

longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

*Panicum niihauense* was known historically from Niihau and one location on Kauai. Currently, this species is only known from one occurrence of 23 individuals at the Polihale State Park area of Kauai on State-owned land (GDSI 2000; HINHP Database 2000).

*Panicum niihauense* is found scattered in sand dunes in coastal shrubland at elevations between 0 and 103 m (0 and 337 ft). Associated native plant species include *Cassytha filiformis* (kaunaoa pehu), *Chamaesyce celastroides*, *Dodonaea viscosa*, *Nama sandwicensis* (hinahina kahakai), *Ophioglossum pendulum* ssp. *falcatum* (puapua moa), *Scaevola sericea* (naupaka kahakai), *Sida fallax*, *Sporobolus virginicus* (akiaki), or *Vitex rotundifolia* (kolokolo kahakai) (HINHP Database 2000; K. Wood, pers. comm., 2001).

Primary threats to *Panicum niihauense* are destruction by off-road vehicles, competition with nonnative plant species, and a risk of extinction from naturally occurring events (e.g., landslides or hurricanes) and reduced reproductive vigor due to the small number of individuals in the one remaining population (HINHP Database 2000; 61 FR 53108).

#### *Phyllostegia knudsenii* (NCN)

*Phyllostegia knudsenii*, a nonaromatic member of the mint family (Lamiaceae), is an erect herb or vine. This short-lived perennial species is distinguished from others in the genus by its specialized flower stalk; it differs from the closely related *P. floribunda* by often having four flowers per group (Wagner *et al.* 1999).

Little is known about the life history of *Phyllostegia knudsenii*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Until 1993, *Phyllostegia knudsenii* was only known from the site of its original discovery made in the 1800s from the woods of Waimea on Kauai. There is currently one known occurrence with a total of 4 to 13 individuals on State-owned land in Koaie Canyon within the Alakai Wilderness Preserve (GDSI 2000; HINHP Database 2000; Wagner *et al.* 1999; K. Wood, *in litt.* 1999).

*Phyllostegia knudsenii* is found in *Metrosideros polymorpha* lowland mesic or wet forest at elevations between 399 and 1,059 m (1,309 and

3,475 ft). Associated native plant species include *Bobea timonioides* (ahakea), *Claoxylon sandwicense*, *Cryptocarya mannii*, *Cyrtandra kauaiensis*, *Cyrtandra paludosa* (moa), *Diospyros sandwicensis*, *Elaeocarpus bifidus*, *Ilex anomala*, *Myrsine linearifolia*, *Perrottetia sandwicensis*, *Pittosporum kauaiense* (hoawa), *Pouteria sandwicensis*, *Pritchardia minor*, *Selaginella arbuscula* (lepelepe moa), *Tetraplasandra oahuensis* (ohe mauka), or *Zanthoxylum dipetalum* (61 FR 53070; K. Wood, pers. comm., 2001).

Major threats to *Phyllostegia knudsenii* include habitat degradation by feral pigs and goats, competition with nonnative plants, and a risk of extinction from naturally occurring events (e.g., landslides and hurricanes) and reduced reproductive vigor due to the small number of individuals in the only known population (61 FR 53070; Service 1998a).

#### *Phyllostegia waimeae* (NCN)

*Phyllostegia waimeae*, a nonaromatic member of the mint family (Lamiaceae), is a climbing perennial plant. Characteristics that distinguish this species from others in the genus are the nearly stalkless bracts that partially overlap and cover the flowers, and relatively fewer oil glands on the leaves (Wagner *et al.* 1999).

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

Historically, *Phyllostegia waimeae* was known from Kaholuamanu and Kaaha on Kauai. Currently, one occurrence with six individuals persists on State land in Kawaiiki Valley within the Na Pali-Kona Forest Reserve (K. Wood, *in litt.* 2001).

This species typically grows in *Acacia koa*-*Metrosideros polymorpha* dominated wet or mixed mesic forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominants at elevations between 655 and 1,224 m (2,149 and 4,016 ft). Associated native plant species include *Broussaisia arguta*, *Claoxylon sandwicense*, *Diplazium sandwichianum*, *Dubautia knudsenii*, *Elaphoglossum* spp., *Gunnera kauaiensis*, *Hedyotis* spp., *Myrsine lanaiensis*, *Pleomele aurea*, *Psychotria* spp., *Sadleria* spp., *Scaevola procera* (naupaka kuahiwi), *Syzygium sandwicensis*, or *Vaccinium* spp. (K. Wood, pers. comm., 2001).

Habitat destruction by feral goats, erosion, and competition with

introduced grasses are the major threats to *Phyllostegia waimeae*. The species is also threatened by over-collecting for scientific purposes; extinction from naturally occurring events, such as hurricanes; and/or reduced reproductive vigor due to the small number of existing individuals (Service 1995).

#### *Phyllostegia wawrana* (NCN)

*Phyllostegia wawrana*, a nonaromatic member of the mint family (Lamiaceae), is a perennial vine that is woody toward the base and has long, crinkly hairs along the stem. This short-lived perennial species can be distinguished from the related *P. floribunda* and *P. knudsenii* by its less specialized flower stalk (Wagner *et al.* 1999).

Seeds were observed in the wild in August 1993. No additional life history information for this species is currently known (Service 1998a).

*Phyllostegia wawrana* was reported to be found at Hanalei on Kauai in the 1800s and along Kokee Stream in 1926. Currently, four occurrences with approximately 34 to 54 individuals are reported from Koaie Canyon, Moaalele, Awaawapuhi Valley, and Makaleha on State-owned land within the Alakai Wilderness Preserve, Hono o Na Pali NAR, and Kokee State Park (GDSI 2000; HINHP Database 2000).

This species grows at elevations between 398 and 1,284 m (1,306 and 4,212 ft) in *Acacia koa*-*Metrosideros polymorpha*-*Cheirodendron* mixed mesic forest. Associated native plant species include *Alectryon macrococcus*, *Asplenium polyodon*, *Athyrium microphyllum*, *Carex* spp., *Claoxylon sandwicense*, *Cyanea fissia* (haha), *Delissea rivularis*, *Dianella sandwicensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Doodia kunthiana*, *Dryopteris wallichiana*, *Dubautia knudsenii*, *Dubautia laevigata*, *Hedyotis tryblum*, *Machaerina angustifolia*, *Panicum nephelophilum*, *Peperomia* spp., *Perrottetia sandwicensis*, *Pleomele aurea*, *Poa sandwicensis*, *Pteridium aquilinum* var. *decompositum*, *Sadleria pallida*, *Scaevola procera*, *Schiedea stellarioides*, *Syzygium sandwicensis*, *Touchardia latifolia*, or *Vaccinium dentatum* (HINHP Database 2000; 61 FR 53070; K. Wood, pers. comm., 2001).

Major threats to *Phyllostegia wawrana* include habitat degradation by feral pigs and competition with nonnative plant species, such as *Erechtites valerianifolia*, *Erigeron karvinskianus*, *Melastoma candidum*, *Passiflora tarminiana*, *Rubus argutus*, and *Rubus rosifolius* (61 FR 53070; Service 1998a).