

environmental requirements, and limiting factors (Service 1998b).

Historically, *Lobelia monostachya* was known only from the Koolau Mountains and had not been seen since its original discovery in the 1800s in Niu Valley, and in the 1920s in Manoa Valley. In 1994, Joel Lau discovered one individual in a previously unknown location in Wailupe Valley on State and private lands. Currently, one occurrence with a total of three plants is known (GDSI 2001; HINHP Database 2001).

*Lobelia monostachya* occurs on steep, sparsely vegetated cliffs in mesic shrubland between 44 and 614 m (144 and 2,014 ft) elevation. Associated native plant species include *Artemisia australis*, *Carex meyenii*, *Eragrostis* sp., or *Psilotum nudum* (HINHP Database 2001).

The major threats to *Lobelia monostachya* are predation by rats; competition with the nonnative plants *Ageratum riparia*, *Kalanchoe pinnata*, *Melinis minutiflora*, and *Schinus terebinthifolius*; and risk of extinction from random environmental events and/or reduced reproductive vigor due to the low number of individuals in the only known occurrence (HINHP Database 2001; 61 FR 53089).

#### *Lobelia oahuensis* (NCN)

*Lobelia oahuensis*, a short-lived perennial member of the bellflower family (Campanulaceae), is a stout, erect, unbranched shrub 1 to 3 m (3 to 10 ft) tall. *Lobelia oahuensis* differs from other members of the genus in having the following combination of characters: Erect stems 1 to 3 m (3 to 10 ft) long, dense rosettes of leaves at the end of stems, lower leaf surfaces covered with coarse grayish or greenish hairs, and flowers 42 to 45 millimeters (mm) (1.7 to 1.8 in) long (Lammers 1999).

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

Historically, *Lobelia oahuensis* was known from Kahana Ridge, Kipapa Gulch, and the southeastern Koolau Mountains of Oahu. The 12 current occurrences totaling 42 individuals are located on private, State, and Federal lands. These occurrences are on Mt. Olympus, Konahuanui summit, Waikakalaua-Waikane Ridge, Puu o Kona, the summit area between Aiea and Halawa Valley, Puu Keahiakahoe and the summit ridge south of Puu Keahiakahoe, Waialae Nui-Waimanalo and Kapakahi-Waimanalo, Puu Kalena,

and Eleao (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Lobelia oahuensis* grows on steep slopes between elevations of 415 and 959 m (1,361 and 3,146 ft) on summit cliffs in cloudswet wet forests or in lowland wet shrubland that is frequently exposed to heavy wind and rain. Associated native plant species include *Bidens* sp., *Broussaisia arguta*, *Cheirodendron trigynum* (olapa), *Cibotium* sp., *Dicranopteris linearis*, *Dubautia laxa*, *Freycinetia arborea*, *Hedyotis* sp., *Labordia hosakana* (kamakahala), *Lycopodiella cernua* (wawae iole), *Machaerina angustifolia*, *Melicope* sp., *Metrosideros polymorpha*, *Peperomia* sp., *Phyllostegia* sp., *Sadleria squarrosa* (apuu), *Scaevola* sp., *Syzygium sandwicensis*, *Vaccinium* sp., or *Wikstroemia* sp. (HINHP Database 2001; Lammers 1999; Service 1998b).

The primary threats to *Lobelia oahuensis* are competition with the nonnative plant species *Clidemia hirta*, *Erigeron karvinskianus*, *Paspalum conjugatum*, *Rubus argutus*, and *Rubus rosifolius*, and habitat degradation by feral pigs (HINHP Database 2001).

#### *Melicope lydgatei* (Alani)

*Melicope lydgatei*, a long-lived perennial member of the citrus family (Rutaceae), is a small shrub that has leaves arranged oppositely or in threes. The species' leaf arrangement, the amount of fusion of the fruit sections, and the hairless exocarp (outermost layer of the fruit wall) and endocarp (innermost layer) distinguish it from other species in the genus (Wagner *et al.* 1999).

This species has been observed in flower in May and in fruit from June to July. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

*Melicope lydgatei* was formerly known throughout the Koolau Mountains of Oahu from Hauula to Kahana, Kipapa Gulch to Waimano, and Kalihi Valley to Wailupe Valley. Eighteen occurrences remain within its historical range on State and private lands along Poamoho Trail, Peahinaia Trail, and Manana Trail (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Melicope lydgatei* typically grows in association with *Acacia koa*, *Bobea elatior*, *Dicranopteris linearis*, *Metrosideros polymorpha*, *Psychotria* sp., or *Syzygium sandwicensis* on ridges in mesic and wet forests at elevations between 349 and 671 m (1,145 and 2,201 ft) (HINHP Database 2001; Service 1998b; EDA, *in litt.* 2001).

The primary threat to *Melicope lydgatei* is a threat of extinction due to random environmental events and/or reduced reproductive vigor because of the small number of occurrences remaining (59 FR 14482).

#### *Melicope saint-johnii* (Alani)

*Melicope saint-johnii*, a long-lived perennial member of the rue family (Rutaceae), is a slender tree 3 to 6 m (10 to 20 ft) tall. This species is distinguished from others in the genus by the combination of the hairless exocarp, hairy endocarp, densely hairy petals, and sparsely hairy to smooth sepals (Stone *et al.* 1999).

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

Historically, *Melicope saint-johnii* was known from both the Waianae and Koolau Mountains at Makaha to Mauna Kapu in the Waianae Mountains and Papali Gulch in Hauula, Manoa-Aihualama, Wailupe, and Niu Valley in the Koolau Mountains. Today 6 occurrences of this species are found on Federal and private lands from the region between Puu Kaua and Puu Kanehoa to Mauna Kapu in the southern Waianae Mountains, with a total of fewer than 170 individuals (GDSI 2001; HINHP Database 2001).

*Melicope saint-johnii* typically grows on mesic forested ridges and gulch bottoms between the elevation of 240 and 953 m (787 and 3,126 ft). Associated native plant species include *Alyxia oliviformis*, *Artemisia australis*, *Bidens torta*, *Carex wahuensis*, *Coprosma longifolia*, *Eragrostis* sp., *Hedyotis schlechtendahliana*, *Labordia kaalae* (kamakahala), *Lysimachia hillebrandii*, *Metrosideros polymorpha*, *Panicum beechyi* (panic grass), *Pipturus albidus*, *Pittosporum* sp., *Pleomele halapepe* (hala pepe), *Psychotria hathewayi*, or *Rumex albescens* (HINHP Database 2001).

The primary threats to *Melicope saint-johnii* are habitat degradation and/or destruction by feral goats and pigs; potential predation by the black twig borer; potential fire; competition with nonnative plant species such as *Ageratina adenophora*, *Ageratina riparia*, *Clidemia hirta*, *Grevillea robusta*, *Lantana camara*, *Melinis minutiflora*, *Morella faya*, *Passiflora suberosa*, *Passiflora* sp., *Psidium cattleianum*, and *Schinus terebinthifolius*; and risk of extinction due to naturally occurring events and/or reduced reproductive vigor because of the few individuals remaining and their restricted distribution (HINHP