photo credit: Susan Ching Harbin
O‘ahu Plant Extinction Prevention Program

Partnerships like PEPP have been very successful in securing collections of the rarest plants in Hawai‘i. The *Cyanea truncata*, pictured on the left, has only two plants remaining in the wild and ex situ cultivation is critical for securing this species.

Implementing the Strategy

Laukahi will work toward these five objectives and 20 targets in three phases. The next five years will build a foundation for ongoing collaboration beyond 2020.

Phase 1, beginning 2015

Gather partners to build ex situ capacity and enhance quality and scope of ex situ collections for Species of Conservation Importance.

Phase 2, beginning 2017

Expand upon these efforts to include the landscape-scale in situ threat management necessary to secure sufficient habitat for rare species recovery, in addition to continued restoration outplantings.

Phase 3, beginning 2019

Emphasize public outreach and education to improve the understanding, knowledge, and awareness of the importance of native habitats and native plant protection.

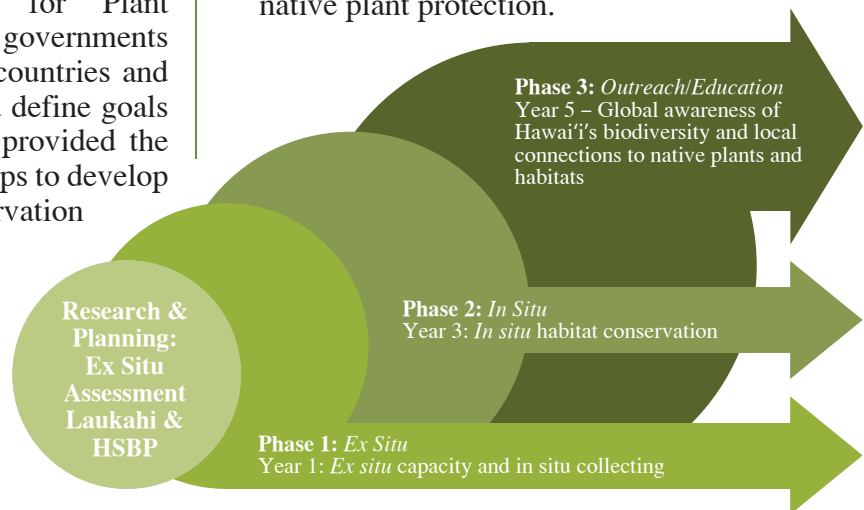


Fig. 1. Phased approach to the implementation of the HSPC. HSBP = Hawai‘i Seed Bank Partnership



OBJECTIVES & TARGETS

I: Organization & Planning

Plant diversity is well understood, documented and recognized

1. An online Flora of native Hawaiian plants.* *(Phase 1)*
2. An annual assessment of the conservation status (in situ and ex situ) of all known plant species, as far as possible, to guide conservation action.* *(Phase 1)*
3. An access restricted central-information management system for compiling and administering geospatial and tabular datasets on biological data. *(Phase 1)*
4. Increased research on pollination and seed biology, genetic analysis, life history, phenology and limiting factors of native plants to facilitate restoration efforts and inform conservation practice. *(Phase 1)*

II: Increasing Capacity

Urgently and effectively conserve plant diversity

5. At least 15% of each ecological region or vegetation type is secured through effective management and/or restoration.* *(Phase 1)*
6. At least 75% of the most important areas for plant diversity of each ecological region protected with effective management are in place for conserving plants and their genetic diversity.*
7. At least 75% of known threatened plant species are conserved in situ.*
8. At least 75% of SCI are secured with adequate ex situ collections by 2020.* *(Phase 1)*
9. Collections of at least 20% of SCI are available for rare species recovery, habitat restoration and watershed protection projects.* *(Phase 1)*
10. Collections are duplicated whenever possible and held at facilities either on-island, within state, nationally or internationally.
11. Conservation plans are developed for SCI to help guide efforts and engage partners to implement habitat protection and secure collections.
12. Effective management plans and biosecurity measures are in place to prevent new biological invasions.*
13. Manage important areas for plant diversity negatively impacted by biological invasions.*

III: Workforce & Network Development

Develop the capacities and public engagement necessary to implement the strategy

14. Trained people working in facilities, according to local needs are sufficient to achieve Strategy targets.* *(Phase 1)*
15. Increase the capacity to provide adequate infrastructure for ex situ facilities. Improve access to ex situ facilities and facilitate inter-island transport of germplasm and plants. *(Phase 1)*
16. Partnerships for plant conservation are established or strengthened at national, regional and international levels.* *(Phase 1)*

IV: Outreach & Education

Promote education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life

17. Broad public understanding of the natural and cultural value of Hawai'i's native plant diversity is achieved by supporting education and awareness.
18. Plant conservation in Hawai'i is promoted to national and international conservation groups, local business interests, and visitors to mobilize additional support.

V: Sustainability & Appropriate Use

Use plant diversity in a sustainable and equitable manner

19. No native plant species are endangered by commercial trade. Only certified responsibly-sourced native plants are used in commercial trade and restoration projects.*
20. Indigenous and local knowledge innovations and practices associated with plant resources are maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.*

* Targets shared with the Global Strategy for Plant Conservation

Why Network? Why Now?

