

Valley, between Puu Hapapa and Puu Kanehoa, Puu Kailio, between Kolekole Pass and Puu Hapapa, North of Palikea, Puu Kaa-Kauhiuhi-Pahoa-Halona subdistricts, and Lualualei Naval Magazine in 40 occurrences containing between 362 and 397 individual plants on Federal, State, city, and county lands (EDA Database 2001; GDSI 2001; HINHP Database 2001).

Lobelia niihauensis on Oahu typically grows on exposed mesic or dry cliffs and ledges, at elevations from 339 to 926 m (1,112 to 3,037 ft). Associated native plant species include *Artemisia* sp., *Bidens* sp., *Carex meyenii*, *Dodonaea viscosa*, *Doryopteris* sp., *Eragrostis* sp., *Leptecophylla tameiameia*, *Lipochaeta tenuis*, *Osteomeles anthyllidifolia*, *Plectranthus parviflorus*, *Schiedea mannii*, or *Sida fallax* (HINHP Database 2001; 56 FR 55770).

On Oahu, the major threats to *Lobelia niihauensis* are habitat degradation and predation by feral goats, rats, and slugs; fire; potential impacts from military activities; and competition from the nonnative plant species *Acacia confusa*, *Ageratina riparia*, *Erigeron karvinskianus*, *Ficus microcarpa*, *Grevillea robusta*, *Kalanchoe pinnata*, *Lantana camara*, *Leucaena leucocephala*, *Melinis minutiflora*, *Melinis repens*, and *Schinus terebinthifolius* (HINHP Database 2001; 56 FR 55770).

Lysimachia filifolia (NCN)

Lysimachia filifolia, a short-lived perennial member of the primrose family (Primulaceae), is a small shrub 15 to 50 cm (0.5 to 1.6 ft) tall. This species is distinguished from other members of the genus by its leaf shape and width, calyx lobe shape, and corolla length (Service 1995b; Wagner *et al.* 1999).

Little is known about the life history of *Lysimachia filifolia*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995b).

Historically, *Lysimachia filifolia* was known only from Kauai. This species is now known from Oahu and Kauai. On Oahu, there is one occurrence containing a total of 50 individuals, on the slopes of Waiahole Valley in the Koolau Mountains on State land (GDSI 2001; HINHP Database 2001).

On Oahu, *Lysimachia filifolia* typically grows on mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests at elevations of 65 to 798 m (213 to 2,617 ft). Associated

plants include mosses, ferns, liverworts, and *Pilea peploides* (NCN) (HINHP Database 2001; Service 1995b; Wagner *et al.* 1999).

The major threat to *Lysimachia filifolia* on Oahu is competition with the nonnative plant species *Ageratina riparia*, *Blechnum appendiculatum*, *Cordyline fruticosa*, *Pluchea* sp. (sourbush), and *Schefflera actinophylla*. Additionally, individuals of the species are vulnerable to rock slides. Because only one occurrence of *Lysimachia filifolia* exists on each of only two islands, the species is threatened by extinction due to naturally caused events (HINHP Database 2001; 59 FR 09304).

Mariscus pennatifolius (NCN)

Mariscus pennatifolius, a member of the sedge family (Cyperaceae), is a short-lived perennial plant with a woody root system covered with brown scales. This species differs from other members of the genus by its three-sided, slightly concave, smooth stems; the length and number of spikelets; the leaf width; and the length and diameter of stems. The two subspecies (*Mariscus pennatifolius* ssp. *pennatifolius* and *Mariscus pennatifolius* ssp. *bryanii*) are distinguished by the length and width of spikelets, shape and length of fruits, and color, length, and width of glumes.

Subsequent to the final rule listing this species in 1994, we became aware of Tucker's (1994) treatment of this genus reclassifying it to *Cyperus*. Tucker's (1994) treatment is cited in the supplement in the revised edition of the *Manual of the Flowering Plants of Hawaii* as the basis for recognizing *Mariscus* as *Cyperus*. We will address this name change in a future **Federal Register** notice (Service 1999; Wagner *et al.* 1999).

Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown for *Mariscus pennatifolius* ssp. *pennatifolius* (Service 1999).

Historically, *Mariscus pennatifolius* was known from Kauai, Oahu (Waianae Mountains on a ridge above Makaha Valley), East Maui, the island of Hawaii, and Laysan Island in the Northwestern Hawaiian Islands. *Mariscus pennatifolius* ssp. *bryanii* is known from Laysan. Only one occurrence of *Mariscus pennatifolius* ssp. *pennatifolius* has been seen in the last 70 years on the main Hawaiian islands, in Keanae Valley on Maui in the 1970s (HINHP Database 2001).

Mariscus pennatifolius typically grows in mesic and wet *Metrosideros polymorpha* forest and *Metrosideros*

polymorpha-Acacia koa forest at elevations between 424 and 1,032 m (1,391 and 3,385 ft). The associated native plant species on Oahu are unknown (J. Lau, *in litt.* 2001).

No threat information is available for *Mariscus pennatifolius* on Oahu.

Marsilea villosa (Iihihi)

Marsilea villosa, a short-lived perennial member of the marsilea family (Marsileaceae), is an aquatic to semiaquatic fern similar in appearance to a four-leaved clover that requires periodic flooding to complete its life cycle. The species is the only member of the genus native to Hawaii and is closely related to *Marsilea vestita* of the western coast of the United States (Service 1996a).

Sexual reproduction of *Marsilea villosa* is initiated through the production of a hard sporocarp (a structure in or on which spores are produced) borne on the rhizome of a leaf pair node. The young sporocarp is covered with rust-colored hairs that are lost as the sporocarp matures. The sporocarp will mature only if the soil dries below threshold levels for leaf growth. The sporocarp remains in the soil for an extended period of time and must be scarified before it will open. It is not known how the sporocarp is scarified in *Marsilea villosa*, but bacterial action is thought to erode the wall of the sporocarp to the point that water can be absorbed and force the sporocarp to open, as in other *Marsilea* species (Service 1996a).

Marsilea villosa was historically known from Oahu, Molokai, and Niihau. Currently, it is found on Oahu and Molokai. There are five occurrences on Oahu with an unknown number of individuals at Koko Head, on Lualualei Naval Reservation, and at Kealakipapa on Federal, city, county, and private lands (GDSI 2001; HINHP Database 2001; Service 1996a).

Marsilea villosa typically grows in cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, or lowland grasslands at elevations between 424 and 1,032 m (1,391 and 3,385 ft). Associated native plant species include *Sida fallax* (HINHP Database 2001).

The main reason for the decline of *Marsilea villosa* on Oahu is habitat destruction and the destruction of natural hydrology; many of the areas where it formerly occurred are now sugar cane fields, industrial parks, housing developments, and pastures. The greatest immediate threats to the survival of this species are encroachment and competition from naturalized, nonnative plants such as