

U.S. FISH AND WILDLIFE SERVICE - SPOTLIGHT SPECIES ACTION PLAN

Common Name: Haha

Scientific Name: *Cyanea grimesiana* subsp. *grimesiana*

Lead Region: Region 1

Lead Field Office: Pacific Islands Fish and Wildlife Office

Species Information:

Status: Endangered

Recovery Priority Number or Listing Priority Number: 6

Recovery Plan or Candidate Assessment Form: U.S. Fish and Wildlife Service. 1999. Recovery plan for multi-island plants. U.S. Fish and Wildlife Service, Portland, Oregon. 206 pages + appendices.

Most Recent 5-year Review: Initiated March 16, 2009

Other:

Critical Habitat –

U.S. Fish and Wildlife Service. 2003a. Endangered and threatened wildlife and plants; final designation of critical habitat for three plant species from the island of Lanai, Hawaii; final rule. Federal Register 68:1220-1274.

U.S. Fish and Wildlife Service. 2003b. Endangered and threatened wildlife and plants; final designations and nondesignations of critical habitat for 42 plant species from the island of Molokai, HI; final rule. Federal Register 68:12981-13141.

U.S. Fish and Wildlife Service. 2003c. Endangered and threatened wildlife and plants; final designation of critical habitat for 60 plant species from the islands of Maui and Kahoolawe, HI; final rule. Federal Register 68:26083-26132.

U.S. Fish and Wildlife Service. 2003d. Endangered and threatened wildlife and plants; final designation or nondesignation of critical habitat for 101 plant species from the island of Oahu, HI; final rule. Federal Register 68:35949-35998.

Taxonomy –

Lammers, T.G. 1998. New names and combinations in Campanulaceae. Novon 8:31-35.

Lammers, T.G. 2004. Five new species of the Endemic Hawaiian genus *Cyanea* (Campanulaceae: Lobelioideae). Novon 14:84-101.

Threats: This taxon is extirpated in the wild on Oahu. It was threatened by habitat degradation from introduced ungulates (mostly feral pigs) (Factor A), competition with invasive introduced plant species (Factor E), and predation by rats and slugs (Factor C). Reintroduced individuals are fenced from ungulates, but continue to be threatened by invasive introduced plant species, rats, and slugs. On Maui, the taxon is threatened by landslides (Factor E), habitat degradation by feral pigs (Factor A), predation by rats and slugs (Factor C), competition with invasive introduced plant species (Factor E), fire (Factor E), and erosion (Factor E). On Molokai and Lanai, the taxon is threatened by habitat degradation by Axis deer and goats (Factor A), competition with invasive

introduced plant species (Factor E), fire (Factor E), erosion (Factor E), predation by rats (Factor C), and possibly predation by feral chickens and introduced turkeys (Factor C).

Target: The target for this taxon is to prevent extinction. Since listing, the taxon has been split into four taxa: *Cyanea grimesiana* subsp. *grimesiana*, extinct in the wild on Oahu and Molokai, with 10 individuals reintroduced on Oahu; *Cyanea magnicalyx*, with 5 wild individuals and approximately 20 reintroduced individuals on Maui; *Cyanea mauiensis*, extinct on Maui; and *Cyanea munroi*, with 3 wild individuals on Molokai and Lanai. The species as a whole is extremely rare, with 8 remaining individuals in the wild and 30 reintroduced individuals for the entire entity as it was listed.

Measure: Maintain [RPN and](#) this taxon in the wild and existing reintroduced populations, and have all known individuals represented in cultivation.

