

feral goats and pigs; competition from the nonnative plant species *Ageratina riparia*, *Bromus mollis* (soft chess), *Grevillea robusta*, *Leucaena leucocephala*, *Melinis minutiflora*, *Melinis repens*, and *Schinus terebinthifolius*; fire; visitation and possible trampling by humans; and a risk of extinction from naturally occurring events due to the small number of remaining individuals (56 FR 55770).

*Eragrostis fosbergii* (Fosberg's love grass)

*Eragrostis fosbergii*, a member of the grass family (Poaceae), is a short-lived perennial species with stout, tufted culms (stems), which are 61 to 102 cm (24 to 40 in) long and usually arise from an abruptly bent woody base. This species is distinguished from others in the genus by its stiffly ascending flowering stalk and the long hairs on the margins of the glumes (floral bracts) and occasionally on the margins of the lemmas (floral bracts) (O'Connor 1999).

No information is available on flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Eragrostis fosbergii* was known only from the Waianae Mountains of Oahu, from the slopes of Mount Kaala, and in Waianae Kai and its associated ridges. Only four individuals are known to remain in Waianae Kai and on Kumaipo Trail in four occurrences on Federal and State lands (GDSI 2001; HINHP Database 2001).

*Eragrostis fosbergii* typically grows on ridge crests or moderate slopes in dry and mesic forests between 578 and 941 m (1,896 and 3,086 ft) elevation.

Associated native plant species include *Acacia koa*, *Alyxia oliviformis*, *Bidens* sp., *Chamaesyce* sp., *Dodonaea viscosa*, *Doodia* sp. (oku pukupulauui), *Eragrostis grandis*, *Melicope* sp., *Metrosideros polymorpha*, *Nephrolepis exaltata*, *Psydrax odorata*, or *Sphenomeris* sp. (palaa) (HINHP Database 2001; 61 FR 53089).

The major threats to *Eragrostis fosbergii* are degradation of habitat by feral pigs and goats; competition with nonnative plant species such as *Grevillea robusta*, *Psidium cattleianum*, and *Schinus terebinthifolius*; trampling by hikers; hybridization with *Eragrostis grandis*; and a threat of extinction from random environmental events and/or reduced reproductive vigor due to the small number of remaining occurrences and individuals (HINHP Database 2001; Service 1998b; G. Koob, pers. comm., 2001).

*Gardenia mannii* (Nanu)

*Gardenia mannii*, a short-lived perennial member of the coffee family (Rubiaceae), is a tree 5 to 15 m (16 to 50 ft) tall. This species is distinguished from others in the genus by the shape and number of the calyx spurs (Wagner *et al.* 1999).

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

Historically, *Gardenia mannii* was known from 7 widely scattered occurrences in the Waianae Mountains and 39 occurrences distributed along almost the entire length of the Koolau Mountains of Oahu. Currently, there are 49 occurrences of *Gardenia mannii* at Haleauau Gulch, Peahinaia Ridge, Kaunala Gulch and Kaunala-Waimea Ridge, Castle Trail, Halawa Valley and Halawa-Kalauao Ridge, Moanalua Valley, Makaua-Kahana Ridge, Poamoho and Halemano Gulches, Kaluaa and Maunauna Gulches, Waimano Trail, Kawailoa Trail, Puu Hapapa and Waieli Gulch, Wiliwilinui Ridge, Koloa Stream, Waialae Nui-Kapakahi Ridge, Manaiki Valley, Laie Trail, Malaekahana-Waimea Summit Ridge, Haleauau Gulch, Schofield-Waikane Trail, Kaukonahua Gulch, Kapakahi Gulch, Manana Trail, Peahinaia Trail and Opaepala Stream, Kamana Nui Stream, Pukele, Hanaimoa Gulch, Papali Gulch, Kawai Nui, and Kaipapau Gulch. The 49 extant occurrences are on private, State, and Federal lands. The existing occurrences total between 69 and 80 plants (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Gardenia mannii* is usually found on moderate to moderately steep gulch slopes, ridge crests, in gulch bottoms, and on stream banks in mesic or wet forests between 82 and 1,050 m (269 and 3,444 ft) in elevation. Associated native plant species include *Acacia koa*, *Alyxia oliviformis*, *Antidesma platyphyllum*, *Bohea* sp., *Boehmeria grandis*, *Broussaisia arguta*, *Cheirodendron* sp. (NCN), *Cibotium* sp., *Coprosma foliosa*, *Dicranopteris linearis*, *Elaeocarpus* sp., *Freyinetia arborea*, *Hedyotis acuminata*, *Ilex anomala*, *Melicope* sp., *Metrosideros polymorpha*, *Perottetia sandwicensis*, *Pipturus* sp., *Pisonia* sp., *Pouteria sandwicensis*, *Psychotria mariniana*, *Syzygium sandwicensis*, and *Thelypteris* sp. (HINHP Database 2001).

The major threats to *Gardenia mannii* are habitat degradation and/or destruction by feral pigs; potential

impacts from military activities; competition with nonnative plant species such as *Clidemia hirta*, *Leptospermum scoparium*, *Passiflora suberosa*, *Psidium cattleianum*, *Psidium guajava*, *Rubus argutus*, and *Toona ciliata*; fire; and risk of extinction from random environmental events and/or reduced reproductive vigor due to the widely dispersed, small number of remaining individuals. The Kapakahi Gulch occurrence is also threatened by the black twig borer (HINHP Database 2001; Service 1998b; 61 FR 53089).

*Hedyotis degeneri* (NCN)

*Hedyotis degeneri*, a short-lived perennial member of the coffee family (Rubiaceae), is a prostrate shrub with four-sided stems and peeling, corky bark. This species can be distinguished from others in the genus on Oahu by its low-growing habit, the peeling corky layers on older stems, and the short, crowded, leafy shoots growing in the leaf axils; two varieties within the species are recognized: *Hedyotis degeneri* var. *coprosmifolia* and *Hedyotis degeneri* var. *degeneri* (Wagner *et al.* 1999).

This species has been observed in flower in June, July, and November, and in fruit in July. No further information is available on flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Hedyotis degeneri* is known from Mt. Kaala in the northern Waianae Mountains. Variety *coprosmifolia* has not been collected since the 1980s, and no current occurrences are known. Four occurrences, totaling 60 individuals, of variety *degeneri* are known from Makaleha, Pahole Gulch, Kahanahaiki, and Alaihehe Gulch on Federal, State, city, and county lands (GDSI 2001; HINHP Database 2001; Wagner *et al.* 1999).

*Hedyotis degeneri* typically grows on ridge crests in diverse mesic forest between 349 and 1,083 m (1,145 and 3,552 ft) elevation. Associated native species include *Alyxia oliviformis*, *Carex meyenii*, *Chamaesyce multiflora*, *Cocculus* sp. (huehue), *Dicranopteris linearis*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Gahnia* sp. (NCN), *Hedyotis terminalis*, *Leptecophylla tameiameia* (pukiaue), *Lobelia yuccoides* (panaunau), *Lysimachia hillebrandii* (kolokolo kuahiwi), *Metrosideros polymorpha*, *Pleomele* sp., *Psychotria hathewayi*, *Psydrax odorata*, or *Wikstroemia oahuensis* (akia) (HINHP Database 2001).