

hillebrandii, *Machaerina angustifolia*, *Melicope* sp., *Myrsine lessertiana*, *Myrsine sandwicensis* (kolea lau nui), *Neraudia* sp. (NCN), *Nothocestrum* sp., *Perottetia sandwicensis*, *Phyllostegia grandiflora* (kapana), *Pipturus* sp., *Pisonia* sp., *Pleomele* sp., *Pouteria sandwicensis*, *Psychotria* sp., *Rumex albescens*, *Scaevola gaudichaudiana* (naupaka kuahiwi), *Streblus pendulinus*, *Zanthoxylum kauaense* (ae), or native ferns (HINHP Database 2001; Service 1998b; 61 FR 53089).

The primary threats to *Phyllostegia hirsuta* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; rockslides; predation by rats; and competition with *Adiantum raddianum*, *Athyrium* sp. (NCN), *Axonopus fissifolius*, *Blechnum appendiculatum*, *Buddleia asiatica*, *Clidemia hirta*, *Drymaria cordata* (pipili), *Lantana camara*, *Melinis minutiflora*, *Passiflora suberosa*, *Paspalum conjugatum*, *Physalis peruviana* (poha), *Pimenta dioica*, *Psidium cattleianum*, *Rubus argutus*, *Rubus rosifolius*, or *Schinus terebinthifolius* (HINHP Database 2001).

Phyllostegia kaalaensis (NCN)

Phyllostegia kaalaensis, a member of the mint family (Lamiaceae), is a short-lived perennial herb. The egg-shaped leaves are 5 to 13 cm (2 to 5 in) long. The species is distinguished from others of the genus by the spreading, pointed teeth on the leaf edges and by the hairs along the margins of the calyx and bracts (Wagner *et al.* 1999).

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

Phyllostegia kaalaensis was formerly known from only six scattered locations in the Waianae Mountains of Oahu. Currently, this species is known from 7 occurrences containing a total of fewer than 45 plants, in Waianae Kai, Pahole Gulch, central Ekahanui Gulch, Ekahanui Gulch, and Palikea Gulch. These occurrences are on State and private lands (GDSI 2001; HINHP Database 2001).

Phyllostegia kaalaensis is found on gulch slopes and bottoms and on almost vertical rock faces in mesic forest or *Sapindus oahuensis* forest between 374 and 796 m (1,227 and 2,611 ft) elevation. Associated native plant species include *Antidesma platyphyllum*, *Claoxylon sandwicense*, *Diplazium sandwichianum*, *Freycinetia arborea*, *Hibiscus* sp., *Myrsine lanaiensis*, *Myrsine lessertiana*, *Neraudia melastomifolia*, *Pipturus albidus*, *Pouteria sandwicensis*,

Psychotria hathewayi, *Streblus pendulinus*, or *Urera glabra* (HINHP Database 2001).

The major threats to *Phyllostegia kaalaensis* are habitat degradation and/or destruction by feral pigs and goats; fire; trail clearing; competition with the nonnative plant species *Ageratina adenophora*, *Aleurites moluccana*, *Blechnum appendiculatum*, *Buddleia asiatica*, *Christella parasitica*, *Clidemia hirta*, *Cordyline fruticosa*, *Lantana camara*, *Oplismenus hirtellus*, *Passiflora edulis* (passion fruit), *Passiflora ligularis*, *Passiflora suberosa*, *Psidium cattleianum*, *Psidium guajava*, *Rubus rosifolius*, *Schinus terebinthifolius*, and *Toona ciliata*; and risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of occurrences and individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

Pritchardia kaalae (Loulou)

Pritchardia kaalae, a long-lived perennial member of the palm family (Arecaceae), is a single-stemmed palm up to 5 m (16 ft) tall. The waxy, hairless leaves are thin and papery or thick and leathery. Sometimes small points, dots, or linear, rusty scales are scattered on the lower leaf surface. *Pritchardia kaalae* is distinguished from other members of the genus by the hairless or scaly leaves (Read and Hodel 1999).

Pritchardia kaalae plants have been observed in fruit in April, August, and October and may fruit 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, *Pritchardia kaalae* was known from scattered occurrences in the central and north-central Waianae Mountains of Oahu. Currently, 6 occurrences are known from Manuwai Gulch, East Makaleha, Kaumokunui Gulch, Waianae Kai-Haleauau summit divide, Makua-Keaau Ridge and Makaha Valley, totaling about 200 individuals. These occurrences are located on Federal, State, city, and county lands (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Pritchardia kaalae is typically found on steep slopes and gulches in mesic forest or shrubland between elevations of 421 and 1,123 m (1,381 and 3,683 ft). Associated native plant species include *Bidens* sp., *Dodonaea viscosa*, *Dubautia* sp., *Eragrostis* sp., *Metrosideros polymorpha*, *Metrosideros tremuloides*, *Myrsine* sp., *Pipturus* sp., or *Tetraplasandra* sp. (ohe ohe) (HINHP

Database 2001; Service 1998b; 61 FR 53089; EDA, *in litt.* 2001).

Major threats to *Pritchardia kaalae* are habitat degradation by feral pigs and goats; fruit predation by rats; potential impacts from military activities; competition with the nonnative plant species *Ageratina adenophora*, *Rubus argutus*, and *Schinus terebinthifolius*; potential fire; and risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of occurrences (HINHP Database 2001; Service 1998b; 61 FR 53089).

Sanicula mariversa (NCN)

Sanicula mariversa, a short-lived perennial member of the parsley family (Apiaceae), is an upright herb, 40 to 70 cm (16 to 28 in) tall, that produces a caudex (a single branched stem from a sturdy base) growing just beneath the surface of the soil. The larger size of the plant and basal leaves, the color of the flower petals, and the hooked prickles on the fruit separate this species from others of the genus in Hawaii (Constance and Affolter 1999).

Sanicula mariversa is known to flower from February through May, and fruits can be found until August. Dry fruits remain on the plant for a long time and may persist beyond August. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Sanicula mariversa* was known from the central Waianae Mountains from Makua-Keaau Ridge to Kalua-Lualualei Summit Ridge. This species is now extant on Ohikilolo Ridge, Keaau-Makaha Ridge, Kamaileunu Ridge, and northwest of Puu Kanehoa on Federal, State, city, and county lands. The 4 known occurrences contain approximately 170 individuals (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Sanicula mariversa typically grows on well-drained, dry slopes and rock faces in mesic shrublands and open grassy areas at elevations between 582 and 978 m (1,909 and 3,208 ft). Associated native species include *Bidens torta*, *Carex meyenii*, *Doryopteris* sp., *Eragrostis* sp., *Metrosideros polymorpha*, or *Metrosideros tremuloides* (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Sanicula mariversa* are habitat degradation by feral goats; fire; erosion; competition from the nonnative plant species *Ageratina riparia*, *Erigeron karvinskianus*, *Melinis minutiflora*, *Schinus terebinthifolius*, and