Actions:

1. Continue preserving the genetic material at the University of Hawaii Harold L. Lyon Arboretum's Micropropagation Laboratory, maintaining the 3 genetic lineages of *Cyanea grimesiana* subsp. *grimesiana* and the 4 of *Cyanea magnicalyx* currently in storage with at least 5 healthy seedlings of each lineage. The party responsible for this action is Harold L. Lyon Arboretum's Micropropagation Laboratory. This will address recovery action #145, propagate and maintain genetic stock *ex situ*; and partially address recovery action #5, reestablish wild populations within historic range. This action will partially address all listing factors and threats impacting this taxon and will continue over all 5 years.
2. Collect any additional fruits the wild and reintroduced plants produce over the next 5 years that are ripe enough to provide viable seeds, and place the seeds in propagation and storage at Lyon Arboretum's Micropropagation Laboratory. The Plant Extinction Prevention Program is responsible for this action. This will address recovery action #145, propagate and maintain genetic stock *ex situ*; and partially address recovery action #5, reestablish wild populations within historic range. This action will partially address all listing factors and threats impacting this taxon and will continue over all 5 years.
3. Propagate as many clones of the genetic lineages in micropropagation as possible. The party responsible for this action is Harold L. Lyon Arboretum's Micropropagation Laboratory. This will address recovery action #145, propagate and maintain genetic stock *ex situ*; and partially address recovery action #5, reestablish wild populations within historic range. This action will partially address all listing factors and threats impacting this taxon and will continue over all 5 years.
4. Large and healthy enough clones will be transferred to potting soil and placed in the green house at Harold L. Lyon Arboretum's Micropropagation Laboratory, the Hawaii Division of Forestry and Wildlife's Pahole Rare Plant Facility, or the Olinda Rare Plant Facility, as appropriate. Others will remain in test tubes as source material for future clones and for genetic storage. The parties responsible for this action are Harold L. Lyon Arboretum's Micropropagation Laboratory, the Pahole Rare Plant Facility, and the Olinda Rare Plant Facility. This will address recovery action #145, propagate and maintain genetic stock *ex situ*; and partially address recovery action #5, reestablish wild populations within historic range. This action will partially address all listing factors and threats impacting this taxon and will continue over all 5 years.

5. Maintain the ten seedlings in the reintroduced population of *Cyanea grimesiana* subsp. *grimesiana* on Oahu. This includes maintaining the fence protecting these seedlings; monitoring them for health, vigor, and reproduction; maintaining rat and slug control at the site; and removing invasive introduced plant species as they occur in the area. The reintroduced population will be monitored once every two months. The responsible party for this action is the Plant Extinction Prevention Program. This will address recovery actions #1411, construct and maintain fencing, and will partially address threats from ungulates (Factor A); #142, conduct alien plant control, and will partially address threats from invasive introduced plant species (Factor E); #144, control rodents, if necessary, and will partially address threats from rats (Factor C); #148, control insects, slugs, snails, and/or disease, if necessary, and will partially address threats from slugs (Factor C); and #5, reestablish wild populations within historic range. This action will partially address all threats and listing factors and will continue over all 5 years.
6. Maintain the wild populations of *Cyanea magnicalyx*. Continue working with the landowner to expand fencing for the Kaluanui population on Maui, as well as control rats during the flowering and fruiting season, control invasive introduced plant species in the immediate area, and monitor the plants for health, vigor, and reproduction at the three known locations, three times a year. The responsible party for this action is the Plant Extinction Prevention Program. This will address recovery actions #1411, construct and maintain fencing, addressing threats from ungulates (Factor A); #142, conduct alien plant control, addressing threats from invasive introduced plant species (Factor E); #144, control rodents, if necessary, partially addressing threats from rats (Factor C); and #148, control insects, slugs, snails, and/or disease, if necessary, partially addressing threats from slugs (Factor C). This action will continue over all 5 years.
7. Maintain the wild populations of *Cyanea munroi*, including monitor the existing fence annually. In addition, the plants will be monitored for health, vigor, and reproduction; rats will be controlled during the flowering and fruiting season; and invasive introduced plant species will be controlled in the immediate area three times a year. The responsible party for this action is the Plant Extinction Prevention Program. This will address recovery actions #1411, construct and maintain fencing, partially addressing threats from ungulates (Factor A); #142, conduct alien plant control, addressing threats from invasive introduced plant species (Factor E); and #144, control rodents, if necessary, partially addressing threats from rats (Factor C). This action will continue over all 5 years.
8. Initiate discussions with landowners to select additional reintroduction sites on Oahu, Maui, and Molokai. If funds and time allow, and landowners agree, these sites will be fenced, ungulates removed and invasive introduced plant species managed in preparation for planting seedlings of *Cyanea grimesiana* spp. *grimesiana*, *Cyanea magnicalyx*, and *Cyanea munroi*. If these criteria are met at each site and seedlings of the species are healthy and large, then seedlings of the appropriate species will be planted at each site. Once planting occurs, seedlings will to be monitored regularly once a month for a year. This action may not be completed by September 30, 2013, but progress toward reaching this goal will be met. The responsible party for this action is the Plant Extinction Prevention Program. This will address recovery action #5, reestablish wild populations within historic range. This action will partially address all threats and listing factors and will continue over all 5 years.

