

Cyanea grimesiana ssp. *grimesiana* is typically found in mesic forest often dominated by *Metrosideros polymorpha* or *M. polymorpha* and *Acacia koa*, or on rocky or steep slopes of stream banks, at elevations between 114 and 746 m (374 and 2,447 ft). Associated native plant species include *Alyxia oliviformis*, *Antidesma* sp., *Bobea* sp., *Clermontia persicaefolia* (oha wai), *Coprosma* sp., *Cyanea angustifolia* (haha), *Dicranopteris linearis*, *Diplazium sandwichianum*, *Joinvillea* sp. (ohe), *Melicope* sp., *Myrsine* sp., *Nestegis sandwicensis*, *Psychotria* sp., *Syzygium sandwicensis*, or *Xylosma* sp. (Service 1999; 61 FR 53108).

The threats to *Cyanea grimesiana* ssp. *grimesiana* on Oahu are habitat degradation and/or destruction caused by wild and feral goats and pigs; competition with the nonnative plant species *Clidemia hirta*, *Psidium cattleianum*, and *Toona ciliata*; random naturally occurring events creating a risk of extinction due to the small number of existing individuals; fire; trampling by hikers and/or military activities; landslides; and predation by rats and various species of slugs (Service 1999; 61 FR 53108).

Cyperus trachysanthos (Puukaa)

Cyperus trachysanthos, a member of the sedge family (Cyperaceae), is a short-lived, perennial, grass-like plant with a short rhizome. The stems are densely tufted, obtusely triangular in cross-section, tall, sticky, and leafy at the base. This species is distinguished from others in the genus by the short rhizome, the leaf sheath with partitions at the nodes, the shape of the glumes, and the length of the stems (Koyama 1999).

Little is known about the life history of *Cyperus trachysanthos*. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1999).

Historically, *Cyperus trachysanthos* was known from Niihau, Kauai, scattered locations on Oahu, Molokai, and Lanai. This species is now extant on Niihau, Kauai, and Oahu. On Oahu, it is known from Kaena Point NAR, nearby Manini Gulch, Diamond Head, Makapuu, Queens Beach, and the Kawainui Marsh area, on Federal, State, and private lands. There are 6 occurrences with a total of 40 individuals on Oahu (HINHP Database 2001; Service 1999).

Cyperus trachysanthos is usually found in seasonally wet sites (mud flats, wet clay soil, seasonal ponds, or wet cliff seeps) on seepy flats, coastal cliffs,

or talus slopes at elevations between 6 and 194 m (609 ft). *Hibiscus tiliaceus* (hau) is often found in association with this species (HINHP Database 2001; Koyama 1999; Service 1999; 61 FR 53108).

The threats to *Cyperus trachysanthos* on Oahu are a risk of extinction from naturally-occurring events due to the small number of occurrences; competition with nonnative plant species; habitat degradation by feral goats; fire; habitat disturbance by off-road vehicles; pumping of wetlands for flood and mosquito control; modifications to the wetland topography; mowing; herbicide application; and run-off from nearby Hawaii Army National Guard (HIARNG) activities such as the cleaning of vehicles, dumping of paints or thinners, or the use of pesticides (Service 1999; 61 FR 53108).

Diellia erecta (Asplenium-leaved diellia)

Diellia erecta, a member of the spleenwort family (Aspleniaceae) and a short-lived perennial, is a fern that grows in tufts of three to nine lance shaped fronds that emerge from a rhizome covered with brown to dark gray scales. This species differs from other members of the genus in having larger brown or dark gray scales, fused or separate sori along both margins of the pinna, shiny black midribs that have a hardened surface, and veins that do not usually encircle the sori (Degener and Greenwell 1950; Wagner 1952).

Little is known about the life history of *Diellia erecta*. Reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Diellia erecta* was known from Kauai, the Koolau Mountains on Oahu, Molokai, Lanai, Maui, and the island of Hawaii. Currently, it is known from Kauai, Molokai, Maui, Oahu, and Hawaii. On Oahu, it is known from a single occurrence containing at least 20 plants on Hawaii Loa Ridge on State and private lands (GDSI 2001; HINHP Database 2001).

Diellia erecta is found on moderate to steep gulch slopes or sparsely vegetated rock faces in mesic forest at elevations between 118 and 550 m (387 and 1,804 ft). Associated native plant species include *Coprosma* sp., *Dodonaea viscosa*, *Dryopteris unidentata*, *Myrsine* sp., *Psychotria* sp., *Psydrax odorata*, *Sapindus oahuensis*, *Syzygium sandwicensis*, or *Wikstroemia* sp. (HINHP Database 2001; Service 1999).

The major threats to *Diellia erecta* on Oahu are habitat degradation by pigs; competition with nonnative plant

species, including *Blechnum appendiculatum*, *Clidemia hirta*, *Cordyline fruticosa* (ti), *Oplismenus hirtellus*, *Phymatosorus grossus* (lauae), *Psidium cattleianum*, *Schefflera actinophylla*, and *Schinus terebinthifolius*; and random naturally-occurring events causing extinction and/or reduced reproductive vigor due to the small number of occurrences and existing individuals (HINHP Database 2001; Service 1999; 59 FR 56333).

Diplazium molokaiense (NCN)

Diplazium molokaiense, a short-lived perennial member of the woodfern family (Dryopteridaceae), has a short prostrate rhizome and green or straw colored leaf stalks with thin-textured fronds. This species can be distinguished from other species of *Diplazium* in the Hawaiian Islands by a combination of characteristics, including venation pattern, the length and arrangement of the sori, frond shape, and the degree of dissection of the frond (Wagner and Wagner 1992).

Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors for *Diplazium molokaiense* are unknown (Service 1998a).

Historically, *Diplazium molokaiense* was found at Makaleha and Schofield Barracks on Oahu, Kauai, Molokai, Lanai, and Maui. However, within the last 20 years, only one occurrence of one individual has been recorded from East Maui. This species was last collected on Oahu in 1945 from Kolekole Pass to Kaala (HINHP Database 2001).

Diplazium molokaiense on Oahu was found on steep, rocky, wooded gulch walls in wet forests from 618 to 1,202 m (2,027 to 3,943 ft) elevation (HINHP Database 2001).

Nothing is known of the threats to *Diplazium molokaiense* because this species was last collected there in 1945.

Eugenia koolauensis (Nioi)

Eugenia koolauensis, a long-lived perennial member of the myrtle family (Myrtaceae), is a small tree or shrub between 2 and 7 m (7 and 23 ft) tall with branch tips covered with dense brown hairs. *Eugenia koolauensis* is one of two species in the genus that are native to Hawaii. It differs from the other species in having leaves that are densely hairy on the lower surface and leaf margins that curve under the leaves (Wagner et al. 1999).

This species has been observed in flower from February to December. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific