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Plants

Amaranthus brownii

SPECIES STATUS:

Federally Listed as Endangered

Genetic Safety Net Species

IUCN Red List Ranking - Critically Endangered (CR D)

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

Endemism - Nihoa

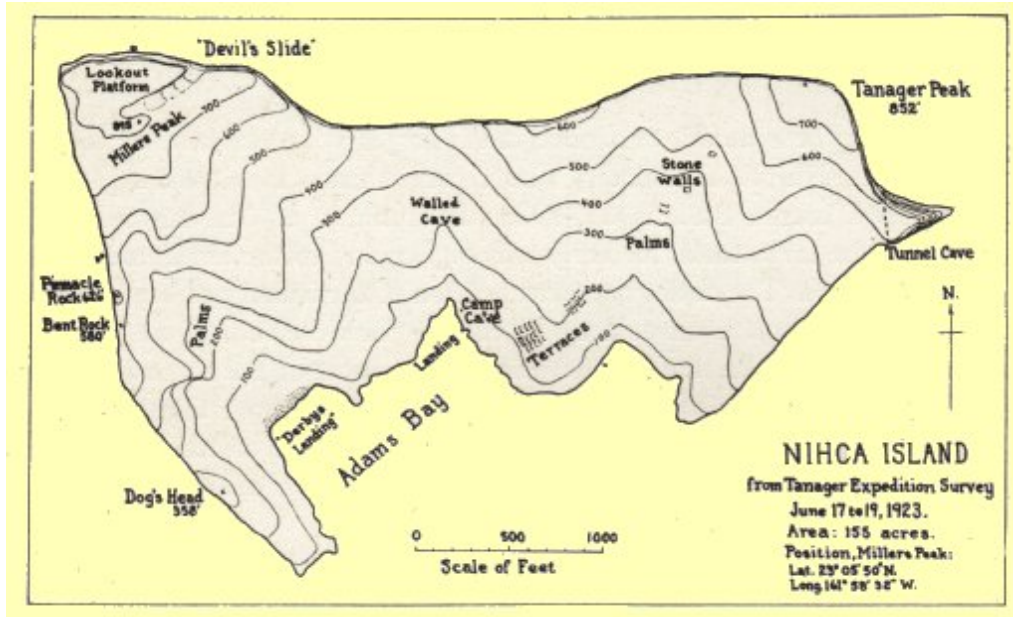
Critical Habitat - Designated

SPECIES INFORMATION: *Amaranthus brownii*, a member of the amaranth family (Amaranthaceae), is an annual herb with leafy upright or ascending stems, one to three ft (30 to 90 cm) long. The slightly hairy, alternate leaves are long and narrow, 1.6 to 2.8 in (4 to 7 cm) long, 0.06 to 0.16 in (1.5 to 4 mm) wide, and more or less folded in half lengthwise. Flowers are either male or female, and both sexes are found on the same plant. The green flowers are subtended by two oval, bristle-tipped bracts about 0.04 in (1 mm) long and 0.03 in (0.7 mm) wide. The flattened, oval fruit, which does not split open at maturity, is 0.03 to 0.04 in (0.8 to 1 mm) long and 0.02 to 0.03 in (0.6 to 0.8 mm) wide and contains one shiny, lens-shaped, reddish black seed. This species can be distinguished from other Hawaiian members of the genus by its spineless leaf axils, its linear leaves, and its fruit which does not split open when mature.

DISTRIBUTION: Endemic to the island of Nihoa in the Northwestern Hawaiian Islands. The island is part of the Hawaiian Islands National Wildlife Refuge, and has an area of only 0.65 km². When *Amaranthus brownii* was first collected in 1923, it was recorded as "most common on the ridge leading to Millers Peak, but abundant also on the ridges to the east."

ABUNDANCE: The two known populations are separated by a distance of 0.25 mi (0.4 km) and contain approximately 35 plants: about 23 plants near Millers Peak and about 12 plants in Middle Valley.

LOCATION AND CONDITION OF KEY HABITAT: During its growing season of December through July, *Amaranthus brownii* typically grows on rocky outcrops in fully exposed locations at elevations between 390 and 700 ft (120 and 215 m). Associated species include 'aheahea, kakonakona, and kupala. An undocumented non-native amaranth species is also present in the habitat.



THREATS:

- Competition from invasive alien plant species;
- Landslides;
- Fire;
- Possible hybridization with non-native amaranth species;
- Small number of populations and individuals and limited distribution increases threats by stochastic extinction;
- Reduced reproductive vigor.

CONSERVATION ACTIONS: The goals of conservation actions are to not only protect current populations, but to also establish further populations to reduce the risk of extinction. Seeds have been collected for cultivation, but resulting germination and survival rates were very low, indicating that there may have been a reduction in the reproductive vigor of the species. The US Fish and Wildlife Service 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:

- Establish secure *ex-situ* stocks with full founder representation;
- Augment wild population and establish new populations in safe harbors.

MONITORING:

- Survey for populations and distribution in known and likely habitats;
- Monitor populations for signs of hybridization with non-native amaranth species;
- Monitor wild plants for insect damage and plant diseases.

RESEARCH PRIORITIES:

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

References:

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