

cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Lowrey 1999).

Historically, *Tetramolopium capillare* is known from Lahaina Luna to Wailuku on West Maui. Currently, 5 known occurrences with a total of 166 individuals are known from State (West Maui Forest Reserve) and privately owned lands within the West Maui Mountains Watershed Partnership, south of Kanaha Stream, Kauaula, Ulaula, and Koia (GDSI 2001; Lowrey 1999; Service 1997; 59 FR 49860).

*Tetramolopium capillare* typically grows on rocky substrates in *Heteropogon contortus* (pili grass) lowland dry forest containing *Dodonaea viscosa* or *Myoporum sandwicense* (naio); or in *Metrosideros polymorpha*-*Leptecophylla tameiameia* montane mesic or wet shrubland and wet cliff faces containing one or more of the following associated plant species: *Dodonaea viscosa*, *Leptecophylla tameiameia* or *Metrosideros polymorpha*, at elevations between 131 and 1,432 m (430 and 4,698 ft) (Service 1997; 59 FR 49860; R. Hobdy, pers. comm., 2001).

The major threats to *Tetramolopium capillare* are fires; competition from nonnative plant species, particularly *Lantana camara*, *Leucaena leucocephala* (koa haole), or *Melinis repens* (nata redtop); and reduced reproductive vigor and/or extinction from random environmental events caused by the small number of existing occurrences and individuals (Service 1997; 59 FR 49860).

### Multi-Island Species

#### *Acaena exigua* (Liliwai)

*Acaena exigua* is a small perennial rosette herb in the rose family (Rosaceae) with narrow, fern-like, divided leaves. It is easily hidden among the other low, tufted bog plants with which it grows. It is distinguished from other Hawaiian rose family members by its lack of petals and by the urn-shaped, constricted base of the flower, that encloses the fruit (Wagner *et al.* 1999).

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

Historically, *Acaena exigua* was known from Puu Kukui on West Maui and from Mount Waialeale on Kauai. On Maui, *A. exigua* was last seen by Hank

Oppenheimer and Steve Perlman in 1999 within the Puu Kukui Watershed Management Area. It has not been seen in the wild since March 2000 (Hank Oppenheimer, Maui Pineapple Company Limited, pers. comm., 2001; Service 1997; 57 FR 20772).

*Acaena exigua* is known only from montane bogs characterized by a thick peat substrate overlying an impervious clay substrate, with hummocks of sedges and grasses, stunted trees, and shrubs at elevations between 1,178 and 1,764 m (3,865 and 5,787 ft). Associated native species include the sedges and grasses *Carex montis-eeke* (NCN), *Deschampsia nubigena*, *Dichanthelium cynodon* (NCN), *Dichanthelium hillebrandianum* (NCN), *Dichanthelium isachnoides* (NCN), *Oreobolus furcatus* (NCN), or *Rhynchospora chinensis* (kuolohia), and the shrubs *Lagenifera maviensis* (howaiaulu), *Metrosideros polymorpha*, *Myrsine* spp., *Vaccinium* spp., or *Viola maviensis* (pamakani) (R. Hobdy, pers. comm., 2001; Service 1997; 57 FR 20772).

The reason for the disappearance of this species is not known. The main current threats to *Acaena exigua*, if it exists, are believed to include small occurrence size; human impacts (collecting and site degradation); consumption of vegetative or floral parts by nonnative slugs and rats; predation and habitat disturbance by feral pigs; and competition with nonnative plant species (Service 1997; 57 FR 20772).

*Adenophorus periens* (Pendent kihi fern)

*Adenophorus periens*, a member of the grammitis family (Grammitidaceae) and a short-lived perennial, is a small, pendent, epiphytic (not rooted in the ground) fern. This species differs from others in this endemic Hawaiian genus by having hairs along the pinna (leaflet) margins, by the pinnae being at right angles to the midrib axis, by the placement of the sori (spore-bearing structures) on the pinnae, and by the degree of dissection of each pinna (Linney 1989).

Little is known about the life history of *Adenophorus periens*, which seems to grow only in closed canopy dense forest with high humidity. Its breeding system is unknown, but outbreeding is very likely to be the predominant mode of reproduction. Spores are dispersed by wind, possibly by water, and perhaps on the feet of birds or insects. Spores lack a thick resistant coat which may indicate their longevity is brief, probably measured in days at most. Due to the weak differences between the seasons, there seems to be no evidence of seasonality in growth or

reproduction. Additional information on reproductive cycles, longevity, specific environmental requirements, and limiting factors is not known (Linney 1989).

Historically, *Adenophorus periens* was reported from Kauai, Oahu, Lanai, Maui, and the island of Hawaii. Currently, it is known from Kauai, Molokai, and Hawaii. On Maui, it has not been seen in the wild since 1929 (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333).

Nothing is known of the preferred habitat of or native plant species associated with *Adenophorus periens* on the island of Maui (Service 1999; 59 FR 56333).

Nothing is known of the threats to *Adenophorus periens* on the island of Maui (Service 1999; 59 FR 56333).

#### *Alectryon macrococcus* (Mahoe)

*Alectryon macrococcus*, a long-lived perennial member of the soapberry family (Sapindaceae), consists of two varieties, *macrococcus* and *auwahiensis*, both trees with reddish-brown branches and leaves with one to five pairs of sometimes asymmetrical egg-shaped leaflets. The underside of the leaf has dense brown hairs, persistent in *A. macrococcus* var. *auwahiensis* but only on leaves of young *A. macrococcus* var. *macrococcus*. The only member of its genus found in Hawaii, this species is distinguished from other Hawaiian members of its family by being a tree with a hard fruit 2.5 cm (1 in) or more in diameter (Service 1997; Wagner *et al.* 1999; 57 FR 20772).

*Alectryon macrococcus* is a relatively slow-growing, long-lived tree that grows in xeric to mesic sites and is adapted to periodic drought. Little else is known about the life history of *A. macrococcus*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown (Service 1997; 57 FR 20772).

Historically and currently, *Alectryon macrococcus* var. *macrococcus* is known from Kauai, Oahu, Molokai, and Maui. On Maui, 10 occurrences with a total of 10 individuals are found along the Honokowai Ditch Trail, Launiupoko Valley, and Iao Valley on privately owned land within the West Maui Mountains Watershed Partnership. Currently, *A. macrococcus* var. *auwahiensis* is known from 3 occurrences with 22 individuals on leeward East Maui in Auwahi in the Hana District and on the ridge east of Pahihi Gulch on private and State-owned (Kahikinui Forest Reserve) lands (GDSI 2001; HINHP Database 2001;