from others in the genus in that it has large, red, capsular fruit (Koutnik 1990).

Chamaesyce rockii was known historically from scattered populations along the Koolau Mountains on the island of Oahu (HHP 1994d1 to 1994d13). Eleven of the thirteen known populations of this species are extant and are found on private land and State land leased by DOD for the Kawailoa Training Area, as well as on Federal land on Schofield Barracks Military Reservation (HHP 1994d1 to 1994d11). Currently the total number of plants is estimated to be between 300 and 400 plants. Chamaesyce rockii typically grows in wet 'ohi'a-Dicranopteris linearis (uluhe) forest and shrubland between 640 and 915 m (2,100 and 3,000 ft) in elevation. Associated plant taxa include Dubautia laxa (na'ena'e pua melemele), *Machaerina* sp. ('uki), Psychotria fauriei (kopiko), Wikstroemia sp. ('akia), and the proposed species Myrsine juddii (kolea) (HHP 1994d4).

The primary threats to *Chamaesyce rockii* are habitat degradation and/or destruction by feral pigs, potential impacts from military activities, and competition with alien plant taxa such as strawberry guava and *Clidemia hirta* (Koster's curse) (HHP 1994d1 to 1994d5,

1994d7, 1994d8).

While a pharmaceutical botanist on the vessel Uranie, Charles Gaudichaud-Beaupre collected a new lobelioid on Oahu, which he later described and named Delissea acuminata (Hillebrand 1888). Wilhelm Hillebrand (1888) transferred this species to the genus Cyanea, resulting in the new combination Cyanea acuminata. This is the name accepted in the current treatment of Hawaiian members of the family (Lammers 1990). Other published names considered synonymous with Cyanea acuminata include C. acuminata var. calycina, C. acuminata forma latifolia, C. occultans, Delissea acuminata var. calycina, D. acuminata forma latifolia, D. acuminata var. latifolia, D. occultans, and Lobelia acuminata (Degener and Degener 1982, Hosaka and Degener 1938, Lammers 1990, St. John 1981 and 1987b, Wawra

Cyanea acuminata, a member of the bellflower family (Campanulaceae), is an unbranched shrub 0.3 to 2 m (1 to 6.6 ft) tall. The leaves, 11 to 32 cm (4.3 to 12.6 in) long and 3 to 9 cm (1.2 to 3.5 in) wide, are inversely lance-shaped to narrowly egg-shaped or elliptic. The upper leaf surface is green, whereas the lower surface is whitish green. The slightly hardened leaf edges contain small, spreading, pointed teeth. The leaf stalks are 2 to 10 cm (0.8 to 4 in) long. Six to 20 flowers are arranged on a

flowering stalk 15 to 60 mm (0.6 to 2.4 in) long. The calyx lobes, 2 to 5 mm (0.08 to 0.2 in) long, are narrowlytriangular. The corolla is white and sometimes tinged purplish, 30 to 35 mm (1.2 to 1.4 in) long and 3 to 4 mm (0.1 to 0.2 in) wide. The tubular portion of the flower is almost erect to slightly curved, while the lobes are one-fourth to one-third as long as the tube and spreading. The yellow to yellowish orange, round berries are approximately 5 mm (0.2 in) long. This species is distinguished from others in this endemic Hawaiian genus by the color of the petals and fruit and length of the calyx lobes, flowering stalk, and leaf stalks (Lammers 1990).

Historically Cyanea acuminata was known from 31 scattered populations in the Koolau Mountains of Oahu (HHP 1994e1 to 1994e32). Currently fewer than 100 plants are known from 15 populations on privately owned land; City and County of Honolulu land; State land, including land leased by the DOD for the Kawailoa Training Area; and Federal land on Schofield Barracks Military Reservation and the Omega Coast Guard Station (HHP 1994e1 to 1994e12, 1994e20, 1994e24, 1994e25). This species typically grows on slopes, ridges, or stream banks from 305 to 915 m (1,000 to 3,000 ft) elevation. The plants are found in mesic to wet 'ohi'auluhe, koa-'ohi'a, or *Diospyros* sandwicensis (lama)-'ohi'a forest (HHP 1994e1 to 1994e9, 1994e11, 1994e12, 1994e24, 1994e25; Lammers 1990).

