

occurring in mesic or wet sites are apparently consumed by introduced slugs and snails. In contrast, *Schiedea* occurring in dry areas produce abundant seedlings following winter rains, presumably because there are fewer nonnative predators in drier sites. Other information about reproductive cycles, longevity, specific environmental requirements, and limiting factors is unknown (Service 1999).

Historically *Schiedea nuttallii* was known from scattered locations on Kauai, Oahu, Molokai, and Maui. Currently, it occurs on Kauai, Oahu, and Molokai. On Oahu, 7 occurrences with 49 individuals are found on Pahole-Makua Ridge, Pahole-Kahanahaiki Ridge, Ekahanui Gulch, Kahanahaiki Valley, and Pahole Gulch, on Federal, State, and private lands (EDA Database 2001; GDSI 2001; HINHP Database 2001; Service 1999).

Schiedea nuttallii on Oahu typically grows on steep rock walls and forested slopes in *Acacia koa*-*Metrosideros polymorpha* lowland mesic forest and *Metrosideros polymorpha*-*Dodonaea viscosa* forest at elevations between 436 and 1,185 m (1,430 and 3,887 ft). Associated native plant species include *Alyxia oliviformis*, *Antidesma platyphyllum*, *Bidens torta*, *Cibotium chamissoi*, *Coprosma* sp., the endangered *Cyanea longiflora*, *Hedyotis terminalis*, *Ilex anomala*, *Machaerina* sp., *Peperomia* sp., *Perrottetia sandwicensis*, *Pipturus* sp., or *Psydrax odorata* (HINHP Database 2001; EDA, *in litt.*, 2001).

Schiedea nuttallii on Oahu is seriously threatened by competition with the nonnative plant species *Andropogon virginicus*, *Clidemia hirta*, *Grevillea robusta*, *Melinis minutiflora*, *Paspalum conjugatum*, and *Psidium cattleianum*; predation by the black twig borer, slugs, and snails; habitat degradation by feral pigs; and a risk of extinction from naturally occurring events (e.g., landslides) and/or reduced reproductive vigor due to the small number of individuals (HINHP Database 2001; Service 1999; 61 FR 53108).

Sesbania tomentosa (Ohai)

Sesbania tomentosa, a short-lived perennial member of the pea family (Fabaceae), is typically a sprawling shrub but may also be a small tree. Each compound leaf consists of 18 to 38 oblong to elliptic leaflets that are usually sparsely to densely covered with silky hairs. The flowers are a salmon color tinged with yellow, orange-red, scarlet, or, rarely, pure yellow. *Sesbania tomentosa* is the only endemic Hawaiian species in the genus,

differing from the naturalized *S. sesban* by the color of the flowers, the longer petals and calyx, and the number of seeds per pod (Geesink *et al.* 1999).

The pollination biology of *Sesbania tomentosa* has been studied by David Hopper, University of Hawaii. His findings suggest that although many insects visit *Sesbania* flowers, the majority of successful pollination is accomplished by native bees of the genus *Hylaeus* and that occurrences at Kaena Point on Oahu are probably pollinator-limited. Flowering at Kaena Point is highest during the winter-spring rains and gradually declines throughout the rest of the year. Other aspects of this plant's life history are unknown (Service 1999).

Currently, *Sesbania tomentosa* occurs on six of the eight main Hawaiian Islands (Kauai, Oahu, Molokai, Kahoolawe, Maui, and Hawaii) and in the Northwestern Hawaiian Islands (Nihoa and Necker). It is no longer extant on Niihau and Lanai. On Oahu, *Sesbania tomentosa* is known from 3 occurrences of 54 to 55 wild and approximately 200 outplanted individuals on State-owned land within the Kaena Point NAR and from Keawaula on State and private lands (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333).

On Oahu, *Sesbania tomentosa* is found on cliff faces, broken basalt, and sand dunes with rock outcrops in *Scaevola sericea* coastal dry shrubland and *Sporobolus virginicus* (aki aki) mixed grasslands between sea level and 152 m (0 and 499 ft) elevation. Associated native plant species include *Heliotropium anomalum* (ahinahina), *Jacquemontia ovalifolia* ssp. *sandwicensis*, *Melanthera* sp., *Myoporum sandwicense*, or *Sida fallax* (HINHP Database 2001; Service 1999).

The primary threats to *Sesbania tomentosa* on Oahu are competition with the nonnative plant species *Lantana camara* and *Leucaena leucocephala*; lack of adequate pollination; seed predation by rats, mice, and, potentially, nonnative insects; fire; trampling by hikers, motorcycles, and all-terrain vehicles; and a risk of extinction from naturally occurring events (e.g. tsunami) and/or reduced reproductive vigor due to the small number of occurrences and individuals (HINHP Database 2001; Service 1999; 59 FR 56333).

Silene lanceolata (NCN)

Silene lanceolata, a member of the pink family, is an upright, short-lived perennial with stems 15 to 50 cm (6 to 20 in) long, which are woody at the base. The flowers are white with deeply-

lobed, clawed petals. This species is distinguished from other Hawaiian members of the genus by its erect stem, terminal inflorescence, and length of the calyx, clawed petals, and carpophore (ovary structure) (Wagner *et al.* 1999).

Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors for *Silene lanceolata* are unknown (Service 1996d).

The historical range of *Silene lanceolata* includes five Hawaiian Islands: Kauai, Oahu, Molokai, Lanai, and Hawaii. *Silene lanceolata* is presently extant on Molokai, Oahu, and Hawaii. On Oahu, there are 4 occurrences with 62 individuals located in Koiahi Gulch and Waianae Kai on Federal and State lands (EDA Database 2001; GDSI 2001; HINHP Database 2001).

On Oahu, *Silene lanceolata* grows on cliff faces and ledges of gullies in dry to mesic shrubland and cliff communities at elevations of about 351 to 978 m (1,151 to 3,208 ft). Associated native plant species include *Artemisia australis*, *Bidens* sp., *Carex* sp., *Chamaesyce* sp., *Dodonaea viscosa*, *Lysimachia* sp., *Osteomeles anthyllidifolia*, *Schiedea mannii*, or the endangered *Tetramolopium filiforme* (HINHP Database 2001).

The threats to *Silene lanceolata* on Oahu are habitat destruction by feral goats and pigs; wildfires; and competition with the nonnative plant species *Ageratina riparia*, *Erigeron karvinskianus*, *Lantana camara*, *Melinis minutiflora*, *Melinis repens*, and *Schinus terebinthifolius* (HINHP Database 2001; Service 1996d; 57 FR 46325).

Solanum sandwicense (Popolo aiakeakua)

Solanum sandwicense, a member of the nightshade family (Solanaceae), is a large sprawling shrub. The younger branches are more densely hairy than older branches, and the oval leaves usually have up to four lobes along the margins. This short-lived perennial species differs from other members of the genus by having dense hairs on young plant parts, a greater height, and lacking prickles (Symon 1999).

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

Historically, *Solanum sandwicense* was known from both Oahu and Kauai. This species was last seen on Oahu in 2000. Currently, this species is only