

shaped, constricted receptacle (top of flower stem where floral parts are attached) that encloses the carpels (ovule-bearing floral part) (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).

Historically, *Acaena exigua* was known from Puu Kukui on West Maui and from Mount Waialeale on Kauai. On Kauai, *A. exigua* was last collected between 1869 and 1870, and has not been seen in the wild since (Wagner *et al.* 1999).

Acaena exigua is known only from sites with extensive cloud cover and moderate to strong winds in wet montane shrub bog or bog margins characterized by a thick peat substrate overlying an impervious clay substrate, with hummocks of sedges and grasses, stunted trees, and shrubs and elevations between 666 and 1,598 m (2,185 and 5,244 ft). Associated native plant species include *Deschampsia nubigena* (hair grass), *Dichanthelium cynodon* (NCN), *Dichanthelium hillebrandianum* (NCN), *Dichanthelium isachnoides* (NCN), *Dubautia* spp., *Melicope* spp., *Metrosideros polymorpha*, *Oreobolus furcatus* (NCN), or *Vaccinium* spp. (K. Wood, pers. comm., 2001).

The reason for the disappearance of this species is not known. Although impacts from herbivory and rooting by pigs are assumed and often cited, feral pigs have become established at Waialeale (Kauai) only within the past two decades. The main current threats to *Acaena exigua*, if it exists, are believed to include small population size; human impacts (collecting and site degradation); potentially consumption of vegetative or floral parts of this species by nonnative slugs and/or rats; predation and habitat disturbance by feral pigs; and nonnative plant species, especially *Juncus planifolius* (57 FR 20772).

Achyranthes mutica (NCN)

Achyranthes mutica, a member of the amaranth family (Amaranthaceae) and a short-lived perennial, is a many-branched shrub with egg-shaped leaves and stalkless flowers. This species is distinguished from others in the genus by the shape and size of the sepals and by characteristics of the spike, which is short and congested (Wagner *et al.* 1999).

Historically, *Achyranthes mutica* was known from three collections from opposite ends of the main archipelago:

Kauai and Hawaii. Currently, this species is known only from Hawaii Island, from Kilohana Gulch on private land. It was last observed on Kauai in the 1850s (GDSI 2000; HINHP Database 2000; 61 FR 53108).

Nothing is known of the preferred habitat of or native plant species associated with *Achyranthes mutica* on the island of Kauai.

Nothing is known of the threats to *Achyranthes mutica* on the island of Kauai.

Adenophorus periens (pendent kihi fern)

Adenophorus periens, a member of the grammitis family (Grammitidaceae), is a small, pendent, epiphytic (not rooted on the ground) fern. This species differs from other species in this endemic Hawaiian genus by having hairs along the pinna (a leaflet) margins, by the pinnae being at right angles to the midrib axis, by the placement of the sori on the pinnae, and 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 several locations on Kauai, Molokai, and Hawaii (HINHP Database 2000). On Kauai, there is a total of seven occurrences on private and State-owned lands (Halelea Forest Reserve, Hono o Na Pali NAR, and Kealia Forest Reserve), with approximately 59 individuals, that occur at Pihea, Pali Elele, Waioli Valley, Mount Namahana, Lumahai Valley, Wainiha Valley, and Kapalaoa (GDSI 2000; HINHP Database 2000; 59 FR 56333;).

This epiphytic species usually growing on *Metrosideros polymorpha* trunks, is found in riparian banks of stream systems in well-developed, closed canopy that provides deep shade or high humidity in *M. polymorpha*-

Cibotium glaucum lowland wet forests, open *M. polymorpha* montane wet forest, or *M. polymorpha-Dicranopteris linearis* lowland wet forest at elevations between 107 and 1,593 m (351 and 5,228 ft). Associated native plant species include *Antidesma platyphyllum*, *Athyrium sandwichianum*, *Broussaisia arguta*, *Cheirodendron trigynum*, *Cyanea* spp., *Cyrtandra* spp., *Dicranopteris linearis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia hirtella*, *Machaerina angustifolia*, *Psychotria hexandra*, *Psychotria* spp., *Syzygium sandwicensis*, or *Tetraplasandra oahuensis* (Linney 1989; 59 FR 56333; K. Wood, pers. comm., 2001).

The threats to this species on Kauai include habitat degradation by feral pigs and goats and competition with the nonnative plant *Psidium cattleianum* (HINHP Database 2000; 59 FR 56333).

Alectryon macrococcus var. *macrococcus* (mahoe)

Alectryon macrococcus, a 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* plants. 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 2.3 cm (0.9 in) or more in diameter (Wagner *et al.* 1999).

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 *Alectryon macrococcus*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown (Service 1997).

Alectryon macrococcus var. *macrococcus* historically and currently occurs on Kauai, Oahu, Molokai and Maui. On Kauai, *A. macrococcus* var. *macrococcus* occurs on State-owned land in the Alakai Wilderness Preserve, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve. A total of 18 occurrences of 159 to 174 individuals is known from Kalalau Valley, Kipalau Valley, Haelele Valley, Waimea Canyon, Hipalau Valley, and Kawaiiki Falls (GDSI 2000; K. Wood, *in litt.* 1999). *Alectryon macrococcus* var. *auwahiensis* is found