

percent of the flowers produce pollen; very few fruits are produced per inflorescence; there are 20 to 60 seeds per capsule; and plants in cultivation have been known to flower at nine months of age. This species was observed in flower during August. Little else is known about the life history of *Brighamia rockii*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2000; Service 1996b; 57 FR 46325).

Historically, *Brighamia rockii* ranged along the northern coast of East Molokai from Kalaupapa to Halawa, may possibly have grown on Maui, and was last seen on Lanai in 1911. Currently, it is extant only on Molokai (HINHP Database 2000; Lammers 1999; Service 1996b; 57 FR 46325; K. Wood, *in litt.* 2000).

On Lanai, *Brighamia rockii* occurred on sparsely vegetated ledges of steep, rocky, dry cliffs, at elevations between 119 and 756 m (390 and 2,480 ft) with native grasses, sedges, herbs and shrubs (Service 1996b; 57 FR 46325; J. Lau, pers. comm., 2001).

Threats to *Brighamia rockii* on the island of Lanai included habitat destruction from axis deer and mouflon sheep, competition with nonnative plants, and depressed reproductive vigor due to a limited local gene pool (Service 1996b).

*Cenchrus agrimonioides* (kamanomano (= sandbur, agrimony))

*Cenchrus agrimonioides* is a short-lived perennial member of the grass family (Poaceae) with leaf blades that are flat or folded and have a prominent midrib. There are two varieties, *Cenchrus agrimonioides* var. *laysanensis* and *Cenchrus agrimonioides* var. *agrimonioides*. They differ from each other in that var. *agrimonioides* has smaller burs, shorter stems, and narrower leaves. This species is distinguished from others in the genus by the cylindrical to lance-shaped bur and the arrangement and position of the bristles (O'Connor 1999).

Little is known about the life history of *Cenchrus agrimonioides*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown. This species has been observed to produce fruit year-round (Service 1999; 61 FR 53108).

Historically, *Cenchrus agrimonioides* var. *agrimonioides* was known from Oahu, Lanai, Maui, and an undocumented report from the Island of

Hawaii. Historically, *C. agrimonioides* var. *laysanensis* was known from Laysan, Kure, and Midway, all within what is now the Northwestern Hawaiian Islands National Wildlife Refuge. This variety was never known from the island of Lanai. Currently, *Cenchrus agrimonioides* var. *agrimonioides* is known from Oahu and Maui. On Lanai it was last seen in 1915 (HINHP Database 2000; Service 1999; 61 FR 53108).

*Cenchrus agrimonioides* var. *agrimonioides* was found on slopes in mesic *Metrosideros polymorpha* forest or shrubland at elevations between 583 and 878 m (1,912 and 2,880 ft) (HINHP Database 2000; Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001).

The major threats to *Cenchrus agrimonioides* var. *agrimonioides* on Lanai included competition with nonnative plant species; browsing and habitat degradation by axis deer, mouflon sheep, and cattle (*Bos taurus*); and depressed reproductive vigor due to a limited local gene pool (Service 1999; 61 FR 53108).

*Centaurium sebaeoides* (awiiwi)

*Centaurium sebaeoides*, a member of the gentian family (Gentianaceae), is an annual herb with fleshy leaves and stalkless flowers. This species is distinguished from *Centaurium erythraea*, which is naturalized in Hawaii, by its fleshy leaves and the unbranched arrangement of the flower cluster (Wagner *et al.*, 1999).

*Centaurium sebaeoides* has been observed flowering in April. Flowering may be induced by heavy rainfall. Occurrences are found in dry areas, and plants are more likely to be found following heavy rains. Little else is known about the life history of *Centaurium sebaeoides*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

*Centaurium sebaeoides* was historically and is currently known from Kauai, Oahu, Molokai, Lanai, and Maui. On Lanai, there is one occurrence containing between 20 and 30 individual plants in Maunalei Valley on privately owned land (HINHP Database 2000).

This species is found on dry ledges at elevations between 39 and 331 m (128 and 1,086 ft). Associated species include *Hibiscus brackenridgei* (HINHP Database 2000).

The major threats to this species on Lanai are competition from nonnative plant species, grazing and habitat destruction caused by axis deer and

mouflon sheep, depressed reproductive vigor, and natural or human-caused environmental disturbance that could easily be catastrophic to the only known population due to the small number of remaining individuals and the limited and scattered distribution of the species (HINHP Database 2000; Service 1999; R. Hobdy *in litt.* 2002).

*Clermontia oblongifolia* ssp. *mauiensis* (oha wai)

*Clermontia oblongifolia* ssp. *mauiensis*, a short-lived perennial and a member of the bellflower family (Campanulaceae), is a shrub or tree with oblong to lance-shaped leaves with petioles. *Clermontia oblongifolia* is distinguished from other members of the genus by its calyx and corolla, which are similar in color and are each fused into a curved tube that falls off as the flower ages. *Clermontia oblongifolia* ssp. *mauiensis* is reported from Maui and Lanai, while the other two subspecies of this species are only known from Oahu and Molokai (Lammers 1988, 1999; 57 FR 20772).

*Clermontia oblongifolia* ssp. *mauiensis* is known to flower from November to July. Little else is known about the life history of *C. oblongifolia* ssp. *mauiensis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Rock 1919; Service 1997).

*Clermontia oblongifolia* ssp. *mauiensis* was historically and is currently known from Lanai and Maui. On Lanai, an unknown number of individuals has been reported from Kaiholena Gulch on privately owned land (HINHP Database 2000; Lammers 1999; 57 FR 20772).

This plant typically grows in gulch bottoms in mesic forests at elevations between 700 and 1,032 m (2,296 and 3,385 ft) (HINHP Database 2000).

The threats to this species on Lanai are its vulnerability to extinction from a single natural or human-caused environmental disturbance; depressed reproductive vigor; and habitat degradation by axis deer and mouflon sheep (Service 1997; 57 FR 20772).

*Ctenitis squamigera* (pauoa)

*Ctenitis squamigera* is a short-lived perennial fern and a member of the spleenwort family (Asplenaceae). It has a rhizome (horizontal stem), creeping above the ground and densely covered with scales similar to those on the lower part of the leaf stalk. It can be readily distinguished from other Hawaiian species of *Ctenitis* by the dense covering