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Plants

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Cyanea hamatiflora subsp. *carlsonii*

SPECIES STATUS:

Federally Listed as Endangered

IUCN Red List Ranking - Critically Endangered (CR D)

Hawai'i Natural Heritage Ranking - Subspecies Critically Imperiled (G1T1)

Endemism - Island of Hawai'i

Critical Habitat - Designated

SPECIES INFORMATION: *Cyanea hamatiflora* subsp. *carlsonii*, a member of the bellflower family (Campanulaceae), is a palm-like tree that grows to a height of up to 9.8 to 26 ft (3 to 8 m). It has alternate sessile leaves 20 to 31 in (50 to 80 cm) long and 3 to 5.5 in (8 to 14 cm) wide. Clusters of 5 to 10 flowers have a main stalk 0.6 to 1.2 in (1.5 to 3 cm) long; each flower has a stalk 0.2 to 0.5 in (0.5 to 1.2 cm) long. The hypanthium is topped with five small narrow calyx lobes. The magenta petals are fused into a one-lipped tube 2.3 to 3.1 in (6 to 8 cm) long and 0.2 to 0.4 in (0.6 to 1.1 cm) wide with five down-curved lobes. The purplish-red berries are topped by the persistent calyx lobes. This subspecies is distinguished from subsp. *hamatiflora*, the only other subspecies, by its long flower stalks and larger calyx lobes. The species differs from others in the genus by its growth habit, its stalkless leaves, the number of flowers in each cluster, and the size and shape of the corolla and calyx. Despite efforts to re-introduce plants within its known range, *Cyanea hamatiflora* ssp. *carlsonii* has declined to just three or four individuals. Seed held in gene banks has also been found to be non-viable.

DISTRIBUTION: *Cyanea hamatiflora* ssp. *carlsonii* is only known to have occurred at two sites on the island of Hawai'i, on the western slope of Hualalai and the southwestern slope of Mauna Loa. A population is found at Honuaua Forest Reserve and another at Keokea, 28 miles away.

ABUNDANCE: These two extant populations, located on privately and State-owned land at Honuaua Forest Reserve and Keokea, are about 28 miles (45 km) apart and contained approximately 19 individuals when the species was listed in 1994. Current numbers of the species at these sites have not been verified recently. There is a record of 16 plants observed at Olelomoana, Hawai'i, in January 2005. In addition two subpopulations were planted within the native range, 45 at Honuaua Forest Reserve and 6 at Pu'u Wa'awa'a.

LOCATION AND CONDITION OF KEY HABITAT: Honuauia Forest Reserve, South Kona Forest Reserve, and Pu'u Wa'awa'a. This taxon typically grows in 'ōhi'a-dominated montane wet forests at elevations between 4,000 and 5,700 ft (1,220 and 1,740 m). Associated species include kawa'u, pilo, and *Myoporum sandwicense*. This habitat has been invaded by a number of alien plant species, including *Passiflora tarminiana* (banana poka).



THREATS:

- Competition from alien plant species;
- Grazing and trampling by cattle;
- Feral pigs;
- Fruit predation by rats;
- Stochastic extinction;
- Reduced reproductive vigor due to the small number of existing populations and individuals.

CONSERVATION ACTIONS: The goals of conservation actions are not only to protect current populations, but also to establish further populations to reduce the risk of

extinction. Two subpopulations were planted within the native range, 45 at Honualua Forest Reserve and 6 at Pu'u Wa'awa'a. 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:

- Survey for populations and distribution in known and likely habitats;
- Monitor exclosure fences for damage and inside exclosures for signs of ungulate ingress;
- 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:

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