The major threats to Cyanea acuminata are habitat degradation and/ or destruction by feral pigs; potential impacts from military activities; potential predation by rats; competition with the noxious alien plant taxa Christmas berry, Koster's curse, and Ageratina adenophora (Maui pamakani); and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HHP 1994e1 to 1994e4, 1994e7, 1994e8, 1994e10 to 1994e12, 1994e20; J. Lau, C. Russell, and Joan Yoshioka, TNCH, pers. comms. 1994).

While a botanist on the vessel *La Bonite* on his third trip to Hawaii, Gaudichaud-Beaupre collected a new lobelioid on Oahu which he later described and named as Rollandia humboldtiana (Lammers 1990). Other published names considered synonymous with *Rollandia humboldtiana* include *Delissea racemosa, Rollandia humboldtiana* forma *albida, R. pedunculosa,* and *R. racemosa* (Hillebrand 1888, Lammers 1990, Mann 1867–1868, St. John 1940, Wawra 1873). Recently Lammers,

Thomas Givnish, and Kenneth Sytsma merged the endemic Hawaiian genera *Cyanea* and *Rollandia* under the former name and published the new combination *Cyanea humboldtiana* (Lammers *et al.* 1993). The specific epithet honors the German naturalist and explorer, Baron Alexander von Humboldt.

Cyanea humboldtiana, a member of the bellflower family, is an unbranched shrub with woody stems 1 to 2 m (3.2 to 6.6 ft) tall. The leaves are inversely egg-shaped to broadly elliptic, 18 to 45 cm (7 to 18 in) long and 7 to 16 cm (2.8 to 6.3 in) wide. The leaf edges are hardened and have shallow, ascending rounded teeth. Five to twelve flowers are arranged on a hairy, downward bending flowering stalk which is 8 to 25 cm (3 to 10 in) long. The dark magenta or white petals are 6 to 7.5 cm (2.4 to 3 in) long and hairy. The pale orangish yellow berries are elliptic to inversely egg-shaped. This species differs from others in this endemic Hawaiian genus by the downward bending flowering stalk and the length of the flowering stalk (Lammers 1990).

Cyanea humboldtiana was known historically from 17 populations from the central portion to the southern end of the Koolau Mountains of Oahu (HHP 1994f1 to 1994f17). Currently between 100 and 220 plants are known from three populations—Konahuanui summit, Moanalua-Kaneohe summit, and Lulumahu Gulch. These populations occur on private land, State land, and Federal land on the Omega U.S. Coast Guard Station (HHP 1994f1 1994f2, 1994f16). This species is usually found in wet 'ohi'a-uluhe shrubland from 550 to 960 m (1,800 to 3,150 ft) elevation. Associated native plant taxa include ferns, alani, 'uki, *Ilex anomala* (kawa'u), and Scaevola mollis (naupaka kuahiwi) (HHP 1994f1, 1994f16).

Habitat degradation and/or destruction by feral pigs, potential predation by rats, competition with the alien plant Koster's curse, and a risk of extinction from naturally occurring events and/or reduced reproductive vigor, due to the small number of remaining populations, are the major threats to *Cyanea humboldtiana*. The Konahuanui summit population is also threatened by trampling by hikers (HHP 1994f1, 1994f2; J. Lau, C. Russell, and J. Yoshioka, pers. comms. 1994).

Cyanea koolauensis was first described by Hillebrand (1888) as

Rollandia longiflora var. angustifolia, based on a specimen he collected on Oahu. In 1918 Rock elevated the variety to full species status as Rollandia angustifolia (Rock 1918b). Lammers et al. (1993) published the new name