

*Blechnum occidentale* (NCN); and random naturally occurring events that could cause extinction and/or reduced reproductive vigor caused by the small number of existing individuals (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).

Little is known about the life history of *Diplazium molokaiense*. Reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a; 59 FR 49025).

Historically, *Diplazium molokaiense* was found on Kauai, Oahu, Molokai, Lanai, and East and West Maui. Currently, this species is only known from Maui. Four occurrences with a total of 23 individuals are found on State (Kula and Kahikinui Forest Reserves) and privately owned lands within the East Maui Watershed Partnership near Polipoli in Kamaole, between Kahakapao Gulch and Puu O Kaka, Honomanu, and Waiopai Gulch (GDSI 2001; HINHP Database 2001; Service 1998a; Warshauer 1998; 59 FR 49025).

This species occurs near water courses, often in proximity to waterfalls, in lowland or montane mesic *Metrosideros polymorpha*-*Acacia koa* forest at elevations between 273 and 1,917 m (896 and 6,289 ft) (HINHP Database 2001; Service 1998a; 59 FR 49025; R. Hobdy, pers. comm., 2001).

The primary threats on Maui are habitat degradation by feral goats, cattle, pigs, and axis deer; competition with nonnative plant species; decreased reproductive vigor; and extinction from randomly occurring natural events caused by the small number of occurrences and individuals (HINHP Database 2001; Service 1998a; 59 FR 49025).

*Flueggea neowawraea* (Mehamehame)

*Flueggea neowawraea*, a long-lived perennial member of the spurge family (Euphorbiaceae), is a large tree with white oblong pores covering its scaly, pale brown bark. This species is the only member of the genus found in Hawaii and can be distinguished from

similar Hawaiian species in the family by its hairless whitish lower leaf surfaces and round fruits (Hayden 1999; Linney 1982; Neal 1965; Service 1999).

Individual trees of *Flueggea neowawraea* bear only male or female flowers, and must be cross-pollinated from a different tree to produce viable seed. Little else is known about the life history of *F. neowawraea*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Hayden 1999; Service 1999; 59 FR 56333).

Historically, *Flueggea neowawraea* was known from the islands of Oahu, Kauai, Molokai, and Hawaii. Currently, occurrences are known from Kauai, Oahu, East Maui, and Hawaii. On Maui, there are four occurrences on State (DHHL) and privately owned lands at Auwahi, and above Lualailua and Alena (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; Mahealani Kaiaokamalie, Ulupalakua Ranch, *in litt.* 2000).

*Flueggea neowawraea* occurs in dry or mesic forest at elevations between 633 and 971 m (2,078 and 3,186 ft) and containing one or more of the following associated native plant species:

*Alectryon macrococcus*; *Antidesma pulvinatum*; *Bobea timonioides* (ahakea); *Charpentiera* spp. (papala); *Diplazium sandwichianum*; *Diospyros* spp.; *Myrsine lanaiensis* (kolea); *Nesoluma polynesicum* (keahi); *Nestegis sandwicensis*; *Pleomele auwahiensis*; *Pleomele* spp.; *Pouteria sandwicensis*; *Psydrax odorata*; *Rauvolfia sandwicensis* (hao); or *Tetraplasandra* spp. (oheohe) (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

The threats to the populations on Maui are the black twig borer; habitat degradation by feral pigs, goats, deer, and cattle; competition with nonnative plant species; depressed reproductive vigor; the risk of extinction from a random environmental event caused by the small number of individuals; and predation of the fruit by rats (HINHP Database 2001; Service 1999; 59 FR 56333).

*Gouania vitifolia* (NCN)

*Gouania vitifolia*, a member of the buckthorn family (Rhamnaceae) and a short-lived perennial, is a climbing shrub with tendriled flowering branches. This species differs from other members of its genus by having flowering branches with a tendril and coarsely wavy to toothed leaf margins (Wagner *et al.* 1999).

In winter and late spring, the main vine of *Gouania vitifolia* produces new

young side shoots which soon die. Plants have been observed flowering from late November to January, but flowering probably depends on precipitation. Little else is known about the life history of *G. vitifolia*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 59 FR 32932).

Historically, *Gouania vitifolia* was known from West Maui, the Kau District of the island of Hawaii, and Oahu. The species currently occurs on Oahu and on the island of Hawaii (GDSI 2001; Service 1998b; 59 FR 32932; Jon Giffin, DOFAW, *in litt.* 2000).

On Maui, *Gouania vitifolia* typically grows on the sides of ridges and gulches in dry to mesic forests at elevations between 155 and 1,326 m (509 and 4,350 ft). Associated plant species include: *Bidens* spp.; *Carex meyerii* (NCN); *Chamaesyce* spp. (akoko); *Diospyros sandwicensis*; *Dodonaea viscosa*; *Erythrina sandwicensis*; *Hedyotis* spp.; *Hibiscus* spp.; *Melicope* spp.; *Nestegis sandwicensis*; *Pipturus albidus*; *Psychotria* spp.; or *Urera glabra* (opuhe) (Service 1998b; 59 FR 32932; J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Gouania vitifolia* on the island of Maui (Service 1998b; 59 FR 32932).

*Hedyotis coriacea* (Kioele)

*Hedyotis coriacea*, a member of the coffee family (Rubiaceae), is a small, short-lived perennial shrub with leathery leaves which are generally elliptic to oblong in shape, 3 to 8 cm (1.2 to 3.1 in) long and usually 1.5 to 3 cm (0.6 to 1.2 in) wide. This species is distinguished from others of the genus by its small, triangular calyx lobes, which do not enlarge in fruit, and the combination of capsules which are longer than wide and flower buds which are square in cross-section (Wagner *et al.* 1999).

Little is known about the life history of *Hedyotis coriacea*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Hedyotis coriacea* was known from Oahu and the island of Hawaii. Considered extinct on all islands in recent years, this species was discovered in 1990 by Steve Perlman in the State-owned Lihau section of the West Maui NAR and in 1991 on the 1859 lava flow in the Pohakuloa Training Area, island of Hawaii. Currently, only a single individual is known from West Maui on State-owned