

Gulch on Federal, State, city, county, and private lands (EDA Database 2001; GDSI 2001; HINHP Database 2001; Wagner *et al.* 1999; EDA, *in litt.* 2001).

Alectryon macrococcus var. *macrococcus* grows on slopes or ridges, or in gulches, within mesic lowland forests between elevations of 367 and 941 m (1,204 and 3,086 ft). Associated native plant species include *Alyxia oliviformis*, *Antidesma platyphyllum*, *Canavalia* sp., *Charpentiera* sp., *Claoxylon sandwicense*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Diplazium sandwichianum*, *Elaeocarpus bifidus*, *Hibiscus arnottianus*, *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Neraudia* sp., *Nestegis sandwicensis*, *Pipturus albidus*, *Pisonia sandwicensis*, *Pisonia umbellifera*, *Pouteria sandwicensis*, *Psychotria hathewayi*, *Psydrax odorata*, *Streblus pendulinus*, or *Xylosma* sp. (HINHP Database 2001).

The threats to *Alectryon macrococcus* var. *macrococcus* on Oahu are habitat degradation by feral goats and pigs; competition with the nonnative plant species *Aleurites moluccana*, *Blechnum appendiculatum*, *Buddleia asiatica*, *Christella parasitica*, *Clidemia hirta*, *Heliocarpos popayanensis*, *Lanata camara*, *Melinis minutiflora*, *Oplismenus hirtellus*, *Passiflora suberosa*, *Pennisetum clandestinum* (kikuyu grass), *Psidium cattleianum*, *Psidium guajava*, *Rubus rosifolius*, *Schinus terebinthifolius*, *Syzygium cumini*, and *Toona ciliata*; damage from the black twig borer; seed predation by rats, mice (*Mus domesticus*), and insects; fire; depressed reproductive vigor; loss of pollinators; and, due to the very small remaining number of individuals and their limited distribution, a single natural or human-caused environmental disturbance, which could easily be catastrophic (Service 1997; 57 FR 20772).

Bonamia menziesii (NCN)

Bonamia menziesii, a member of the morning-glory family (Convolvulaceae) and a short-lived perennial, is a vine with twining branches that are fuzzy when young. This species is the only member of the genus that is endemic to the Hawaiian Islands and differs from other genera in the family by its two styles, longer stems and petioles, and rounder leaves (Austin 1999).

Little is known about the life history of *Bonamia menziesii*. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1999).

Historically, *Bonamia menziesii* was known from Kauai, the Waianae Mountains of Oahu, Molokai, Maui, and the island of Hawaii. Currently, this species is extant on Kauai, Oahu, Lanai, Maui, and Hawaii. There are 18 total occurrences on Oahu, containing a total of fewer than 100 plants. These occurrences are found in Niu Valley, Makaleha Valley, Makua-Keaau Ridge, Wailupe, Waialae Nui-Kapakahi Ridge and Kapakahi Gulch, Kaluakauila Gulch, Keawaula, Hawaii Loa Ridge and Kului Gulch, Nanakuli Valley, Kuaokala, Halona, Waialae Iki, Kapuna Gulch, Mikilua, Waianae Kai, and Alaihehe Gulch on Federal, State, and private lands (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Bonamia menziesii is found on Oahu on steep slopes or level ground in dry or mesic forest in open or closed canopy at elevations between 31 and 809 m (102 and 2,654 ft). Associated native species include *Acacia koa*, *Alyxia oliviformis*, *Dianella sandwicensis*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Erythrina sandwicensis*, *Hedyotis terminalis*, *Leptecophylla tameiameiae*, *Melicope* sp., *Metrosideros polymorpha*, *Myoporum sandwicense*, *Nestegis sandwicensis*, *Pisonia* sp., *Pittosporum* sp., *Pleomele* sp., *Pouteria sandwicensis*, *Psydrax odorata*, *Rauvolfia sandwicensis*, *Sapindus oahuensis*, *Sicyos* sp., *Sida fallax*, or *Waltheria indica* (HINHP Database 2001; Service 1999).

The primary threats to *Bonamia menziesii* on Oahu are habitat degradation and possible predation by wild and feral pigs, goats, and cattle; competition with the nonnative plant species *Aleurites moluccana*, *Grevillea robusta*, *Hyptis pectinata*, *Kalanchoe pinnata*, *Lantana camara*, *Leucaena leucocephala*, *Melia azedarach*, *Montanoa hibiscifolia*, *Panicum maximum*, *Passiflora suberosa*, *Pennisetum setaceum* (fountain grass), *Pimenta dioica*, *Psidium cattleianum*, *Rivina humilis*, *Schinus terebinthifolius*, *Syzygium cumini*, and *Toona ciliata*; fire; and nonnative insect (*Physomerus grossipes*); and potential impacts from military activities (HINHP Database 2001; Service 1999; 59 FR 56333).

Cenchrus agrimonoides (Kamanomano)

Cenchrus agrimonoides, a member of the grass family (Poaceae) and a short-lived perennial, has leaf blades that are flat or folded and that have a prominent midrib. There are two varieties, *C. agrimonoides* var. *laysanensis* and *C. agrimonoides* var. *agrimonoides*. They differ from each other in that var. *agrimonoides* has smaller burs, shorter stems, and narrower leaves. This species

is distinguished from others in the genus by the cylindrical to lance-shaped bur and the arrangement and position of the bristles (O'Conner 1999).

Little is known about the life history of *Cenchrus agrimonoides*. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors, except that this species has been observed to produce fruit year-round (Service 1999; 65 FR 53108).

Historically, *Cenchrus agrimonoides* var. *agrimonoides* was known from the Waianae Mountains of Oahu, Lanai, Maui, and an undocumented account from the island of Hawaii. *Cenchrus agrimonoides* var. *laysanensis* was historically and currently only known from the Northwest Hawaiian Islands. Currently, *Cenchrus agrimonoides* var. *agrimonoides* is known from Oahu and Maui; on Oahu from a total of 7 occurrences containing between 113 and 118 individuals. These occurrences are found in Pahole Gulch, on Makaha-Waianae Kai Ridge, in or near Kahanahaiki Gulch, in east Makaleha, Puu Kaua, Huliwai Gulch, and in Pualii drainage, on Federal, State, city, county, and private lands (EDA Database 2001; GDSI 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

Cenchrus agrimonoides var. *agrimonoides* on Oahu is usually found on dry upper slopes or ridges in lowland mixed mesic forest at elevations between 357 and 890 m (1,171 and 2,919 ft). Associated native plant species include *Acacia koa*, *Alyxia oliviformis*, *Bobea* sp., *Carex wahuensis*, *Chamaesyce multiflora*, *Coprosma foliosa*, *Diospyros sandwicensis*, *Eragrostis variabilis*, *Gahnia beecheyi* (NCN), *Leptecophylla tameiameiae*, *Metrosideros polymorpha*, *Nestegis sandwicensis*, *Psydrax odorata*, or *Psychotria* sp. (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Cenchrus agrimonoides* var. *agrimonoides* on Oahu are habitat degradation and/or destruction by feral pigs; competition with the nonnative plant species *Ageratina riparia*, *Blechnum appendiculatum*, *Casuarina* sp., *Clidemia hirta*, *Grevillea robusta*, *Paspalum conjugatum*, *Passiflora suberosa*, *Psidium cattleianum*, *Rubus argutus*, and *Schinus terebinthifolius*; trampling and fire from military activities; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of existing individuals (HINHP Database 2001; Service 1999; 61 FR 53108).