

(GDSI 2000, HINHP Database 2000, Service 1999a).

On Molokai, *Cyanea grimesiana* ssp. *grimesiana* is typically found in mesic forest often dominated by *Metrosideros polymorpha* or *M. polymorpha* and *Acacia koa* (koa), or on cliffs, at elevations between 93 and 1,354 m (305 and 4,441 ft). Associated plants include *Antidesma* sp. (hame), *Bobea* sp. (ahakea), *Cibotium* sp., *Cyrtandra* sp., *Dicranopteris linearis*, *Doodia* sp. (okupukupu lauii), *Freycinetia arborea*, *Nephrolepis* sp. (kupukupu), *Psychotria* sp., *Syzygium sandwicensis*, or *Xylosma* sp. (maua) (HINHP Database 2000).

The threats to this species on Molokai are habitat degradation and/or destruction caused by axis deer, feral goats, and pigs; competition with various non-native plants, such as *Clidemia hirta*; catastrophic extinction by randomly naturally occurring events (e.g., fire, landslides) due to the small number of existing individuals; trampling by hikers; seed predation by rats; and predation by various species of slugs (*Milax* spp.) (HINHP Database 2000, Service 1999a, 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 (underground stem). The culms (aerial 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 (floral bracts), and the length of the culms (Koyama 1999).

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

Historically, *Cyperus trachysanthos* was known from Niihau, Kauai, and scattered locations on Oahu, Molokai, and Lanai. This species is now extant on Niihau, Kauai, and Oahu. This species was last collected on Molokai in 1912 from Maunaloa by J. F. Rock (HINHP Database 2000).

Nothing is known of the preferred habitat or native species associated with *Cyperus trachysanthos* on Molokai.

Nothing is known of the threats to *Cyperus trachysanthos* on Molokai.

Diellia erecta (asplenium-leaved diellia)

Diellia erecta, a short-lived perennial fern in the spleenwort family (Aspleniaceae), grows in tufts of three to

nine lance-shaped fronds emerging 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 this species. Its reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999a).

Historically, *Diellia erecta* was known from Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii Island. Currently, it is known from Kauai, Oahu, Molokai, Maui, and Hawaii. On Molokai, it is known from a total of 4 occurrences containing at least 10 individuals in Halawa Valley, Kahuaawi Gulch, Makolelau, and Onini Gulch on privately owned lands (HINHP Database 2000; Service 1999a; K. Wood, *in litt.* 1999).

On Molokai, *Diellia erecta* is found in mixed mesic forest and mesic *Diospyros sandwicensis* forest between elevations of 716 and 1,133 m (2,348 and 3,716 ft). Associated native plant species include *Alyxia oliviformis*, *Bobea* sp., *Coprosma foliosa* (pilo), *Dodonaea viscosa*, *Dryopteris unidentata*, *Dubautia linearis* ssp. *opposita* (naenae), *Leptecophylla tameiameia*, *Metrosideros polymorpha*, *Myrsine* sp., *Ochrosia compta* (holei), *Pleomele auwahiensis*, *Psychotria* sp., *Sophora chrysophylla*, *Syzygium sandwicensis*, or *Wikstroemia* sp. (HINHP Database 2000; K. Wood, *in litt.* 1999).

The major threats to *Diellia erecta* on Molokai are habitat degradation by pigs, goats, and axis deer; competition with the non-native plant species *Blechnum occidentale* (NCN), *Fraxinus uhdei* (tropical ash), *Melinis minutiflora*, *Psidium cattleianum*, and *Ricinus communis*; catastrophic extinction due to random naturally occurring events; and reduced reproductive vigor due to the small number of existing individuals (HINHP Database 2000; K. Wood, *in litt.* 1999; Service 1999a; 59 FR 56333).

Diplazium molokaiense (NCN)

Diplazium molokaiense, a short-lived fern in the spleenwort family (Aspleniaceae), 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* on the Hawaiian Islands by a combination of characters, including venation pattern, the length and arrangement of the sori, frond

shape, and the degree of dissection of the frond (Wagner and Wagner 1992).

Little is known about the life history of *Diplazium molokaiense*.

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

Historically, *Diplazium molokaiense* was found on Kauai, Oahu, Molokai, Lanai, and Maui. Currently, this species is known only from Maui. This species was last collected on Molokai in 1912 from Kaluaaha Valley by C. N. Forbes (HINHP Database 2000).

On Molokai, *Diplazium molokaiense* was found on steep, rocky, wooded gulch walls in wet forests between elevations of 97 and 1,349 m (318 and 4,425 ft) (HINHP Database 2000).

There is no information on threats that may affect *Diplazium molokaiense* on Molokai (Service 1998a).

Eugenia koolauensis (nioi)

Eugenia koolauensis, a member of the myrtle family (Myrtaceae), is a long-lived perennial tree or shrub between 2 and 7 m (7 and 23 ft) tall with branch tips covered with dense brown hairs. *Eugenia koolauensis* differs from the other species in the genus 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 in various years. No other information exists on its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Eugenia koolauensis* was known from Maunaloa on western Molokai and from Oahu. Currently, this species is extant on Oahu. It was last collected on Molokai in 1912 from the west end of the island by J. F. Rock (HINHP Database 2000).

On Molokai, *Eugenia koolauensis* was found in rocky gulches or on gentle slopes with deep soil between 475 and 992 m (1,558 and 3,254 ft) in elevation. Associated native plant species include *Diospyros sandwicensis*, *Erythrina sandwicensis* (wiliwili), *Nesoluma polynesianum*, *Nestegis sandwicensis*, *Nototrichium sandwicensis*, *Reynoldsia sandwicensis*, or *Xylosma hawaiiense* (J. Lau, *in litt.* 2001).

Information on threats that may affect *Eugenia koolauensis* on Molokai is unknown.