A Plan for Hawaiian Plants and Their Ecosystems

by Marie M. Bruegmann

***One of only about 1,000 remaining individuals of* Dubautia waialealae**
Photo by Marie Bruegmann

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The native plants and animals of the Hawaiian Islands comprise one of the world's most remarkable examples of insular evolution. However, since colonization of these islands by humans, starting with the Polynesian voyagers over 1,500 years ago, and more recently following Western contact in 1778, most native ecosystems have been significantly altered. As a result, many native species have declined or become extinct. About 100 of the approximately 1,500 known native plant species are considered extinct, and 312 species or subspecies are listed as endangered or threatened by the Fish and Wildlife Service and the Hawai'i Department of Land and Natural Resources. Additionally, approximately 106 species are candidates for listing, and roughly 257 species are believed to be declining.

Time remains to save many of the native plant resources, but only by a concerted effort through a comprehensive strategy that embraces conservation at both the species and ecosystem levels. The Service asked the Hawai'i and Pacific Plants Recovery Coordinating Committee (HPPRCC), the plant recovery team for the Pacific Islands Office, to develop such a strategy. This Hawaiian Plant Conservation Strategy is intended to provide guidance to the state's citizens, conservation agencies, and other interested parties about plant conservation issues and needs and assist them in coordinating within the broad strategy.

The Hawaiian Plant Conservation Strategy will consist of nine major components: 1) emergency *ex situ* (off site) and *in situ* (on site) actions; 2) species and ecosystem recovery actions; 3) quarantine and invasive species; 4) species and habitat monitoring; 5) field surveys; 6) research; 7) data management; 8) public outreach and education; and 9) capacity building, or increasing infrastructure and funding. *Bulletin* 27(3): 8-11

The dry forests of Hawai'i have been reduced to 90 percent of their original range. Major weed control efforts, restoration of common native species, and reintroduction of endangered species will be required to restore these ecosystems and species to some semblance of their former grandeur.
Photo by Marie Bruegmann

provides more detail on the types of emergency *ex situ* and *in situ* actions planned for Hawaiian plant species.

Part 1 of this plan, the Conservation Strategy, will identify those threats and issues that are common to all of the islands and affect the most species (such as habitat loss, control of harmful nonnative species, fire management, and research needs) and address how to determine appropriate management using the nine components listed above. Part 2, the Implementation Plan, will provide a regional framework for identifying and prioritizing management/recovery actions. It will include action statements representing specific tasks needed to achieve the Plan's overall goals.

While emergency actions may prevent the extinction of species and provide short-term protection for critically endangered plants, large-scale habitat management is necessary for full recovery. The HPPRCC has taken the first step by identifying those habitats that are essential for the recovery of endangered, threatened, and candidate Hawaiian plant species. The next step will be to refine and prioritize the essential habitats and implement the necessary management actions. For example, montane bogs are extremely rare and fragile, and already have been the focus of many conservation efforts. In addition to habitat management, many species will require propagation and reintroduction efforts to achieve full recovery, as is discussed in *Bulletin* 23(6):4-5, 23(2/3):21-25, and 11(6):8-10 regarding the Mauna Kea and Mauna Loa silverswords (*Argyroxiphium s.* ssp. *sandwicense* and *A. kauense*).

Exclusion of new animal and plant invaders is another essential component for long-term protection and recovery of endangered species and Hawaiian ecosystems. The introduced two-spotted leafhopper *(Sophonia rufofascia*) and glory bush *(Miconia calvescens)* are particularly destructive examples of species that have recently entered Hawai'i with devastating consequences for the future of native plant resources.

Miconia calvescens ***is one of the major invasive plant species in Hawai'i, with the potential to replace essential habitat for endangered species recovery up in all tropical rain forest areas of Maui and Hawai'i to approximately 5,000 feet elevation within the next three to five decades.***
Photo by Mindy Wilkinson/State of Hawaii

Other components of the strategy, which include species and habitat monitoring, field surveys, research, data management, public outreach and education, and capacity building, are integral to achieving recovery. Species and habitat monitoring will help us determine whether our management actions are successful or else allow us to adapt new methods. Additional surveys are needed, particularly in the more rugged and inaccessible areas of Hawai'i, which we hope hold more populations.

Many aspects of plant conservation in Hawai'i are still poorly understood, and research will play a key role for conservation. While the major factors responsible for ecosystem decline are often known, effective and economical methods of controlling these factors are frequently elusive. Finding more efficient alien control methods would greatly reduce the funding needed to protect habitats. In addition, little is known about the pollinators and seed dispersers for most species, and even less is known about the role of each species in the overall function of the ecosystem.

The success of the conservation strategy ultimately depends on support from partners, both the public and the implementing agencies. The public outreach and education components include increasing public exposure to the native plant species (both rare and common species), increasing public awareness of Hawaiian plant conservation problems and the consequences of further loss of these unique resources, and enlisting public support in refining and implementing this strategy.

The development of a conservation plan for such a widespread and diverse area as the Hawaiian Islands involves many steps. This plan, which should be completed soon, will identify the necessary components at all levels that are needed to develop and implement plant conservation in the Hawaiian Islands. Additional resources must be found beyond those currently available to the Service, and there must be a close coordination between the many different entities involved with the conservation effort. The HPPRCC's goal is to assist the Service in the development and implementation of this ambitious plan.

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