

*Viola kauaiensis* var. *wahiawaensis* is known only from two occurrences in the Wahiawa Mountains of Kauai with a total of 13 individual plants, on privately owned land. This taxon is not known to have occurred beyond its current range (GDSI 2000; HINHP Database 2000).

*Viola kauaiensis* var. *wahiawaensis* is found in *Machaerina angustifolia*-*Rhynchospora rugosa* (kuolohia) lowland bog or mixed wet shrubland and adjacent *Metrosideros polymorpha* wet forest at elevations between 393 and 1,006 m (1,291 and 3,301 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii*, *Bidens forbesii* (kookoolau), *Chamaesyce remyi* (akoko), *Chamaesyce sparsiflora* (akoko), *Coprosma* spp., *Cyanea fissa*, *Dicranopteris linearis*, *Diplopterygium pinnatum* (uluhe lau nui), *Dubautia imbricata* (naenae), *Dubautia railardioides*, *Gahnia vitiensis* (NCN), *Leptechophylla tameiameia*, *Lobelia kauaensis* (NCN), *Machaerina angustifolia*, *Machaerina mariscoides*, *Melicope* spp., *Psychotria wawrae*, *Sadleria pallida*, *Scaevola gaudichaudii*, *Sphenomeris chinensis*, *Syzygium sandwicensis*, *Tetraplasandra oahuensis*, or *Vaccinium dentatum* (HINHP Database 2000; Lorence and Flynn 1991; Service 1998a; 61 FR 53070; K. Wood, pers. comm., 2001).

The primary threats to *Viola kauaiensis* var. *wahiawaensis* are a risk of extinction from naturally occurring events, such as landslides or hurricanes, and reduced reproductive vigor due to the small number of existing populations and individuals; habitat degradation through the rooting activities of feral pigs; and competition with nonnative plants, such as *Juncus planifolius* (NCN) or *Pterolepis glomerata* (NCN) (HINHP Database 2000; Lorence and Flynn 1991; Service 1994; 61 FR 53070).

*Wilkesia hobdyi* (dwarf iliau)

*Wilkesia hobdyi*, a member of an endemic Hawaiian genus in the aster family (Asteraceae), is a short-lived perennial shrub which branches from the base. The tip of each branch bears a tuft of narrow leaves growing in whorls joined together into a short sheathing section at their bases. The cream-colored flower heads grow in clusters. It is distinguished from the other species of *Wilkesia* by having shorter branched stems and fewer shorter leaves per whorl (Carr 1982a, 1999b).

This species is probably pollinated through outcrossing and is probably self-incompatible. Insects are the most likely pollinators. In 1982, Carr reported

that reproduction and seedling establishment were occurring and appeared sufficient to sustain the populations. Flowering has been observed most often in the winter months, but also during June. Fruits may be dispersed when they stick to the feathers of birds. Densities reach one plant per sq m (approximately one sq yard) in localized areas, and hybridization with *Wilkesia gymnoxiphium* may be occurring (Carr 1982a).

First collected in 1968 on Polihale Ridge, Kauai, this species was not formally described until 1971 (St. John 1971). Currently, there are nine occurrences with a total of 406 to 471 individuals. This species occurs on State-owned lands within the Hono o Na Pali NAR, Na Pali Coast State Park, and Puu Ka Pele Forest Reserve and on land under Federal jurisdiction within the Pacific Missile Range Facility (PMRF) at Makaha Ridge. The plants occur in Milolii Valley, Makaha Ridge, Haeleele Ridge, Kaaweiki Ridge, Polihale Spring, Pohakumano, and Pohakuao (GDSI 2000; HINHP Database 2000).

*Wilkesia hobdyi* grows on coastal dry cliffs or very dry ridges at elevations between 12 and 685 m (40 and 2,246 ft). The associated native plant species include *Artemisia australis*, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hibiscus kokio* ssp. *saint johnianus*, *Lipochaeta connata*, *Lobelia niihauensis*, *Myoporum sandwicense*, *Peperomia blanda* (ala ala wai nui), *Peperomia tetraphylla* (ala ala wai nui), *Peperomia* spp., *Peucedanum sandwicense*, *Psydrax odorata*, *Sida fallax*, *Waltheria indica* (uhaloa), or *Wilkesia gymnoxiphium* (Service 1995; Wagner *et al.* 1999; 57 FR 27859; K. Wood, pers. comm., 2001).

The greatest immediate threats to the survival of this species are habitat disturbance and browsing by feral goats. Although the low number of individuals and their restricted habitat could be considered a potential threat to the survival to the species, the plant appears to have vigorous reproduction and may survive indefinitely if goats were eliminated from its habitat. Fire and extinction through naturally occurring events, such as landslides or hurricanes, could also be threats to the survival of the species (Service 1995; 57 FR 27859).

*Xylosma crenatum* (NCN)

*Xylosma crenatum* is a dioecious (plant bears only male or female flowers, and must cross-pollinate with another plant to produce viable seed) long-lived perennial tree in the

flacourtia family (Flacourtiaceae). The tree grows up to 14 m (45 ft) tall and has dark gray bark. More coarsely toothed leaf edges and hairy undersides of the leaves distinguish *X. crenatum* from the other Hawaiian member of this genus (Wagner *et al.* 1999).

Little is known about the life history of *Xylosma crenatum*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Historically, *Xylosma crenatum* was known from three occurrences on Kauai: along upper Nualolo Trail and along Mohihi Road between Waiakoali and Mohihi drainages. Currently, this species is extant on State-owned land in Kainamanu, Nualolo Trail, and Mohihi Valley within Kokee State Park, Kuia NAR, and Na Pali-Kona Forest Reserve. There are three occurrences with a total of 16 individual plants (GDSI 2000; HINHP Database 2000; Service 1995; 57 FR 20580).

*Xylosma crenatum* is known from diverse *Acacia koa*-*Metrosideros polymorpha* montane mesic or wet forest, or *M. polymorpha*-*Dicranopteris linearis* montane wet forest, at elevations between 936 and 1,284 m (3,070 and 4,212 ft). Associated native plant species include *Athyrium sandwicense*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Coprosma* spp., *Cyanea* spp. (haha), *Diplazium sandwicense*, *Dubautia knudsenii*, *Hedyotis* spp., *Ilex anomala*, *Lobelia yuccoides*, *Myrsine* spp., *Nestegis sandwicensis*, *Perrottetia sandwicensis*, *Pleomele aurea*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Scaevola procera*, *Streblus pendulinus*, *Tetraplasandra* spp., *Touchardia latifolia*, or *Zanthoxylum dipetalum* (HINHP Database 2000; Service 1995; 57 FR 20580; K. Wood, pers. comm., 2001).

The small number of individuals and scattered distribution make this species vulnerable to human or natural environmental disturbance. *Xylosma crenatum* is also threatened by competition from nonnative plants, particularly *Psidium guajava*. In addition, feral pigs may threaten this species (HINHP Database 2000; Service 1995; 57 FR 20580).

*Multi-Island Species*

*Acaena exigua* (liliwai)

*Acaena exigua* is a small perennial rosette herb in the rose family (Rosaceae) with narrow, fern-like, divided leaves. It is distinguished from the other Hawaiian rose family members by its lack of petals and by its urn-