

(partridge pea), *Digitaria insularis*, *Lantana camara*, and *Prosopis pallida*; damage by off-road vehicles or by grazing cattle and axis deer; habitat destruction, degradation, and fragmentation through development, fire, and trampling by humans and introduced mammals; and catastrophic extinction from random environmental events and from reduced reproductive vigor due to few occurrences and small occurrence sizes (Service 1996c, 57 FR 27863).

*Melicope mucronulata* (alani)

*Melicope mucronulata*, a long-lived perennial of the rue family (Rutaceae), is a small tree up to 13 ft (4 m) tall with oval to elliptic-oval leaves. 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 this species. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997).

First discovered in 1920 in Kanaio, East Maui, *Melicope mucronulata* was not relocated until 1983. On Molokai, two occurrences of three individuals were found two years later in Kupaia on the privately owned Kamakou Preserve (GDSI 2000, HINHP Database 2000, Stone *et al.* 1999).

On Molokai, *Melicope mucronulata* occurs on steep, west- or north-facing slopes in mesic *Diospyros sandwicensis*-*Metrosideros polymorpha* forest, *M. polymorpha*-*Dodonaea viscosa* shrubland, or *M. polymorpha*-*Leptechophylla tameiameia* shrubland between elevations of 199 and 1,143 m (653 and 3,749 ft). Associated native species include *Alyxia oliviformis*, *Alphitonia ponderosa* (kauila), *Coprosma foliosa*, *Hedyotis terminalis*, *Melicope hawaiiensis* (alani), *Myrsine lanaiensis* (kolea), *Nestegis sandwicensis*, *Ochrosia compta*, *Osteomeles anthyllidifolia*, *Phyllanthus* sp. (NCN), *Pleomele auwahiensis*, *Pittosporum* sp., or *Psychotria mariniana* (kopiko) (HINHP Database 2000; J. Lau, *in litt.* 2001).

On Molokai, the major threat to the continued existence of this species is catastrophic extinction from random environmental events due to the few extant occurrences and small number of individuals. Habitat degradation by goats and pigs, predation by goats, and competition with non-native plants, particularly *Melinis minutiflora*, also

pose immediate threats to this species (Service 1997, 57 FR 20772).

*Melicope munroi* (alani)

*Melicope munroi*, a long lived perennial of the rue family (Rutaceae), is a sprawling shrub up to 3 m (10 ft) tall. The new growth of this species has minute hairs. This species differs from other Hawaiian members of the genus in the shape of the leaf and the length of the inflorescence (flower cluster) stalk (Stone *et al.* 1999).

Little is known about the life history of *Melicope munroi*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001).

Historically, this species was known from the Lanaihale summit ridge of Lanai and above Kamalo on Molokai. Currently, *Melicope munroi* is only known from Lanai. This species was last collected on Molokai in 1910 by J. F. Rock (HINHP Database 2000).

Nothing is known of the preferred habitat of or native plants associated with *Melicope munroi* on Molokai.

Nothing is known of the threats to *Melicope munroi* on Molokai.

*Neraudia sericea* (NCN)

*Neraudia sericea*, a short-lived perennial and a member of the nettle family (Urticaceae), is a 3 to 5 m (10 to 16 ft) tall shrub with densely hairy branches. The lower leaf surface is densely covered with irregularly curved, silky gray to white hairs along the veins. *Neraudia sericea* differs from the other four species of this endemic Hawaiian genus by the density, length, color, and posture of the hairs on the lower leaf surface and by its mostly entire leaf margins (Wagner *et al.* 1999).

Little is known about the life history of this species. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999a).

*Neraudia sericea* was known historically from Molokai, Lanai, Maui, and Kahoolawe. Currently, this species is found only on Maui and Molokai. On Molokai, one occurrence of 50 to 100 individuals is known from Makolelau on privately owned land (GDSI 2000, HINHP Database 2000).

On Molokai, *Neraudia sericea* generally occurs on gulch slopes and gulch bottoms in lowland dry to mesic *Metrosideros polymorpha*-*Dodonaea viscosa*-*Leptechophylla tameiameia* shrubland or forest between 691 and 1,043 m (2,266 and 3,421 ft) in

elevation. Other associated plant species include *Alyxia oliviformis*, *Coprosma* sp., *Hedyotis* sp., or *Pleomele auwahiensis* (HINHP Database 2000; Wagner *et al.* 1999; J. Lau, *in litt.* 2001).

The primary threats to *Neraudia sericea* on Molokai are habitat degradation by feral pigs and goats; competition with the non-native plant *Melinis minutiflora*; and catastrophic extinction through random environmental events due to the vulnerability of a single population (Service 1999a, 59 FR 56333).

*Peucedanum sandwicense* (makou)

*Peucedanum sandwicense*, a short-lived perennial member of the parsley family (Apiaceae), is a parsley-scented, sprawling herb. Hollow stems arise from a short, vertical stem with several fleshy roots. This species is the only member of the genus in the Hawaiian Islands (Constance and Affolter 1999).

Little is known about the life history of this species. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995b).

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai. In 1990, it was discovered on Oahu. On Molokai, five occurrences are known from private and State-owned lands in Pelekunu Valley, on Huelo Islet and Mokapu Islet, and State-owned lands managed by the National Park Service at Kalaupapa National Historical Park. The 5 occurrences total approximately 50 individuals (GDSI 2000; HINHP Database 2000; Service 1995b; K. Wood, *in litt.* 2000).

On Molokai, *Peucedanum sandwicense* grows in cliff habitats in brown soil and talus in *Chamaesyce celastroides* var. *amplectans*-*Chenopodium oahuense* coastal dry shrubland or *Diospyros sandwicensis* forest from sea level to above 840 m (0 to 2,755 ft) in elevation. *Peucedanum sandwicense* is associated with native species such as *Artemisia australis* (ahinahina), *Dianella sandwicensis*, *Eragrostis* sp. (kawelu), *Lepidium bidentatum* var. *o-waihiense*, *Melathra integrifolia*, *Metrosideros polymorpha*, *Osteomeles anthyllidifolia*, *Peperomia remyi* (NCN), *Pittosporum halophilum*, *Plectranthus parviflorus* (ala ala wai nui), *Plumbago zeylanica* (iliee), *Portulaca lutea* (ihi), *Pritchardia hillebrandii*, *Reynoldsia sandwicensis*, *Santalum ellipticum* (iliahialoe), *Scaevola sericea*, *Schiedea globosa*, *Senna gaudichaudii*, or *Sida fallax* (Constance and Affolter 1999; HINHP