

Geranium hillebrandii (nohoanu); *Lagenifera maviensis*; *Leptecophylla tameiameia*; *Lycopodium* spp.; *Machaerina* spp.; *Myrsine vaccinioides* (kolea); *Oreobolus furcatus*; *Plantago pachyphylla* (laukahi kuahiwi); or *Viola maviensis* (HINHP Database 2001; Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001).

Habitat degradation by feral pigs, a risk of extinction caused by random environmental events and reduced reproductive vigor caused by the small number of existing occurrences, and slugs are the major threats to *Sanicula purpurea* (HINHP Database 2001; Service 1999; 61 FR 53108).

Schiedea hookeri (NCN)

Schiedea hookeri, a member of the pink family (Caryophyllaceae), is a sprawling or clumped perennial herb. This species is distinguished from others in this endemic Hawaiian genus by its open, hairy, and sometimes sticky inflorescence, and by the size of the capsules (Wagner *et al.* 1999).

Based on field and greenhouse observations, *Schiedea hookeri* is hermaphroditic, which means that each individual has both male and female reproductive organs. Mature fruits have been observed in June and August. *Schiedea hookeri* appears to be an outcrossing species. Under greenhouse conditions, flowers do not set fruit unless pollinated. In the field, the species is presumed to be pollinated by insects, although none have been observed. A related species, *S. lydgatei* on Molokai, is apparently pollinated by native, night-flying moths. A series of self-pollinations, intra-population crosses, and crosses among populations have demonstrated that *S. hookeri* experiences moderately strong inbreeding depression. These results indicate that reductions in population size could result in inbreeding depression among progeny, with negative consequences for the long-term persistence of this species. Individuals of *S. hookeri* appear to be long-lived, but there is no evidence of reproduction from seed under field conditions. Seedlings of *Schiedea* occurring in mesic or wet sites are apparently consumed by introduced slugs and snails, which have been observed feeding on *S. membranacea*, another mesic forest species that occurs on Kauai. In contrast to mesic forest species, *Schiedea* occurring in dry areas produce abundant seedlings following winter rains, presumably because the drier sites have fewer nonnative predators. *Schiedea hookeri* differs considerably through its range in potential for clonal growth. Plants from

Kaluakauila Gulch are upright and show little potential for clonal spread. In contrast, clonal growth has been detected for individuals at Kaluua Gulch, where the growth form is decumbent and plants apparently root at the nodes. Little else is known about the life history of *Schiedea hookeri*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are otherwise unknown (HINHP Database 2001; Service 1999; Weller and Sakai, unpublished data; 61 FR 53108).

Historically, *Schiedea hookeri* was known from the Waianae Mountains of Oahu and from a single fragmentary collection from Haleakala on Maui that may represent *S. menziesii* rather than *S. hookeri*. Currently, this species is known only from Oahu (Environmental Division of the Army (EDA) Database 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

Nothing is known of the preferred habitat of, or native plant species associated with, *Schiedea hookeri* on the island of Maui (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001), and nothing is known of the threats to *Schiedea hookeri* on the island of Maui (Service 1999; 61 FR 53108).

Schiedea nuttallii (NCN)

Schiedea nuttallii, a member of the pink family (Caryophyllaceae), is a generally hairless, erect subshrub. This long-lived perennial species is distinguished from others in this endemic Hawaiian genus by its habit, length of the stem internodes, length of the inflorescence, number of flowers per inflorescence, and smaller leaves, flowers, and seeds (Wagner *et al.* 1999).

Little is known about the life history of *Schiedea nuttallii*. Based on field and greenhouse observations, it is hermaphroditic. Plants on Oahu have been under observation for 10 years, and they appear to be long-lived. *Schiedea nuttallii* appears to be an outcrossing species. Under greenhouse conditions, plants fail to set seed unless hand-pollinated, suggesting that this species requires insects for pollination. Fruits and flowers are abundant in the wet season but can be found throughout the year. Little else is known about the life history of *S. nuttallii*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are otherwise unknown (Service 1999; 61 FR 53108).

Historically, *Schiedea nuttallii* was known from Kauai and Oahu and was reported from Maui. Currently, it is found on Kauai, Oahu, and Molokai

(GDSI 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

Nothing is known of the preferred habitat of, or native plant species associated with, *Schiedea nuttallii* on the island of Maui (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001), and nothing is known of the threats to *Schiedea nuttallii* on the island of Maui (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 which are usually sparsely to densely covered with silky hairs. The flowers are salmon colored, 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 at Manoa. 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 populations 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 the life history of *S. tomentosa* are unknown (Service 1999; 59 FR 56333).

Historically, *Sesbania tomentosa* occurred on all eight of the main Hawaiian Islands and on the northwestern Hawaiian Islands of Nihoa and Necker. Currently, *S. tomentosa* occurs on Kauai, Oahu, Molokai, Kahoolawe, Maui, Hawaii, Nihoa, and Necker. On Maui, *S. tomentosa* is known from 7 occurrences with a total of 83 individuals. The occurrences are located on State-owned and/or State-leased land (Lihau section of West Maui NAR, Hana Forest Reserve, and Kanaio Training Area), under Federal jurisdiction (Kanaio National Guard Training Area) and on privately owned land within the East Maui Watershed Partnership and West Maui Mountains Watershed Partnership at Poelua Bay, Mokolea Point, between Kahakuloa Head and Puu Kahulianapa, Mahinanui, Olowalu, and Pimoe, south of Puu Puou. Off the south central coast of Kahoolawe, approximately 100 individuals of *S. tomentosa* are found on a small islet, Puu Koae, a State-