



## Plants

# Wawae'iole

## *Huperzia mannii*

### SPECIES STATUS:

Federally Listed as Endangered

Genetic Safety Net Species

Hawai'i Natural Heritage Ranking – Critically Imperiled (G1)

Endemism status –Kaua'i, Maui, Island of Hawai'i

Critical Habitat - Designated

**SPECIES INFORMATION:** *Huperzia mannii*, a member of the club moss family (Lycopodiaceae), is a pendent epiphyte (plant not rooted in the ground) with clustered, delicate, red stems which are 1.6 to 3.9 in (4 to 10 cm) long and less than 0.04 in (1 mm) thick. Leaves, arranged in three rows on the stem, are pointed, flat, and lance-shaped and measure 0.2 to 0.5 in (4 to 1 mm) long and 0.04 to 0.08 in (1 to 2 mm) wide. Fruiting spikes branch four to six times and are 4.7 to 8 in (12 to 20 cm) long and 0.4 to 0.8 in (1 to 2 cm) wide. Bracts on the fruiting spike are arranged in two to four ranks, measure 0.04 in (1 mm) long, and conceal the spore capsules. This species can be distinguished from others of the genus in Hawai'i by its epiphytic habit, its delicate red stems, and its forked fruiting spikes.

**DISTRIBUTION:** Historically known from Haelaau and Hanaula on West Maui, Captain Cook-Kona on the island of Hawai'i, and Waiakoali on Kaua'i. Although not recorded from East Maui before 1982, this species is now known from Kipahulu and Manawainui on East Maui, Lihau and Pu'u Kukui on West Maui, and Laupahoehoe Natural Area Reserve on the island of Hawai'i, on State and private land.

**ABUNDANCE:** Currently there are 35 individuals found within 6 populations.

**LOCATION AND CONDITION OF KEY HABITAT:** *Huperzia mannii* typically grows on plants such as 'ōhi'a or *Acacia koa* (koa) in mesic to wet montane 'ōhi'a/ koa forests on Maui and the island of Hawai'i at an elevation of 2,900 to 5,200 Ft (900 to 1,600 m). Other associated species include pilo. *Cheirodendron trigynum* ('olapa) and *Ilex anomala* (kawa'u).

### THREATS:

- Habitat degradation by pigs and cattle;
- Competition with alien plants (prickly Florida blackberry);
- Reduced reproductive vigor due to the small number of extant individuals.

**CONSERVATION ACTIONS:** The goals of conservation actions are not only to protect current populations, but also to establish new populations to reduce the risk of extinction. The USFWS has developed a recovery plan that details specific tasks needed to recover this species. In addition to common statewide and island conservation actions, specific actions include:

- Survey historic range for surviving populations;
- Establish secure *ex-situ* stocks with complete representation of remaining individuals;
- Augment wild population and establish new populations in safe harbors.

**MONITORING:**

- Continue surveys of population and distribution in known and likely habitats;
- Monitor plants for insect damage and plant diseases.

**RESEARCH PRIORITIES:**

- Develop proper horticultural protocols and pest management;
- Survey *ex-situ* holdings and conduct molecular fingerprinting;
- Conduct pollination biology and seed dispersal studies;
- Map genetic diversity in the surviving populations to guide future re-introduction and augmentation efforts.

**References:**

Carr, G., Hawaiian Native Plant Genera, University of Hawaii Botany Department, <http://www.botany.hawaii.edu/faculty/carr/images>.

Center for Plant Conservation, 2005. National Collection of Endangered Plants. [http://www.centerforplantconservation.org/ASP/CPC\\_NCList\\_Quick.asp](http://www.centerforplantconservation.org/ASP/CPC_NCList_Quick.asp).

Hawai'i Natural Heritage Program. 2005. Hawaii Natural Heritage Program Search, <http://www.hinhp.org>.

International Union for Conservation of Nature and Natural Resources, 2004, IUCN Red List of Threatened Species: Data Base Search, <http://www.redlist.org/search/search-basic.html>.

US Fish and Wildlife Service. 1992. Final Listing, Endangered ETWP; Determination of Endangered or Threatened Status for 15 Plants from the Island of Maui, Hawaii; Federal Register, Vol. 57, No. 95, (15-MAY-92), 57 FR 20772 20788, 9 pp.

Wagner, W. L., D. R. Herbst, and D. H. Lorence. 2005. Flora of the Hawaiian Islands website. <http://ravenel.si.edu/botany/pacificislandbiodiversity/hawaiianflora/index.htm> [August, 2005].

Wagner, W.L., Herbst, D.R., and Sohmer, S.H., 1999. Manual of the flowering plants of Hawai'i-- Revised Edition. Honolulu, HI: University of Hawaii Press and Bishop Museum Press. 1853p.