

## The Islands of Kauai and Niihau

Because of its age and relative isolation, Kauai has levels of floristic diversity and endemism that are higher than on any other island in the Hawaiian archipelago. However, the vegetation on Kauai has undergone extreme alterations because of past and present land use. Land with rich soils was altered by the early Hawaiians and, more recently, converted to agricultural use or pasture. Intentional or inadvertent introduction of nonnative plant and animal species has also contributed to the reduction of native vegetation on the island of Kauai. Native forests are now limited to the upper elevation mesic (moist) and wet regions within Kauai's Conservation District. The land that supports the habitat essential to the conservation of the 83 plant taxa is owned by various private parties, the State of Hawaii (including State parks, forest reserves, natural area reserves, and a wilderness area), and the Federal government. Most of the taxa included in this final rule persist on steep slopes, precipitous cliffs, valley headwalls, and other regions where unsuitable topography has prevented agricultural development, or where inaccessibility has limited encroachment by nonnative plant and animal species (Gagne and Cuddihy 1999).

Niihau's relative isolation and severe environmental conditions have produced a few endemic species. Unfortunately, human disturbance, primarily ungulate ranching, has drastically changed the vegetation and hydrological parameters of the island, leaving few of the native vegetation communities. Niihau has been privately owned since 1864 and access has been, and continues to be, restricted (Department of Geography 1998). Therefore, current information on plant locations and population status is extremely limited.

## Discussion of Plant Taxa

### *Species Endemic to Kauai and Niihau*

#### *Alsinidendron lychnoides* (kuawawaenohu)

*Alsinidendron lychnoides*, a member of the pink family (Caryophyllaceae), is a weakly climbing or sprawling subshrub, woody at the base, with a dense covering of fine glandular hairs throughout. This short-lived perennial species is distinguished from others in this endemic Hawaiian genus by the weakly climbing or sprawling habit, color of the sepals (modified leaves), number of flowers per cluster, and size of the leaves. It is closely related to *A.*

*viscosum*, which differs primarily by having narrower leaves, fewer capsule valves (fruit chambers), and fewer flowers per cluster (Wagner *et al.* 1999).

This species has been observed with fruits during February. No additional life history information for this species is currently known (Service 1998a).

Historically, *Alsinidendron lychnoides* was found on the island of Kauai on the east rim of Kalalau Valley near Keanapuka, the western and southeastern margins of the Alakai Swamp, and southwest of the Swamp near Kaholuamano. Currently, there are four occurrences with a total of eight individual plants. This species is extant on State-owned land in the Alakai Swamp, the Mohihi-Waialae Trail, Keanapuka and Pihea in the Alakai Wilderness Preserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve (Geographic Decision Systems International (GDSI) 2000; Hawaii Natural Heritage Program (HINHP) Database 2000).

*Alsinidendron lychnoides* typically grows on steep riparian clay or silty soil banks in montane wet forests dominated by *Metrosideros polymorpha* (ohia) and *Cheirodendron* spp. (olapa), or by *M. polymorpha* and *Dicranopteris linearis* (uluhe), at elevations between 828 and 1,344 meters (m) (2,715 and 4,408 feet (ft)). Associated native plant species include *Asplenium* spp. (no common name (NCN)), *Astelia* spp. (painiu), *Broussaisia arguta* (kanawao), *Carex* spp. (NCN), *Cyrtandra* spp. (haiwale), *Diplazium sandwichianum* (NCN), *Elaphoglossum* spp. (ekaha), *Hedyotis terminalis* (manono), *Machaerina* spp. (uki), *Peperomia* spp. (ala ala wai nui), or *Vaccinium* spp. (ohelo) (61 FR 53070; Ken Wood, National Tropical Botanical Garden (NTBG), pers. comm., 2001).

The major threats to this species are competition from the aggressive nonnative plant species *Rubus argutus* (prickly Florida blackberry); habitat degradation by feral pigs (*Sus scrofa*); trampling by humans; risk of extinction from naturally occurring events, such as landslides or hurricanes; and reduced reproductive vigor due to the small number of extant individuals (61 FR 53070).

*Alsinidendron viscosum* (no common name (NCN))

*Alsinidendron viscosum*, a member of the pink family (Caryophyllaceae), is a weakly climbing or sprawling subshrub densely covered with fine glandular hairs. This short-lived perennial species is distinguished from others in this endemic Hawaiian genus by the weakly climbing or sprawling habit, color of the sepals, number of flowers per cluster,

and size of the leaves. It is closely related to *A. lychnoides*, which differs primarily in having wider leaves and more capsule valves and flowers per cluster (Wagner *et al.* 1999).

*Alsinidendron viscosum* has been observed in flower during January, February, and April. No additional life history information for this species is currently known (Service 1998a).

Historically, *Alsinidendron viscosum* was found at Kaholuamano, Kokee, Halemanu, Nawaimaka, and Waialae areas of northwestern Kauai. Currently, there are a total of seven occurrences containing about 319 individuals on the island of Kauai. These occurrences are on State-owned land at the Halemanu-Kokee Trail, Mohihi-Waialae Trail, Kawaiiki Valley, Waialae Falls, and Nawaimaka Valley in the Alakai Wilderness Preserve, Kokee State Park, and the Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000; 61 FR 53070).

*Alsinidendron viscosum* is typically found at elevations between 754 and 1,224 m (2,474 and 4,016 ft), on steep slopes in *Acacia koa* (koa)-*Metrosideros polymorpha* lowland and montane mesic forest. Associated native plant species include *Alyxia oliviformis* (maile), *Asplenium polyodon* (punana manu), *Bidens cosmoides* (poola nui), *Bobea* spp. (ahakea), *Carex meyenii* (NCN), *Carex wahuensis* (NCN), *Coprosma* spp. (pilo), *Dianella sandwicensis* (ukiuki), *Dodonaea viscosa* (aalii), *Doodia kunthiana* (ohupuku pulauui), *Dryopteris glabra* (kilau), *Dryopteris unidentata* (akole), *Dryopteris wallichiana* (ionui), *Dubautia laevigata* (naenae), *Gahnia* spp. (NCN), *Ilex anomala* (aiea), *Melicope* spp. (alani), *Panicum nephelophilum* (konakona), *Pleomele aurea* (hala pepe), *Psychotria* spp. (kopiko), *Pteridium aquilinum* var. *decompositum* (bracken fern), *Schiedea stellarioides* (laulihilihi), or *Vaccinium dentatum* (ohelo) (K. Wood, pers. comm., 2001).

The major threats to this species are destruction of habitat by feral pigs and goats (*Capra hircus*); competition with the nonnative plant species *Lantana camara* (lantana), and *Melinis minutiflora* (molasses grass), *Rubus argutus*; a risk of extinction from naturally occurring events, such as landslides or hurricanes; and reduced reproductive vigor due to the small number of extant populations and individuals (61 FR 53070).

*Brighamia insignis* (olulu)

*Brighamia insignis*, a member of the bellflower family (Campanulaceae), is an unbranched plant with a succulent stem that is bulbous at the bottom and