

pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

*Tetraplasandra gymnocarpa* was historically known from Punaluu, Waikakalaua Gulch, Mount Olympus, and the region between Niu and Wailupe, all in the Koolau Mountains of Oahu. This species was also sighted in the Waianae Range at Palikea in 1954. Currently, 30 occurrences are scattered along the summit ridges of the Koolau Mountains from the region of Paumalu at the northern extreme to Kulioou and Waimanalo at the southeasternmost point, on Federal, State, city, and county lands. Fewer than 100 individuals are known (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Tetraplasandra gymnocarpa* is typically found on windswept summit ridges, on slopes, or in gullies in wet or sometimes mesic lowland forests and shrublands between elevations of 93 and 959 m (305 and 3,146 ft). Associated native plant species include *Acacia koa*, *Antidesma platyphyllum*, *Bidens* sp., *Bobea elatior*, *Broussaisia arguta*, *Cheirodendron* sp., *Cibotium chamissoi*, *Cibotium* spp., *Cyanea humboltiana*, *Dicranopteris linearis*, *Diplopterygium pinnatum*, *Dubautia laxa*, *Freycinetia arborea*, *Hedyotis fosbergii* (manono), *Hedyotis terminalis*, *Labordia* sp., *Lobelia hypoleuca* (kuhiaikamoowahie), *Machaerina angustifolia*, *Melicope* spp., *Metrosideros polymorpha*, *Myrsine fosbergii* (kolea), *Pouteria sandwicensis*, *Psychotria* spp., *Sadleria* spp., *Syzygium sandwicensis*, *Tetraplasandra oahuensis* (ohe mauka), or *Wikstroemia* sp. (HINHP Database 2001; Service 1998b; 59 FR 14482).

The major threats to *Tetraplasandra gymnocarpa* are competition with the nonnative plant species *Aleurites moluccana*, *Araucaria columnaris* (Norfolk Island pine), *Ardisia elliptica* (shoebutton ardisia), *Axonopus fissifolius*, *Clidemia hirta*, *Erigeron karvinskianus*, *Eucalyptus* sp. (gum tree), *Paspalum conjugatum*, *Psidium cattleianum*, *Pterolepis glomerata*, *Sacciolepis indica*, and *Setaria palmifolia*; the two-spotted leafhopper; habitat degradation by feral pigs; and reduced reproductive vigor due to the species' limited gene pool as a consequence of the small number of extant individuals (HINHP Database 2001; Service 1998b; 59 FR 14482).

*Trematolobelia singularis* (NCN)

*Trematolobelia singularis*, a short-lived perennial member of the bellflower family (Campanulaceae), is

an unbranched shrub with stems 0.6 to 1.5 m (2 to 5 ft) long. This species differs from others of this endemic Hawaiian genus by the unbranched, erect flowering stalk (Lammers 1999).

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

*Trematolobelia singularis* has been reported only from the southern Koolau Mountains. Approximately 165 plants are known from 3 occurrences at Moanalua-Tripler Ridge summit to Puu Keahiakahoe, Konahuanui, and Puu Lanipo. These occurrences are found on State and private lands (GDSI 2001; HINHP Database 2001).

This species usually grows on steep, windswept cliff faces or slopes in *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet shrubland from 545 to 953 m (1,788 to 3,126 ft) elevation. Associated native plant species include *Broussaisia arguta*, *Cibotium* sp., *Dubautia laxa*, *Eugenia* sp. (nioi), *Melicope* sp., *Sadleria* sp., or *Wikstroemia* sp. (HINHP Database 2001; Service 1998b; 61 FR 53089).

The major threats to *Trematolobelia singularis* are habitat degradation by feral pigs, potential predation by rats and slugs, competition with the aggressive nonnative plant species *Clidemia hirta*, and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of extant occurrences (HINHP Database 2001; Service 1998b; 61 FR 53089).

*Urera kaalae* (Opuhe)

*Urera kaalae*, a long-lived perennial member of the nettle family (Urticaceae), is a small tree or shrub 3 to 7 m (10 to 23 ft) tall. This species can be distinguished from the other Hawaiian species of the genus by its heart-shaped leaves (Wagner *et al.* 1999).

*Urera kaalae* has been observed flowering in the spring. It is difficult to predict when seeds will be produced and they are often sterile. This may be an indication of pollinator limitation. The plants are fast-growing. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Urera kaalae* was known from the central to southern windward Waianae Mountains, from Waianae Uka to Kupehau Gulch. This species now occurs only in North and South

Ekahanui, Pualii Gulch, Halona Gulch, Kaluaa Gulch, North and South Palawai, Puu Hapapa, Napepeiauloelo Gulch, and Waianae Kai on Federal, State, and private lands. The 12 known occurrences contain approximately 41 individuals (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Urera kaalae* typically grows on slopes and in gulches in diverse mesic forest at elevations of 439 to 1,074 m (1,440 to 3,523 ft). Associated native species include *Alyxia oliviformis*, *Antidesma platyphyllum*, *Asplenium kaulfusii*, *Athyrium* sp., *Canavalia* sp., *Charpentiera* sp., *Chamaesyce* sp., *Claoxylon sandwicense*, *Diospyros hillebrandii*, *Doryopteris* sp., *Freycinetia arborea*, *Hedyotis acuminata*, *Hibiscus* sp., *Nestegis sandwicensis*, *Pipturus albidus*, *Pleomele* sp., *Pouteria sandwicensis*, *Psychotria* sp., *Senna gaudichaudii* (kolomona), *Streblus pendulinus*, *Urera glabra*, or *Xylosma hawaiiense* (HINHP Database 2001; Service 1998b; Wagner *et al.* 1999; 61 FR 53089).

The major threats to *Urera kaalae* are habitat degradation by feral pigs; competition from the nonnative plant species *Buddleia asiatica*, *Christella parasitica*, *Clidemia hirta*, *Heliocarpus popayaensis*, *Melinis minutiflora*, *Morella faya*, *Passiflora suberosa*, *Pimenta dioica*, *Psidium cattleianum*, *Psidium guajava*, *Rubus rosifolius*, and *Schinus terebinthifolius*; fire; rockslides; and a risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

*Viola chamissoniana* ssp. *chamissoniana* (Pamakani)

*Viola chamissoniana* ssp. *chamissoniana*, a short-lived perennial member of the violet family (Violaceae), is a branched shrub up to 90 cm (3 ft) tall. This subspecies can be distinguished from the other members of the genus in the Waianae Mountains by the small size of its leaves (Wagner *et al.* 1999).

*Viola chamissoniana* ssp. *chamissoniana* has been observed in fruit and flower in April, August, and October. No further information is available on flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Viola chamissoniana* ssp. *chamissoniana* was known from the central and southern Waianae Mountains and Makaleha Valley. This taxon now occurs on Kamaileunu Ridge,