Laukahi, the Hawai'i Plant Conservation Network, will facilitate collaboration among agencies and organizations in implementing the Hawai'i Strategy for Plant Conservation. Over the next three years, Laukahi will focus on Phase 1. Laukahi aims to achieve the Strategy's targets through a conservation community that:

- Builds relationships and communication among members
- Supports collective planning and shared goal-setting
- Adopts standard language and metrics to monitor collective progress toward goals
- Facilitates data sharing and information exchange
- Enables collaborative projects and efficient resource use
- Creates opportunities to attract new funding sources

The Laukahi network will invite all programs with conservation efforts in habitat protection (watershed protection, post-fire restoration, threat control, ecosystem health), rare plant recovery (research, in situ collecting, outplanting, biodiversity preservation), and environmental education organizations to join in this collaborative effort. Laukahi will operate with guidance from an elected board representing member programs, and a full-time Network Coordinator will lead the planning, project coordination, and collaborative work of the emerging network.

Investing in Capacity

Phase 1 of the Strategy identifies ten priority targets for immediate action (noted by Phase 1 on prior page). These targets informed a more detailed Action Plan that is available upon request. This Action Plan includes targets, milestones and budgets to help guide the launch Laukahi and begin implementing the Strategy over the next two years. In addition to forming the network to share information and engage with the global conservation movement, this first phase has two primary conservation goals: building capacity at ex situ facilities and increasing the quality and size of the ex situ collections through increased collecting from wild populations so that genetic diversity is well represented.

Over the next two years, Laukahi will launch three network initiatives and three collaborative

conservation projects to work toward these integrated goals and address all ten Phase 1 targets. These initiatives and projects are summarized on the opposite page. Accomplishing these will help the network make progress in achieving the goals proposed for Phase 1 of the Strategy by creating a network identity, growing capacity for making collections and using past and current data to inform plans to efficiently increase the quantity and quality of ex situ collections.

Investing in the network's capacity to carry out these initiatives and projects, as well as support its members, is essential. The network aims to be complementary, not competitive with its members, and will seek modest funds for coordination, administration, network gatherings, member travel, project management contracts, technology, and other specific projects. Laukahi's work will support members' ability to efficiently build ex situ collections of high conservation value.

Hawai'i Strategy for Plant Conservation

Representatives from fifteen agencies, organizations and conservation groups provided important input to develop Phase 1 of the Strategy. This group will be asked to continue participating in Laukahi efforts going forward.

Bernice Pauahi Bishop Museum
Harold L. Lyon Arboretum
Hau'oli Mau Loa Foundation
Hawai'i Association of Watershed Partnerships
Hawai'i Conservation Alliance
Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife
Honolulu Botanical Gardens
National Tropical Botanical Garden
The Nature Conservancy of Hawai'i
Plant Extinction Prevention Program
U.S. Geological Survey – Pacific Island Ecosystems Research Center
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Army
University of Hawai'i



NETWORK INITIATIVES

Building the Network

Establish the structure and leadership to ensure Laukahi supports the coordination and capacity of network of conservation partners who can accomplish more together than operating alone

Sharing Real-Time Data

Build (or adapt existing) technological platform to gather and share up-to-date and secure data, enable efficient resource use, identify species research and management needs and report on conservation progress

Global Connections

Engage with national and international conservation efforts to raise Hawai'i's profile in the global conservation movements, attract new resources and advance our conservation efforts

SELECT ACTIONS (with target completion dates)

- Form the Laukahi Advisory Council (early 2015)
- Hire Network Coordinator (early 2015)
- Establish charter; convene members (mid 2015)
- Complete a financial / funding plan (end 2016)
- Draft Phase 2 of HSPC (end 2016)
- Complete scope of work and solicit bids (end 2015)
- Select developer and begin project (early 2016)
- Conduct alpha testing with members (mid 2016)
- Complete full-featured database rollout plan (end 2016)
- Complete the International Union for the Conservation of Nature (IUCN) Red List applications (end 2015)
- Support interactive conservation campus or other event at World Conservation Congress (Sept 2016)

CONSERVATION PROJECTS

Conservation Research Agenda

Create a shared agenda for research and funding priorities that advance conservation efforts and disseminate information among local and global partners

Species Curation Project

Gather complete collection and provenance data for five pilot species across all participating conservation partners and one ex situ facility's entire collection in order to begin assessing in situ collecting needs

Building Ex Situ Collections

Invest in companion efforts to increase collecting of plants in the wild and keep them safe in ex situ locations by building infrastructure, facilities, knowledge and human resources capacity

SELECT ACTIONS (with target completion dates)

- Conduct statewide survey (mid-2015)
- Share results with partners and researchers (end 2015)
- Use research priorities for database development and global outreach (2016)
- Identify priority species for pilot project (end 2015)
- Identify volunteer organization for curation of complete collection (end 2015)
- Hire contract curation project manager (early 2016)
- Complete curation and share results (mid 2016)
- Secure funding for Hawai'i Seed Bank meetings (2015)
- Complete disaster planning at facilities (2016)
- Support in situ collectors through training/gatherings (2016)"
- Complete master plan for Moloka'i nursery (2016)

Detailed implementation plans for network initiatives and conservation projects, including milestones, timelines, and budgets for each, are laid out in the Laukahi Action Plan.

Please contact Matt Keir and Lauren Weisenberger at info@laukahi.org for more information.



ACKNOWLEDGEMENTS

Laukahi is indebted to the work of dedicated professionals in locating, describing, protecting and conserving our Hawaiian flora over the past decades. This work has prevented the extinction of many species and further degradation of native habitats invaluable to Hawai'i and global biodiversity. Conservationists of Hawai'i's past and present have laid a foundation for preserving our unique and rare plants. Laukahi stands on your shoulders as we continue working toward a future where native Hawaiian flora and their habitats thrive for future generations.

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