

wet forests at elevations between 331 and 762 m (1,086 and 2,499 ft).

Cyrtandra polyantha probably grows in association with *Broussaisia arguta*, *Coprosma foliosa* (pilo), *Dicranopteris linearis*, *Machaerina angustifolia*, and *Psychotria* sp. (HINHP Database 2001; Service 1998b).

The primary threats to *Cyrtandra polyantha* are habitat degradation by feral pigs; competition with the invasive plant species *Ageratina adenophora*, *Clidemia hirta*, *Erigeron karvinskianus*, and *Melinis minutiflora*; extinction due to naturally caused events and/or reduced reproductive vigor due to the small number of remaining individuals and their restricted distribution (HINHP Database 2001; Service 1998b; 59 FR 14482).

Cyrtandra subumbellata (Haiwale)

Cyrtandra subumbellata, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is a shrub 2 to 3 m (6.6 to 10 ft) tall. Papery in texture, the leaves are almost circular to egg-shaped. It is distinguished from other species in the genus by its leaf shape and texture, the number of flowers per cluster, and the length of bracts, flower stem, calyx lobes, floral tube, and styles (Wagner *et al.* 1999).

Cyrtandra subumbellata has been observed in fruit in September. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Cyrtandra subumbellata* was known from the Koolau Mountains of Oahu. Currently, there are 5 occurrences containing 12 individuals in the central Koolau Mountains at Schofield-Waikane Trail, Puu Ohulehule, and in Kaukonahua drainage on Federal, private, and State lands (EDA Database 2001; HINHP Database 2001).

Cyrtandra subumbellata typically grows on moist, forested slopes or gulch bottoms dominated by *Metrosideros polymorpha* or in mixed *Metrosideros polymorpha*-*Dicranopteris linearis*-*Acacia koa* wet forests between 345 and 790 m (1,132 and 2,591 ft) elevation. Associated native plant species include *Boehmeria grandis*, *Broussaisia arguta*, *Dryopteris* sp. (palapalai), and *Machaerina* sp. (HINHP Database 2001; Service 1998b; Wagner *et al.* 1999).

The primary threats to *Cyrtandra subumbellata* are competition with the nonnative plant species *Clidemia hirta*, impacts from military activities, predation by rats, fire, and risk of extinction from naturally occurring

events and/or reduced reproductive vigor due to the small number of extant occurrences and individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

Cyrtandra viridiflora (Haiwale)

Cyrtandra viridiflora, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is a small shrub 0.5 to 2 m (1.6 to 6.6 ft) tall. This species is distinguished from others in the genus by the leaves, which are thick, fleshy, heart-shaped, and densely hairy on both surfaces (Wagner *et al.* 1999).

Cyrtandra viridiflora has been observed in flower and fruit from May through September. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Cyrtandra viridiflora* was known from scattered occurrences in the Koolau Mountains on the island of Oahu. Fifty-two plants are known from 23 occurrences at Puu Kainapuaa, Maakua-Kaipapau Ridge, Kawai Nui Drainage, Opauala Gulch, and Kawai Nui-Laie Divide (GDSI 2001; HINHP Database 2001).

Cyrtandra viridiflora is usually found on wind-blown ridge tops in cloud-covered wet forest or shrubland at elevations between 443 and 867 m (1,453 and 2,844 ft). Associated native plant species include *Broussaisia arguta*, *Cheirodendron platyphyllum* (olapa), *Dicranopteris linearis*, *Diplopterygium pinnatum*, *Dubautia* sp., *Freyinetia arborea*, *Hedyotis* sp., *Ilex anomala*, *Machaerina* sp., *Melicope* sp., *Metrosideros polymorpha*, *Metrosideros rugosa* (lehua papa), *Psychotria* sp., or *Syzygium sandwicensis* (HINHP Database 2001; Wagner *et al.* 1999; EDA, *in litt.* 2001).

The major threats to *Cyrtandra viridiflora* are habitat degradation or destruction by feral pigs, impacts from military activities, predation by rats, competition with the nonnative plant species *Clidemia hirta* and *Psidium cattleianum*, and risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining occurrences and individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

Delissea subcordata (Oha)

Delissea subcordata, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is a branched or unbranched shrub 1 to 3 m (3.5 to 10 ft) tall. This species is distinguished from others in this endemic Hawaiian genus by the shape and size of the leaves, the length of the calyx lobes and

corolla, and the hairless condition of the anthers (Lammers 1999).

Fertile plants of *Delissea subcordata* have been observed in July. An examination of herbarium specimens shows that this plant flowers throughout the year. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Delissea subcordata* was known from scattered occurrences in the Waianae and Koolau Mountains of Oahu. A specimen collected by Mann and Brigham in the 1860s and labeled from the island of Kauai is believed to have been mislabeled. *Delissea subcordata* is now known from 21 occurrences at South Huliwai Gulch, Palikea Gulch, Kaluaa Gulch, South Mohiaka Gulch, Kahanahaiki Valley, Kapuhi Gulch, South Ekahanui Gulch, Waikoekoe Gulch, Pahole Gulch, Kaawa Gulch, North Palawai Gulch, Kealia land section, Kapuna Gulch, Keawapilau Gulch, North Huliwai Gulch, Kuaokala, and Kolekole. This species is found on private, Federal, and State lands. The total number of plants is estimated to be fewer than 70 (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Delissea subcordata typically grows on moderate to steep gulch slopes in mixed mesic forests between 162 and 1,025 m (531 and 3,362 ft) elevation. Associated native plant species include *Acacia koa*, *Alyxia oliviformis*, *Antidesma* sp., *Bobea* sp. (ahakea), *Chamaesyce multiformis* (akoko), *Charpentiera obovata*, *Claoxylon sandwicense*, *Diospyros hillebrandii* (lama), *Diospyros sandwicensis*, *Hedyotis acuminata*, *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Pisonia* sp., *Pouteria sandwicensis*, *Psychotria hathewayi*, *Psydrax odorata*, or *Streblus pendulinus* (HINHP Database 2001; Service 1998b).

The major threats to *Delissea subcordata* are habitat degradation and/or destruction by pigs and goats; impacts from military activities, including road construction and housing development; predation by rats and slugs; competition with the nonnative plant species *Blechnum appendiculatum*, *Clidemia hirta*, *Grevillea robusta*, *Lantana camara*, *Melinis minutiflora*, *Oplismenus hirtellus*, *Passiflora suberosa*, *Pimenta dioica*, *Psidium cattleianum*, *Schinus terebinthifolius*, *Syzygium cumini*, and *Toona ciliata*; fire; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of