9. Continue surveys within suitable habitat for individuals of *Cyanea mauiensis* on East and West Maui, and for *Cyanea magnicalyx* on West Maui. The responsible party for this action in the Plant Extinction Prevention Program. This will address recovery action #11, identify and map all extant wild populations. This action will partially address all threats and listing factors and will continue over all 5 years.

Estimated costs of the actions:

Action	Estimated cost (all figures approximate)	
	Ecological Services	Partners
1. Continue preserving the genetic material	\$4,500	\$20,500
2. Collect any additional propagation material (included in actions 5, 6, and 7 below)	\$0	\$2,000
3. Micropropagate clones of the available genetic lineages to propagate for reintroduction	\$7,000	\$18,000
4. Move plants as they are large enough to propagate in greenhouses	\$1,000	\$0
5. Maintain the ten seedlings in the reintroduced population of <i>Cyanea grimesiana</i> subsp. <i>grimesiana</i>	\$7,000	\$3,000
6. Maintain wild populations of <i>Cyanea magnicalyx</i> (rat control \$100/yr), helicopter access \$6,000/yr)	\$30,000	\$5,000
7. Maintain wild populations of <i>Cyanea munroi</i> (rat control, invasive introduced plant species control, inspect fence annually, airfare, 4WD rental, accommodations, \$1,000/yr)	\$3,000	\$2,000
8. Initiate discussions with landowners to control threats within suitable historical range	\$0	\$500
9. Survey within suitable habitat for individuals of <i>Cyanea mauiensis</i> and <i>Cyanea magnicalyx</i> (helicopter time)	\$7,500	\$7,500

Role of other agencies: The Plant Extinction Prevention Program, funded in part by USFWS, conducts the ongoing on-the-ground recovery actions for this species, and oversees the implementation of any *ex situ* actions. The cooperation of the Lyon Arboretum Micropropagation Laboratory is critical for the preservation of the species. It is the only facility storing the remaining live material of the species. The Hawaii Division of Forestry and Wildlife's Pahole Rare Plant Facility and the Olinda Rare Plant Facility are also critical for propagating material from the Lyon Arboretum Micropropagation Laboratory to the size that it can be reintroduced into the wild. The continued cooperation of the landowners, allowing the *in situ* management, is also critical for the conservation of the species.

Role of other ESA programs: Section 6 grants contribute funds to implementing the actions necessary for the success of the species, including funding to the Hawaii Division of Forestry and

Wildlife's Pahole Rare Plant Facility and the University of Hawaii Center for Conservation and Research Training's Olinda Rare Plant Facility.

Role of other FWS programs: The Partners program has provided funding to one of the landowners for the reintroduction of this and four other rare plant species.

Additional funding analysis: The actions described above cannot be undertaken nor the stated target reached without the estimated funding from the Service and outside sources described above. Even with this and additional funding was received and available the completion of actions may not be met in this short period of time. The length of time required is based on the limited amount of genetic material available for propagation and the growth period of the species. Additional funding would allow research on the potential effects of outbreeding depression of the Kaluanui and Puehuehunui populations of *Cyanea magnicalyx*, and whether those individuals should be mixed or kept separate as founders for establishing new populations.