

*Neraudia sericea* (NCN)

*Neraudia sericea*, a short-lived perennial 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. The male flowers may be stalkless or have short stalks. *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 *Neraudia sericea*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

*Neraudia sericea* was known historically from Molokai, Lanai, Olowalu Valley on West Maui, the southern slopes of Haleakala on East Maui, and from Kahoolawe. Currently, this species is known from Molokai and Maui. On Maui, five occurrences are found on State (DHHL) and privately owned lands in Pohakea Gulch (West Maui) and in Manawainui and Kamole Gulches (East Maui) (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; M. Kaiaokamalie, *in litt.* 2000).

*Neraudia sericea* generally occurs in dry to mesic *Metrosideros polymorpha*-*Dodonaea viscosa*-*Leptecophylla tameiameia* shrubland or forest or *Acacia koa* forest at elevations between 198 and 1,658 m (650 and 5,439 ft) and containing one or more of the following associated native plant species: *Bobea* spp.; *Coprosma* spp.; *Cyrtandra oxybapha* (haiwale); *Cyrtandra* spp.; *Diospyros* spp.; *Hedyotis* spp.; *Sida fallax*; or *Urera glabra* (HINHP Database 2001; Service 1999; Wagner *et al.* 1999; 59 FR 56333; M. Brueggmann, *in litt.* 1995; R. Hobdy, pers. comm., 2001).

The primary threats to *Neraudia sericea* on Maui are habitat degradation by feral pigs and goats; competition with the nonnative plant species *Cymbopogon refractus* (barbwire grass), *Eragrostis* spp. (love grass), *Holcus lanatus*, *Melinis minutiflora*, and *Pennisetum clandestinum*; and a risk of extinction caused by random environmental events (Service 1999; 59 FR 56333).

*Nototrichium humile* (Kului)

*Nototrichium humile*, a member of the amaranth family (Amaranthaceae), is an upright to trailing shrub with branched stems to 1.5 m (5 ft) long. This species is distinguished from the only other

species in the genus by its inflorescence, a slender spike 4 mm (0.2 in) in diameter or less, which is covered with short hairs (Wagner *et al.* 1999).

*Nototrichium humile* has been observed flowering after heavy rain, but flowering is generally heaviest in the spring and summer. Fruits mature a few weeks after flowering. In cultivation, this species is known to live for more than a decade. Little else is known about the life history of *N. humile*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 56 FR 55770).

Historically, *Nototrichium humile* was known from Oahu and Maui. It currently occurs only on Oahu. On Maui, *N. humile* was last seen in the wild by Robert Hobdy in 1979 in Pohakea Gulch (HINHP Database 2001; Service 1998b; 56 FR 55770).

On Maui, *Nototrichium humile* occurred on old cinder cones in dry shrubland at elevations between 338 and 734 m (1,110 and 2,407 ft) with one or more of the following associated native plant species: *Dodonaea viscosa*; *Erythrina sandwicensis*; *Heteropogon contortus*; and *N. sandwicense* (kului) (Service 1998b; 56 FR 55770; J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Nototrichium humile* on the island of Maui (Service 1998b; 56 FR 55770).

*Peucedanum sandwicense* (Makou)

*Peucedanum sandwicense*, a member of the parsley family (Apiaceae), is a short-lived, parsley-scented, sprawling herb. Hollow stems arise from a short, vertical, perennial stem with several fleshy roots. This species is the only member of the genus in the Hawaiian Islands. It is distinguished from other Hawaiian members of the family by being a slightly succulent perennial herb and having broad basal leaflets, white flowers, and by its floral bracts, the size and shape of its fruit, and the oil glands in the fruit wall (Constance and Affolter 1999).

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

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai. Discoveries in 1990 extended the known distribution of this species to the island of Oahu. Currently on Maui, there are 3 occurrences on State and privately owned lands at Keopuka Islet, near

Pauwahu Point, and east of Hanawi Stream, with a total of 32 individuals (GDSI 2001; HINHP Database 2001; Service 1995a; 59 FR 9304).

This species grows on sparsely vegetated steep to vertical cliff habitats with little soil in mesic or coastal communities at elevations between 0 and 1,132 m (0 and 3,714 ft) and containing one or more of the following associated native species: *Artemisia australis*; *Bidens* spp.; *Carex* spp.; *Chamaesyce* spp.; *Diospyros sandwicensis*; *Eragrostis* spp.; *Hedyotis littoralis*; *Lysimachia mauritiana*; *Metrosideros polymorpha*; *Peperomia* spp.; *Pandanus tectorius* (hala); *Scaevola taccada*; or *Schiedea globosa* (NCN) (Constance and Affolter 1999; HINHP Database 2001; Service 1995a; 59 FR 9304; R. Hobdy and J. Lau pers. comms., 2001).

Competition with introduced plants is the major threat to *Peucedanum sandwicense* on Keopuka Rock. Additionally, small occurrence sizes also make the species subject to extinction caused by random environmental events (Service 1995a; 59 FR 9304).

*Phlegmariurus mannii* (Wawae iole)

*Phlegmariurus* (= *Huperzia*, = *Lycopodium*) *mannii*, a short-lived perennial member of the clubmoss family (Lycopodiaceae), is a hanging epiphyte with clustered, delicate red stems and forked reproductive spikes. These traits distinguish it from others in the genus in Hawaii (Degener and Degener 1959; Holub 1991; St. John 1981; Wagner and Wagner 1992).

Little is known about the life history of *Phlegmariurus mannii*. Reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Phlegmariurus mannii* was known from Kauai, West Maui (Haelaau and Hanaula), and the island of Hawaii. Currently, this species is found on Maui and Hawaii. On Maui, this species is now known on State (Lihau section of West Maui NAR, Makawao Forest Reserve, DHHL, and Kipahulu Forest Reserve), Federal and privately owned lands in Honokohau, Lihau, Puu Okakae, Manawainui, Healani Stream, Puu Ahulili, and Kaapahu within the East Maui Watershed Partnership and the West Maui Mountains Watershed Partnership. There are 7 occurrences with a total of 22 individuals on Maui (GDSI 2001; HINHP Database 2001; Service 1997; 57 FR 20772).

On Maui, *Phlegmariurus mannii* typically grows as an epiphyte on