

Lahaina on West Maui and from Oahu. Currently, it is found only on Maui on State (Lihau section of West Maui NAR and the West Maui Forest Reserve) and privately owned lands at Helu, Lihau, east of Halepohaku, and Ulaula within the West Maui Mountains Watershed Partnership. The 4 Maui occurrences number approximately 240 individuals (GDSI 2001; HINHP Database 2001; Service 1997; Wagner *et al.* 1999; 57 FR 20772).

*Lysimachia lydgatei* typically grows on the sides of steep ridges in *Metrosideros polymorpha*-*Dicranopteris linearis*-dominated wet to mesic shrubland or *Metrosideros polymorpha*-*Cheirodendron* spp. montane forest at elevations between 829 and 1,432 m (2,720 and 4,698 ft) and containing one or more of the following associated native plant species: *Astelia* spp. (painiu); *Broussaisia arguta*; *Coprosma* spp.; *Dodonaea viscosa*; *Eurya sandwicensis* (anini); *Ilex anomala*; *Leptecophylla tameiameia*; *Lycopodium* spp. (wawae iole); *Ochrosia* spp. (holei); *Vaccinium* spp.; or mat ferns such as *Dicranopteris* spp. (HINHP Database 2001; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

The greatest threats to *Lysimachia lydgatei* are extinction from a random environmental event caused by the small number of occurrences; competition with nonnative plant species such as *Rubus argutus*; and fire (Service 1997; 57 FR 20772).

#### *Mariscus pennatiformis* (NCN)

*Mariscus pennatiformis*, a short-lived member of the sedge family (Cyperaceae), is a perennial plant with a woody root system covered with brown scales. *Mariscus pennatiformis* is divided into two subspecies, ssp. *bryanii* and ssp. *pennatiformis*, which are distinguished by the length and width of the spikelets; color, length, and width of the glume; and by the shape and length of the fruit. This species differs from other members of the genus by its three-sided, slightly concave, smooth stems; the length and number of spikelets; the leaf width; and the length and diameter of stems (Koyama 1990).

*Mariscus pennatiformis* is known to flower from November to December after heavy rainfall. Little else is known about the life history of *M. pennatiformis*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Mariscus pennatiformis* was known from Kauai, Oahu, East

Maui (Keanae Valley, Hana, and Nahiku), the island of Hawaii, and from Laysan in the northwestern Hawaiian Islands. *Mariscus pennatiformis* ssp. *bryanii* is only known from Laysan Island. *Mariscus pennatiformis* ssp. *pennatiformis* is currently found only on East Maui. Two occurrences of approximately 30 individuals are found on State-owned land near the mouth of Hanawi Stream (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; K. Wood, *in litt.* 1999).

On Maui, *Mariscus pennatiformis* ssp. *pennatiformis* is found on cliffs with brown soil and talus within reach of ocean spray in *Pandanus tectorius* (hala) coastal wet forests at elevations between 0 and 188 m (0 and 615 ft) and containing one or more of the following associated native plant species: *Cyperus laevigatus* (makaloa); *Eragrostis* spp. (NCN); *Ipomoea* spp. (morning glory); *Lysimachia mauritiana*; or *Sadleria pallida* (HINHP Database 2001; Service 1999; 59 FR 56333; J. Lau, pers. comm., 2001; K. Wood, *in litt.* 1999).

Threats to *Mariscus pennatiformis* ssp. *pennatiformis* on Maui include grazing and habitat destruction caused by ungulates; competition with nonnative plant species; and extinction from random naturally occurring events (Service 1999; 59 FR 56333).

#### *Melicope knudsenii* (Alani)

*Melicope knudsenii*, a long-lived perennial member of the rue family (Rutaceae), is a tree with smooth gray bark and yellowish brown to olive-brown hairs on the tips of the branches. The species is distinguished from *M. haupuensis* and other members of the genus by the distinct carpels (chambers) present in the fruit, a hairless endocarp (fruit wall), a larger number of flowers per cluster, and the distribution of hairs on the underside of the leaves (Stone *et al.* 1999).

Little is known about the life history of *Melicope knudsenii*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995a; 59 FR 9304).

Historically and currently, *Melicope knudsenii* is known from the southeastern slope of Haleakala on Maui and from Kauai. Currently on Maui, there are four occurrences on State (DHHL) and privately owned lands from Puu Mahoe to east of Puu Ouli (GDSI 2001; HINHP Database 2001; Service 1995a; 59 FR 9304).

*Melicope knudsenii* grows in *Nestegis sandwicensis*-*Pleomele* sp. mixed open dry forests at elevations between 648 and 1,331 m (2,125 and 4,367 ft) and

containing one or more of the following associated native plant species: *Alphitonia ponderosa*; *Dodonaea viscosa*; *Osteomeles anthyllidifolia*; *Santalum ellipticum*; or *Xylosma hawaiiense* (HINHP Database 2001; Service 1995a; 59 FR 9304; R. Hobdy, pers. comm., 2001).

Threats to *Melicope knudsenii* include habitat degradation by nonnative animals, such as goats, cattle, and pigs; reduced reproductive vigor; fire; natural aging and death; and invasive plant species, such as *Pennisetum clandestinum* (Service 1995a; 59 FR 9304).

#### *Melicope mucronulata* (Alani)

*Melicope mucronulata*, a long-lived perennial of the rue family (Rutaceae), is a small tree up to 4 m (13 ft) tall with oval to elliptic-oval leaves, 8 to 16 cm (3 to 6.5 in) long and 3.5 to 6.5 cm (1.5 to 2.5 in) wide. This species is distinguished from others in the genus by the growth habit, the number of flowers in each flower cluster, the size and shape of the fruit, and the degree of hairiness of the leaves and fruit walls (Stone *et al.* 1999).

Little is known about the life history of *Melicope mucronulata*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

First discovered in 1920 in Kanaio, East Maui, *Melicope mucronulata* was not relocated until 1983 when it was reported from privately owned land with an unknown number of plants in Auwahi. This species was also found two years later on East Molokai (GDSI 2001; HINHP Database 2001; Service 1997; Stone *et al.* 1999; 57 FR 20772).

*Melicope mucronulata* typically grows on gentle south-facing slopes in lowland dry to mesic forest at elevations between 625 and 1,331 m (2,050 and 4,367 ft) and containing one or more of the following associated species: *Antidesma pulvinatum*; *Dodonaea viscosa*; *Melicope hawaiiensis* (alani); *Nestegis sandwicensis*; *Pleomele auwahiensis*; *Pouteria sandwicensis*; and *Streblus pendulinus* (Service 1997; 57 FR 20772; J. Lau, pers. comm., 2001).

The major threat to the continued existence of the only known occurrence of *Melicope mucronulata* on Maui is the risk of extinction from a random environmental event. Habitat degradation by goats and pigs, predation by goats, and competition with nonnative plant species, particularly *Melinis minutiflora*, also pose immediate threats to this species (Service 1997; 57 FR 20772).