

evidence from related species; and catastrophic extinction through naturally occurring events due to this species' few occurrences and small number of individuals (Service 1996a).

*Cyanea procera* (haha)

*Cyanea procera*, a member of the bellflower family (Campanulaceae), is a palm-like, short-lived perennial tree 3 to 9 m (10 to 30 ft) tall. It has stalkless, lance-shaped leaves 60 to 75 cm (24 to 30 in) long and 10 to 17 cm (3.9 to 6.7 in) wide with tiny hardened teeth along the margins. This species can be distinguished from other species of the genus by its growth habit, its stalkless leaves, and the single-lipped appearance of the corolla (Lammers 1999, 57 FR 46325).

Little is known about the life history of *Cyanea procera*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996a).

Historically, *Cyanea procera* was known only from an unspecified site in the Kamalo region of East Molokai. Currently, this species is found on private land and the State's Puu Alii Natural Area Reserve (NAR) with a total of 5 occurrences containing at least 10 individuals (GDSI 2000, HINHP Database 2000).

*Cyanea procera* is found on the walls of steep gulches in wet *Metrosideros polymorpha*-dominated lowland mixed forests between 277 and 1,248 m (909 and 4,093 ft) in elevation. Associated plant species include *Asplenium* spp. (no common name (NCN)), *Broussaïssia arguta*, *Coprosma ochracea* (pilo), *Cyanea* spp. (haha), *Cyrtandra macrocalyx* (haiwale), *Dicranopteris linearis*, *Pipturus albidus*, *Pisonia* spp., *Scaevola procera* (naupaka kuahiwi), or *Touchardia latifolia* (olona) (HINHP Database 2000, Service 1996a).

Threats to *Cyanea procera* are predation by rats (as suggested by evidence on related species) and feral goats, habitat degradation by feral goats and pigs, habitat destruction through erosion, and catastrophic extinction from naturally occurring events due to the vulnerability of a few occurrences with a small number of individuals (57 FR 46325).

*Hibiscus arnottianus* ssp. *immaculatus* (kokio keokeo)

*Hibiscus arnottianus* ssp. *immaculatus*, a member of the hibiscus family (Malvaceae), is a long-lived perennial tree up to 3 m (10 ft) tall with alternate, oval, toothed leaves measuring 5 to 7 cm (2 to 2.8 in) long

and 4 to 6.5 cm (1.6 to 2.6 in) wide. This subspecies is distinguished from other native Hawaiian members of the genus by its white petals and white staminal column (Bates 1999, 57 FR 46325).

This species was observed in flower during July. Little else is known about the life history of *Hibiscus arnottianus* ssp. *immaculatus*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2000, Service 1996a).

*Hibiscus arnottianus* ssp. *immaculatus* once ranged from Waihanau Valley east to Papalaua Valley on East Molokai. Currently this species is found west of Papalaua Valley on privately owned land and in the State's Olokui NAR above Waiehu. There are a total of 3 occurrences containing between 20 and 30 individuals (GDSI 2000, HINHP Database 2000).

*Hibiscus arnottianus* ssp. *immaculatus* individuals are scattered along steep sea cliffs in mesic forests between 8 and 1,014 m (26 and 3,326 ft) in elevation. Associated native plant species include *Athyrium* spp. (akolea), *Cyanea grimesiana* (haha), *Antidesma platyphyllum*, *Boehmeria grandis* (akolea), *Diospyros sandwicensis* (lama), *Metrosideros polymorpha*, *Pipturus* spp. (mamaki), *Psydrax odorata*, or *Urera glabra* (opuhe) (Bates 1999, HINHP Database 2000).

The major threats to *Hibiscus arnottianus* ssp. *immaculatus* are habitat destruction by feral goats and catastrophic extinction by naturally occurring events due to the vulnerability of the three occurrences and few individuals (Service 1996a).

*Labordia triflora* (kamakahala)

*Labordia triflora*, a short-lived perennial member of the logan family (Loganiaceae), is similar to *L. tinifolia* var. *lanaiensis*, except in the following characteristics: The stems of *L. triflora* are climbing; the leaf stalks are only 1 to 3 millimeters (mm) (0.04 to 0.1 in) long; inflorescence stalks are 40 to 50 mm (1.6 to 2 in) long; and each flower stalk is 10 to 25 mm (0.4 to 1 in) long (Motley 1995).

The flowers of this species are functionally unisexual. Little else 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 (Motley 1995, HINHP Database 2000).

Until 1990, *Labordia triflora* was known only from the type collection at Mapulehu and was believed to be

extinct. In 1990, Joel Lau rediscovered the species in Kua Gulch on Molokai. Currently, only 10 individuals are known from one occurrence on privately owned land (GDSI 2000, HINHP Database 2000, Motley 1995).

This species occurs on gulch slopes in mixed mesic *Metrosideros polymorpha* forest, between 191 and 1,143 m (626 and 3,749 ft) in elevation. Associated species include *Coprosma* sp., *Myrsine lessertiana* (kolea lau nui), *Nephrolepis exaltata* (sword fern), *Pouteria sandwicensis* (alaa), *Sadleria cyatheoides* (amau), or *Tetraplasandra hawaiiensis* (ohe ohe) (Motley 1995; J. Lau, *in litt.* 2001).

The threats to *Labordia triflora* include habitat degradation and destruction by feral pigs and goats; predation by rats that eat seeds; competition with the non-native plant species *Schinus terebinthifolius*; catastrophic extinction through environmental events; and reduced reproductive vigor due to the species' few occurrences and small number of individuals (Motley 1995, 64 FR 48307).

*Lysimachia Maxima* (NCN)

*Lysimachia maxima*, a member of the primrose family (Primulaceae), is a sprawling, short-lived perennial shrub with reddish-brown bark. This species is differentiated from others in this genus by the leaves borne in groups of 3, the broadest portion of the leaf located above the middle, and rusty hairs that disappear with maturity (Wagner *et al.* 1999).

Flowers, buds, and immature fruit of *Lysimachia maxima* have been observed in late May through July. 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 1998a, 61 FR 53130).

*Lysimachia maxima* is only known from one occurrence containing between 45 and 50 individuals on the rim of Pelekunu Valley near Ohialele, on the privately owned land of TNCH's Pelekunu Preserve (GDSI 2000, HINHP Database 2000).

This species occurs in *Metrosideros polymorpha*-*Dicranopteris linearis* montane wet forest between 446 and 1,329 m (1,463 and 4,359 ft) in elevation. Associated species include *Dubautia* sp. (naenae), *Hedyotis* sp. (NCN), *Ilex anomala* (kawau), *Psychotria* sp. (kopiko), or *Vaccinium* sp. (HINHP Database 2000).

The major threats to *Lysimachia maxima* are catastrophic extinction from random environmental events (e.g., landslides); reduced reproductive vigor