

The major threats to *Hedyotis degeneri* are habitat destruction by feral pigs; competition from the nonnative plant species *Ageratina adenophora*, *Blechnum appendiculatum*, *Clidemia hirta*, *Grevillea robusta*, *Melinis minutiflora*, *Psidium cattleianum*, *Psidium guajava*, *Rubus argutus*, *Schinus terebinthifolius*, and *Toona ciliata*; and a threat of extinction from random environmental events and/or decreased reproductive vigor due to the small number of extant individuals and occurrences (HINHP Database 2001).

Hedyotis parvula (NCN)

Hedyotis parvula, a short-lived perennial member of the coffee family (Rubiaceae), is a small, many-branched shrub, either upright or sprawling, with stems usually no more than 30 cm (1 ft) in length. Closely spaced, overlapping leaves that are uniform in size along the stem distinguish this species from other members of the genus on Oahu (Wagner *et al.* 1999).

Hedyotis parvula has been observed flowering in both winter and summer. The plant is found in dry areas and flowering may be induced by rain. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Hedyotis parvula* was known from the central and southern Waianae Mountains, from Makaleha Valley to Nanakuli Valley. Currently, this species is known from five locations on Federal, State, city, and county lands at Makaleha Ridge, Makua-Keaau Ridge, Lualualei-Nanakuli Ridge, Ohikilolo Ridge, and Halona. Seven occurrences totaling between 116 and 131 individuals are known (EDA Database 2001; GDSI 2001; HINHP Database 2001; Wagner *et al.* 1999).

Hedyotis parvula typically grows on and at the base of cliff faces, rock outcrops, and ledges in mesic habitat at elevations between 331 and 1,160 m (1,086 and 3,805 ft). Associated native species include *Bidens* sp., *Carex* sp., *Chamaesyce* sp., *Dodonaea viscosa*, *Eragrostis* sp. (kawelu), *Metrosideros polymorpha*, *Metrosideros tremuloides* (lehua ahihi), *Plectranthus parviflorus*, *Psydrax odorata*, or *Rumex* sp. (HINHP Database 2001; Wagner *et al.* 1999; 56 FR 55770).

The major threats to *Hedyotis parvula* are habitat degradation by feral goats and pigs; competition from the nonnative plant species *Ageratina riparia*, *Melinis minutiflora*, *Morella faya*, and *Schinus terebinthifolius*; and a threat of extinction from random environmental events and/or decreased

reproductive vigor due to the small number of individuals and occurrences (HINHP Database 2001; 56 FR 55770).

Labordia cyrtandrae (Kamakahala)

Labordia cyrtandrae, a short-lived perennial member of the logania family (Loganiaceae), is a shrub 0.7 to 2 m (2.3 to 6.6 ft) tall. This species is distinguished from others in the genus by its fleshy, hairy, cylindrical stem that flattens upon drying, the shape and length of the floral bracts, and the length of the corolla tube and lobes (Wagner *et al.* 1999).

Labordia cyrtandrae has been observed flowering from May through June, fruiting from July through August, and is sporadically fertile year-round. The flowers are functionally unisexual, and male and female flowers are on separate plants. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Labordia cyrtandrae* was known from both the Waianae and Koolau Mountains of Oahu. In the Koolau Mountains, this species extended from Kawailoa Trail to Waialae Iki, almost the entire length of the mountain range. This species currently is known only from 20 individuals in 10 occurrences in Haleauau Gulch, Mohiakea Gulch, Kaala, and Makaleha. These occurrences are on State, city, county, and private lands (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Labordia cyrtandrae typically grows in shady gulches, slopes, and glens in mesic to wet forests and shrublands dominated by *Metrosideros polymorpha*, *Diplopterygium pinnatum*, and/or *Acacia koa* between the elevations of 212 and 1,233 m (695 and 4,044 ft). Associated native plant species include *Antidesma* sp., *Artemisia australis*, *Bidens* sp., *Boehmeria grandis*, *Broussaisia arguta*, *Chamaesyce* sp., *Coprosma* sp., *Cyrtandra* sp., *Dicranopteris linearis*, *Diplazium sandwicense*, *Dubautia plantaginea* (naenae), *Lysimachia hillebrandii*, *Peperomia membranacea* (ala ala wai nui), *Perrottetia sandwicensis*, *Phyllostegia* sp., *Pipturus albidus*, *Pouteria sandwicensis*, *Psychotria* sp., or *Rumex* sp. (HINHP Database 2001; Service 1998b).

The major threats to *Labordia cyrtandrae* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; competition with the nonnative plant species *Axonopus fissifolius*, *Clidemia hirta*, *Juncus planifolius* (NCN), *Psidium cattleianum*, *Rubus argutus*, *Setaria*

parviflora (yellow foxtail), and *Schinus terebinthifolius*; fire; and risk of extinction from random environmental events and/or reduced reproductive vigor due to the small number of remaining individuals and occurrences (HINHP Database 2001; Service 1998b).

Lepidium arbuscula (Anaunau)

Lepidium arbuscula, a short-lived perennial member of the mustard family (Brassicaceae), is a gnarled shrub 0.6 to 1.2 m (2 to 4 ft) tall. The species is distinguished from others in the genus by its height (Wagner *et al.* 1999).

Lepidium arbuscula has been observed in flower in February. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Lepidium arbuscula* was known from 10 occurrences in the Waianae Mountains on Oahu. Currently, there are a total of approximately 1,000 individuals known from 12 occurrences on Federal, State, city, and county lands at Kamaileunu Ridge, Lualualei-Nanakuli Ridge, Kapuhi Gulch, northwest of Puu Kaua, Manini Gulch, Mohiakea Gulch, Ohikilolo Ridge, Makua-Keaau Ridge, the ridge between the Paahoa and Halona subdistricts, northwest of Puu Ku Makalii, and Halona subdistrict (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Lepidium arbuscula generally grows on exposed ridge tops and cliff faces in mesic and dry vegetation communities between 131 and 978 m (430 and 3,208 ft) elevation. This species is typically associated with native plant species such as *Artemisia australis*, *Bidens* sp., *Carex meyenii*, *Carex wahuensis* (NCN), *Chamaesyce multifloris*, *Dodonaea viscosa*, *Dryopteris unidentata*, *Dubautia* sp., *Eragrostis* sp., *Leptecophylla tameiameia*, *Lysimachia hillebrandii*, *Metrosideros polymorpha*, *Peperomia* sp., *Psydrax odorata*, *Rumex albescens* (huahuako), *Schiedea ligustrina* (NCN), *Sida fallax*, or *Sophora chrysophylla* (HINHP Database 2001; Service 1998b).

The primary threats to *Lepidium arbuscula* are habitat degradation and/or destruction by feral goats, potential impacts from military activities, competition with nonnative plants, and fire. The occurrence at the head of Kapuhi Gulch is also threatened by its proximity to a road (HINHP Database 2001; 61 FR 53089).

Lipochaeta lobata var. *leptophylla* (Nehe)

Lipochaeta lobata var. *leptophylla*, a member of the aster family (Asteraceae),