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## Plants

### *Diellia pallida*

#### SPECIES STATUS:

Federally Listed as Endangered

Genetic Safety Net Species

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

Endemism – Kaua'i

Critical Habitat - Designated

**SPECIES INFORMATION:** *Diellia pallida*, a member of the spleenwort family (Aspleniaceae), is a plant that grows in tufts of three to four light green, lance-shaped fronds along with a few persistent dead ones. The midrib of the frond ranges from dark purple to brownish gray in color and has a dull sheen. Scales on the midrib are brown, gray, or black. 0.1 to 0.2 in (3 to 5 mm) long; and rather inconspicuous. The fronds measure 12 to 22 in (30 to 55 cm) in length and 2 to 5 in (5 to 12 cm) in width and have short black hairs on the underside. Each frond has approximately 20 to 40 pinnae (divisions or leaflets). The largest pinnae are in the middle section of the frond, while the lower section has triangular, somewhat reduced pinnae, with the lowermost pair of pinnae raised above the plane of the others. The sori (groups of spore-producing bodies), which are frequently fused along an extended line, are encircled by a prominent vein. This species differs from others of this endemic Hawaiian genus by the color and sheen of the midrib, the presence and color of scales on the midrib, and the frequent fusion of sori.

**DISTRIBUTION:** *Diellia pallida* was known historically from Halemanu on Kaua'i. The species had not been seen since 1949, when a collection was made in Kuia NAR, Mahanaloa Valley, northwest Kaua'i.

**ABUNDANCE:** It is currently known from two populations on State land on the island of Kaua'i within Kuia NAR and Koaie Canyon. The recently discovered population on the west side of Waimea Canyon within Puu Ka Pele Forest Reserve is now apparently extirpated. The two known populations extend over a 7 by 3 mi (11 by 5 km) area. The Koaie Canyon population of three or four individuals was discovered in 1987. Additionally, two plants in Puu Ka Pele Forest Reserve have been discovered, but they have since disappeared and were likely destroyed by goats. Recent visits to the Kuia NAR and Koaie populations have found a total of less than ten extant individuals for this species.

**LOCATION AND CONDITION OF KEY HABITAT:** This species grows on bare soil on steep, rocky, dry slopes of lowland mesic forests, 1,700 to 2,300 ft (530 to 690 m) in

elevation. Associated plant taxa include koa, *Alectryon macrococcus* (mahoe), *Aleurites noluccana* (kukui), *Antidesma platyphyllum* (hame), 'ōhi'a, *Myrsine lanaiensis* (kolea), and *Rauvolfia sandwicensis* (hao). Alien species that have invaded this habitat include *Lantana camara*, *Melia azedarach*, *Stenotaphrum secundatum* (St. Augustine grass) and *Oplismenus hirtellus* (basketgrass), and two naturalized taxa of Polynesian introduction, kukui and *Cordyline fruticosa* (ti).

#### **THREATS:**

- Competition with alien plants;
- Feral goats cause erosion near the plants and trample and possibly browse these plants;
- Feral pigs;
- Mule deer;
- Fire;
- Over-collecting for scientific purposes;
- Stochastic extinction;
- Reduced reproductive vigor due to the small number of existing individuals.

**CONSERVATION ACTIONS:** The goals of conservation actions are to not only protect current populations, but also establish new populations to reduce the risk of extinction. A USFWS recovery plan 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 enclosure fences for damage and inside enclosures 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;
- Map genetic diversity in the surviving populations to guide future re-introduction and augmentation efforts.

#### **References:**

Hawai'i Natural Heritage Program, 2005. Hawaii Natural Heritage Program Search, <http://www.hinhp.org/printpage.asp?spp=PDMAL0H0A0>.

Palmer, Daniel D., 2003, *Hawaii's Ferns and Fern Allies*, Honolulu, HI: University of Hawaii Press, 324p.

USFWS. 1994. Final Listing, Endangered ETWP; Determination of Endangered or Threatened Status for 24 Plants From the Island of Kauai, HI. Federal Register, Vol. 59, No. 38, (25-FEB-94) 59 FR 9304 9329, 26 pp.

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